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October 31, 2018

BY HAND DELIVERY AND E-FILING

Mark D. Marini, Secretary
Commonwealth of Massachusetts
Department of Public Utilities
One South Station
Boston, MA 02110

Re: Cape Light Compact JPE, D.P.U. 18-116
2019-2021 Three-Year Energy Efficiency Plan

Dear Secretary Marini:

Pursuant to G.L. c. 164, § 134 and G.L. c. 25, §§ 19 and 21, the Cape Light Compact JPE (the "Compact") respectfully submits this filing, requesting approval from the Department of Public Utilities (the "Department") of its proposed energy efficiency investment plan, budget, and allocation of program operating costs for its energy efficiency programs during the period January 1, 2019 through December 31, 2021 ("Three-Year Plan"). The Compact proposes to adopt, as its Three-Year Plan, the 2019-2021 Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan, which the Massachusetts Program Administrators developed in collaboration with the Massachusetts Energy Efficiency Advisory Council ("Council"), the Council's consultants ("Consultants"), and other interested stakeholders. In support of this request, please find the following:

A. Pre-Hearing Statement

B. Petition for Approval of Energy Efficiency Investment Plan during the Period January 1, 2019 through December 31, 2021, which is supported by the following exhibits:

Vermont Office:
P.O. Box 205
Woodstock, Vermont 05091
Telephone: 802.457.9050
Facsimile: 802.419.8283
E-Mail: bckvt@bck.com

Mountain States Office:
P.O. Box 3625
Hailey, Idaho 83333
Telephone: 617.584.8338
Facsimile: 802.419.8283
E-Mail: bckidaho@bck.com

Exhibit Compact-1	2019-2021 Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan
Exhibit Compact-2	Pre-Filed Testimony of Margaret T. Downey, Doug Hurley and Joint Testimony of Margaret T. Downey, Margaret Song and Austin Brandt
Exhibit Compact-3	Guide to the Filing Requirements of the Green Communities Act and the Department in the 2019-2021 Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan
Exhibit Compact-4	Compact-specific Energy Efficiency Data Tables
Exhibit Compact-5	BCR Screening Model (on CD-Rom)
Exhibit Compact-6	Bill Impact Analysis
Exhibit Compact-7	Affidavits of Margaret T. Downey, Margaret Song, Austin Brandt, Doug Hurley and Erin Malone
Exhibit Compact-8	Compact Stakeholder Engagement Report
Exhibit Compact-9	Compact Board of Governors Presentations
Exhibit Compact-10	Compact Board of Governors Meeting Minutes
Exhibit Compact-11	Compact Public Outreach
Exhibit Compact-12	Synapse Energy Economics Reports to Compact

C. Motion for Interim Continuation of Existing Energy Efficiency Programs, which is being filed for approval in order to ensure continuity of program services as the Department reviews the 2019-2021 Three-Year Plan.

D. Appearances of Counsel

Throughout the collaborative process established under G.L. c. 25, § 21, the Compact worked diligently with the Council, the Consultants, interested stakeholders, and the other Massachusetts Program Administrators. On October 19, 2018, the Program Administrators, the Department of Energy Resources, and the Attorney General's Office reached an agreement on

the 2019-2021 goals, budgets, and performance incentives[1] reflected in the Three-Year Plan. On October 30, 2018, the Council passed a resolution supporting the Three-Year Plan. The Compact appreciates the intense efforts devoted to this process by many stakeholders and its fellow Program Administrators. These collective efforts contributed to the development of an integrated statewide electric and gas plan that continues the Commonwealth's strong investment in innovative energy efficiency and demand reduction efforts, while providing over $8.5 billion in projected benefits to customers and the Commonwealth, as well as significant environmental benefits. The Three-Year Plan builds on Massachusetts' historic success of delivering nation-leading energy efficiency programs, while also adopting innovative new approaches, such as active demand reduction, fuel neutral services, strategic electrification, and the incorporation of approaches to assist customers with switching to renewable energy and clean energy technologies.

In accordance with 220 C.M.R. § 7.02, the Compact respectfully submits its proposed operating budgets for the audit costs associated with residential conservation services ("RCS") and a comparison between planned and actual RCS spending for the previous three-year term in the Three-Year Plan to meet the requirements of subsection (b) of section 7 of chapter 465 of the Acts of 1980.

The Compact proposed budget for the three-year period is $162,931,023 ($45,681,618 in 2019, $55,799,419 in 2020, and $61,449,986 in 2021).

If the Compact's Three-Year Plan is approved as proposed, the proposed budgets will have the following effects:

- A residential customer R-1 using 516 kWh per month could experience a monthly peak bill increase of $1.31 or 1.1 percent in 2019; a monthly peak bill increase of $3.96 or 3.3 percent in 2020; and a monthly peak bill increase of $1.92 or 1.5 percent in 2021;

- A residential low-income customer (R-2) using 488 kWh per month could experience a monthly peak bill decrease of $-0.33 or -0.5 percent in 2019; a monthly peak bill increase of $1.00 or 1.5 percent in 2020; and a monthly peak bill increase of $0.43 or 0.6 percent in 2021; and

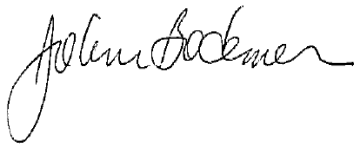
- Bill impacts for commercial and industrial customers will vary.

Customers who participate in energy efficiency programs may experience a monthly bill decrease over the duration of the Three-Year Plan.

[1] The Compact is a public entity and does not earn performance incentives.

The $100 filing fee is enclosed. Should you have any questions with respect to today's filing, please do not hesitate to contact me.

Very truly yours,



Jo Ann Bodemer

JAB/drb
Enclosures

cc: Sarah Smegal, Hearing Officer (via email only)
Jeffrey Leupold, Hearing Officer (via email and hand)
Energy Efficiency Advisory Council Members (via email and/or first class mail)
Service List in D.P.U. 18-110 through D.P.U. 18-118 (via email and/or first class mail)
D.P.U. 15-166 Service List (via email and/or first class mail)
Margaret T. Downey, Compact Administrator (via email and first class mail)

CAPE LIGHT COMPACT JPE
D.P.U. 18-116

Three-Year Energy Efficiency Plan
January 1, 2019 - December 31, 2021

October 31, 2018

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THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

PRE-HEARING STATEMENT ON BEHALF OF THE CAPE LIGHT COMPACT JPE

The Cape Light Compact JPE (the "Compact") respectfully requests approval from the Department of Public Utilities (the "Department"), pursuant to G.L. c. 164, § 134 and G.L. c. 25, §§ 19 and 21, of its proposed energy efficiency plan, budget and allocation of program operating costs for its energy efficiency programs for the period January 1, 2019 through December 31, 2021 ("Three-Year Plan") (Exhibit Compact-1 through Exhibit Compact-12). The Compact proposes to adopt, as the core of its Three-Year Plan, the 2019-2021 Massachusetts Joint Statewide Three-Year Energy Efficiency Plan, which was developed through a collaborative process, unanimously adopted by the other gas and electric distribution companies and the Compact (together "Program Administrators" or "PAs"). On October 30, 2018, the Energy Efficiency Advisory Council (the "Council") passed a resolution supporting the Three-Year Plan. In accordance with section 3.7.2(b) of the Department's *Energy Efficiency Guidelines*, D.P.U. 11-120-A, Phase II (2013), the Compact hereby submits its pre-hearing statement setting forth the relevant information for the Compact's Three-Year Plan.

As its pre-hearing statement, the Compact states the following:

1. One or more of the following Compact personnel may be called upon to testify on behalf of the Compact's Three-Year Plan:

(a) Margaret T. Downey, Compact Administrator, with respect to the administration of the Compact, and the accompanying Petition and supporting Exhibit Compact-1 through Exhibit Compact-12;

(b) Margaret Song, Commercial & Industrial ("C&I") Program Manager, with respect to the Compact's C&I programs, and the accompanying Petition and supporting Exhibit Compact-1; and

(c) Austin Brandt, Senior Power Supply Planner, with respect to the Compact's proposed Cape and Vineyard Electrification Offering and energy storage initiative.

Annexed hereto as Exhibit 1 are the resumes of Margaret T. Downey, Margaret Song and Austin Brandt.

2. In addition, the Compact has retained Synapse Energy Economics, Inc. ("Synapse") to develop the quantitative components of its Three-Year Plan. It is anticipated that the Compact will present the following Synapse personnel as expert witnesses:

(a) Erin Malone, Senior Associate, responsible for the Compact's quantitative analysis included in the Three-Year Plan Data Tables and the coordination between PAs of consistent program assumptions for all applicable calculations; and

(b) Doug Hurley, Principal Associate, contributed his expertise in the areas of Forward Capacity Market calculations.

Annexed hereto as Exhibit 2 are the resumes of Erin Malone and Doug Hurley.

3. Accompanying the Compact's Petition filed with the Department in D.P.U. 18-116 are the following exhibits:

(a) Exhibit Compact-1 – 2019-2021 Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan, which the Compact adopts as the core of its Three-Year Plan;

(b) Exhibit Compact-2 – Pre-Filed Testimony of Margaret T. Downey, Doug Hurley and the Joint Testimony of Margaret T. Downey, Margaret Song and Austin Brandt;

(c) Exhibit Compact-3 – Guide to the Filing Requirements of the Green Communities Act and the Department in the 2019-2021 Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan;

(d) Exhibit Compact-4 – Compact Specific Energy Efficiency Data Tables;

(e) Exhibit Compact-5 – BCR Screening Model (on CD-Rom);

(f) Exhibit Compact-6 – Bill Impact Analysis;

(g) Exhibit Compact-7 – Affidavits of Margaret T. Downey, Margaret Song, Austin Brandt, Doug Hurley and Erin Malone;

(h) Exhibit Compact-8 – Compact Stakeholder Engagement Report

(i) Exhibit Compact-9 – Compact Board of Governors Presentations;

(j) Exhibit Compact-10 – Compact Board of Governors Meeting Minutes

(k) Exhibit Compact-11 – Compact Public Outreach; and

(l) Exhibit Compact-12 – Synapse Energy Economics, Inc. Reports to Compact

4. On October 31, 2018, the Compact submitted the Three-Year Plan for Department review and approval pursuant to G.L. c. 164, § 134 and An Act Relative to Green Communities, Acts of 2008, c. 169, codified at G.L. c. 25, §§ 19, 21-22, amended by An Act Relative to Competitively Priced Electricity in the Commonwealth, Acts of 2012, c. 209, and by An Act to

Advance Clean Energy, Acts of 2018, c. 227[1] ("Green Communities Act" or "GCA") ("Three-Year Plan Filing"). The Compact developed its Three-Year Plan, in consultation with the Council, the Council's Consultants, interested parties and in collaboration with the other Program Administrators, resulting in state-of-the-art programs and ambitious goals for energy efficiency within the Compact's service territory. Both the statewide and Compact-specific tables filed herewith were developed in accordance with the GCA and as a result of many months of discussions and collaboration.

5. The Three-Year Plan Filing is consistent with the templates established by the Department and the Department's Additional Filing Requirements Memorandum (October 3, 2018), and includes both the Three-Year Plan, which is an integrated, statewide plan, and Compact-specific data. As detailed in the Three-Year Plan, the annual budgets for these programs expand energy efficiency efforts during 2019 to 2021 and are consistent with the mandate of the GCA to implement all available cost-effective energy efficiency. *2016-2018 Three-Year Plans Order*, D.P.U. 15-160 through 15-169 (2016); *2013-2015 Three-Year Plans Order*, D.P.U. 12-100 through D.P.U. 12-111 (2013). These budgets will support the aggressive savings goals and new, innovative programs proposed in the Three-Year Plan through cost-effective and sustained efforts that take into account customer bill impacts.

6. The Compact's filing is consistent with the goals of G.L. c. 25, §§ 19 and 21, the requirements of G.L. c. 164, § 134(b), and the Department's previous review and approval of energy efficiency investment plan programs for the prior three-year terms. The Compact's filing is also consistent with the Department's Orders in *Energy Efficiency Guidelines*, D.P.U. 08-50-A (2009) and D.P.U. 08-50-B, D.P.U. 08-50-D, Order on Bill Impacts (2012), *Energy*

1 Acts of 2018, c. 227 was signed on August 9, 2018 and is effective November 7, 2018 (the Act does not

Efficiency Guidelines, D.P.U. 11-120-A, Order on Program Net Savings and Environmental Compliance Costs (2012), and *Energy Efficiency Guidelines*, D.P.U. 11-120-A, Phase II, Order Approving Revised Energy Efficiency Guidelines (2013). Under the Three-Year Plan, the Compact will deliver energy efficiency and demand reduction program offerings in a cost-effective manner that captures all available efficiency and demand savings opportunities for its customers and minimizes administrative costs to the fullest extent practicable while utilizing competitive procurement to the fullest extent practicable.

7. The Compact is not aware of any issues requiring stipulation.

8. The Compact has separately filed for Department approval a Motion for Interim Continuation of Existing Energy Efficiency Programs ("Program Motion"). The Program Motion proposes to continue the Compact's energy efficiency program offerings at budget levels approved for 2018 during the period January 1, 2019 through January 29, 2019, or until the Department approves the Three-Year Plan (Exhibit Compact-1). As grounds for the Program Motion, the Compact relies upon prior Department precedent. *See 2013-2015 Three-Year Plans Order* at 16-161.

9. As of this date, the Compact has not filed any motions seeking confidentiality with respect to the Compact's Three-Year Plan.

10. As of this date, no experts have been designated so the Compact has no objections to offer on expert witness qualifications at this time. However, the Compact reserves the right to object should such a witness be offered at a later time, in accordance with the procedural schedule in this proceeding.

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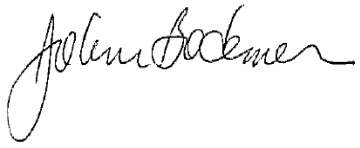
include an emergency preamble).

Respectfully submitted by,

CAPE LIGHT COMPACT JPE
By its attorneys,



Jeffrey M. Bernstein, Esq.
Jo Ann Bodemer, Esq.
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271 Waverley Oaks Road, Suite 203
Waltham, Massachusetts 02452
Telephone: (617) 244-9500
Fax: (802) 419-8283

Dated: October 31, 2018

MARGARET TARA DOWNEY
Post Office Box 1234
Barnstable, MA 02630
(508) 362-5845

Education:

1996-2002	Harvard University, Graduate Certificate of Special Studies in Administration and Management, Cambridge, MA.
1987-1991	Masters of Public Administration, University of Washington, Seattle, WA.
1981-1985	Bachelors of Arts, Environmental Studies, Johnson State College, Johnson, VT.

Additional Professional Training:

1993	Cascade Management Series, Cascade Center for Public Service, University of Washington, Seattle, WA.

Work Experience:

2014-Present Cape Light Compact Administrator

1996-2014 Assistant County Administrator/Cape Light Compact Administrator, Barnstable County, Cape Cod, MA.

- Responsible for the development and implementation of regional services
- Responsible for the management and oversight of the Cape Light Compact's 21-town municipal aggregation project including both Energy Efficiency and Power Supply Programs. Responsibilities include budget preparation, chief procurement officer functions, power supply contract negotiations, and oversight of technical and legal consultants
- Assists the County Administrator in coordinating the functions of the County under the direction and guidance of the Board of Commissioners
- Manage the Office of County Commissioners including the supervision and discipline of employees, preparation of the department's budget and annual reports
- Monitor and oversee budgets and compliance requirements for the County's Dredge, Resource Development, Children's Cove and Human Services Departments; including supervisory responsibilities for these departments
- Serves as the Human Resources Director for the County. Advises department heads on methods to be used when administering personnel procedures including: hiring, disciplining and terminating. Maintains the County's Personnel Policies
- Responsible for implementing and monitoring the Barnstable County Employee Performance Appraisal System
- Represent the County Commissioners in collective bargaining negotiations and interactions with Union representatives
- Represents the County Commissioners at meetings with the County's legislative body, Assembly of Delegates
- Implement and oversee special projects as directed by the County Commissioners and the Barnstable County Assembly of Delegates
- Represent the County Commissioners at the Town, State, and Federal level on regional projects

- Acts in the absence of the County Administrator

1994-1996 Resource Development Manager, Barnstable County, Cape Cod, MA.

- Responsible for the fiscal oversight of the County's $1.8 million grant programs.
- Administer the County's Federal funded JTPA Summer Youth Employment Program on behalf of the 15 Towns in the County.
- Write and research grant and other funding proposals for County and Town Departments.
- Prepare and disseminate information, via a Newsletter, on funding opportunities to County and Town departments.

1993-1994 Environmental/Community Services Department Manager, City of Issaquah, Issaquah, WA

- Disseminate and track work assigned to the members of the Department.
- Responsible for implementation of the Department's annual goals.
- Develop and manage the Department annual budget.
- Public Affairs Spokeswoman for the City
- Responsible for ensuring that City Council actions are in compliance with the Washington State Environmental Policy Act (SEPA).
  Participate with the Executive Team in the development of the City's Strategic Plan.

1989-1993 Research Analyst, City of Issaquah, Issaquah, WA

- Participate in and conduct intergovernmental meetings and forums with other public agencies on behalf of the City regarding technical environmental matters, community affairs, and social and human services issues.
- Coordinate and administer all phases of environmental review for private development projects, City projects, and regional projects.
- Manage ongoing production of Environmental Impact Statements and Technical Reports including consultant selection, contract negotiation, consultant performance, and final review of all documents.
- Plan, write, and coordinate the City's Quarterly Community Newsletter.
- Manage and monitor the City's Community Development Block Grant Program.
- Research and prepare various grant applications on behalf of the City.
- Develop, revise, and research City Ordinances.
- Provide staff reports to Mayor and City Administrator on all legislative matters that may potentially impact the City.

Volunteer Experience:

- Former Member of the Governing Board of the Cape Cod Chapter of the American Red Cross, 1997-2000.
- Former Member of the Board of Directors, March of Dimes Cape & Islands Chapter, 1995-1998.
- 1995 Graduate of Cape Cod Community Leadership Institute Program.

Margaret Song

Cape Light Compact JPE. 261 Whites Path, Unit 4, South Yarmouth, MA 02664

Experience

Program Manager, Cape Light Compact

2003-present South Yarmouth, MA

- Responsibility for implementation of commercial & industrial energy efficiency programs for Cape Cod and Martha's Vineyard residents from 2016 to present
- Responsibility for implementation of residential and low-income energy efficiency programs from 2003 - 2015
- Frequent speaker on energy efficiency topics including Department of Energy (DOE), the Consortium for Energy Efficiency, American Council for an Energy-Efficiency Economy, and local organizations
- Former board member, New England HERS Alliance; member, DOE Commercially Available LED Product Evaluation and Reporting (CALiPER) program advisory committee.

Member, AmeriCorps Cape Cod

2002-2003 Throughout Barnstable County, MA

- Voluntary, 11 month program for environmental service, concentrating on land and water conservation as well as disaster services. Work consists of larger, group projects and individual placements at local agencies.
- Individual placements include: Education/Outreach Intern at Monomoy National Wildlife Refuge in Chatham, MA; Energy Education Intern for the Cape Light Compact; and Mentor for the Green Grant Youth Council, guiding high school students in environment philanthropy, leadership, and service learning.

Account Executive, TimePiece Public Relations

2000-2002 Dallas, Texas

- Initially served as summer intern, later hired as account executive from summer of 2001 to early spring of 2002.
- Write and release press releases, act as a liaison between media and the clients, and facilitate client meetings and interviews

Education

Northeastern University, College of Professional Studies, Boston, MA (2008 to 2016), cum laude

- Bachelors of Science in Mechanical Engineering Technology
- Inducted into Sigma Alpha Lamba Honor Society in 2012

Harvard University, Cambridge, MA (2003 to 2007)

- Courses completed for Masters of Liberal Arts in History and Women's Studies

Hendrix College, Conway, AR (Fall 1998 to Spring 2002)

- B.A., Major in English, Minor in Spanish
- Sigma Tau Delta Society (International English Honor Society)
- Raney Hall Award Recipient

Specialized Skills

Proficient in: Microsoft Office Suite and Adobe Creative Suite

- Working knowledge of spoken and written Spanish, native speaker in Korean.

References

References are available on request.

Austin Brandt
261 Whites Path, Suite 4, S. Yarmouth, MA 02664 | 508.375.6623 | austin.brandt@capelightcompact.org

Professional Experience

Senior Power Supply Planner October 2015 - Present
Cape Light Compact, S. Yarmouth, MA

- Manage contracts to serve the aggregated electricity load of the Cape Light Compact's (CLC) power supply customers.
- Coordinate with CLC Administrator and counsel to advocate for Cape & Vineyard ratepayers at the state level.
- Develop, implement, and manage CLC's demand response initiatives.
- Manage CLC Green program, including REC procurement and retirement.
- Administer the Compact's SREC pre-purchase and PV grant programs for affordable housing.
- Represent CLC as a Director and Executive Committee Member on the Cape & Vineyard Electric Cooperative Board of Directors.
- Provide updates to the CLC Governing Board and represent CLC on power supply-related issues.

Energy Manager and Conservation Agent August 2014 – September 2015
Town of Provincetown, Provincetown, MA

- Developed, implemented, and managed initiatives to reduce municipal energy use.
- Tracked municipal energy use and completed annual reporting for Green Community designation.
- Principal administrator of over $175,000 in energy and environmental grant funds.
- Led efforts to expand municipal renewable energy generation.
- Coordinated with Cape Light Compact to educate residents and students on energy issues and energy efficiency.
- Initiated and led the Solarize Provincetown program, which approximately tripled residential solar PV production capacity in Provincetown.
- Led efforts and secured grant funding to install the first public electric vehicle charging stations in Provincetown.
- Administered and enforced the Massachusetts Wetlands Protection Act and Provincetown Wetlands Protection Bylaw.
- Managed over 200 acres of Town-owned conservation land.

AmeriCorps Conservation Assistant October 2013 – July 2014
Provincetown Conservation Commission, Provincetown, MA

- Tracked all municipal electricity and fossil fuel consumption to maintain Provincetown's Massachusetts Green Community designation.
- Produced ArcGIS maps of town- and trust-owned properties for conservation projects, including topography, wetland, and structure features.
- Recruited, coordinated, and managed volunteers for conservation projects.

AmeriCorps General Corps Member September 2013 – July 2014
AmeriCorps Cape Cod, Barnstable, MA

Appointments

- Cape Light Compact Director, Board of Directors and Executive Committee, Cape and Vineyard Electric Cooperative. October 2015 – Present.
- Provincetown Director, Board of Directors, Cape and Vineyard Electric Cooperative. September 2014 – September 2015.
- Provincetown Representative, Barnstable County Coastal Resources Committee. March 2015 - September 2015.

Education

B.S. Environmental Science, UNC-Chapel Hill, May 2013

Erin Malone, Senior Associate

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 2 I Cambridge, MA 02139 I 617-453-7021
emalone@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, May 2016 – Present, *Associate*, June 2013 – April 2016, *Research Associate*, January 2012 – June 2013.

- Assists in the evaluation of energy efficiency program design and implementation, including: efficiency technology assessment; program design and budgeting; cost-benefit analyses; avoided cost analyses; and regulatory policies, including program cost recovery and revenue decoupling.
- Conducts research and performs analysis with a special focus on energy efficiency topics, including: energy efficiency research and development; ratepayer-funded efficiency programs; energy efficiency as a central component in utility integrated resource planning; and the role of efficiency in addressing climate change.
- Creator of several proprietary Excel-based models designed to forecast the impacts of energy efficiency, including its impact on customers' rates and bills, expected savings and benefits, and budget forecasting and reporting.

Massachusetts Department of Public Utilities, Boston, MA. *Economist in Electric Power Division*, July 2008 – December 2011.

- Specialized in the review of electric utilities' energy efficiency activities.
- Established efficiency policy by recommending decisions to the Commission on issues related to cost-effectiveness, cost-recovery, and utility performance incentives. Managed timely approval of Massachusetts utilities' 2008-2012 efficiency plans and 2006-2010 efficiency reports by analyzing program implementation and reviewing evaluation studies.
- Created a model that analyzes all impacts of efficiency on consumers' rates and bills. Led stakeholder working groups, and investigated energy efficiency as a central component in utility integrated resource planning.

EDUCATION

Boston College, Chestnut Hill, MA
Bachelor of Arts in Economics, 2008. *Cum Laude*.

LEED Green Associate Accreditation, March 2012

PUBLICATIONS

Cook, R., J. Koo, N. Veilleux, K. Takahashi, E. Malone, T. Comings, A. Allison, F. Barclay, L. Beer. 2017. *Rhode Island Renewable Thermal Market Development Strategy*. Meister Consultants Group and Synapse Energy Economics for Rhode Island Office of Energy Resources.

Whited, M., E. Malone, T. Vitolo. 2016. *Rate Impacts on Customers of Maryland's Electric Cooperatives: Impacts on SMECO and Choptank Customers*. Synapse Energy Economics for Maryland Public Service Commission.

Malone, E., W. Ong, M. Chang. 2015. *State Net-to-Gross Ratios: Research Results and Analysis for Average State Net-to-Gross Ratios Used in Energy Efficiency Savings Estimates*. Synapse Energy Economics for the United States Environmental Protection Agency.

Woolf, T., K. Takahashi, E. Malone, A. Napoleon, J. Kallay. 2015. *Ontario Gas Demand-Side Management 2016-2020 Plan Review.* Synapse Energy Economics for the Ontario Energy Board.

Stanton, E. A., P. Knight, J. Daniel, B. Fagan, D. Hurley, J. Kallay, E. Karaca, G. Keith, E. Malone, W. Ong, P. Peterson, L. Silvestrini, K. Takahashi, R. Wilson. 2015. *Massachusetts Low Gas Demand Analysis: Final Report.* Synapse Energy Economics for the Massachusetts Department of Energy Resources.

Brockway, N., J. Kallay, E. Malone. 2014. *Low-Income Assistance Strategy Review*. Synapse Energy Economics for the Ontario Energy Board.

Woolf, T., E. Malone, F. Ackerman. 2014. *Cost-Effectiveness Screening Principles and Guidelines for Alignment with Policy Goals, Non-Energy Impacts, Discount Rates, and Environmental Compliance Costs.* Synapse Energy Economics for Northeast Energy Efficiency Partnerships (NEEP) Regional Evaluation, Measurement and Verification Forum.

Woolf, T., E. Malone, C. Neme, R. LeBaron. 2014. "Unleashing Energy Efficiency." *Public Utilities Fortnightly,* October, 30-38.

Woolf, T., E. Malone, C. Neme. 2014. *Regulatory Policies to Support Energy Efficiency in Virginia*. Synapse Energy Economics and Energy Futures Group for the Virginia Energy Efficiency Council.

Woolf, T., M. Whited, E. Malone, T. Vitolo, R. Hornby. 2014. *Benefit-Cost Analysis for Distributed Energy Resources: A Framework for Accounting for All Relevant Costs and Benefits.* Synapse Energy Economics for the Advanced Energy Economy Institute.

Malone, E. T. Woolf, K. Takahashi, S. Fields. 2013. "Appendix D: Energy Efficiency Cost-Effectiveness Tests." *Readying Michigan to Make Good Energy Decisions: Energy Efficiency*. Synapse Energy Economics for the Council of Michigan Foundations.

Stanton, E. A., S. Jackson, G. Keith, E. Malone, D. White, T. Woolf. 2013. *A Clean Energy Standard for Massachusetts.* Synapse Energy Economics for the Massachusetts Clean Energy Center and the Massachusetts Departments of Energy Resources, Environmental Protection, and Public Utilities.

Woolf, T., E. Malone, J. Kallay. 2014. *Rate and Bill Impacts of Vermont Energy Efficiency Programs.* Synapse Energy Economics for the Vermont Public Service Department.

Malone, E. 2014. "Driving Efficiency with Non-Energy Benefits." Presentation at the National Symposium on Market Transformation, April 1, 2013.

Woolf, T., E. Malone, J. Kallay, K. Takahashi. 2013. *Energy Efficiency Cost-Effectiveness Screening in the Northeast and Mid-Atlantic States.* Synapse Energy Economics for Northeast Energy Efficiency Partnerships, Inc. (NEEP).

Woolf, T., E. Malone, L. Schwartz, J. Shenot. 2013. *A Framework for Evaluating the Cost-Effectiveness of Demand Response.* Synapse Energy Economics and Regulatory Assistance Project for the National Forum on the National Action Plan on Demand Response: Cost-effectiveness Working Group.

Woolf, T., W. Steinhurst, E. Malone, K. Takahashi. 2012. *Energy Efficiency Cost-Effectiveness Screening: How to Properly Account for 'Other Program Impacts' and Environmental Compliance Costs.* Synapse Energy Economics for Regulatory Assistance Project and Vermont Housing Conservation Board.

Woolf, T., E. Malone, K. Takahashi, W. Steinhurst. 2012. *Best Practices in Energy Efficiency Program Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For*. Synapse Energy Economics for National Home Performance Council.

Woolf, T., J. Kallay, E. Malone, T. Comings, M. Schultz, J. Conyers. 2012. *Commercial & Industrial Customer Perspectives on Massachusetts Energy Efficiency Programs*. Synapse Energy Economics for the Massachusetts Energy Efficiency Advisory Council.

TESTIMONY

Massachusetts Department of Public (DPU 16-169): Oral testimony regarding Nation Grid's petition for ruling regarding the provision of gas energy efficiency services. On behalf of the Cape Light Compact. March 8-9, 2017.

Massachusetts Department of Public (DPU 16-169): Direct testimony of Tim Woolf and Erin Malone regarding Nation Grid's petition for ruling regarding the provision of gas energy efficiency services. On behalf of the Cape Light Compact. November 2, 2016.

Massachusetts Department of Public Utilities (DPU 16-127): Testimony regarding program results and cost-effectiveness inputs in the Cape Light Compact's 2013-2015 Energy Efficiency Three-Year Term Report. On behalf of the Cape Light Compact. February 10, 2017.

Massachusetts Department of Public Utilities (DPU 15-166): Testimony regarding program cost-effectiveness inputs in the Cape Light Compact's 2016-2018 Three-Year Energy Efficiency Plan. On behalf of the Cape Light Compact. December 9, 2015.

Massachusetts Department of Public Utilities (DPU 12-54 and DPU 13-118): Testimony regarding program results and cost-effectiveness inputs in the Cape Light Compact's 2011 and 2012 Annual Energy Efficiency Reports. On behalf of the Cape Light Compact. March 4, 2014.

Doug Hurley, Principal Associate

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 2 I Cambridge, MA 02139 I 617-453-7032
dhurley@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Principal Associate*, October 2011 – present; *Associate* July 2008 – October 2011; *Research Associate*, April 2004 – July 2008.

More than a decade of ongoing assistance to our clients in navigating the complex labyrinth of RTO market rules, especially regarding the participation of energy efficiency, distributed generation, and battery storage in wholesale capacity markets. Analyze and report the benefits of demand resource participation in wholesale capacity markets. Serving in sixth year as the leader of NEPOOL's Alternative Resources sector. Maintain our End User and Alternative Resource Sector clients' interests at ISO-NE and PJM stakeholder meetings. Analyze economic dispatch models and prepare expert testimony for regulatory proceedings. Analyze economic and environmental implications of renewable portfolio standards and clean energy policy scenarios. Investigate electricity market price trends and fluctuations.

Massachusetts Institute of Technology, Cambridge, MA. *Consultant*, 2002 – 2003.

Redesigned and renovated database for applicant information and reporting for the Department of Economics.

Outward Bound, Thompson Island in Boston Harbor, MA. *Instructor*, 2001 – 2003.

Led both multi-week youth courses for Outward Bound and one-day adult courses for Outward Bound Professional. Youth courses focused on character development for teenage boys and girls. Adult courses focused on team building for departments and entire corporations with emphasis on effective communication, rapid consensus-building, and courageous leadership.

Logictier, Inc., San Mateo, CA. *West Coast Research & Development*, 2000 - 2001.

Led the West Coast R&D team of this startup web hosting company. Helped grow the fledging company from 25 to 150 people, and the R&D group from a team of 2 to a department of 10.

Ernst & Young, Tyson's Corner, VA and Mountain View, CA. *Consultant*, 1992 - 1999.

Consulted to several Fortune 500 companies and public service organizations in various industries. Issues regarded information acquisition, network and application strategies, and database design, development, and deployment. Led teams of up to 10 people. Major clients included PSE&G of New Jersey, Public Service Company of Colorado, Coca Cola, Honda, Reebok, Lotus Development Corp., AmSouth Bank, Kaiser-Permanente, and OntarioHydro.

EDUCATION

Cornell University, Ithaca, NY
Bachelor of Science in Electrical Engineering, 1992

PUBLICATIONS

Peterson, P., D. Hurley, P. Knight. 2018. *Understanding ISO New England's Operational Fuel Security Analysis*. Prepared for Conservation Law Foundation, Acadia Center, New Hampshire Office of the Consumer Advocate, PowerOptions, RENEW Northeast, Vermont Energy Investment Corporation.

Horowitz, A., A. Allison, N. Peluso, B. Fagan, M. Chang, D. Hurley, P. Peterson. 2017. *Comments on the United States Department of Energy's Proposed Grid Resiliency Pricing Rules (FERC Docket RM18-1-000)*. Prepared for Earthjustice.

Stanton, E. A., P. Knight, J. Daniel, B. Fagan, D. Hurley, J. Kallay, E. Karaca, G. Keith, E. Malone, W. Ong, P. Peterson, L. Silvestrini, K. Takahashi, R. Wilson. 2015. *Massachusetts Low Gas Demand Analysis: Final Report.* Synapse Energy Economics for the Massachusetts Department of Energy Resources.

Hurley, D., P. Knight, J. Daniel, S. Fields. 2014. *Brayton Point Capacity Payment Requirement Analysis*. Synapse Energy Economics for Consumer Advocates of New England.

Daniel, J., S. Fields, and D. Hurley. 2014. *Memorandum Regarding an Updated Economic Analysis of Schiller Station Coal Units*. Synapse Energy Economics for the Conservation Law Foundation.

Knight, P., D. Hurley, S. Fields. 2014. *Energy Efficiency in US Capacity Markets.* Synapse Energy Economics.

Jackson, S., P. Peterson, D. Hurley, T. Woolf. 2013. *Forecasting Distributed Generation Resources in New England: Distributed Generation Must Be Properly Accounted for in Regional System Planning.* Synapse Energy Economics for E4 Group.

Hurley, D., P. Peterson, M. Whited. 2013. *Demand Response as a Power System Resource: Program Designs, Performance, and Lessons Learned in the United States.* Synapse Energy Economics for Regulatory Assistance Project.

Peterson, P., D. Hurley, S. Jackson, M. Schultz. 2012. *The Road to Better System Planning: ISO-New England's Revised Energy Efficiency Forecast.* Synapse Energy Economics for Connecticut Office of Consumer Counsel.

Hornby, R., D. Hurley, P. Knight. 2011. *A Review of Demand Response Potential in the United States*. Synapse Energy Economics for US Environmental Protection Agency.

White, D. E., D. Hurley, J. Fisher. 2011. *Economic Analysis of Schiller Station Coal Units*. Synapse Energy Economics for Conservation Law Foundation.

Peterson, P., V. Sabodash, M. Wittenstein, D. Hurley. 2011. *PJM System Planning: Enhancements for the 21st Century*. Synapse Energy Economics for Conservation Law Foundation.

Peterson, P., V. Sabodash, R. Wilson, D. Hurley. 2010 *Public Policy Impacts on Transmission Planning*. Synapse Energy Economics.

Peterson, P., D. Hurley, V. Sabodash. 2010. *Demand Response Potential in ISO New England's Day-Ahead Energy Market.* Synapse Energy Economics.

Peterson, P., D. Hurley, V. Sabodash. 2009. *Impact of PRD Participation in Day-Ahead Energy Market.* Synapse Energy Economics for NEPOOL Clients in Alternative Resources and End User Sectors.

Hurley, D., K. Takahashi, B. Biewald, J. Kallay, R. Maslowski. 2008. *Costs and Benefits of Electric Utility Energy Efficiency in Massachusetts*. Synapse Energy Economics.

Levine, S., D. Hurley, S. Kaplan. 2008. "Prime Time for Efficiency." *Public Utilities Fortnightly*, June 2008.

Peterson, P., D. Hurley, E.D. Hausman. 2008. *Incorporating Demand Resources in the PJM Reliability Pricing Model*. Synapse Energy Economics for Office of the Ohio Consumers' Counsel, Pennsylvania Office of Consumer Advocate, Office of the People's Counsel for the District of Columbia, EnerNOC, and Conservation Services Group.

Peterson, P., D. Hurley, D. White. 2007. *ISO New England Scenario Analysis Companion Report – Constructing a Future that Meets Regional Goals*. Synapse Energy Economics for Conservation Law Foundation and Northeast Energy Efficiency Partnerships.

Peterson, P., D. Hurley. 2006. *Options for State Funded Energy Efficiency Programs in the Forward Capacity Market*. Synapse Energy Economics.

Peterson, P., D. Hurley, T. Woolf, B. Biewald. 2006. *Incorporating Energy Efficiency into the ISO New England Forward Capacity Market: Ensuring the Capacity Market Properly Values Energy Efficiency Resources.* Synapse Energy Economics for Conservation Services Group.

Hurley, D. 2006 *Update on New England's Demand Response Programs.* Synapse Energy Economics.

PRESENTATIONS

Hurley, D. 2017. *Energy Efficiency in Wholesale Capacity Markets*. Presentation at the Alberta Energy Efficiency Conference, June 0, 2017.

Peterson, P., D. Hurley. 2007. "Demand Resources in the New England Forward Capacity Market." Synapse Energy Economics presentation at the ACEEE and CEE National Symposium on Market Transformation, March 2007.

TESTIMONY

Massachusetts Department of Public Utilities (Docket Nos. DPU 09-119, DPU 15-166): Oral testimony regarding the participation of the Cape Light Compact in New England's Forward Capacity Market as part of the submission of their 2010-2012 and 2016-2018 three-year energy efficiency plans.

New Hampshire Public Utilities Commission (Docket No. DE 10-261): Testimony regarding Public Service Company of New Hampshire's 2010 Least Cost Integrated Resource Plan. On behalf of Conservation Law Foundation. July 2011.

New Hampshire Public Utilities Commission (Docket No. DE 10-261): Expert report filed by Doug Hurley (White, D., D. Hurley, J. Fisher. 2012. *Economic Analysis of Schiller Station Coal Units*. Synapse Energy Economics for Conservation Law Foundation). On behalf of Conservation Law Foundation. July 2011.

Federal Energy Regulatory Commission (Docket No. ER10-2477-000): Testimony regarding ISO-New England Reliability Studies and Salem Harbor. On behalf of Conservation Law Foundation. October 2010.

Resume dated October 2018

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

PETITION FOR APPROVAL OF ENERGY EFFICIENCY INVESTMENT PLAN FOR THE PERIOD JANUARY 1, 2019 THROUGH DECEMBER 31, 2021

1. The Cape Light Compact JPE (the "Compact") respectfully requests approval from the Department of Public Utilities (the "Department"), pursuant to G.L. c. 164, § 134 and G.L. c. 25, §§ 19 and 21, of its proposed energy efficiency investment plan, budget, allocation of program operating costs for its energy efficiency programs for the period January 1, 2019 through December 31, 2021 ("Three-Year Plan") (Exhibit Compact-1). The Compact proposes to adopt, as its Three-Year Plan, the 2019-2021 Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan, which all gas and electric distribution companies and municipal aggregators with certified energy plans (together "Program Administrators" or "PAs") developed in collaboration with the Massachusetts Energy Efficiency Advisory Council ("Council"), its consultants ("Consultants"), and other interested stakeholders. The Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan is an integrated plan for the electric and gas Program Administrators and represents the jointly prepared energy efficiency investment plan for electric PAs and the jointly prepared natural gas investment plan for gas PAs in accordance with G.L. c. 25, § 21, as amended by Act to Advance Clean Energy, Acts of 2018, c. 227. Following months of detailed and comprehensive discussions, the Three-Year Plan was unanimously approved by Program Administrators.

In support of this Petition, the Compact states the following:

2. The Compact is a municipal aggregator with a certified energy plan pursuant to G.L. c. 164, § 134, and maintains a business office at 261 Whites Path, Unit #4, South Yarmouth, MA 02664.

3. The Compact consists of the towns of Aquinnah, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dennis, Edgartown, Eastham, Falmouth, Harwich, Mashpee, Oak Bluffs, Orleans, Provincetown, Sandwich, Tisbury, Truro, West Tisbury, Wellfleet and Yarmouth, and Dukes County organized and operating collectively as the Cape Light Compact JPE, a joint powers entity organized pursuant to G.L. c. 40, § 4A1/2.

4. The design, implementation, and cost recovery of the Compact's energy efficiency programs are subject to the jurisdiction of the Department under the provisions of G.L. c. 164 and G.L. c. 25, §§ 19 and 21.

5. Consistent with G.L. c. 25, § 21, and section 3.7.3 of the Department's *Energy Efficiency Guidelines*, D.P.U. 11-120-A, Phase II (2013) ("Guidelines"), the Compact seeks approval of its Three-Year Plan for effect during the three-year period commencing January 1, 2019 and ending December 31, 2021 ("Plan Term"). The Three-Year Plan will allow the Compact to satisfy the mandate of the Green Communities Act to capture all available cost-effective energy efficiency and demand reduction opportunities during the 2019-2021 Plan Term and maximize environmental benefits and net economic benefits through a sustained and integrated statewide energy efficiency effort.[1] In setting aggressive energy efficiency goals, the

[1] As a municipal aggregator, the Compact maintains that approval by the Department of its Three-Year Plan does not require the same finding that its plan ensures the capture of all energy efficiency as is the case for utility program administrators. G.L. c. 25, § 21(d)(2) (omitting municipal aggregators from this express directive). Nevertheless, the Compact submits that its Three-Year Plan captures all available cost-effective energy efficiency opportunities in its service territory.

Three-Year Plan takes into account many competing considerations, including, without limitation, cost efficiency, integrated program delivery, rising baselines and market saturation, and bill impacts, as well as environmental and economic benefits. The Three-Year Plan also incorporates new offerings, such as strategic electrification and renewable and clean energy technologies, including photovoltaics and wood pellet heating, permitted by the revisions to G.L. c. 25, § 21 by the Act to Advance Clean Energy, Acts of 2018, c. 227.

6. The Compact currently operates comprehensive energy efficiency programs targeting the residential, income eligible, and commercial & industrial customer sectors. These programs are operated pursuant to the 2016-2018 Three-Year Energy Efficiency Plan approved by the Department on January 28, 2016. *2016-2018 Three-Year Energy Efficiency Plans Order*, D.P.U. 15-160 through D.P.U. 15-169 (2016) ("2016-2018 Order"). The Three-Year Plan builds on the successes of the PAs' past three energy efficiency plans, which have resulted in Massachusetts being ranked number one in the nation for energy efficiency by the American Council for an Energy-Efficient Economy in every year since 2011. The Three-Year Plan proposes a comprehensive energy efficiency and demand reduction package to ensure that Massachusetts continues to lead the nation in energy efficiency and demand savings using an innovative, sustained, and integrated statewide approach.

7. This filing is consistent with the goals of the Green Communities Act, and the Department's previous review and approval of energy efficiency investment plan programs for the prior three-year terms. It is also consistent with the Department's Orders in *Energy Efficiency Guidelines,* D.P.U. 08-50-A (2009), D.P.U. 08-50-B, D.P.U. 08-50-D, Order on Bill Impacts (2012), *Energy Efficiency Guidelines,* D.P.U. 11-120-A, Order on Program Net Savings and Environmental Compliance Costs (2012), and *Energy Efficiency Guidelines*, D.P.U.

11-120-A, Phase II, Order Approving Revised Energy Efficiency Guidelines (2013). The filing also has fully incorporated the required elements set forth in the Department's Additional Filing Requirements Memorandum (October 3, 2018). In accordance with the Department's requirements, today's filing includes Compact-specific data to supplement the statewide Three-Year Plan.

8. As detailed in the Three-Year Plan, the proposed budgets and savings goals are consistent with the energy efficiency and demand reduction goals of the Green Communities Act, and support the aggressive savings goals and the significant environmental and economic benefits anticipated in this Three-Year Plan. The three-year total budget proposed by the Compact is $162,931,023 as detailed in the Three-Year Plan and the Compact-specific tables set forth in Exhibit Compact-4 of today's filing. Additionally, the Compact proposes aggressive savings goals that contribute to a sustainable energy efficiency effort. The total three-year lifetime savings goals proposed by the Compact reflect the savings from the variety of measures under the programs. The goals are 1,206,741 lifetime MWh (excluding fuel switching and active demand) and 9,312,089 lifetime adjusted MMBtus, including MMBtu savings at site from energy efficiency and fuel switching, and MMBtu savings at source from combined heat and power, as detailed in the Three-Year Plan and the Compact-specific tables set forth in Exhibit Compact-4 of today's filing. The total three-year summer and winter demand goals proposed by the Compact are 26 MW and 30 MW, respectively. The demand goals include both passive and active demand savings as detailed in the Three-Year Plan and the PA-specific tables set forth in Exhibit Compact-4 of today's filing. These savings goals do not assume any additional outside funding. The Compact also proposes to calculate bill impacts based on the Department's traditional bill impact methodology, consistent with the

Department's Guidelines § 3.2.1.6.3. See Exhibit Compact-6 and Exhibit Compact-1, Section V.C.

9. Where appropriate, and as detailed in the Compact's pre-filed testimony (Exhibit Compact-2) as well as in the Three-Year Plan (Exhibit Compact-1), the Compact has proposed programs that are based on current market conditions and that are responsive to the Council and the Green Communities Act's mandate to develop three-year plans that will "provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." G.L. c. 25, § 21(b)(1).

10. When appropriate and consistent with the Guidelines, the Compact proposes to retain the flexibility during the Plan Term to make modifications without Department approval. Specifically, when appropriate, the Compact may adjust spending, add or subtract program measures, and make ongoing revisions and enhancements after the adoption of the Three-Year Plan in order to reflect in-the-field conditions, technological advances, financing opportunities, and new opportunities. The Compact will seek Department and/or Council approval for modifications requiring such approval as set forth in Guidelines § 3.8 and relevant Department precedent (*see NSTAR Electric Company and Western Massachusetts Electric Company, each d/b/a Eversource Energy*, D.P.U. 16-178, at 26-27).

11. Detailed budgets and, where applicable, cost-effectiveness analysis for the Compact's proposed programs are included in the Compact-specific tables and are described in the Compact's pre-filed testimony and in the Three-Year Plan accompanying this Petition. *See* Exhibit Compact-1; Exhibit Compact-2; Exhibit Compact-4; Exhibit Compact-5. The Compact has projected the expected benefits and costs associated with the Three-Year Plan consistent with the requirements of the Guidelines and D.P.U. 08-50-A, in which the Department affirmed

that "the Total Resource Cost test is the appropriate test for evaluation of the cost-effectiveness of rate-payer funded energy efficiency programs." The Compact identified and quantified costs and benefits needed to calculate the cost-effectiveness of programs consistent with the Total Resource Cost test, including developing avoided supply costs through participation in the regional Avoided Energy Supply Cost Study discussed in more detail in the Three-Year Plan, Section IV.G.2. As detailed in the Three-Year Plan, Section IV.G.3.b.ii, the Compact also included the benefits identified in the Department of Energy Resources' study of the avoided cost of compliance with the Global Warming Solutions Act in the Compact's cost-effective analysis and benefit targets. The cost-effective calculations in Exhibits Compact-4 and Compact-5 are provided both with and without the benefits from this study for reference purposes.

12. During the Plan Term, the Compact proposes to recover its energy efficiency related costs. The energy efficiency surcharge ("EES") is a fully reconciling funding mechanism that the Department approves for funding the Three-Year Plans. G.L. c. 25, § 21(d)(2). The Compact proposes to collect the EES through its Energy Efficiency Reconciliation Factor ("EERF") in accordance with established Department practice in a separate proceeding. Guidelines §§ 2(9), 3.2.1.6. Along with this filing, the Compact has also filed its petition for approval by the Department of its 2019 EES.

13. The Compact understands the importance of the evaluation, measurement and verification ("EM&V") of its programs, and thus proposes a framework whereby both the Department and the Council, through its Consultants, provide oversight of the Compact's EM&V programs. The Compact proposes to continue to work collaboratively with the Council

in a transparent process, as detailed in the Three-Year Plan, to ensure that the Compact may report savings to the Department with full confidence.

14. The Compact administers its energy efficiency programs as both a municipal aggregator and energy efficiency program administrator, under the authority granted by G.L. c. 164, § 134(b). Pursuant to this authority, within the discretion of the Compact's member municipalities, the Compact may administer energy efficiency programs that differ from those administered by the other utility program administrators. D.T.E. 00-47-C. The Department routinely approves the Compact-specific program enhancements, including, but not limited to, enhanced incentives. *See e.g.* D.P.U. 12-107 (2013); D.T.E. 00-47-C (2001). For the Plan Term, the Compact proposes to continue all of the Department approved program enhancements from 2016-2018, with the exception of its classroom-based energy efficiency education program. Additionally, in response to the recent amendments to the Green Communities Act, the Compact has developed its Cape and Vineyard Electrification Offering ("CVEO"). CVEO is designed to serve oil, propane or electric resistance heat customers and will provide incentives for the installation of cold climate air source heat pumps, solar photovoltaic systems and battery storage units. See Exhibit Compact-2 (Pre-Filed Joint Testimony of Downey, Song and Brandt); Exhibit Compact-1, Appendix K.

15. Due to the timing of the Department's review of the three-year energy efficiency investment plans under G.L. c. 25, § 21, the Compact's proposed energy efficiency programs will expire on December 31, 2021, approximately 30 days prior to the Department's approval of the next three-year plan for the term 2022-2024. In order to ensure program continuity, the Compact proposes, consistent with the Department's finding in the *2013-2015 Three-Year Plans Order*, D.P.U. 12-100 through D.P.U. 12-111 at 160-161 (2013), to continue all energy

efficiency programs and budgets for plan year 2021 until the Department concludes its investigation of the subsequent three-year plan. Such approval will alleviate the administrative burden of the preparation and review of a motion for interim continuation of the existing energy efficiency programs.

16. In view of the Compact's history of successfully delivering energy efficiency services, and consistent with the collaborative energy efficiency process envisioned in the Green Communities Act, the Compact would be pleased to participate in settlement discussions or technical sessions at any time found to be convenient by the Department and other interested parties.

WHEREFORE, the Petitioner hereby respectfully requests that the Department:

a) Promptly issue its order of notice and publication with respect to the Compact's Petition and the applicable public hearing on such date or dates as may be necessary or appropriate;

b) Approve the Compact's proposed energy efficiency investment plan, including the Compact-specific programs, budget, and allocation of program operating costs for its energy efficiency programs for the period January 1, 2019 through December 31, 2021;

c) Approve the Compact's incorporation of avoided environmental compliance costs in the cost-effectiveness analysis;

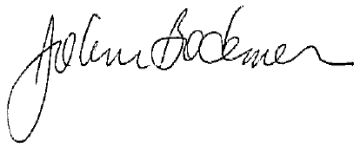
d) Approve the Compact's recovery of the costs of such energy efficiency programs through its currently reviewed and approved energy efficiency surcharge; and

e) Provide such other and further relief as may be necessary or appropriate.

Respectfully submitted by,

CAPE LIGHT COMPACT JPE

By its attorneys,



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Fax: (802) 419-8283

Dated: October 31, 2018

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all parties of record in this proceeding in accordance with the requirements of 220 CMR 1.05(1) (Department's Rules of Practice and Procedure).

Dated at Waltham, Massachusetts this 31st day of October, 2018.

Jo Ann Bodemer, Esq.
BCK Law, P.C.
271 Waverley Oaks Road, Suite 203
Waltham, MA 02452
(617) 244-9500

Of Counsel for the Compact

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

MOTION OF THE CAPE LIGHT COMPACT JPE FOR THE INTERIM CONTINUATION OF EXISTING ENERGY EFFICIENCY PROGRAMS

The Cape Light Compact JPE (the "Compact") requests that the Department of Public Utilities ("Department") approve the Compact's request to continue to implement its existing energy efficiency and Residential Conservation Service ("RCS") programs,[1] during the period January 1, 2019 through January 29, 2019, or until the Department approves the Program Administrator's proposed energy efficiency investment plan, budget and allocation of program operating costs for its energy efficiency programs for the period January 1, 2019 through December 31, 2021 ("Three-Year Plan"). In support of its motion, the Program Administrator states as follows:

1. The Compact is a municipal aggregator pursuant to G.L. c. 164, § 134, and maintains a business office at 261 Whites Path, Unit #4, South Yarmouth, MA 02664.

2. The Compact consists of the towns of Aquinnah, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dennis, Edgartown, Eastham, Falmouth, Harwich, Mashpee, Oak Bluffs, Orleans, Provincetown, Sandwich, Tisbury, Truro, West Tisbury, Wellfleet and Yarmouth, and

[1] In accordance with 220 C.M.R. § 7.02, the Compact included its proposed operating budgets for the RCS program in the Three-Year Plan to meet the requirements of subsection (b) of section 7 of chapter 465 of the Acts of 1980. Therefore, any reference in this motion to energy efficiency programs and budgets shall include RCS program budgets and recovery of program operating costs as applicable.

Dukes County organized and operating collectively as the Cape Light Compact JPE, a joint powers entity organized pursuant to G.L. c. 40, § 4A1/2.

3. On this day, October 31, 2018, in accordance with G.L. c. 164, § 134 and G.L. c. 25, §§ 19 and 21, the Compact filed for Department review and approval its proposed energy efficiency investment plan, budget, and allocation of program operating costs for its energy efficiency programs for the period January 1, 2019 through December 31, 2021.

4. The Department is required to issue a decision on the Three-Year Plan within 90 days of submission. G.L. c. 25, § 21(d)(2).

5. The design, implementation, and cost recovery of the Compact's energy efficiency programs are subject to the Department's jurisdiction under the provisions of G.L. c. 164 and G.L. c. 25, §§ 19 and 21.

6. The Compact currently operates comprehensive energy efficiency programs pursuant to the 2016-2018 Three-Year Energy Efficiency Plan approved by the Department on January 28, 2016, which ends on December 31, 2018. *2016-2018 Three-Year Energy Efficiency Plans Order*, D.P.U. 15-160 through D.P.U. 15-169 (2016) ("2016-2018 Order").

7. As the Compact's current energy efficiency and RCS programs expire on December 31, 2018, the Compact seeks, consistent with past practice, to continue them at expenditure levels consistent with those approved for 2018 for the interim period from January 1, 2019, through the date of the Department's final order approving the Compact's 2019-2021 Three-Year Plan. *See 2013-2015 Three-Year Plans Order*, D.P.U. 12-100 through D.P.U. 12-111, Order on Motions for Interim Continuation (2012); *Electric Three-Year Energy Efficiency Plans 2010-2012*, D.P.U. 09-116 through D.P.U. 09-127, Order on Motions for Interim Continuation of Energy Efficiency Programs (2009); *see also Cambridge Electric Light*

Program Administrator/Commonwealth Electric Program Administrator, D.P.U. 91-234-B at 37 (1994) (program continuity is an important goal in energy efficiency efforts); *Cambridge Electric Program Administrator/Commonwealth Electric Program Administrator*, D.P.U. 92-218 at 18 (1993) (same). Consistent with the Department's prior directives, all funds expended during this time on the continuation of energy efficiency programs will be charged to the Compact's 2019 budget.

8. Approval of this motion will ensure that the Compact is able to continue to offer its energy efficiency programs on an uninterrupted basis.

9. Approval of this motion will not result in any undue bill impacts for the Compact's customers.

10. The Compact will continue to recover all costs incurred in implementing and delivering its energy efficiency and RCS programs during this time.

WHEREFORE, the Compact hereby respectfully requests that the Department:

(a) Approve the Compact's motion, as detailed above, to continue to implement existing energy efficiency and RCS programs, consistent with the 2018 budget reviewed and approved in 2016-2018 Order;

(b) Approve the Compact's recovery of costs related to the ongoing development and implementation of its energy efficiency programs;

(c) Approve and ratify the Compact's ongoing implementation of the energy efficiency investment plan for 2016-2018 approved in 2016-2018 Order;

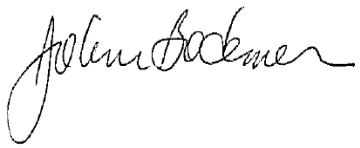
(d) Approve this motion on or before December 31, 2018; and

(e) Grant such other and further relief relating to this motion as may be appropriate.

Respectfully submitted by,

CAPE LIGHT COMPACT JPE

By its attorneys,



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Dated: October 31, 2018

COMMONWEALTH OF MASSACHUSETTS

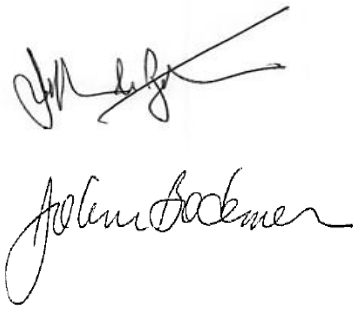
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

NOTICE OF APPEARANCE

Pursuant to 220 C.M.R. § 1.02(7), the undersigned attorneys hereby appear for and on behalf of the Cape Light Compact JPE in the above-captioned case.

Dated this 31st day of October, 2018.



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THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

PRE-FILED TESTIMONY OF

MARGARET T. DOWNEY

ON BEHALF OF

THE CAPE LIGHT COMPACT JPE

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Margaret T. Downey. My business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit #4, South Yarmouth, MA 02664.

Q. By whom are you employed?

A. I am employed by the Cape Light Compact JPE (the "Compact").

Q. Please state your current position and provide a brief job description.

A. I am the Administrator for the Compact and have served in that capacity since the Compact's inception in 1997. As the Administrator, I oversee the administration of the Compact and its development and implementation of its energy efficiency plans since 2001, as well as its provision of competitive energy supply through its municipal aggregation program.

Q. Provide a brief job description for your position as Administrator for the Compact.

A. As the Compact's Administrator, I manage the Compact's activities as an Energy Efficiency Program Administrator and as a municipal aggregator for residents and businesses of Cape Cod and Martha's Vineyard. Specifically, with respect to the Compact's energy efficiency activities, I oversee the administration of the Compact's annual energy efficiency program budget that are part of the three-year statewide Department of Public Utilities ("DPU or "Department") approved plan. I also represent the Compact on the Program Administrators' Leads Committee and serve as the Compact's representative on the Energy Efficiency Advisory Council. In addition, I am also the Compact's Chief Procurement Officer. I am responsible for local and state

regulatory reporting and approvals, as well as the oversight of the participation and compliance in the ISO New England Forward Capacity Market. I regularly make presentations and report to customers, Compact staff, board members, regulatory agencies and community advocates.

Q. What is the purpose of this pre-filed testimony?

A. The purpose of this testimony is to provide information in support of the Compact's 2019-2021 Three-Year Plan, set forth in Exhibit Compact-1 (the "Three-Year Plan" or "Plan"), highlight core aspects of the Three-Year Plan and provide an overview of how the Compact has satisfied the filing requirements of G.L. c. 25, §§ 19 and 21, an Act Relative to Green Communities, Chapter 169 of the Acts of 2008 ("Green Communities Act" or "GCA"), as amended by an Act Relative to Competitively Priced Electricity in the Commonwealth, St. 2012, c. 209, ("Energy Act of 2012"), and as recently amended by An Act to Advance Clean Energy, Chapter 227 of the Acts of 2018, the Department's Orders in D.P.U. 08-50, the Department's Energy Efficiency Guidelines, as most recently updated in D.P.U. 11-120-A, Phase II (2013) (the "*Guidelines*"), the Department's Order approving the 2016-2018 Three-Year Energy Efficiency Plans, D.P.U. 15-160 through D.P.U. 15-169, and the October 3, 2018 Hearing Officer Memorandum with additional filing requirements have been satisfied.

In addition, I am offering this testimony to provide 1) background information on the Compact; 2) identification of specific initiatives or program designs that are unique to the Compact; and 3) a discussion of the *Cape Light Compact 2019-2021 Potential Study*,

prepared by Opinion Dynamics Corporation and Dunsky Energy Consulting ("Opinion Dynamics/Dunsky") (June 2018) ("Potential Study").

Finally, I will be offering additional testimony jointly with Margaret Song, Commercial & Industrial Program Manager and Austin Brandt, Senior Power Supply Planner in support of the Compact's proposed Cape and Vineyard Electrification Offering ("CVEO").

Q. How is your testimony organized?

A. Section II of my testimony provides the joint statewide testimony in support of the Three-Year Plan. Section III provides specific information about the Compact and the proposed Compact specific components to the Three-Year Plan.

Q. Could you describe the purpose of filing joint testimony?

A. The Three-Year Plan is a comprehensive document that covers many complex and interlocking areas of energy efficiency and demand reduction program planning, implementation, funding, incentivizing and evaluation in the Commonwealth. The witnesses work together to develop and implement the Program Administrators' energy efficiency programs. The Three-Year Plan was developed in a collaborative process among all the gas and electric distribution companies and municipal aggregators with certified energy plans (together "Program Administrators" or "PAs") in which individuals having expertise in specific aspects of energy efficiency led efforts in drafting sections of the Three-Year Plan where they have relevant expertise. Each individual witness can testify during Department evidentiary hearings, if necessary, to those areas of the Three-Year Plan for which the individual has relevant experience, background and/or expertise.

The Compact also anticipates that, in addition to its testimony, there will be common PA witnesses to be designated at a later time who will testify in support of certain parts of the Three-Year Plan, consistent with how the Department conducted evidentiary hearings for the Compact and other PAs during the hearings for the 2010-2012, 2013-2015, and 2016-2018 three-year energy efficiency plans.

Q. Please describe the Compact's Three-Year Plan and how it was developed.

A. The Compact proposes to adopt, as its Three-Year Plan, the 2019-2021 Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan, which the Massachusetts Program Administrators finalized after extensive collaboration with the Massachusetts Energy Efficiency Advisory Council ("Council"), the Council's consultants ("Consultants"), and other interested stakeholders. Planning for the development of the Three-Year Plan began in summer 2017 and continued with increasing rigor throughout 2018. During this time, the PAs have been engaged in detailed and comprehensive discussions with the Council, its Consultants and stakeholders. As part of the development of the Three-Year Plan, the PAs participated in 22 Council and Executive Committee meetings in 2018, nine Council-sponsored public listening sessions, and six workshops, at which the PAs presented on a variety of topics as requested by the Council and the Consultants. In addition, the PAs convened numerous working groups and held one-on-one meetings with stakeholders to address best practices and discuss issues related to the development of the Three-Year Plan. The PAs developed and filed with the Council draft versions of the Three-Year Plan on April 30, 2018 and September 14, 2018. Since the September draft, the PAs remained

actively engaged in a diligent, collaborative review process with the Council and the Consultants in an effort to reach as much consensus as possible and obtain the full support of the Council. On October 19, 2018, the PAs, the Department of Energy Resources ("DOER"), and the Office of the Attorney General ("Attorney General"), reached an agreement on 2019-2021 goals, budgets, and performance incentive pool, and other key terms reflected in the Plan (*see* Exhibit Compact-1 at Appendix F). The PAs submitted a memorandum providing updates to the Three-Year Plan since the September 14th draft to the Council in advance of its October 25, 2018 meeting, where the Council began to discuss a draft resolution about proposed efforts. The Council issued a final resolution on the Three-Year Plan at its October 30, 2018 meeting.

Q. Is the Compact seeking Department approval of the Three-Year Plan?

A. Yes. On this date, the Compact is submitting the Three-Year Plan for Department review and approval pursuant to G.L. c. 164, § 134 and G.L. c. 25, §§ 19 and 21. The Three-Year Plan will allow the Compact to satisfy the GCA's mandate to acquire all available cost-effective energy efficiency and demand reduction opportunities during the years 2019 to 2021, and maximize environmental benefits and net economic benefits through a sustained and integrated statewide energy efficiency effort. In setting aggressive energy efficiency goals, the Three-Year Plan takes into account many competing considerations, including, without limitation, bill impacts, cost efficiency, integrated program delivery, contractor and market infrastructure, and environmental and economic benefits.

Q. Is the Three-Year Plan filing consistent with the filing requirements established by the D.P.U. 08-50 Working Group, the *Guidelines*, and the Hearing Officer Memorandum issued on October 3, 2018 (the "Filing Requirements Memo")?

A. The Three-Year Plan filing is consistent with the Department's requirements as established in D.P.U. 08-50 Working Group, the *Guidelines*, and the Hearing Officer Memorandum issued on October 3, 2018. The Plan includes information about proposed and integrated electric and gas efforts as well as information about Compact-specific efforts proposed for implementation in 2019-2021.

Q. Does the Compact currently operate comprehensive energy efficiency programs?

A. Yes. The Compact currently operates comprehensive energy efficiency programs targeting the residential, income eligible, and commercial and industrial ("C&I") customer sectors. These programs are operated pursuant to the 2016-2018 Three-Year Plan approved by the Department. *2016-2018 Three-Year Plans Order*, D.P.U. 15-160 through D.P.U. 15-169 (2016). The 2019-2021 Three-Year Plan builds on the successes of the PAs' prior energy efficiency investment plans, which have resulted in Massachusetts being ranked number one in the nation for energy efficiency by the American Council for an Energy-Efficient Economy ("ACEEE") every year since 2011.

Q. Is the Compact seeking approval of any unique Compact-specific enhancements in this filing?

A. Yes. The Compact is seeking approval to continue certain Plan enhancements that were approved as part of its 2016-2018 Three-Year Plan, as well as Department approval of the Compact's proposed Cape and Vineyard Electrification Offering as further set forth in

the accompanying Joint Testimony of Downey, Song and Brandt, as well as in Exhibit Compact-1 at Appendix K.

Q. Please discuss the format of the Three-Year Plan.

A. The Three-Year Plan is organized consistent with the structure of previous plans and Department templates. A brief overview of key elements of the Three-Year Plan follows:

- Section I provides an executive summary highlighting key benefits of the Three-Year Plan including core goals for 2019-2021, program enhancements, and an overview of compliance with the GCA.
- Section II provides an introduction to the Three-Year Plan, including core goals, statutory and regulatory context, and an overview of GCA compliance.
- Section III provides an overview of statewide programs, including mechanisms for collaboration, continuous improvement, sharing of best practices, and engagement with other Program Administrators and third-party stakeholders.
- Section III.B describes the Residential and Income Eligible Programs including highlights, new and innovative programs for 2019-2021, and core initiative descriptions.
- Section III.C describes the C&I programs, including accomplishments during the 2016-2018 term, 2019-2021 term enhancements, mechanisms for collaboration, continuous improvement, and sharing of best practices, and descriptions of core initiatives.

- Compact-specific Data tables for all proposed efforts are included as Exhibit Compact-4. The related statewide data tables are provided as Appendix C to the Three-Year Plan.
- Section III.D describes proposed Hard-to-Measure Efforts, including Marketing Activities, Residential Education Efforts, Sponsorships and Subscriptions, and Research and Development, for the 2019-2021 term.
- Section III.E outlines Program Administrator specific programming and includes a descriptive reasoning for why differences among the Program Administrators exist and/or are necessary based on each service area's unique characteristics or conditions. Additional information regarding Program Administrator specific initiatives can be found in Appendix K of the Plan.
- Section IV of the Plan details the statewide budget, savings and benefits.
- Section IV.A provides the Program Administrators' goals, including budgets, lifetime savings, and benefits.
- Section IV.B provides a description how the Program Administrators collaboratively develop and review common assumptions to provide the best available data in the most consistent manner. The section also discusses the electronic technical reference manual ("eTRM").
- Section IV.C provides a detailed discussion of the development of goals process and discusses the assumptions made by the Program Administrators, unique service area drivers, and examples of cost drivers.

- Section IV.D describes the budget cost categories including definitions, salary allocation, vendor-related costs, and a description of continuous improvement.
- Section IV.E describes the Program Administrators' compliance with the GCA requirements to minimize administrative costs and utilize competitive procurement to the maximum extent practicable, as well as compliance with the statutory allocations for income eligible programs.
- Section IV.F describes Performance Incentives[1] including a summary of relevant precedent and *Guidelines*, and a description of the Performance Incentive proposal for 2019-2021.
- Section IV.G provides a description of the core benefits and cost-effectiveness, including energy and demand savings, environmental benefits, net benefits and cost-effectiveness, and additional benefits.
- Section IV.H describes the Evaluation, Measurement and Verification ("EM&V") framework, the work of the Evaluation Management Committee, descriptions of research areas, proposed evaluation budgets, types of evaluation functions, evaluation planning, and the Strategic Evaluation Plan. The Strategic Evaluation Plan is provided at Appendix S.
- Section IV.I provides an overview of reporting on actual performance for the 2019-2021 Plan Term.

[1] The Compact is a public entity and does not collect performance incentives.

- Section V describes the cost recovery and funding sources, including the Forward Capacity Market ("FCM") and Regional Greenhouse Gas Initiative ("RGGI") Proceeds for electric Program Administrators.
- Section V.C provides information on the bill impacts to customers for the Three-Year Plan budget as well as an analysis of the actual costs associated with the proposed Three-Year Plan. Bill impacts are included at Exhibit Compact-6.

Q. Does the Three-Year Plan also contain Appendices and background information?

A. Yes. The Three-Year Plan also contains detailed appendices and background information, including a glossary, maps of service areas, statewide energy efficiency data tables, the Council's February 28, 2018 Resolution, the Council's July 31, 2018 Resolution, the Council's October 30, 2018 Resolution, the Agreement of October 19, 2018 on terms between the Attorney General, DOER, and the Program Administrators, the 2018 report about avoided energy supply costs in New England, the sponsorship and subscription policy, PA-specific programming, eTRM, participant definitions, studies of remaining potential, vendor cost categories, the Administrative Cost Study, list of competitively procured vendors that the Compact has already contracted with for services to be provided during the Plan Term, the Strategic Evaluation Plan, evaluation study summaries, and evaluation studies.

Q. Has the Compact prepared a chart cross-referencing key filing requirements of the D.P.U. 08-50 Working Group and the GCA with sections of the Three-Year Plan?

A. Yes. The Three-Year Plan Filing includes a chart that outlines these key filing requirements and the location by section in the Three-Year Plan in Exhibit Compact-3.

Q. Has the Compact addressed each of the additional pre-filed testimony items set forth in the Filing Requirements Memo regarding additional filing requirements for the 2019-2021 Three-Year Plan?

A. Yes. Responses to Filing Requirements Memo, Item No. 1-9 are contained herein. Item No. 10 has been incorporated in the Compact's cover letter accompanying its filing.

II. THE STATEWIDE JOINT ENERGY EFFICIENCY PLAN

A. Overview of Programs

Q. Describe the Compact's understanding of the strategic goals of the energy efficiency and demand reduction programs under the GCA and Department directives in D.P.U. 08-50.

A. The GCA specifies the types of programs that statewide energy efficiency plans may include and requires that programs be screened in aggregate for cost-effectiveness at the sector level. G.L. c. 25, §§ 21(b)(2)(iv) and (b)(3). As the Department has recognized, however, the following energy efficiency programs and activities allowed by the GCA may not have immediate energy savings or those savings may be difficult to quantify: (1) programs for research, development and commercialization of efficiency products; (2) programs to support new appliance and product efficiency standards; (3) programs to integrate efficiency products with building energy codes or high performance sustainable buildings that exceed code; and (4) programs for public education regarding energy efficiency (collectively, "hard-to-measure energy efficiency programs"). D.P.U. 08-50-A at 24-25, *citing* G.L. c. 25, § 21(b)(2); *see also Guidelines* at § 2(11). The Department has directed the Program Administrators to include the costs and benefits of hard-to-

measure energy efficiency programs within the cost-effectiveness evaluation of the most relevant customer sector and has required that any such hard-to-measure energy efficiency program must be fully described in the energy efficiency plan. *See Guidelines* at § 3.4.3.2; *see also* D.P.U. 08-50 at 19-20.

Consistent with these directives, the Three-Year Plan includes a detailed description of each program design, which together with the rest of the Plan will provide for the acquisition of all available cost-effective energy efficiency and demand reduction resources. In developing these program descriptions, the PAs sought to ensure consistent messaging among the Program Administrators, meet aggressive savings targets, incorporate new offerings including active demand reduction and strategic electrification, allow for a review of new technologies being developed and offered to increase the efficiency of energy use for residential, income eligible and C&I customers, provide details regarding the thoughtfully-designed community-based efforts within a Program Administrator's service area, provide information regarding workforce development goals associated with the programs, and offer insights into the long-term goals of the particular programs.

Q. How has the Compact expanded upon existing energy efficiency and demand reduction offerings?

A. To develop the programs set out in the Three-Year Plan, the Program Administrators reviewed in-the-field experience, evaluation results, national market trends, and best practices, and collaborated extensively through formal and informal channels, including PA management committees and working groups. In addition, the Program

Administrators worked collaboratively with the Council, the Consultants and other stakeholders to design a broad portfolio of programs that significantly expands upon existing offerings and also introduces bold new initiatives and program designs. The Three-Year Plan sets forth general program descriptions as well as detailed strategies for coordinated program implementation in the residential, income eligible, and C&I sectors. The Three-Year Plan has been developed in recognition of an evolving energy marketplace and the revised GCA. The Program Administrators' nation-leading and collaborative efforts have accelerated market transformation, and contributed to lower demand, lower energy prices, and a more efficient energy system. Sustaining very high claimable savings goals becomes increasingly difficult in each subsequent year as markets become saturated, "easy" savings no longer exist, and rising baselines continue to reduce claimable savings opportunities. In the Three-Year Plan, the Program Administrators will deploy strategies designed to find ways to mine savings from more difficult, costly, and challenging projects and market segments.

The core goal of the programs is to drive customer participation and influence behavior, given that customer participation in energy efficiency programs is voluntary. Unlike mandatory compliance with statutes or building codes, participation in energy efficiency programs requires developing attractive offers that anticipate and meet customers' needs and goals.

Customers throughout the Commonwealth are remarkably diverse – they have different economic considerations, priorities, and levels of wealth; they have different views on public policies and approaches; they face different barriers; they live in cities,

suburbs, and rural communities; they may own a residence or rent. The Program Administrators value all customers and have designed a comprehensive portfolio of programs that use multiple market channels and strategies to offer a wide array of services and options in order to serve customers and acquire all available cost-effective energy efficiency. Fundamentally, the Program Administrators seek to influence customers to adopt technologies and behaviors that are appropriate for the individual customer and reduce overall energy use.

From years of experience, the Program Administrators know that different strategies will appeal to different types of customers. Energy decisions are complex and customers weight different factors differently. Some customers favor tried and true systems and technologies, while others are early adopters of cutting edge technologies. Some customers favor online or technology-based experiences, and others prefer personal relationships. Some customers prioritize environmental benefits, some prioritize economic considerations, and some prioritize convenience and comfort. Some customers may prefer all electric energy options, especially as renewable energy generation sources increase, while others may be concerned with current electric generation mixes and/or costs, and may prefer other fuel options, like natural gas. Based on the Program Administrators' recognition that customers are diverse and have varied desires, the 2019-2021 programs provide multiple pathways and channels to engage customers. From high-touch in-home assessments, to retail programs where customers may not even realize they are participating in the programs, the Program Administrators seek to meet customers where they are. As examples of this effort, the Program Administrators have

developed community partnership strategies, created online assessments, and market the programs through many outreach channels order to reach a wide array of customers at multiple entry points.

In recognition of the diversity among customers, and in support of the Program Administrators' goal of educating customers, the Program Administrators have adopted a new overall approach called Energy Optimization. Energy Optimization focuses on more holistic and integrated efforts to target and reduce customers' overall energy use. The holistic approach aligns with the revised GCA and focuses on customers' individual energy needs and goals, such as customers' desires for cleaner and less expensive energy. In particular, the Program Administrators will provide fuel neutral education and incentives to drive efficiency and optimize energy use. The Program Administrators have also realigned the residential programs to target customer-specific opportunities and provide multiple engagement paths for customers to drive participation. The Plan also incorporates new Passive House, active demand reduction, new construction pay for savings, moderate income, renter, and strategic electrification offerings/strategies.

The program designs reflect comprehensive proven strategies that provide for: (1) an enhanced customer experience, including seamless delivery strategies that integrate gas and electric efforts; (2) an expanded, diverse, and well-trained workforce; and (3) the delivery of new state-of-the-art technologies and services. Section III of this Three-Year Plan provides more detail on statewide electric and gas programs for 2019-2021.

Q. Describe the reasons why the Program Administrators are proposing to realign the residential programs in the Three-Year Plan.

A. The residential program realignment, along with multiple enhancements and innovations, is intended to meet the challenge posed by the decline of residential lighting savings by increasing participation across all customer segments, driving broader penetration of energy efficiency and demand reduction to new participants, and securing deeper savings from existing program participants. As discussed above, customers have diverse interests, goals, and needs. While existing programs, such as single family and multifamily retrofit, were defined in a particular manner based on historic evolution of the programs, the distinctions between the programs pose barriers to addressing the challenges of evolving markets. In order to continue to drive energy efficiency savings in the evolving market, the Program Administrators reassessed previous program structures and market channels and examined how they could be modified to increase accessibility for all customers, expand pathways for entry, and increase presence and savings opportunities in a customer's preferred channel. The realigned programs will provide easier program access for customers, remove barriers, and better allow the Program Administrators to pursue all cost-effective energy efficiency opportunities in the evolving energy market.

Q. Explain how the residential programs are realigned in the Three-Year Plan.

A. In developing the Three-Year Plan, the Program Administrators re-examined existing program structures and designs. Several programs were defined based on historic needs and program evolutions. Single family was defined as residential properties with one to

four units. Multifamily was defined as residential properties with more than four units. However, this simple distinction does not accurately reflect differences in building science or the similarities and differences between customers in those buildings. For example, townhouses may have been classified as multifamily buildings but are more similar in terms of building science to a standalone home. A three or four unit building may have the same barriers as a 100 unit building. In order to broaden and tailor services better for customers, a realignment was needed. As such, the Program Administrators are eliminating the number of unit distinctions from programs and focusing on building science and market channels for customers. Recognizing that some customers want comprehensive services and others are interested in a particular product or do-it-yourself option, the residential programs are aligned to offer services through whatever channel a customer chooses.

The Residential Coordinated Delivery initiative provides facilitated services to customers. Customers will be offer facilitated comprehensive weatherization and home energy efficiency upgrades. The Residential Coordinated Delivery initiative will help establish the Program Administrators as the customer's trusted energy advisor, building long-term relationships that lead to ongoing, comprehensive energy-efficiency upgrades to Massachusetts' homes. The initiative provides access to the information, technical support services, and implementation contractors who can assist customers from the identification of cost-effective energy efficiency opportunities through final implementation of energy-efficient measures. The goal is to deliver a seamless experience and maximum energy savings to every customer, regardless of unit type or

ownership structure. By focusing the delivery of services on building science, opportunity, customer choice, and what each customer has the authority to implement, the new design aims to put customers in control of their energy future and reduce the number of customer confusion points along the way. Focusing on clear, uncomplicated participation pathways will result in a more equitable distribution of benefits by making it easier for all customers to engage in our programs.

The Residential Retail initiative is designed to provide customers who are not interested in a fascinated pathway and prefer a self-driven process access to energy efficient technologies. The goal is to drive a broader integrated marketplace so energy efficient products are positioned as attractive, primary choices for customers making purchasing decisions, whether online, in-store, or through independent contractors. The initiative allows customers to access high-efficiency lighting, heating, cooling, and water heating equipment, including thermostats, lighting controls, appliances and other energy efficient products.

Finally, the Residential Behavior initiative continues to encourage customers to engage in behavior that will result in energy conservation and demand reductions. The Residential Behavior core initiative seeks to leverage the motivational factors that cause residential customers to actively employ personal energy saving actions or participate in energy efficiency and demand reduction offerings. Customers may participate in the program activity through passive receipt of program treatment or active enrollment in a specific behavioral program offering, such as new active demand offerings. The behavior offerings provide services to customers who are not interested in making technology,

appliance, or building upgrades, in addition to providing deeper savings for customers participating or who have participated in other program pathways.

Q. Identify and describe the new technologies and initiatives that the Program Administrators have included in the Three-Year Plan.

A. The Program Administrators are deploying multiple forward-looking strategies and innovations that pivot the portfolio toward new areas of focus to ensure continued robust savings and benefits for customers. Please see the Plan for a full description of the Program Administrators' programs and offerings. New offerings in the Plan include:

- Active Demand Reduction
- Passive House
- Tailored Energy Savings Packages
- Pay for Savings
- HVAC Optimization including Operations & Maintenance ("O&M") Savings and Retro-Commissioning ("RCx")
- Strategic Energy Management Cohort

Among the newer technologies under review for 2019-2021 program inclusion are the following:

- Battery Storage
- Temperature Optimization
- Electrochromic Windows
- Block Heater Smart Controls

- Wood Pellet Stoves

These lists are not exhaustive, as the Program Administrators continuously evaluate and incorporate new offerings and technologies on an ongoing basis and will continue to do so during the Plan term. The Three-Year Plan incorporates updated versions of technologies available in the market.

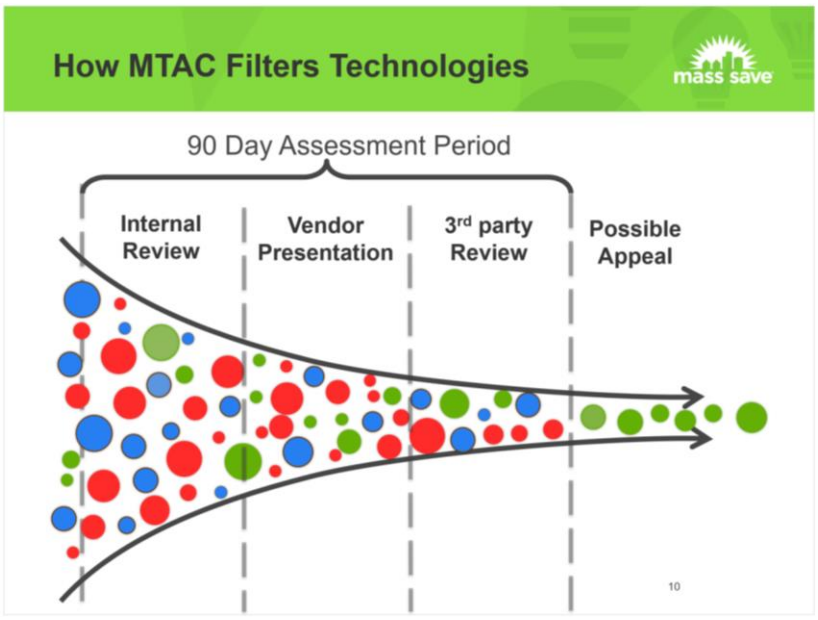
Q. Explain how the Program Administrators evaluate new technologies and initiatives to determine cost-effectiveness and savings potential.

A. Technologies and initiatives that demonstrate energy savings are evaluated for cost-effectiveness and market potential. An individual PA will lead this process and work with all PAs through the management committee process including both implementation and evaluation staff. The necessary documentation typically includes technical and market assessments. The documentation includes but is not limited to, the following:

- Determination of the appropriate baseline scenario and measure savings
- Gaining market intelligence on deployment strategies with recommendations for incentives
- Estimation of the measure life and costs
- Research on non-energy benefits
- Establishing appropriate evaluation factors
- Conducting small scale technology implementation efforts such as Roof Top Unit ("RTU") Optimizers through the Massachusetts Technology Assessment Committee ("MTAC") and small-scale offerings such as the industrial and process segment-targeted approach.

MTAC reviews new technologies that have the potential to cost-effectively save energy. MTAC is both a proactive and a reactive body and consists of key PA technical staff. The committee addresses residential, C&I technologies, drawing on the subject matter experts from the committee, PA staff or outside expertise as necessary. It establishes and publishes threshold technical requirements that must be met to qualify products or processes as eligible for program incentives. It documents its findings in a standardized manner and disseminates them to the PA implementation-based committees for inclusion in the programs.

MTAC materials can be found here: www.masssave.com/MTAC.



The process for managing proposals that can be found at https://www.masssave.com/en/learn/partners/process-for-managing-proposals/.

The Program Administrators work together to incorporate innovative new technologies and initiatives that meet cost effectiveness screening requirements. Any

new prescriptive measures are added to the eTRM while custom measures may have custom express tools, which allow for consistent review of custom measures and can aid in screening projects.

The Program Administrators also deploy appropriate training and outreach strategies to ensure that new technologies/initiatives are assimilated in the market place and continuously adapt their offerings based on information and knowledge as a result of implementation.

B. Targeted Approaches for Serving Specific Customer Segments

Q. Describe how the Program Administrators intend to overcome barriers and achieve deeper participant savings for renters in the residential programs.

A. The Program Administrators are committed to ensuring equitable access to program savings and benefits for renters. The Plan includes enhancements and strategic targeted approaches to reduce barriers and increase participation for renters.

The Program Administrators have had good success in targeting landlords. When landlords are engaged throughout the process, the Program Administrators are able to successfully deliver comprehensive weatherization work to the whole building, which produces the greatest energy benefits for renters. The Program Administrators are planning to offer scaled incentives to encourage landlords of buildings under four stories, to install energy efficiency measures for all units in a building, with a 90 percent insulation incentive for landlords willing to complete all recommended insulation and air sealing.

The Program Administrators are increasing the scope and sophistication of online assessments and telephone intake to learn more about a customers' needs and opportunities to better connect customers with more applicable solutions, particularly for those customers who do not have opportunities for major measure adoption. This category includes renters who may not wish to have a traditional in-home assessment and customers who live in a home that does not have opportunity for major measures based on initial screening or previous program participation. These customers will still be able to receive benefits via a tailored energy savings package that responds to remaining savings opportunities and reduces the need for customers to dedicate time to an in-home visit, mitigating the time barrier. The Program Administrators will also continue direct outreach to rental unit property owners, when renters are willing to provide contact information, to help promote whole building energy efficiency upgrades that may only be possible with property owner permission and which can greatly benefit the renter.

The Program Administrators will launch a statewide municipal outreach partnership to provide additional opportunities for municipalities to promote energy efficiency. The goal of the partnership strategy is to create a stronger connection to municipal governments, whose local knowledge and trusted relationships can be a valuable connection point for increasing awareness and participation in the Program Administrators' efficiency offerings. The strategy will advance the shared goal of promoting energy efficiency with a focus on achieving increased savings for renters, as well as communities identified as having lower program participation. The Program

Administrators will provide municipalities with marketing materials, trainings, and networking check-ins to share program updates and best practices.

Q. Describe how the Program Administrators intend to overcome barriers and achieve deeper participant savings in hard-to-reach communities in the residential and income-eligible programs.

A. The Program Administrators remain fully committed to ensuring that all customers, and specifically traditionally hard-to-reach communities, have access to the benefits of energy efficiency. The Program Administrators' dedication to delivering the benefits of energy efficiency to hard-to-reach communities is evident through the many initiatives the Program Administrators have implemented to help mitigate some of the most common barriers facing this market segment. Past examples include partnerships with municipalities and community organizations, targeted outreach and events to landlords, increased financial incentives, and the Efficient Neighborhoods+® initiative.

Initiatives within the current 2016-2018 Three-Year Plan continue to demonstrate the Program Administrators' continued strong commitment to equitable distribution through the moderate income and renter offers, and a trial with the LEAN testing a facilitated delivery structure to serve moderate-income customers similar to the structure of the income eligible program. With each effort, the Program Administrators learn more and use these experiences to improve processes and offerings to reach every household.

The moderate income and renter offers in the 2016-2018 Plan were premised on the assumption that financial constraints are the primary barrier for this customer segment, and incentive levels are the most critical motivational levers to secure customer

participation. Recent evaluation, however, require the Program Administrators to take a broader view of the factors influencing participation of different targeted populations. A recent evaluation suggests that time is actually the greatest challenge moderate-income customers face in participating in the Programs.[2] This finding aligns with the Program Administrators' extensive experience in delivering the programs to all customers and working closely with stakeholders. This study led PAs to reexamine the current approach in order to more effectively reach all customers.

The Program Administrators fully understand that financial burdens remain a challenge among moderate-income households and therefore will continue to offer this segment of customers' weatherization upgrades and income verification services at no cost. However, focusing exclusively on income level and financial barriers has come at the expense of addressing more fundamental barriers to participation such as time and complexity of participation.

Ensuring simplicity and ease of participation for customers is the core principle underlying the realignment of the residential programs, which drives out unnecessary roadblocks, and focuses on ensuring each customer is afforded a positive experience where their needs are the primary focus of every interaction. The new alignment allows for increased accessibility for all customers to all programs by expanding pathways for entry and increasing PA presence in preferred customer channels while continuing the Program Administrators' unwavering commitment to deliver ever greater access to

[2] http://ma-eeac.org/wordpress/wp-content/uploads/Moderate-Income-Market-Characterization-Report-Final-16Mar2018.pdf.

customer segments, such as moderate income and renters. The Program Administrators are redoubling efforts to use evaluations and market research, along with community partner and stakeholder input, to ensure the PAs are continuously learning and expanding ways to equitably serve all customers. While maintaining a focus on delivering clear and accessible programs, the Program Administrators will continue to look for innovative, data-driven ways to ensure all customers are able to access the programs.

The Program Administrators recognize the unique role municipalities can have in supporting community outreach and have developed a statewide municipal and community partnership strategy ("Partnership Strategy") to target communities identified as having lower program participation.

The new statewide Partnership Strategy will include a stronger connection to municipal governments, whose local knowledge and trusted relationships can be a valuable connection point for increasing awareness and participation in the Program Administrator efficiency offers. The Partnership Strategy will support municipally led outreach for cities and towns of all sizes to enroll local participants. As a core element, the Program Administrators will establish a two-way communication channel for municipalities by offering regular check-in calls, periodic trainings, and a suite of marketing materials. The two-way communication channel will provide a forum for the Program Administrators and municipal staff to share program updates and communicate strategies for targeting hard-to-reach populations. The Program Administrators will leverage the Partnership Strategy to formulate community specific efforts, including outreach to areas that also have language barriers.

Q. Describe how the Program Administrators intend to overcome barriers and achieve deeper participant savings in C&I customer segments.

A. The Program Administrators provide both broad and targeted participation pathways for all customers in the C&I sector. Examples of broadly applicable approaches designed to incentivize thousands of customers to participate include upstream delivery, downstream prescriptive and custom delivery, and turnkey delivery for small businesses of any segment including, but not limited to, real estate, non-profits, and small and mid-sized C&I customers. Examples of targeted participation pathways include the Memorandum of Understanding ("MOU") and/or Managed Account approaches for large customers of any segment including, but not limited to, municipal, healthcare, real estate, education, non-profit, hospitality, and manufacturing customers. The Program Administrators will continue their efforts to provide marketing and program designs that effectively engage all segments and sizes, in recognition of the fact that customers benefit from offers tailored to overcome segment-specific barriers.

The Program Administrators have created expedited pathways to HVAC Optimization including O&M Savings and RCx. The PAs anticipate that opportunities will increase across all segments and sizes due to this enhancement.

The Program Administrators have built up internal staff who have direct experience and/or have engaged vendors with expertise in the manufacturing and industrial, commercial real estate, healthcare, hospitality, grocery and other distinct business segments. The Program Administrators have continued to learn the language of their customers, which results in improving the experience for customers while deepening

the PAs' ability to work with facility managers across the spectrum of sectors and segments to identify, scope, and specify projects.

Within the C&I programs, several strategic enhancements have been outlined in the Plan to continue to reduce participation barriers and achieve deeper participant savings for segments such as municipal, healthcare, real estate, education, non-profit, hospitality, and small and mid-sized C&I.

Small Businesses

The Program Administrators are continuing to enhance aspects of the small business turnkey pathway, adding tailored segment-specific marketing packages and increasing training and direction for vendors to support comprehensive projects. Upstream offerings, where historically small businesses make up the bulk of participants, will be expanded, which will allow the Program Administrators to deliver efficiency solutions that effectively respond to the customer's unique circumstances.

As discussed above, the Program Administrators have developed a statewide municipal outreach strategy to provide additional partnership opportunities to municipalities. The strategy will advance the shared goal of promoting energy efficiency, particularly with harder to serve small businesses.

Mid-size C&I

The Program Administrators deploy many approaches to reach mid-size customers and streamline solutions. For example, the Program Administrators use a managed account approach for national, franchise, and municipal customers who would

generally be considered mid-size customers. The upstream delivery model is also used to broadly reach customers when they are replacing equipment.

The Program Administrators have developed tools that allow more customized offerings to be rapidly taken up by mid-sized customers. One example is custom express tools, which streamline, simplify and standardize analysis of similar energy conservation measures. The tool allows the Program Administrator to distill a complex set of energy efficiency measures into a simple to use, quick set of potential outcomes in language that resonates with customers. Custom express tools allow customers to overcome the time barrier and move quickly from initial engagement to defined measure and incentive offer.

The C&I 2011-2016 Mid-size Customer Assessment found that the Program Administrators have shown that they continue to review and address mid-size markets. Each Program Administrator targets their approaches to their firmographic audience, and as a collective group, have shown that these approaches make an impact on overall performance with mid-size customers.

Municipalities

Cities and towns represent a key segment of the C&I market and critical partners in Program Administrator service areas. Cities and towns own and operate a wide array of buildings and infrastructure and have many unique operational aspects. The Program Administrators offer a standardized pathway for municipalities to build long-term relationships with the Program Administrators. All Program Administrators have dedicated points of contact for municipalities and maintain a "continuous engagement

approach" with municipal customers and offer a mix of standard prescriptive or upstream offerings and the option for custom measure offerings.

Each Program Administrator tailors its implementation strategies to reflect and best serve its unique geographies. Each Program Administrator has dedicated vendors and/or staff to support each municipality with a customized approach, which starts with technical assistance to identify opportunities for efficiency measures and works with the municipality to determine the best path forward. The municipal vendor or staff working with municipalities is familiar with the process for DOER's Green Communities designation and can support municipalities in securing these designations. The designations and competitive grants require working with the Program Administrator's efficiency programs as part of the process. Similarly, the Program Administrators collaborate with the Massachusetts Clean Energy Center, which recommends working with the efficiency programs on any project as well.

As part of their overall engagement with municipalities, the Program Administrators will continue to actively promote streetlight conversions through the course of the Three Year Plan. The Program Administrators will contact each municipality within its service territory that have not completed conversions of streetlights and educate the municipality about the PA's LED conversion offerings. Additionally, the Program Administrators will provide a participatory webinar targeted to municipalities that walks through pathways and resources available to support municipalities to reduce their energy use.

Education

Schools represent a significant portion of the municipal energy profile. The services provided to support municipalities detailed in the Plan includes support for energy savings in schools, both existing and new or proposed. Small private schools are typically served through the C&I Existing Building Retrofit initiative, where the turnkey approach with financing is available.

The Program Administrators have also been actively involved in conversations with the Massachusetts School Building Authority ("MSBA"), which recently issued a Project Advisory in April 2018, regarding the school's ability to receive incentives for energy efficiency measures without reducing the funding from the MSBA. This clarification of third-party funding is an excellent example of collaboration between school personnel, the building community and the Program Administrators to ensure that the incentive dollars could be used to help improve the building efficiency without harm to the overall project funding.

Higher education institutions generally participate through the Managed Account approach for Large and Medium customers detailed in the Plan. Some participate through a MOU process, as detailed in the Plan. These MOUs facilitate longer term energy efficiency projects that achieve greater depth in savings and comprehensiveness of projects, as well as align with individual customer's long term goals and vision for overall energy management.

Healthcare

The Program Administrators include hospitals and laboratories in their segmented approaches. The Program Administrators' approach is tailored based on the common attributes of these segments including energy intensity, significant thermal loads, and sensitivity to costs. Non-energy related drivers heavily impact capital deployment for this segment. This segment is dominated by larger customers, some of which participate in the MOU process detailed in the Plan which facilitates longer term energy efficiency projects that achieve greater depth in savings and comprehensiveness of projects, as well as align with individual customer's long term goals and vision for overall energy management.

Commercial Real Estate

Common barriers that have limited full participation by some commercial real estate customers in the past continue to pose challenges. These include challenges associated with (1) identifying and working with individual tenants (and associated decision-makers) in buildings with multiple tenants, (2) cost-effectively engaging multiple, sometimes small, tenants leasing space in a single building, (3) identifying decision-makers in buildings with one property management entity and a different ownership entity, (4) differing goals between the customer paying the bill and the entity actually using the energy, and (5) identifying single building limited liability corporations ("LLCs") that may be part of larger ownership entity. Over recent plan years, the Program Administrators have undertaken several efforts, discussed in the Property Management & Commercial Real Estate section of the Plan, to try to break through these

barriers to drive increased participation and engage commercial real estate customers in a multi-level approach. These efforts enabled the Program Administrators to identify opportunities and work through delivery challenges. These efforts will continue over the Plan term to further refine engagement strategies and drive participation.

Hospitality

The Program Administrators have a segment-specific approach for the hospitality sector. The PAs utilize marketing materials to address the common measures, business models, and barriers within this market segment. Customers within the hospitality market segment tend to have more gas opportunities relative to other segments and the Program Administrators use their segmented approach to capture these additional opportunities.

Non-Profit

Non-profits come in all sizes; they include large universities and hospitals, as well as small churches or community-based organizations. The Program Administrators have offerings tailored to the specific barriers that individual non-profits face and utilize pathways specific to the individual non-profit circumstances. As discussed earlier, large non-profits such as universities and hospitals are generally served through MOUs or as Managed Accounts, while small, community-based non-residential non-profits are generally served through the myriad of commercial pathways including turnkey, upstream, and downstream pathways. The Program Administrators continue to do extensive outreach to non-profits to help them participate in the programs.

Q. Describe how the Program Administrators intend to engage outside organizations to enhance program delivery.

A. Over the past several plan cycles, the Program Administrators have worked with municipalities and community stakeholders to test various strategies for community-wide engagement. During the planning period for the Plan, the Program Administrators closely reviewed the elements of different community and municipal partnership efforts and attended sessions with stakeholders interested in providing input into how the Program Administrators work with municipalities and communities. The Program Administrators plan to leverage municipalities to gain insights on reaching renters/landlords and multilingual populations. The Program Administrators developed the Partnership Strategy to target communities identified as having lower program participation, discussed above.

As discussed above, the new statewide Partnership Strategy will include a stronger connection to municipal governments, whose local knowledge and trusted relationships can be a valuable connection point for increasing awareness and participation in Program Administrator efficiency offers. The two-way communication channel will provide a forum for the Program Administrators and municipal staff to share program updates and communicate strategies for targeting hard-to-reach populations, as discussed above. The Program Administrators will also explore inclusion of a similar strategy for Non-Governmental Organizations whose municipalities have not yet joined the statewide Partnership Strategy.

Additionally, the PAs, in collaboration with LEAN and Community Action Agencies ("CAA") will continue to engage in targeted, localized outreach efforts to notify customers of the availability and value of energy efficiency services. Examples of such efforts include participation in local community events such as job fairs, senior centers, and employee presentations, as well as the development of case studies.

Q. Describe how the Program Administrators intend to address saturation and encourage deeper savings for new and repeat participants.

A. Over the next three-year term, the Program Administrators plan to continue to encourage deep energy savings within the residential, income eligible, and C&I sectors for both new and repeat participants.

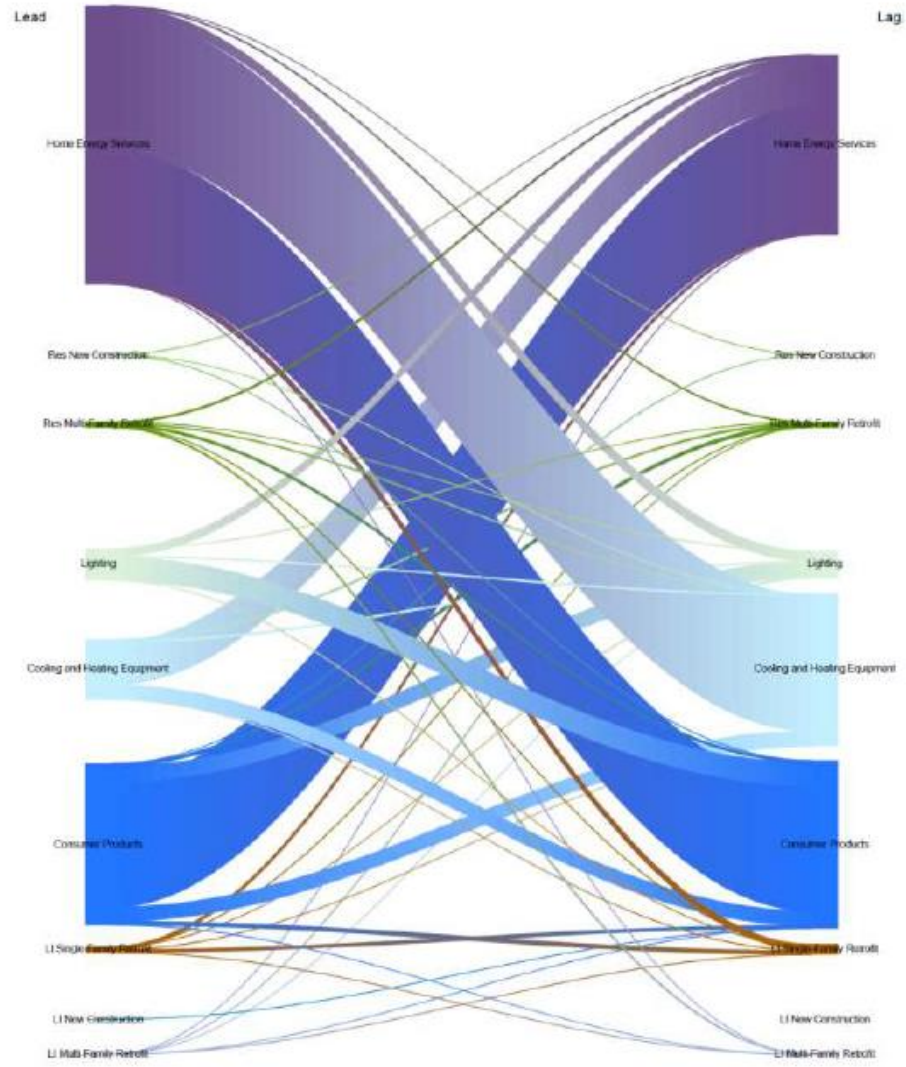
As shown by the table below, over program years 2014-2016, 15 percent of all unique premises participated in two or more times in the electric residential and income eligible programs, and 12 percent of all unique premises participated two or more times in the gas residential and income eligible programs. Two types of participation are considered in this table: (1) participation by a customer across different core initiatives; and (2) participation by a customer within the same initiative (*e.g.*, participant in former Home Energy Services initiative in multiple years). Often, repeat participation within the residential programs is due to the customer receiving a Home Energy Assessment ("HEA") in one year and installing the measures in the next.

Residential and Income Eligible Participation from 2014-2016

PA	Number of times Participating	# Premises	% of Multi-Participating Premises
Electric	Premises participating once	355,189	
Electric	Premises participating twice	58,607	14%
Electric	Premises participating three times	4,586	1%
Gas	Premises participating once	188,764	
Gas	Premises participating twice	23,858	11%
Gas	Premises participating three times	1,440	1%

Figures 3-5 and 3-6 of the 2013-2015 Residential Customer Profile Report, reproduced below, offer a graphical representation of cross initiative participation for electric and gas customers, respectively. The figures, based on the initiatives and programs implemented in prior terms, illustrate that most cross-initiative participation occurred between the HES program and the Cooling and Heating Equipment and the Consumer Products programs (for electric customers) and between HES program and the Residential Heating and Water Heating program (for gas customers).

Figure 3-5. Electric cross initiative participant movement, 2014-2015

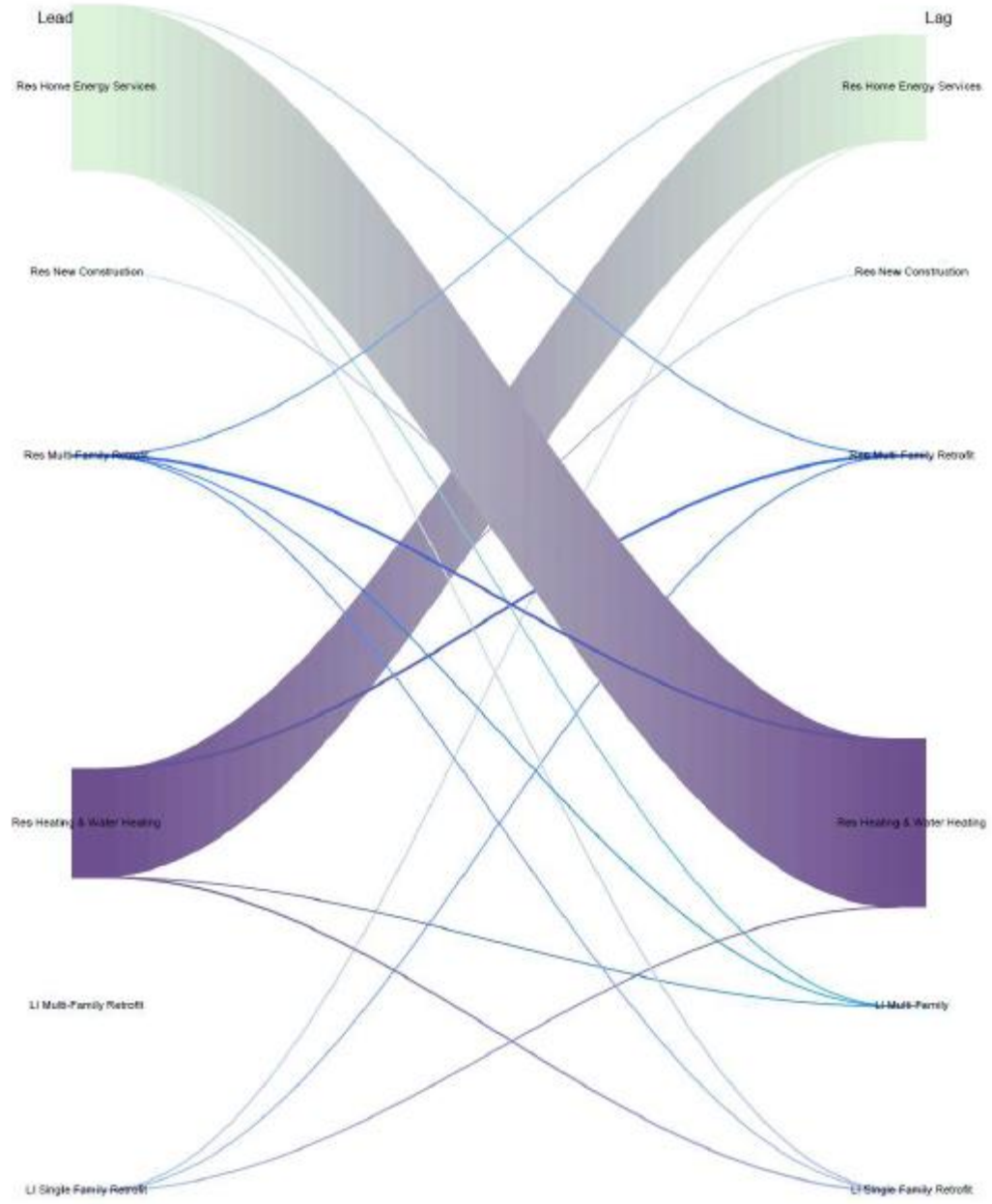


749

2017 Energy Efficiency Plan-Year Reports, D.P.U. 18-51, App. 4D, Study 17-46, at 37, Fig. 3-5.

750

Figure 3-6. Gas cross initiative participant movement, 2014-2015



751

2017 Energy Efficiency Plan-Year Reports, D.P.U. 18-51, App. 4D, Study 17-46, at 39, Fig. 3-6.

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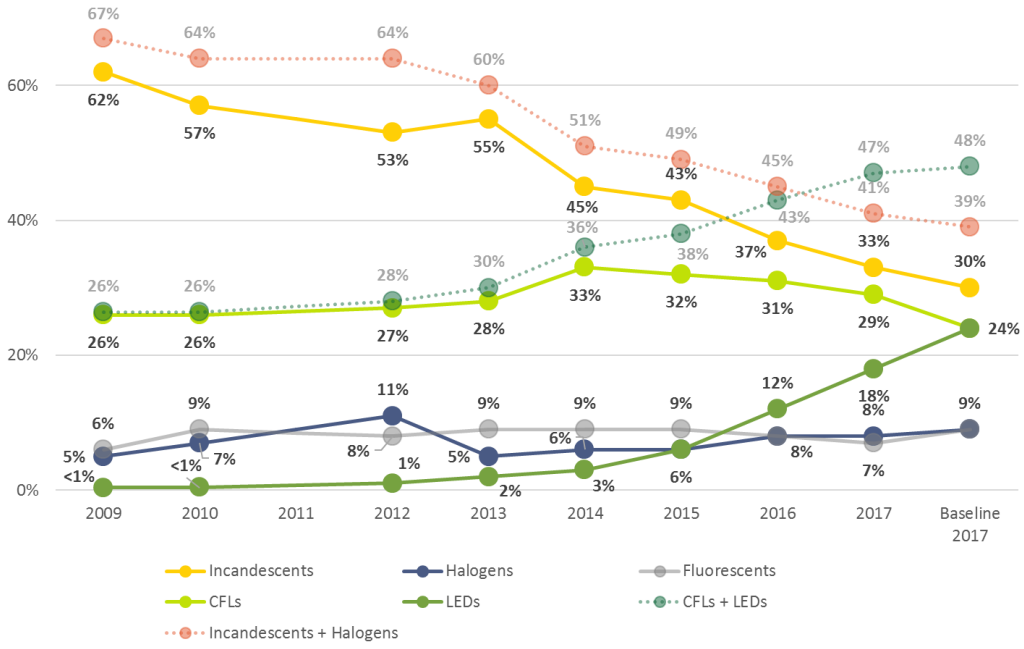
For new participants, the residential sector realignment as described in the Plan is designed to drive the adoption of weatherization and other major measures for all residential buildings, allowing customers to more efficiently pursue all energy efficiency opportunities in their homes without needing to pursue multiple participation pathways. In short, the Program Administrators are looking to make it easier for customers to participate comprehensively in the programs.

For upstream programs, the PAs necessarily estimate the number of repeat customers, since account-level data is not available due to the nature of upstream programs. In general, however, upstream programs are designed to have a broader reach and higher participation rates, likely resulting in greater repeat participation, both within the upstream programs and across initiatives. For example, the PAs find that increasingly, customers who are visited for a HEA already have LED bulbs installed in some of their sockets, which likely indicates previous participation in the upstream program. The 2017 Lighting Market Assessment Consumer Survey and On-site Saturation Study Update found that saturation of efficient lighting (LED and CFL) has been steadily increasing over the years, from 28 percent in 2012 to 48 percent in 2017.

MA Saturation Rates 2009-Spring 2017



In addition to the Residential Customer Profile Study, the Residential Panel Study commissioned by the EMC continues to examine the saturation and characterization of equipment in customer homes through the Residential Panel Study. The Residential Panel Study will allow PAs to monitor the changing saturations of electric and gas end use equipment in customers' homes over time. In addition to changes in the saturations of equipment, the panel study will also examine the characterization of these types of equipment, such as capacity and efficiency level. This data will be collected through online surveys and onsite visits. Findings from this panel study will allow the PAs to better understand the types and efficiency levels of equipment installed in customers' homes, allowing the PAs to identify potential trends in equipment adoption, and new

opportunities for savings. This will allow for adjustments to implementation strategies to meet the needs of the customers and achieve greater energy savings.

For the C&I sector, the Program Administrators expect to continue to pursue multi-year projects strategically planned with their largest customers. These repeat/ongoing customers represent a significant portion of overall sales and are large enough and have building systems that require continual maintenance and upgrading, that projects occur over multiple years. Engaging with these customers is critical to the success of meeting and maintaining high energy savings goals. However, while this approach can provide energy savings, cost effective opportunities do diminish over time. Additionally, the customer composition and number of operational C&I customers within PA specific territory is also an important factor in the opportunity for multi-year projects within a PA's portfolio.

Q. Explain historical close rates and how the Compact developed its current assumptions for its planned close rates.

A. The Program Administrators have historically used the term "close rate" to describe the conversion of customers who participated in a HEA and received turnkey weatherization retrofit work (insulation and/or air sealing) through the former HES initiative for 1-4 unit homes. The table below provides HEA to weatherization close rates from January 2013 through 2017 (the last full year of data). The Program Administrators note that not all customers that receive an HEA reside in properties that offer weatherization opportunities, so those customers do not receive a recommendation, but are counted as "not closed." Thus, the rates of customers that have a weatherization opportunity and

then choose to implement the recommended work are higher than the closure rates shown below.

HES Statewide Close Rate	2013	2014	2015	2016	2017
Full Home Energy Assessments (HEA)	83,218	89,416	100,539	76,758	83,873
Electric	43,665	45,840	50,597	36,831	40,777
Gas	39,553	43,576	49,942	39,927	43,096
Total # of Unique Customers with Weatherization Installations	25,931	31,636	35,284	29,900	25,360
Electric	15,253	17,892	18,377	14,392	12,772
Gas	10,678	13,744	16,907	15,508	12,588
Closure rate	31.2 %	35.4 %	35.1 %	39.0 %	30.2 %
Electric	34.9 %	39.0 %	36.3 %	39.1 %	31.3 %
Gas	27.0 %	31.5 %	33.9 %	38.8 %	29.2 %

* Data in this table is limited to measures captured by the HES initiatives and does not include additional major measures installed such as mini-split heat pumps, appliances, central air conditioning
and gas heating and hot water systems.
* The customers who installed weatherization measures did not necessarily get an assessment and recommendation made in the same time period.

The residential sector realignment is designed to drive the adoption of weatherization and other major measures for all residential buildings. The Program Administrators have weatherized hundreds of thousands of homes across the Commonwealth over many years of program implementation.

When developing projected measure adoption for the purpose of program planning, the Program Administrators took into account several factors. These factors include, but were not limited to, new opportunities presented by the program realignment, historic measure adoption rates, applicable information contained in potential studies, market conditions, incentive offerings, trade ally and contractor networks, likelihood of

adoption due to familiarity and awareness of the measure being offered, as well as, evaluation results.

To design the multiple integrated enhancements that will allow the PAs to successfully continue weatherizing homes in Massachusetts, the Program Administrators examined each point along the customer's journey to weatherization and worked to plan an optimized experience while remaining cognizant of cost control.

Significant enhancements are being made to ease customer access to the Program Administrators' weatherization offer, including promotion of the 24/7 available online home energy assessment as an initial entry point and simplification of the customer call intake process. The Program Administrators will introduce one Mass Save Residential phone number that allows customers ease of access to all Program Administrator efficiency offers. The background support systems—both online and call center—are being transitioned to utilize industry best practices, integrate customer and public data, and employ algorithms and human resources to offer comprehensive energy savings specific to the opportunities within the customer's home.

The intake enhancements previously described support the Program Administrators' efforts to better target in-home energy assessments to customers with weatherization and other efficiency opportunities. The new, optimized systems will likely reduce the percent of customers requiring an in-home assessment, as customers who are identified as not being candidates for weatherization opportunities will be encouraged to receive other Program Administrator offers that are more appropriate for their specific needs. This means that wait times and other inefficiencies created by using

an in-home energy assessment as the default intervention will be reduced, and the overall customer experience will be improved. For customers using an in-home assessment, the information collected through the optimized intake process will be provided to the Mass Save energy specialist prior to entering the customer's home. This will allow energy specialists more time during the in-home assessment to concentrate on homeowner education and support services.

The Program Administrators are adding, at no cost to the customer, knob-and-tube-assessment and combustion safety testing along with remediation of minor combustion safety issues for customers who commit to installing weatherization measures. This will provide an expedited pathway for resolving the most frequent pre-weatherization barriers associated with impeding the execution of recommended upgrades.

The Program Administrators are also increasing the allowable financing amount and expanding the list of barriers eligible for financing through the Mass Save HEAT Loan® to include the most common pre-weatherization barriers identified during the HEA. Barriers eligible for financing include knob-and-tube wiring, combustion safety issues, as well as, remediation of mold, vermiculite and asbestos, and certain structural concerns.

The Program Administrators also recognize that customers who are engaging in traditional renovations have similar energy savings opportunities and follow a similar contracting process to complete their projects. As a result, the Program Administrators are adding a tailored offer that leverages the existing new construction delivery path.

This new offer for additions and renovations will capitalize on efficiency opportunities that exist when there is a contractor on site, including installation of highest-efficiency systems and maximization of thermal shell improvements. This new offer combines the unique opportunities to secure energy efficiency measures during new construction and renovation activity with the potential for securing all of the traditional energy upgrades, including weatherization and other envelope improvements, for pre-existing portions of the home.

C. Strategic Electrification

Q. Describe how the Program Administrators are incorporating strategic electrification into the residential and income-eligible programs?

A. Electric and gas PAs will provide integrated initiatives aimed at educating consumers about all of their energy efficiency options, including technologies associated with strategic electrification. Comprehensive education on all efficiency options will be provided at every assessment, regardless of which PA is providing the assessment.

The Program Administrators are re-focusing from primarily seeking to reduce electric and gas energy usage to helping customers reduce total energy use and helping lower overall customer energy bills. The Plan will provide a more holistic and integrated approach to helping customers address their energy use and associated costs based on their individual needs and goals, as well as provide broader energy and economic benefits both for participating customers as well as all ratepayers.

This holistic approach aligns with the recent revisions to the GCA and focuses on the customers' individual energy needs and goals, such as customers' desires for cleaner

and less expensive energy, in order to provide significant energy and economic benefits to customers and the Commonwealth. The Program Administrators are seeking to engage customers and provide effective combinations of education and incentives to drive efficiency and optimize energy use.

As part of their education efforts, the Program Administrators propose to inform customers about converting to electric cold climate air source heat pumps. The Program Administrators will not recommend one fuel over another; however, the Program Administrators will provide information that allows customers to compare the installed costs, operating costs, and environmental impact of their primary heating fuels with other available options. The Program Administrators will also be able to provide customers links to resources to help them take the next step whether it be upgrading their existing equipment on their existing fuel or converting to electric cold climate air source heat pumps. The ultimate decision remains, of course, with the customer, but the customer will be armed with information to make an informed decision. The Program Administrators will also encourage customers to adopt weatherization measures to obtain additional efficiency, minimize the impacts if a customer converts to an alternative energy source, and "right size" new heating equipment if necessary.

Information will be provided to customers through several avenues. The Program Administrators are exploring the development of an online calculator to be made available on MassSave.com with the intention of allowing users to estimate and make comparisons of oil, propane, electric and natural gas heating equipment. Use of the online calculator is intended to be available to the public. The Mass Save website will

provide additional information and instructions about the process of converting to more efficient heating.

In addition to the availability of an online calculator, the Program Administrators will provide guidance and tools to energy specialists to allow them to present customers with education about available fuel choices. The Program Administrators will support customers interested in switching to an electric cold climate air source heat pump with the appropriate next steps, including providing qualified manufacturer heat pump contractor contacts.

Consistent with the 2016-2018 Retail Products initiative, customers will not be required to have an on-site home energy assessment to receive incentives provided that existing fuel and equipment information can be confirmed prior to installation. Program Administrators are investigating strategies other than an on-site visit to confirm a customer's existing fuel and heating equipment. An example could include customers submitting past heating fuel bills in order to confirm their existing fuel, or installation contractors documenting existing equipment. Communications and materials will however, recommend that weatherization opportunities be considered prior to a heating system upgrade should a customer decide to convert to a new system without obtaining a HEA.

Incentives will be offered for strategic electrification that reduces greenhouse gases and minimizes ratepayer costs, and switching to clean energy technologies, including wood pellet heating where cost effective. Incentives planned for 2019-2021 are

proportional to total MMBtu savings (a combination of a reduction in previous fuel usage and an increase in new fuel usage).

The Program Administrators and LEAN will assess income eligible customer opportunities for strategic electrification in delivered fuel homes. Customers will receive 100 percent incentives as appropriate.

Customers converting to natural gas will be eligible for the same incentives for high efficiency gas equipment as an existing gas customer; the incentive level will not differ depending on a customer's fuel source.

Q. Describe how the Program Administrators are incorporating strategic electrification into the C&I programs?

A. C&I customers come in all shapes and sizes, from mom and pop pizza places to major manufacturers with 100,000s of square feet of air-conditioned space. While the customer must ultimately choose the most appropriate heating, water heating, and cooling equipment and the fuel (electricity, oil, propane, or natural gas) that will drive that equipment, the PAs will encourage efficient choices. The PAs will drive awareness through existing marketing channels, education of customers, trade ally direct outreach, and trade shows in order to encourage customers to convert from inefficient electric baseboard or standard heat pumps, oil, and propane systems to cold climate heat pumps. The Program Administrators will provide an incentive to encourage adoption of high efficiency equipment.

The Program Administrator will not provide a separate or special energy efficiency incentive for heating system conversions, unless for strategic electrification or

to renewable or C&I Existing Buildings Retrofit Initiative clean energy technologies, which in all instances that are cost-effective, reduce greenhouse gasses and minimize ratepayer costs. As with the residential sector, C&I customers converting to natural gas will be eligible for the same incentives for high efficiency gas equipment as an existing gas customer, the incentive level will not differ depending on a customer's fuel source.

Designing the proper heating, water heating, and cooling system is paramount for reaching the highest level of comfort and efficiency. The PAs will provide customers general information regarding the types of equipment available in the market so that they can make the best holistic decision for their businesses. In providing this information, the PAs will show the customers what savings can be achieved in CO2e, MMBtus, gallons of fuel, kWhs and dollars. Along with installed costs and incentives to buy down these costs, customers can then run their own economic analysis (payback, life cycle cost, etc.) or utilize the PA's proforma tool, which provides comprehensive financial analysis of projects for customers, in order to determine if the investment in converting their heating system is worthwhile.

In order for this to be accomplished, each project needs to be analyzed/modelled on a custom basis, which includes hours of operation, internal heat gain, cooling needs, and information about the building envelope; basically, a heat load/cooling load calculation.

Prescriptive offerings may be warranted in future years if patterns of usage, savings, and equipment sizing can be established. One example of a potential

prescriptive offering might be small to medium restaurants which have patterns based on required heat load (MMBtus) on a square footage basis.

D. Active Demand Offerings

Q. Are the Program Administrators planning to offer an active demand reduction program?

A. Yes. The Program Administrators, building off the learnings of the demand demonstrations in 2016-2018, have proposed statewide cost-effective electric active demand reduction (also known as demand response) offerings for both the Residential and C&I sectors. In addition, some PAs have proposed PA-specific offerings incorporating active demand reduction.

For the residential sector, the Program Administrators are proposing statewide active demand reduction offerings that provide incentives to customers with eligible communicating devices to respond to an event signal during system peak times. The offering will target summer peak demand periods, and possibly winter peak periods if discretionary loads are identified and can be controlled. Residential and income-eligible customers with eligible communicating devices, such as Wi-Fi thermostats are eligible for this offering. Please see Residential Behavior Initiative section of the Plan for more details.

For the C&I sector, the Program Administrators are proposing statewide active demand reduction offerings for customers that are willing to respond to an event signal during system peak times. This effort is coordinated through a preferred list of competitively procured Curtailment Service Providers ("CSPs"), sometimes referred to as

aggregators, who enter into contracts with customers to scope, develop response strategies, and agree on performance incentive splits. Please see the C&I Active Demand Reduction Initiative of the Plan for more details.

Q. How are the Program Administrators proposing to sign up customers for these Active Demand Offerings?

A. With the exception of the multi-year storage agreement approach discussed below and certain PA-specific approaches, the Program Administrators plan to recruit Residential/Income Eligible customers with eligible communicating devices already installed through direct and general marketing campaigns of the energy efficiency rebates. The Program Administrators will also simultaneously market and enroll customers into the active demand offerings at the time of installation of an eligible device installed through the PAs' energy efficiency efforts. Recognizing that customers could decide at any point that this offering isn't for them and opt not to participate, the Program Administrators will enroll customers on an annual basis in order to encourage participation and appropriately plan for anticipated demand reductions. The Program Administrators will seek to keep customers enrolled each subsequent year. Customers can opt out at any time.

For C&I customers, the Program Administrators will leverage the existing consultative sales approach employed for large customers to market to and recruit customers. This fully integrated approach was a key lesson learned from the demonstrations and the primary source of the success allowing PAs to offer cost-effective active demand offerings. The Program Administrators will seek to reenroll customers

each subsequent year. Customers can opt out at any time.

Q. How are the Program Administrators planning to track savings for these Active Demand Offerings?

A. For the Residential Direct Load Control offering, the Program Administrators have used third-party evaluation vendors to study the response rate and demand savings resulting from customer participation in the 2016-2018 demonstrations and will continue to assess this going forward. For the C&I curtailment offerings, where the demonstrations were also evaluated, the Program Administrators will track and calculate demand reduction performance based on actual meter data. The Program Administrators plan to report summer and winter demand reduction savings bi-annually to the Council and in the Plan-Year Reports and Term Report to the Department.

Q. How are the incentives for these Active Demand Offerings set and paid out?

A. Active demand reduction approaches rely on customer choice and therefore are subject to customer engagement and willingness to respond. For the statewide offerings, the Program Administrators will provide a performance-based incentive whereby a customer is reimbursed for their opportunity cost (*e.g.*, forgoing comfort on a hot day or the production of a certain process or shift of work). Performance based incentives are a cost-effective and efficient means to incentivize short duration reduction behavior entirely dependent on customer choice. Longer-term demand reductions are often achieved through energy saving capital or equipment improvements such as those offered under the traditional energy efficiency program.

Since the offerings rely on customer response to called events, the Program

Administrators have learned through demonstrations and best practices that paying incentives annually results in a high percentage of participation in events from enrolled customers. Accordingly, the Program Administrators will pay incentives annually or (bi-annually for the summer and winter seasons) to customers participating in the statewide offerings. For the Residential Direct Load Control offer, incentives will be paid based on annual enrollment. For the Residential Storage Performance offer and the C&I offers, incentives will be paid based on verified kW reductions during events called by the Program Administrators.

Q. Are the Program Administrators planning to offer incentives for storage?

A. Yes. The Program Administrators, through the statewide offers are proposing performance-based incentives for residential/income eligible and C&I customers for installed energy storage to perform during system peak times, similar to the offerings proposed above but incentivized at a greater level. The Program Administrators plan to offer two potential storage incentive pathways. First, a daily dispatch pathway that will require customers to reduce demand through the dispatch of storage during summer daily peak periods, essentially acting like traditional energy efficiency on the summer peak and ensuring the system installed capacity requirement is affected. Second, a targeted peak dispatch that will require customers to reduce demand through the dispatch of storage during specific peak demand hours similar to the Residential and C&I offerings targeted hours. Since the targeted peak dispatch will require performance during a lower number of hours annually, the incentives available for the targeted peak dispatch will be lower than the incentives for the daily dispatch pathway. The Program Administrators plan to

also offer incentives to customers participating in the summer target peak dispatch and daily peak dispatch for performance during targeted winter peak dispatch events.

Depending on the outcome of D.P.U. 17-146 (regarding storage and net metering), if residential battery storage systems' ability to export power to the grid is limited, then the expected amount of kW performance would be reduced and the Program Administrators would have to reevaluate the cost-effectiveness of residential/income eligible storage performance. The Program Administrators do not expect this to impact C&I customers, where batteries can offset larger on-site loads without exporting power to the grid.

Q. Why are the Program Administrators proposing higher incentive levels for storage compared to the other statewide demand reduction offerings?

A. Storage provides many desirable attributes that other active demand reduction technologies may not provide. These include:

- Storage does not cause customer interference or significant behavior changes, meaning there is no customer fatigue and therefore, storage kW should be more assured and can be called much more frequently without impacting customers negatively;
- The Program Administrators hypothesize daily peak events supported by storage would in effect act like traditional energy efficiency, reducing load every day during the summer assuring that the system peak is reduced. This assurance garners a greater percentage of the total avoided cost from capacity, capacity Demand Reduction Induced Price Effects ("DRIPE"), transmission, and distribution than

targeted calls where there is a chance of not hitting the system peak. This assuredness, ranging between 10 percent and 100 percent based on the guidance of the Avoided Energy Supply Cost ("AESC") study contractor, results in the Program Administrators intending to claim 100 percent of the avoided value of capacity, capacity DRIPE, transmission, and distribution instead of just 10 percent as the PAs will for the targeted dispatch offerings.

- Storage can be used during winter peak demand periods when other active demand reduction technologies/strategies that are based on discretionary HVAC load are not available; and
- Storage can be used later in the day when other types of curtailments may not be available. This flexible dispatch is especially important as system peaks occur later in the day, as shown in the below table.[3]

Begin Date	End Date	Peak Date	Peak Hour		System Peak
Date	Date	Date	Hour Begin	Hour End	MW
1/1/2008	12/31/2008	6/10/2008	14:00	15:00	-25,691.470
1/1/2009	12/31/2009	8/18/2009	14:00	15:00	-24,707.827
1/1/2010	12/31/2010	7/06/2010	14:00	15:00	-26,701.350
1/1/2011	12/31/2011	7/22/2011	14:00	15:00	-27,312.342
1/1/2012	12/31/2012	7/17/2012	16:00	17:00	-25,543.347
1/1/2013	12/31/2013	7/19/2013	16:00	17:00	-26,910.954
1/1/2014	12/31/2014	7/02/2014	14:00	15:00	-24,067.772
1/1/2015	12/31/2015	7/29/2015	16:00	17:00	-24,052.353
1/1/2016	12/31/2016	8/12/2016	14:00	15:00	-25,111.431
1/1/2017	12/31/2017	6/13/2017	16:00	17:00	-23,507.885
1/1/2018	**9/30/2018**	**8/29/2018**	**16:00**	**17:00**	**-25,528.391**

[3] https://www.iso-ne.com/static-assets/documents/markets/othrmkts_data/fcm/reports/syspeak/isone_syst_peak_2013_f2.xls.

Because storage provides additional operational flexibility it is appropriate to provide higher incentives.

Q. Are incentives for storage paid on an annual basis like the other Active Demand Offerings?

A. Yes. For the statewide performance-based offerings, the Program Administrators will pay for storage performance annually or bi-annually (for seasonal performance). The incentives will be based on meeting performance criteria under the specific offering.

Q. Are the Program Administrators offering any alternative incentive approaches for new storage projects being developed?

A. Yes. The Program Administrators are seeking Department approval to allow the Program Administrators to enter into five-year commitments for performance based incentives with customers installing new storage projects and ensure recovery of reasonably and prudently incurred costs annually through the Energy Efficiency Surcharge ("EES") or another Department approved mechanism in the event that the Program Administrator is no longer allowed to implement the energy efficiency and/or demand reduction programs. If approved, the Program Administrators may enter into contracts setting forth specific fixed annual performance-based incentive payments available to customers for actual, verified performance in response to events called by the Program Administrators. The customer incentive amounts will be locked for the duration of the contract. The Program Administrators will recover the annual costs, including the customer incentive amounts, through the corresponding annual budget.

Q. Why are the Program Administrators proposing a five-year commitment offer for new storage?

A. As previously discussed, storage may provide additional attributes not available currently through other active demand approaches. Therefore, encouraging the deployment of more storage can provide additional active demand reduction opportunities and benefits for customers. Storage, however, requires a significant upfront investment by customers. The Program Administrators recognize that in order for the energy-storage enabled active demand reduction offerings to exist there must be storage installed. Financing is a key barrier for installing storage. To create a financeable value stream for customers, the performance payment structure must be guaranteed or assured for a number of years at the time of customer enrollment, possibly beyond a typical plan term(s). By providing longer term commitments to performance-based incentives, the Program Administrators can offer a greater degree of confidence of potential revenue streams to customers and market actors. The increased certainty of potential revenue will improve the ability of a project to secure financing. The Program Administrators acknowledge that customers using storage can have access to many revenue streams, one of which may be the PAs' proposed offerings, and that multiple revenue streams may or may not be mutually exclusive, affecting performance and demand savings.

This type of incentive design allows the Program Administrators to encourage the development of storage projects throughout the three-year term that can be used for active demand reductions that benefit the system by lowering peak demand and thereby lowering costs for all customers. Since the contract is valid for five years from signing

and therefore not constrained to a single three-year period (*e.g.*, 2019-2021), the Program Administrators anticipate being able to encourage the enrollment of new storage throughout the full Plan term. If the PAs' ability to commit to offering incentives is limited to the three-year regulatory term, it is unlikely that there would be many storage projects developed in second or third years of the Plan Term because the developer could only rely on one, maybe two years of revenue opportunity keeping in mind the significant length of project development and interconnection time required for these type of projects. Providing the certainty of revenue for a limited period based on performance provides revenue certainty for developers and minimizes risk to ratepayers.

Q. How do the Program Administrators propose to recover costs associated with the remaining portion of the five-year contracts after the 2019-2021 Plan Term?

A. As previously discussed, the Program Administrators will include the annual costs, including the customer incentive amounts, and projected savings associated with the contract in the corresponding program year budget and savings goals (*e.g.*, 2022 costs and savings will be included in the respective PAs' 2022 tables and budget). Funding will be collected annually through the PAs' EES. If a customer does not perform as required in a particular program year, the customer would only receive incentives on the actual performance and the Program Administrators will reconcile the over-collection as part of the PAs' subsequent EES filing.

In the event that a change in law requires the termination of the active demand offerings or in the event that the Program Administrator is no longer permitted to offer energy efficiency services or demand reduction measures, the Program Administrator

will discontinue offering any new storage incentives to customers but will honor existing contracts with customers. In this event, the Program Administrator will petition the Department to identify or develop a mechanism that will allow the Program Administrator to recover the costs associated with the storage contract for the remaining commitment period.

Q. Did the Program Administrators consider any alternative incentive structure for storage?

A. Yes, the Program Administrators considered multiple storage incentive structures. A description of each type of incentive design considered is listed below along with a summary of the advantages and disadvantages of each approach:

- Large upfront incentive:
  - Pro: Provides financial certainty to project developer and/or customer and accelerates deployment of storage
  - Con: Risk that storage does not perform and ratepayers do not receive return for incentives paid to developer and/or customer. Potentially limited recourse to recoup upfront incentive if project does not perform as anticipated.

- Partial upfront incentive with additional payments for dispatch:
  - Pro: Provides some financial certainty to project developer and customer and some protection for ratepayers
  - Con: Developers may take upfront incentive and find an alternate revenue stream to displace the Program Administrator's additional payment for dispatch, resulting in non-performance

- Pay for performance within three-year term period
  - Pro: Provides protection for ratepayers as storage assets would only be paid for actual performance
  - Con: Less certainty of revenue for project developers and customers, limited timeline to earn guaranteed revenue where next plans may have reduced incentive levels due to performance, evaluations, or reduced avoided costs

- Pay for performance over a five-year period
  - Pro: Provides protection for ratepayers as storage assets would only be paid

for actual performance, provides longer term revenue certainty for project developers and customers
- Con: Administratively more challenging than typical incentive structure

Ultimately, the Program Administrators believe that offering a pay for performance design over a five-year period provides the best, balanced solution for a statewide effort at this time, as it accommodates both the need for a long term guaranteed revenue source for developers and customers and also offers ratepayer protections by only paying storage units for their actual reductions. The Program Administrators note that the Compact has filed a proposed offering that includes a full upfront storage incentive. Please refer to Exhibit Compact-2 at Joint Testimony of Downey, Song and Brandt for further information. As always, the PAs will share the lessons learned from differing program designs and may propose additional cost-effective offerings in the future.

Q. Are the Program Administrators planning on offering a winter electric demand response program?

A. Yes. The Program Administrators are planning to offer a targeted winter demand reduction offering based on a dispatch trigger targeting the top ISO-NE system winter demand periods. While there is not necessarily a capacity issue in winter, the system does experience occasional high locational marginal pricing ("LMPs") due to supply fuel prices and may need to rely on generation sources with high greenhouse gas emissions. Therefore, there may be beneficial impacts of reducing electric load during the winter peak periods.

The Program Administrators have proposed a lower amount of winter active demand compared to summer because there is less customer discretionary load and the

PAs believe that customers have a reduced willingness to disrupt winter comfort *(i.e.*, reduce heating load). However, this is hypothetical at this time since none of the Program Administrators demonstrations targeted winter due to the lack of immediately apparent winter benefits. There are certain types of customers that may be able to adjust their operations in the winter in order to respond to an active demand reduction call. For example, a customer may be able to shut down a production line, turn down the lights, or dispatch a storage asset in the winter. The Program Administrators will market the winter active demand reduction offering to customers enrolled in the summer active demand offering to leverage resources that may also be available for winter peak dispatch.

Q. Using current AESC values, is a standalone winter active demand reduction offering cost-effective?

A. Winter demand response as a standalone offering is not cost effective since the majority of the benefits claimed by active demand reductions are capacity-driven, and with the delta between summer and winter peaks being >4 GW, winter peak demand does not drive generation, transmission, or distribution investments. However, in aggregate, an annual active demand reduction that combines winter and summer demand reductions compared to the combined the costs of the two seasonal incentive offerings can be cost effective.

The Program Administrators plan to conduct a study, commencing in Q1 of 2019 to examine potential additional benefits associated with winter peak demand reductions.

Q. Did the Program Administrators consider bidding out the demand response program and then selecting lowest cost responses?

A. The Program Administrators' technology-agnostic, open market approach provides the opportunities for CSPs to recruit and strike mutually agreeable deals with customers. The Program Administrators are agnostic about how the CSPs achieve reductions, only that the reductions materialize when needed. CSPs and customers will only be paid for their actual reductions, based on metered performance.

The Program Administrators have determined that it is best to set the price for demand reduction at a reasonable level, based on experience gained through demonstration projects, relation to avoided costs, ISO-NE Forward Capacity Auction capacity prices, customer demand charges, customer Installed Capacity Tag ("ICAP") charges, demonstration projects, stakeholder feedback, and lessons learned from other states' offerings, that will encourage customers to enroll in the active demand offerings but at the same time protect ratepayers from overpaying for the demand reductions understanding that in most cases customers are bundling multiple revenue streams to make participation worthwhile. While the incentive price has not been set through a competitive bid, the Program Administrators have heard from vendors and customers that the price set is appropriate in order to meet stated objectives. Additionally, the Program Administrators learned through the National Grid demonstration that this dollar value is appropriate to spur participation.

Putting the entire active demand reduction offering out to bid and selecting only the absolute lowest cost resources would likely result in unintended consequences and

missed opportunities. More expensive demand reduction solutions that have other beneficial attributes (such as storage) may be excluded under such a program. Also, the availability for all customer classes to participate may be diminished as there is evidence of fewer customers participating in ISO-NE demand response programs compared to the National Grid demonstrations. The Program Administrators believe their approach provides a new participation pathway for customers to manage their demand and impact the system as a whole.

The price for demand reductions is a function of a supply curve. The market is likely to set the price at a higher marginal cost, which will then be paid to all resources. The Program Administrators have had experience with this unintended consequence in the energy efficiency programs. By setting the price and then allowing CSPs to deliver reductions at that price, the Program Administrators are able to avoid this scenario as well as assure customers that they will receive a performance incentive. The risk of not winning a bid dissuades customers from putting in the upfront effort.

E. Savings Goals

Q. What is your understanding of the requirements under the GCA for savings?

A. It is our understanding that the GCA requires that the Three-Year Plan "shall provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." G.L. c. 25, § 21(b)(1). The GCA further requires that the PAs work with the Council to prepare a statewide energy efficiency investment plan that is designed to achieve the GCA's mandate to capture all cost-effective energy efficiency. G.L. c. 25, § 21(b)(1). This mandate is subject to creating

sustainable delivery over a reasonable period of time and with consideration of short-term customer bill impacts.

Q. Have the Program Administrators worked with stakeholders and the Council to determine their savings goals?

A. Yes. The Program Administrators have collaborated with vendors, contractors, stakeholders and customers in developing the statewide programs and savings goals. As discussed earlier, the Program Administrators have presented multiple drafts of the Three-Year Plan to the Council, presented at Council meetings and taken into consideration feedback from individual Councilors, as well as Council Resolutions, Council workshops and other Council actions. The Program Administrators have worked extensively with the Consultants to share assumptions and develop programs. The Program Administrators have also collaborated with vendors, contractors, stakeholders, and most importantly customers in developing the statewide programs and savings goals.

Q. Describe the development and determination of the proposed statewide and Compact-specific savings goals and explain how technical potential studies and other sources were used in this regard.

A. The Program Administrators engage in a highly collaborative and detailed planning process for setting savings goals and budgets. This process includes reviewing many conditions that affect savings goals and costs, such as program designs, including changes and related opportunities and costs, market conditions and prices, labor and workforce availability, training, education, and marketing needs to support the programs, PA-specific potential studies, and the energy efficiency needs and objectives of

customers within each service territory. The PAs also take into account the articulated goals of the Commonwealth and other stakeholders.

Programmatic decisions that inform savings goals and budgets are made both at the individual PA level and at the statewide level, including work by the respective management committees, which facilitate ongoing stakeholder input, continuous sharing of best practices, and consistency of offerings among the Program Administrators. While ultimately the results associated with development of a Program Administrator's plan are PA-specific and the planning process for savings varies for each program and initiative, certain common processes apply to inform the development and to facilitate regulatory review.

The development and determination of the proposed statewide and Program Administrator-specific savings goals involves many considerations, and there is no simple, algebraic method to develop goals to meet the requirements of the GCA. The Program Administrators' process considers many factors, including the assessment of savings opportunities in individual PA service areas (bottom-up), incorporation of recent evaluation study findings, and a collaborative consideration of statewide policy objectives that balances savings goals with the total cost of capturing energy efficiency (top-down). The bottom-up process involves determining savings by measure, including projected quantities and customer incentive amounts for every piece of energy efficient equipment, and the type of technology or program service. The top-down process looks at the portfolio as a whole, evaluating the potential for achieving savings given the mature markets in which the programs are operating, subject to overall cost. The impact

of evaluation results, including process and market assessment studies, are considered in both bottom-up and top-down planning and may drive other adjustments. The process to determine goals is appropriately fluid, flexible and iterative, incorporating information that the Program Administrators learn throughout the planning process related to program design, evaluation, market conditions, costs and other factors.

The Plan accounts for many interacting considerations, including, but not limited to, bill impacts, cost-efficiency, integrated program delivery, contractor and market infrastructure, economic and environmental benefits, efforts focused on innovation, customer experience, changing market conditions, and the need to establish an "integrated" effort that can be "sustained" over time, as mandated by the GCA. G.L. c. 25, § 22(b). In assessing the level of energy efficiency savings that is possible and sustainable for this Plan, the Program Administrators considered a number of factors. These factors include: (1) quality of program implementation; (2) customer economic conditions; (3) bill impacts; (4) market conditions/seasonality for various measures; (5) lower avoided costs; (6) market barriers; (7) equity concerns; (8) the need to avoid "stops/starts" that send negative messages to the contractor community; (9) the capacity and reach of vendors and contractors; (10) the need to provide consistency over time to be able to capture time-dependent opportunities such as renovations and new construction; (11) the need to accommodate new technologies over time; and (12) input and considerations of priorities articulated by DOER and the Attorney General in Term Sheet discussions. Ensuring sustainability requires the Program Administrators to examine all of these considerations when developing their energy efficiency goals.

The planning process for the 2019-2021 period began with a focus on customers' experience with the suite of energy efficiency programs. Significant effort and expertise was dedicated to reviewing the hierarchy of both residential and C&I programs and initiatives. As a result, the Program Administrators have refined the design of programs to better reflect how energy efficiency services are accessed from the perspective of customers. Refocusing Program Administrator efforts to enhance the customer-centric program design will help to promote flexibility in delivery models and drive maximum achievement of energy efficiency savings and benefits.

a. Bottom-Up Planning

The bottom-up planning process includes a combination of PA-specific and statewide activities, is iterative, and is often impacted by changes to program design and delivery models. The enhanced focus on a customer-centric approach affects bottom-up planning in that the budgeting process will now be driven more strongly through multiple channels. For example, the budgeting process in the Residential Retail initiative is driven by the number of rebates expected to be delivered through mass market, while the Residential Coordinated Delivery initiative is planned based on the projected number of assessments undertaken, homes weatherized, and customers served.

The Program Administrators typically begin each planning process by examining historical data to gain insight into participation trends, savings achieved, and costs to achieve annual and lifetime savings. The Program Administrators also consider recent or pending changes in federal efficiency standards, as well as other third-party research on consumer adoption of new technology. In parallel to each Program Administrator

assessing what they can achieve over the next three years, the Program Administrators collaborate to decide what changes, if any, need to be made to program offerings. For example, the Program Administrators may decide to discontinue measures that have become standard efficiency practice, or to add new measures and services in response to improved technologies or identified consumer needs, subject to consideration of cost-effectiveness. The value of energy benefits is determined through a regional AESC Study, which also guides the Program Administrators as they look to achieve all cost-effective energy efficiency opportunity. *See* Exhibit Compact-1 at Appendix H.

The statewide planning work is undertaken at the respective management committees and working groups, ensuring input from all stakeholders, continuous sharing of best practices, and facilitating consistency of offerings among the Program Administrators. Each Program Administrator uses this information to develop a forecast of energy efficiency that can be achieved in its unique service territory. Program Administrators also consult with their own or statewide vendors to support or augment their forecasts based on their own market intelligence. Manufacturers and contractors may also be consulted for insight into workforce capacity and technology availability and limitations.

b. Top-Down Planning

While bottom-up planning focuses on individual measures within each Program Administrator's service territory, top-down planning considers what is reasonable and achievable for the energy efficiency portfolio as a whole. This planning effort involves the examination of impacts to the markets the programs are targeting, as well as cost

implications to the Program Administrator, for both its participating and non-participating customers.

One of the tools that Program Administrators use in top-down planning is potential studies, which help Program Administrators to better understand the overall opportunity to achieve energy efficiency savings within their territory. Potential studies typically provide the Program Administrator with insight into three types of energy efficiency potential:

- *Technical Potential* is defined as the *complete* saturation of energy efficiency measures that are technologically feasible without consideration of cost or likely consumer acceptance.
- *Economic Potential* is a subset of *technical potential* consisting only of that technology that results in more benefits than costs over the life of the measure.
- *Achievable Potential* is a further subset of economic potential and is limited to that which is attainable given barriers faced by real-world program infrastructure and customer, market or other limitations.[4]

The Program Administrators use the results of potential studies to gain valuable insight into the achievable, cost-effective energy efficiency potential over a period of years. This information helps guide the Program Administrators to set term savings goals that consider not only what is available and cost-effective, but also how willing and able customers are to adopt energy efficiency measures. Each of the Program Administrators

[4] Potential definitions are based on ACEEE definitions available at http://aceee.org/topics/efficiency-potential-and-market-analysis.

has performed a territory-specific potential study in advance of the Plan filing in accordance with the Department's directive. *2016-2018 Three-Year Plans Order* at 24-25. The results of those studies, and the lessons learned, have been shared among all Program Administrators so that each PA can learn from these studies.

The potential studies consider a wide range of factors to estimate potential savings over time, including but not limited to the size of the market, economic trends, current market penetration and saturation of specific equipment, adoption rates for efficient equipment, costs and benefits associated with efficiency upgrades, and market barriers. In addition, to the extent that evaluation results were available when the potential studies were conducted, these results were accounted for in assessing potential savings. The Program Administrators use the results of potential studies to understand the remaining achievable, cost-effective potential opportunity for savings over the next three-year period. This information helps the PAs to set savings goals in the Plan that are sustainable and take into account not only what is available and cost-effective, but also how willing and able customers are to adopt energy efficiency measures.

Each of the potential studies, in addition to providing technical, economic, and achievable scenarios as described above, looks at several different scenarios of achievable potential in order to understand the sensitivity of achievable savings to inputs such as increased incentive levels and higher levels of spending on marketing and program awareness. The studies generally include statements of potential that range from looking at the "business as usual" case, up to a scenario in which the Program Administrator pays 100 percent of customer costs as customer incentives and

significantly ramps up costs associated with marketing and program awareness. The Program Administrators review these scenarios with an understanding of the need to minimize customer bill impacts, and the need to maintain sustainable energy efficiency efforts over time. The Program Administrators also take into account any changes in market conditions or other information that may impact the recommendations from the potential studies. The PA-specific potential study materials are attached at Exhibit Compact-1 at Appendix N.

Please refer to Section III, *infra* for a discussion of the Compact's potential study.

c. Evaluation Results

As noted above, Program Administrators also utilize the results of third party evaluation to inform proposed goals. As part of the statewide EM&V framework, the Program Administrators collectively conduct many different types of evaluation studies, including impact evaluations, baseline studies, net-to-gross studies, market effects evaluation, non-energy impact studies, cost and measure life studies, market characterization, and process evaluations. See Exhibit Compact-1 at Section IV.H.4 (providing more information on each type of study).

d. Cost Drivers

Another step in energy efficiency goal setting for the three year term is to develop budgets to deliver the energy efficiency programs to the marketplace. This involves assessing the cost impact of the programs on participating and non-participating ratepayers in support of "right sizing" proposed budgets. The Program Administrators' statewide energy efficiency programs have matured significantly since the development

of the first Three-Year Plan in 2009, as have the technologies that are promoted through the programs. In the 2019-2021 term, the Program Administrators face new challenges in pursuing all cost-effective energy efficiency, including more robust lighting and equipment baselines, stretch code adoption in most of Commonwealth's towns and cities, and widespread adoption of the least expensive energy efficient technologies, driven by past and ongoing PA-led efforts, such as LED lighting. The cost of marketing, delivering and evaluating ever more sophisticated programs is also expected to increase in order to capture more complex and deeper opportunities, such as controls and demand reduction.

To address these challenges and deliver cost-effective energy efficiency programs to their customers, the Program Administrators have developed a thorough understanding of current and future cost drivers for their proposed energy efficiency programs. Because each Program Administrator is affected to a different degree by each cost driver, variations in savings goals and the cost to achieve these goals are to be expected. Customer demographics, fuel mixes, economic conditions, differences in the built environment and even contractor wages vary widely across the Commonwealth and impact each Program Administrator's service territory differently. Each Program Administrator sets its goals based on their own unique service territory.

From 2009-2011, the cost to achieve savings for electric energy efficiency programs throughout the state was trending downwards.[5] During that same period, the

[5] The Program Administrators note that the costs and savings of large, one-time projects can skew the historical costs to achieve savings, often making the costs appear lower than the average. Because large projects are not typical or replicable, they should not be included in the planning process to estimate budgets or savings, or when calculating costs to achieve savings, without careful analysis and appropriate adjustments. For example, some Program Administrators had large combined heat and power ("CHP")

cost to achieve savings for gas programs was trending upwards. From 2012-2014, the cost to achieve savings for electric and gas energy efficiency programs throughout the state was relatively stable with a modest increase in the cost of delivering gas programs. During the 2016-2018 Plan Term there was an upward trend in cost to achieve savings from the 2013-2015 Plan Term, though thanks to cost-effective implementation practices, the increase was not as great as the Program Administrators anticipated.[6] Although the number of customers to be served in 2019-2021 is expected to remain steady, the average claimable savings per participant will be lower due to naturally-occurring energy efficiency and past participation, as well as more stringent local, state and federal codes and standards. As a result, the Program Administrators anticipate that costs will increase due to a shift to a shorter-lived and more expensive measure mix. Additional details on key cost driver considerations include the following:

- **Codes and Standards** – As federal and state codes and standards become increasingly rigorous, the amount of incremental savings from installing energy efficiency measures decreases (unless the efficiency of the program measures rise as well). This decrease in savings results in a higher cost per unit of savings. The Energy Independence and Security Act ("EISA") lighting standards continue to raise the bar for program delivery, as do federal water heater standards, the highly efficient new construction practices in the Commonwealth driven both by the GCA

projects in 2011, making the cost per kWh appear to decrease in 2011 compared to previous years. When excluded, however, costs were relatively flat.

[6] "Cost to achieve" is typically discussed in terms of net savings. Net to gross factors are only updated at the beginning of a three-year term and their impact may therefore be more pronounced when looking at differences between two different Three-Year Plans.

requirement that member communities adopt stretch codes, as well as by aggressive outreach by the Program Administrators, and increasing federal standards for many different kinds of equipment. While these changes still drive real savings for customers in the Commonwealth, these factors reduce the incremental energy savings the Program Administrators can capture and claim through their programs.

- **Going Deeper and Broader** – Another factor that is impacting the cost to achieve in this Plan is the planned implementation of new program delivery models, including the enhanced customer-centric approach. As certain programs begin to saturate markets, the Program Administrators seek to reach more difficult to reach customers, which requires more creative, and often more expensive marketing efforts, as well as deep savings, such as Passive House. During the 2019-2021 term, the Program Administrators have restructured programs and initiatives to provide multiple points of entry for customers, regardless of the services or equipment sought, which may be more expensive than previous strategies. Some initiatives proposed for 2019-2021, such as Residential Coordinated Delivery, are designed to be more comprehensive in scope than the previous initiatives. This reflects a more seamless, comprehensive, and supportive approach to program design and delivery. The Program Administrators incorporated findings of process and market evaluations to adjust programs to further penetrate markets already deeply penetrated by Program Administrators and their programs.
- **Cost-Effectiveness Limitations** – The 2018 AESC Study projected a continued decline in wholesale natural gas prices as well as electricity and summer demand

prices as a direct result of wholesale natural gas prices and energy efficiency. As a result, the energy-related benefits of energy efficiency programs are lower than they have been in prior terms, challenging the Program Administrators to minimize costs and maximize benefits to maintain cost-effective program delivery. Some traditional measures may become non-cost-effective. The Program Administrators are pursuing new delivery options as well as new technologies to capture untapped energy efficiency potential. These efforts are not without cost, however, which puts pressure on programs in the short term. For example, new active demand reduction initiatives provide benefits to the energy system but have significant upfront and ongoing costs, and the 2018 AESC Study projects declining capacity benefits.

- **Unique Service Area Drivers** – Despite consistent program offerings, variations among Program Administrators in savings goals and costs to achieve naturally result due to each Program Administrator's unique service territory. Each Program Administrator's territory has a distinct mix of customers, markets, and vendors. Contributing to these differences are varying customer demographics, different mixes of building and business types, penetration of natural gas and delivered fuels, economic conditions, depth of community engagement, and population density. Each Program Administrator has unique commercial and residential demographics, which may result in differences in how each Program Administrator approaches program delivery. For example, the service territory of one Program Administrator may have a smaller percentage of commercial customers than the statewide average, and thus may not be able to benefit from the higher savings opportunities that tend to

correspond with that customer segment. Similarly, a Program Administrator may have a higher proportion of lower-income residents, requiring greater coordination with the community and higher costs to serve. Unique characteristics of smaller territories are more apparent than in larger territories, which represent a broader array of customers and communities that make these unique characteristics less visible. Variances among Program Administrators are appropriate, consistent with sound regulatory policy, the GCA, and previous Department recognition of Program Administrator differences. In setting their goals, each Program Administrator has used their knowledge of their unique service territory, as well as inputs and insights from their independent energy efficiency Potential Study, to design programs that best meet the needs of their customers. All Program Administrators are committed to achieving all available cost-effective energy efficiency in accordance with the GCA.

e. Information Sharing

As part of the process of developing goals and budgets, following the submission of the April draft of the Plan, the Program Administrators worked with the Council's consultants to share information on the assumptions that are used for bottom-up planning. The Program Administrators also considered the multiple (and sometimes conflicting) priorities of the Council members and other stakeholders in planning for cost-effective savings opportunities in 2019-2021. For example, the Program Administrators have included a strong commitment to promoting cold climate air source heat pumps in this Plan, which offer an exciting opportunity that is supported by the Commonwealth, but which also come with additional costs. Finally, the Program Administrators worked with

the DOER and the Attorney General to review aspects of the Plan, including savings and cost assumptions, and to ultimately agree to statewide goals and budgets that reflect all cost-effective energy efficiency, and take into account sustainability and bill impacts in accordance with the GCA. *See* Exhibit Compact-1 at Appendix F. These agreed to goals reflect months of review and collaboration and take into account the unique savings opportunities and cost considerations of each individual Program Administrator.

f. Summary of Savings Goals Development

In developing the proposed savings goals, the Program Administrators undertook, individually and collectively, a detailed review of energy efficiency opportunities and costs, with a particular emphasis on customer barriers and opportunities. This analysis included a bottom-up approach to assess savings opportunities by measure and initiative, a top-down look at overall savings potential and cost to achieve savings, and careful consideration of evaluation study findings, potential studies, and market changes. Development of the 2019-2021 Plan was influenced by collaborative discussions with the Council and stakeholders to better understand key savings and cost drivers across the Commonwealth, considering sustainability of delivery efforts and bill impacts. The savings goals were only finalized after review and agreement with DOER and the Attorney General.

Please refer to section III for further information on development of the Compact's savings goals.

F. Program Budgets

Q. What is your understanding of the Program Administrator's program budget under the GCA, the Department's precedent, and the *Guidelines*?

A. Pursuant to the *Guidelines* at § 3.3, a Program Administrator's budget shall be comprised of its energy efficiency program implementation costs, as approved by the Department. *Guidelines* at § 3.3.1. In support of these budgets, each Program Administrator shall present to the Department: (a) information regarding its budget sources; and (b) supporting documentation for the budget sources. *Id.* § 3.3.2. Additionally, a Program Administrator's program implementation costs are defined as all costs incurred by a Program Administrator to implement its Energy Efficiency Programs, including, but not limited to: (a) program planning and administration; (b) marketing and advertising; (c) program participant incentive; (d) sales, technical assistance and training; and (e) evaluation and market research. *Id.* at § 3.3.3.

The Department is required to ensure that energy efficiency activities are delivered in a cost-effective manner using competitive procurement processes to the fullest extent practicable. G.L. c. 25, §§ 19(a-c), 21(a), 21(b)(1), 21(b)(2). In so reviewing and authorizing the Program Administrator energy efficiency programs, the Department is directed to ensure that the programs are delivered in a cost-effective manner that captures all available efficiency and demand reduction opportunities, that minimizes administrative costs to the fullest extent possible and that utilizes competitive procurement to the fullest extent possible. *2016-2018 Three-Year Plans Order* at 31. To that end, the Department has directed the Program Administrators to minimize

administrative costs to the fullest extent practicable and include a detailed description and supporting documentation of the steps taken to minimize such administrative costs. *Guidelines* at § 3.3.6. Further, where able, a Program Administrator is required to use competitive procurement processes to the fullest extent possible. *Id.* at 3.3.7.

Q. Please describe the budgets in the Three-Year Plan.

A. As detailed in the Three-Year Plan, the annual budget for the expanded efforts and savings goals during the years 2019-2021 represents an increase as compared to the budget levels approved in 2016-2018. *See* D.P.U. 15-160 through D.P.U. 15-169. The budget is consistent with the goals of the GCA and supports the aggressive savings goals and the significant environmental and economic benefits anticipated in this Three-Year Plan. The three-year total budget proposed by the Compact is detailed in the Three-Year Plan and the PA-specific tables set forth in Exhibit Compact-4.

The Program Administrators determined the costs and benefits of the Three-Year Plan following an extensive review of plan objectives, cost drivers, as well as savings goals and the cost to achieve savings (including deeper savings), the costs of new and innovative strategies, methods of cost reduction and cost efficiency, and historical data. Proposed budgets also take into account new initiatives, such as active demand reduction, Passive House, and strategic electrification, and other efforts that have been included in the Three-Year Plan in response to stakeholder input. Exhibit Compact-1 at Section IV and Appendix C (providing more detail on budgets and benefits of the Three-Year Plan, including cost drivers).

Q. Is the Compact's program budget consistent with the GCA, with the Department's precedent, and the *Guidelines*?

A. Yes. The Compact's program budgets were developed in compliance with the GCA, the Department's precedent, and the *Guidelines*. In authorizing energy efficiency program budgets, it is the Compact's understanding that the Department is charged with ensuring that (1) Program Administrators have minimized administrative costs to the fullest extent practicable; (2) sufficient funding is allocated to income eligible programs; and (3) competitive procurement proceses are used to the fullest extent practicable. G.L. c. 25, § 19(a–c).

Q. Does the Three-Year Plan address each of these requirements?

A. Yes. First, the Three-Year Plan addresses the PAs' efforts to minimize administrative costs in Section IV.E.1. In addition, the Program Administrators, consistent with the Department's directives in 2016-2018 Three-Year Plans Order at 42, worked with a third-party vendor to study best practices for minimizing administrative costs. The study is discussed further in Section IV.E.1 of the Plan and is provided in Exhibit Compact-1 at Appendix P.

The Compact has planned to expend 16.16 percent of its budget on income eligible programs in accordance with G.L. c. 25, § 19(c). Allocation of funds for income eligible programs and education are addressed in Section IV.E.2 of the Plan.

Finally, a description of the competitive procurement processes planned to be utilized by the PAs is found in Section IV.E.2. In addition, the Program Administrators have provided a list of all competitively procured contracts that the Program

Administrators have already executed for services to be provided during the 2019-2021 Plan Term in Exhibit Compact-1 at Appendix Q. The tables included in Appendix Q also show the percentage and total dollar amount of competitively procured services that have already been procured for the 2019-2021 term for each Program Administrator. In addition to this list, several other contracts are out for bid, or in other intermediate stages of competitive procurement.

Moreover, in developing and presenting budgets, the Compact and its fellow PAs used the cost categories as defined by *Guidelines* at § 3.3.3. In addition, in accordance with 220 C.M.R. § 7.02, the Compact included its proposed audit costs in the residential conservation services ("RCS") budget.

Overall, the Three-Year Plan sets forth detailed strategies for coordinated program implementation in the residential, income eligible, and C&I sectors. The detailed program description section of the Three-Year Plan is the result of collaboration and cooperation among the Program Administrators (both gas and electric), industry experts, market participants, Council members, other interested parties, and the Consultants. Consistent with Department's directives and the GCA, the Program Administrators' budgets were carefully prepared with sensitivity to the statutory requirement to consider bill impacts, minimize administrative costs, and use competitive procurement process to the fullest extent possible. *See* G.L. c. 25, § 19(a-b), *Guidelines* at §§ 3.2.1.5, 3.2.1.6.3, 3.2.2.1, 3.2.2.2, 3.3.6, 3.3.7. The Compact and its fellow PAs were mindful of this multi-dimensional mandate in developing the statewide plans, and

the Compact believes that the administrative costs and procurement practices provided for in the Three-Year Plan are appropriate and consistent with the GCA.

G. Cost Effectiveness

Q. Describe your understanding of the GCA requirement that energy efficiency is to be "cost effective or less expensive than supply."

A. The GCA directs that the Plan "shall provide for the acquisition of all available energy efficiency and demand reduction resources *that are cost effective or less expensive than supply*." G.L. c. 25, § 21(d) (emphasis added). The Department previously has adopted as the appropriate test for cost-effectiveness the "Total Resource Cost" or "TRC" test. *See* D.T.E 98-100. In D.P.U. 08-50, the Department affirmed that the TRC test is consistent with the GCA's references to the cost-effectiveness of energy efficiency and demand reduction resources. D.P.U. 08-50-A at 14; *Guidelines* at § 3.4.3; *see also* D.P.U. 12-100 through D.P.U. 12-111 at 8. This is due to the TRC test's reliance on the avoided cost of supply as one of the most significant benefits of any energy efficiency program. D.P.U. 08-50-A at 14; D.P.U. 12-100 through D.P.U. 12-111 at 8, fn. 11.

The Department's most recently approved *Guidelines* continue to utilize the TRC methodology to determine the cost-effectiveness of energy efficiency programs. D.P.U. 11-120-B, Phase II (2013). First, the Department requires the Program Administrators to perform cost-effectiveness screening on an Energy Efficiency Program specific basis, except for Hard-To-Measure Energy Efficiency Programs. *Guidelines* at §

3.4.3.1.[7] An Energy Efficiency Program shall be deemed cost-effective if the cumulative present value of its benefits is equal to or greater than the cumulative present value of its costs. *Id.*

Recent changes to the GCA through the Act to Advance Clean Energy now provides that for the purpose of cost-effectiveness review, programs shall be aggregated by sector. Therefore, the Compact is also providing a cost-effectiveness screening on a sector level as well as a program and core initiative level.

Q. What is your understanding of the Department's requirement for the Program Administrators to categorize program costs?

A. The Department requires the Program Administrators to categorize program costs as program implementation costs or program participant costs. *Guidelines* at § 3.4.5. Program implementation costs shall include all costs incurred by a Program Administrator to implement its energy efficiency programs, including, but not limited to: (a) program planning and administration; (b) marketing and advertising; (c) program participant incentives; (d) sales, technical assistance and training; and (e) evaluation and market research. *Id.* at §§ 3.3.3 and 3.4.5. Program participant costs shall include all expenses incurred by a program participant as a result of its participation in an energy

[7] The Program Administrators are required to allocate the benefits and costs of Hard-to-Measure Energy Efficiency Programs to the program's customer sector. *Guidelines* at § 3.4.3.2. If such inclusion causes the sector's benefit-cost ratio to fall below one, then that Hard-To-Measure Energy Efficiency Program shall be deemed to be not cost-effective. *Id*. An Energy Efficiency Plan shall include the following information regarding a Hard-to-Measure Energy Efficiency Program: (a) the best estimates available regarding the Hard-To-Measure Energy Efficiency Program's savings, costs and benefits; (b) detailed descriptions of the purpose, scope and design of the Hard-To-Measure Energy Efficiency Program; (c) supporting documentation for why the program is qualified to be treated as Hard-to-Measure Energy Efficiency Program; and (d) any recommendations made by the Council regarding the Hard-To-Measure Energy Efficiency Program. *Id.*

efficiency program, including, but not limited to: (a) the net cost of energy efficient equipment; (b) the cost to plan for and install energy efficient equipment; and (c) the cost of energy efficiency services, such as energy audits or inspections for proper equipment functioning. *Id.* at § 3.4.5.3.

Benefits and costs that are projected to occur over the term of each energy efficiency program shall be stated in present value terms, using a discount rate that is equal to a twelve-month average of the historic yields from the ten-year United States Treasury note, using the previous calendar year to determine the twelve-month average. *Guidelines* at § 3.4.6.

Q. How does the Three-Year Plan comply with the GCA requirement that "all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply" be acquired?

A. The Program Administrators are proposing to obtain all available cost-effective energy efficiency and demand reduction resources through an aggressive and sustainable level of savings for their energy efficiency activities. The PAs' savings goals are consistent with the Department's Orders and the Council's priorities, both of which emphasize setting challenging goals that take into account bill impacts and sustainability of efforts over an extended period. Following the Council's resolution regarding the PAs' April 2018 draft of the three-year plan, the PAs re-assessed their savings goals. On October 19, 2018, following a diligent, collaborative review process, the DOER, the Attorney General, and the PAs agreed to overall savings goals and budgets, both on a statewide basis and individual Program Administrators. This agreement was memorialized in the 2019-2021

Energy Efficiency Plan Term Sheet. *See* Exhibit Compact-1 at Appendix F. The savings, benefits, and budgets set forth in the Three-Year Plan are consistent with the agreement. In formulating these goals, the PAs reviewed the types of projects, customers already served, those markets that have potential to be served as informed by the PAs' market assessment and potential studies, historical performance (taking into account unique projects that are unlikely to be repeated), and EM&V results. These savings goals are designed to achieve all available cost-effective energy efficiency with due consideration of bill impacts. Section IV provides more detail on savings and benefits of the Three-Year Plan, including cost-drivers and unique drivers of savings goals in specific territories. Please see Exhibit Compact-1 at Appendix C and Exhibit Compact-4 for additional data.

Q. Discuss the Compact's tables provided in Exhibit Compact-4.

A. The tables in Exhibit Compact-4 provide Compact-specific and combined information for the Compact in the format collaboratively developed in the D.P.U. 08-50 Working Group and enhanced based on stakeholder feedback. These tables provide detailed underlying information with respect to all aspects of the Three-Year Plan in a manner that is common across all Program Administrators. The statewide tables contained in Appendix C of the Three-Year Plan reflect the mathematical aggregation of the Program Administrator specific information for all Program Administrators across the Commonwealth.

The Energy Efficiency Data Tables, provided by the Program Administrator in Exhibit Compact-4, are created using pivot tables. Pivot tables process a comprehensive

dataset, providing a more understandable, user-friendly display of the data. The PAs' pivot tables are populated from the data on the "Master Data" tab in the Excel workbook version of the Data Tables. The Master Data tab is in turn populated by each PA's Benefit-Cost Screening model. The Benefit Cost Ratio ("BCR") Screening Models ("Screening Models") provide all of the formulas and links to each energy efficiency measure that populate the Master Data tab.

The pivot tables included in each PA's Energy Efficiency Data Tables are formatted to comply with the Department's and stakeholders' directions over the course of the three-year energy efficiency plans. The pivot tables provide all the data views the Department requires and also provide the ability for users to pivot the data and conduct their own analysis.

Q. Can you further describe how the Compact presented cost/benefit analyses in the Three-Year Plan?

A. The Compact presented cost/benefit analyses in its energy efficiency data tables, both by customer sector, by core initiative, and by program in Exhibit Compact-4. The Program Administrator's analysis was completed using BCR Screening Models that implement the TRC test (Exhibit Compact-5). Consistent with the *Guidelines*, the Screening Models filed by the Program Administrators include the program and core initiative level budget information for each of the three years along with the measure level costs, measure level and other resource benefits, and non-resource benefits.

Q. Describe all new or additional benefits that were captured in the most recent AESC Study and how the Program Administrators incorporated these benefits in the Plan.

A. The following table presents all new avoided costs captured in the most recent AESC 2018 and how the PAs have incorporated these benefits.

AVOIDED COST	APPLICATION of BENEFITS
Oil DRIPE	Newly calculated in AESC 2018 and newly applied in the PAs' BCR Models as $/MMBTU of Oil Savings
Wood Pellets & Cordwood (application change)	While calculated in previous AESCs, the wood avoided cost is newly applied in the PAs' BCR Models as $/MMBTU of Wood Savings
Pool Transmission Facilities ("PTF")	Newly calculated in AESC 2018 and newly applied in the PAs' BCR Models as $/kW-year of Summer Capacity Savings
Value of Improved Reliability	Newly calculated in AESC 2018 and newly applied in the PAs' BCR Models as $/kW-year of Summer Capacity Savings
GWSA Cost of Compliance	Newly calculated in AESC 2018 and newly applied in the PAs' BCR Models as: $/kWh for Electric Energy Savings $/MMBTU for Gas, Oil & Propane Savings Note: Cost-Effectiveness in the PAs' BCR Models is calculated with and without GWSA benefits.
Hour-by-Hour Energy Prices and DRIPE	Newly calculated hourly energy benefits provided in an Excel-based tool. Tool allows for customized costing periods. PAs have applied customized benefits to ADR programs in the BCR Models as: $/kWh for Electric Energy $/kWh for Electric DRIPE
Avoided Capacity Costs from Uncleared Demand Response	Newly calculated to address reductions in future peak load forecasts by current demand response efforts that are not cleared as a supply resource in Forward Capacity Auctions. PAs have applied this benefit to ADR programs in the BCR Models as $/kW-year of Summer Capacity Savings.

Q. Describe the DOER Avoided Cost of Compliance with the Global Warming Solutions Act study and explain whether the Program Administrators applied the results.

A. DOER undertook a study to examine the avoided cost of compliance with the Global Warming Solutions Act ("GWSA"). The study examined seven potential strategies for GWSA compliance that the study found are currently being deployed in the Commonwealth in the near to medium term under already promulgated legislation and regulations, or as part of the Massachusetts Clean Energy and Climate Plan for 2020. The strategies are: (1) onshore wind, (2) offshore wind, (3) large solar, (4) medium solar, (5) small solar, (6) clean energy imports, and (7) light-duty vehicle electrification infrastructure. The study used a counterfactual approach that presumed no incremental energy efficiency in 2018 and in all later years. The study states that the incremental avoided costs of compliance with the GWSA may be applied to any measure in the 2019-2021 three-year plan, regardless of fuel.

Under the Department's *Guidelines*, the Program Administrators may include certain avoided costs of complying with environmental laws and regulations as benefits under the TRC test. The avoided costs must be from reasonable foreseeable laws, regulations, or policies that will result in a cost included in electric or gas prices. *See Massachusetts Electric Company v. Department of Public Utilities*, 419 Mass. 239 (1994); D.P.U. 08-50-A at 2.

For the purpose of this Plan only, the Program Administrators have incorporated the benefits identified in the DOER study into the goals and benefit calculations set forth

in this Plan. In order to understand the impact of this study, the Program Administrators have provided benefit calculations provided in the Energy Efficiency Data Tables both with and without the incremental values identified in the study. The study is provided at Exhibit Compact-1 at Appendix I.

H. Funding Sources

Q. What is your understanding of the requirements under the GCA regarding funding sources and financing initiatives?

A. The GCA authorizes the Department to review the funding of energy efficiency programs administered by the Program Administrators. G.L. c. 25, § 19. The GCA also directs the PAs to include in their energy efficiency plans "a fully reconciling funding mechanism which may include, but which shall not be limited to, the charge authorized" by the Department pursuant to G.L. c. 25, § 19. G.L. c. 25, § 21(b)(2)(vii). For electric PAs, the GCA requires the Department to approve "a mandatory charge of 2.5 mills for kilowatt hour for all consumers, except those served by a municipal lighting plant." G.L. c. 25, § 19(a). It also authorizes the Department to approve and fund energy efficiency programs with amounts generated under the FCM, cap and trade pollution control programs, and "other funding as approved by the department after consideration of: (i) the availability of other private or public funds, utility administered or otherwise, that may be available for energy efficiency or demand resources; and (ii) whether past programs have lowered the costs of electricity to residential and commercial consumers." *Id*.

Q. Has the Compact complied with the requirements under the GCA regarding funding sources and financing initiatives?

A. Yes. The Compact proposes to recover its costs through five sources: (1) a system benefit charge ("SBC") of $0.0025 per kWh collected from customers; (2) proceeds from the Program Administrator's participation in the FCM administered by ISO-NE; (3) proceeds from RGGI, a multi-state carbon cap and trade system; (4) outside funding; and (5) an EES, collected through the EERF tariff, to be recovered from ratepayers through distribution rates. The Program Administrator proposes to allocate the SBC, FCM, and RGGI revenue to each customer class in proportion to each classes' kWh consumption, consistent with G.L. c. 25, § 19(a).

Q. Has the Program Administrator allocated funding to income eligible programs in accordance with the GCA?

A. Yes. The Program Administrator has complied with the GCA's mandate in G.L. c. 25, § 19(c) that at least 10 percent of the amount expected for electric energy efficiency programs be spent on income eligible programs (Exhibit Compact-4).

I. The Forward Capacity Market

Q. Please describe the process by which the Program Administrator develops bids for the FCM administered by ISO-New England, Inc.

A. Please refer to the Pre-Filed Testimony of Doug Hurley. Exhibit Compact-2.

Q. Is the Program Administrator bidding energy storage into the FCM?

A. Please refer to the Pre-Filed Testimony of Doug Hurley. Exhibit Compact-2.

J. Bill Impacts

Q. What is your understanding of the Department's directives governing bill impact analyses associated with Three-Year Plans?

A. As noted previously, the GCA requires the acquisition of all available cost-effective energy efficiency and demand reduction resources. G.L. c. 25, § 21(b)(1). However, the Program Administrator's understanding is that the Department has determined that the pace at which the Program Administrators acquire these resources is moderated in part by the requirement that the Department consider the effect of any rate increases on residential and commercial customers' bills before the approval of ratepayer funding for energy efficiency programs. *See* D.P.U. 08-50-D at 9-10 & n.11; *see also* G.L. c. 25, § 19(a). The Program Administrator also understands that the Department has directed the PAs in D.P.U. 08-50-D to provide traditional bill impacts for non-participants as well as information for participants at various usage levels. The Three-Year Plan addresses these requirements in Section V.C and the Compact has provided Compact-specific bill impacts in Exhibit Compact-6.

Q. Has the Compact presented bill impact analyses that are consistent with the Department's directives in D.P.U. 08-50-D?

A. Yes. The bill impact assumptions used by all the PAs is described in Section IV.C of the Three-Year Plan and the Compact-specific bill impact analyses are presented in Exhibit Compact-6. These bill analyses demonstrate that the Compact's proposed Three-Year Plan results in bill impacts that are acceptable, particularly in light of the net economic

benefits produced by, and the persistence of savings to be achieved over many years as a result of, the Three-Year Plan.

K. Evaluation, Measurement, and Verification

Q. Describe the Compact's understanding of GCA and Department requirements regarding EM&V.

A. Section 3.5.2 of the *Guidelines* requires each Program Administrator to prepare an evaluation plan that describes how it intends to monitor and evaluate energy efficiency programs, including a description of how the PA's evaluation plan is consistent with any statewide evaluation plan and how the Program Administrator would coordinate its efforts with other Program Administrators. Section 3.5.3 of the *Guidelines* sets out additional information to be included in evaluation plans. The Department explained that the *Guidelines* are intended to create a statewide strategy that is collaboratively developed by the Council and PAs. *2016-2018 Three-Year Plans Order* at 27-28; *2013-2015 Three-Year Plans Order* at 38; *Electric Three-Year Plan Order* at 129; *Gas Three-Year Plan Order* at 120; *Guidelines* at § 3.5.2. The Department emphasized that consistent and reliable EM&V studies will ensure that program investments continue to provide net benefits to customers. *Electric Three-Year Plan Order* at 129-130; *Gas Three-Year Plan Order* at 120-121.

Q. How has the Compact fulfilled the requirements set forth in the GCA and Department requirements regarding EM&V?

A. The Three-Year Plan defines the substantive approaches, study areas, EM&V budgets, and institutional roles to be in place over the three-year plan term sufficiently to satisfy

the Department's precedent and *Guidelines*. The statewide EM&V framework proposed in the Plan builds on the extensive EM&V achievements accomplished in 2016-2018 and reflects both the core principles of the Council Resolution on Evaluation, Measurement, and Verification approved on September 8, 2009 ("EM&V Resolution") and key lessons learned over the previous terms. While the PAs and the EM&V Consultant will continue to work diligently to reach consensus on evaluation issues, an appeals process has been established to resolve issues on which no consensus can be reached. This appeals process will enable the PAs to fulfill their responsibility to report program savings to the Department with full confidence. To date, the PAs have been able to resolve all areas of difference with the EM&V Consultant without utilizing the appeals process.

In line with past practice, the Three-Year Plan again proposes three research areas: residential, C&I, and special and cross-sector studies. These research areas are organized primarily by target markets to maximize effectiveness while minimizing overlap among areas. Accordingly, the Department should find that the Program Administrators' EM&V framework satisfies the *Guidelines* and Department precedent.

Q. Describe all new non-energy impacts ("NEI") that the Program Administrators anticipate studying during the 2019-2021 Plan Term.

A. The focus of the evaluation planning process in 2018, which culminated with the Strategic Evaluation Plan, was to identify a set of evaluation topics for the near term and a set of priorities to help guide research for the longer term. The PAs have identified several NEI research topics that will likely be studied during the near term. These areas include:

- C&I health and safety NEIs
- A refresh of C&I retrofit NEIs to better reflect current measure offerings
- Finalize Low Income Multi-family NEI study
- NEIs for residential solar
- NEIs for Knob and Tube wiring remediation

The long term priorities that were identified in the Strategic Evaluation Plan included the following:

- Quantifying additional market-rate multifamily and moderate income NEIs
- Identify NEIs associated with energy optimization measures
- Determine the best and most effective methods to communicate NEIs

The Strategic Evaluation Plan is intended to provide a summary of currently identified priorities, while also recognizing the importance of adjusting efforts over time in a way that enhances the program delivery effort. As a result, this is not an exhaustive list of NEIs that may be considered in the 2019-2021 term. New measures and programmatic changes that generate new NEIs will likely occur during the 2019-2021 term and may lead to adjustments to the list that ultimately is subjected to evaluation.

L. Economic Development and Job Growth

Q. What is your understanding of economic development and job growth requirements under the GCA?

A. The GCA requires that a plan shall include "any estimated economic benefits…including job retention, job growth or economic development." G.L. c. 25, § 21(b)(2)(viii). In

addition, with Council approval, a plan may prioritize projects based upon economic development or job creation retention benefits. G.L. c. 25, § 21(b)(2).

Q. How does the Three-Year Plan satisfy the requirements under the GCA?

A. An important element of the Three-Year Plan is the economic impact of energy efficiency on the Commonwealth and its citizens, including job creation and retention stemming from energy efficiency programs. One way that energy efficiency affects consumers and businesses is by reducing energy costs, thereby allowing the money saved to be spent elsewhere, thus stimulating other sectors of the economy. Additionally, energy efficiency programs create a wide variety of jobs, many of them tied to local communities. According to the 2017 Massachusetts Clean Energy Industry Report, energy efficiency jobs in the Commonwealth have grown by 81 percent between 2010 and 2017. The Program Administrators are committed to job training for emerging clean energy industries, as well as sustainable funding of energy efficiency programs in order to maintain a consistent workforce. Exhibit Compact-1 at Section IV.G(c) (providing additional information regarding job growth in the energy sector).

The Program Administrators plan their programs and savings goals to be sustainable over time. This encourages the development of an energy efficiency workforce that can make investments in their businesses knowing that the programs will not have large stops and starts.

M. Education and Marketing – The Statewide Branding of Energy Efficiency

Q. Describe your understanding of the requirements for public awareness of energy efficiency programs under the GCA.

A. The GCA as codified in G.L. c. 25, § 21(b)(2)(iv) requires that a plan shall include "programs for public education regarding energy efficiency." Brand recognition and awareness is a critical element to the engagement of program participants and increasing participation in programs.

Q. How does the Three-Year Plan include programs for public education regarding energy efficiency?

A. The Program Administrators will focus on creating a culture of sustainability within the Commonwealth using public education and marketing as key tools in this effort. The focus is on creating powerful, engaging, and motivating education and marketing strategies that will increase awareness of the benefits of energy efficiency and drive increased participation in the energy efficiency programs and services. Proposed public education and marketing strategies take into account the unique motivational differences between residential and non-residential customers.

The strategies and messages developed for statewide energy efficiency education, outreach and marketing will augment the efforts already in use and complement and leverage program-specific marketing and individual PA efforts across the Commonwealth. Exhibit Compact-1 at Section IV.D (providing further information).

The Program Administrators are confident that the statewide marketing efforts, combined with the program specific marketing, will foster and sustain the environment

through which they will achieve the deeper and broader penetration necessary to achieve the goals of the Three-Year Plan. Equally important, these combined efforts help create seamless consumer experiences that offer integrated portfolios of energy efficiency information and program options that are clear, relevant to the consumer, and available to Massachusetts residents, businesses, and other organizations. The marketing, education, and community outreach, as proposed and described in the Three-Year Plan will provide the Program Administrators the platform to promote the proposed energy efficiency programs, which is critical to the achievement of the proposed Three-Year Plan savings and the realization of Three-Year Plan benefits.

III. THE COMPACT SPECIFIC COMPONENTS OF THE PLAN

A. Background of the Compact

Q. Please describe the Compact's purposes.

A. The purposes of the Compact include, among other things, (1) to provide the basis for aggregation of all consumers on a non-discriminatory basis; (2) to negotiate the best terms and conditions and the most competitive market rates available for electricity supply and transparent pricing; (3) to provide sharing of economic savings to consumers based on current electric rates and/or cost-of service ratemaking approved by the Department; (4) to provide full public accountability to consumers; and (5) to utilize and encourage demand side management and other forms of energy efficiency and to advance consumer awareness and adoption of a wide variety of energy efficiency measures through the implementation of an energy efficiency plan.

Q. How is the Compact different from the other utility program administrators?

A. The Compact is the only approved energy efficiency Program Administrator in Massachusetts that is a municipal aggregator with a certified energy plan (as defined by G.L. c. 164, § 134) and not an investor-owned utility. Unlike every other Department-approved energy efficiency PA, the Compact has no stockholders, has no rate of return, does not collect performance incentives and is controlled by a twenty-two-member governing board consisting of representatives from its municipal members (the twenty-one towns on Cape Cod and Martha's Vineyard and Dukes County). Each Compact member appoints a representative to the Compact Governing Board, which is responsible for setting policy and overseeing the Compact's energy efficiency programs.

Q. Is the Compact's Governing Board involved in the development of the Compact's energy efficiency plans?

A. Yes. The Compact's unique governing structure permits it to maintain its community roots and to be responsive to consumer needs and concerns, as well as devote itself to the advancement of energy efficiency. The Compact Governing Board has been involved in the development and review of the Compact's proposed budget and savings goals for the Three-Year Plan. As part of this planning process, the Compact Governing Board and Compact Staff were guided by the results of the Potential Study. See Exhibit Compact-1 at Appendix N.

B. Development of the Compact's Plan

Q. In connection with the development of the Compact's budget and savings goals, in addition to the Potential Study, did the Compact perform any community outreach and input?

A. Yes, the Compact engaged Opinion Dynamics/Dunsky to hold a series of twelve stakeholder engagement sessions. These sessions started in November 2017 and ended in February 2018. The purpose of these sessions was to solicit customer input on existing and future energy efficiency programs offered by the Compact. The Compact has also presented, or is scheduled to present, a power point overview of the Compact's Three-Year Plan to all twenty-one Compact member towns' Board of Selectmen/Town Council. These meetings are televised on the local government access channel and are available on-line. At these meetings, Selectmen/Councilors and members of the public engage in a question and answer session about the programs offered and the associated costs of the proposed Plan. Additionally, the Compact held three informational sessions, two on Cape Cod and one on Martha's Vineyard on its Three-Year Plan.

Q. Does the Governing Board consider ratepayer impacts in its evaluation of the proposed Three-Year Plan?

A. Yes, the Compact Governing Board discusses ratepayer impacts as part of its evaluation of the proposed Three-Year Plan and all Compact specific enhancements to the Plan. As detailed in Exhibit Compact-9 and 10, the Compact's September and October Governing Board meetings were dedicated to discussing the bill impacts of the Plan and Compact specific enhancements. As part of its CVEO deliberations, the Compact Governing

Board discussed the importance of serving income eligible and moderate-income customers in a manner that minimized bill impacts to this population of customers. The Governing Board recognized the costs and associated bill impacts of the Plan, and ultimately determined that the long-term benefits of offering cost effective energy efficiency and demand services outweigh the short-run bill impacts of the Plan.

C. Compact Specific Program Enhancements

Q. Does the Compact provide enhanced core program initiatives as part of its approved 2016-2018 Three-Year Plan?

A. Yes. In addition to the Statewide Plan, which is the core of the Compact's approved 2016-2018 Three-Year Plan, the Compact provides specific program enhancements in several plan areas. These program departures result from the Governing Board's policy direction to continue existing programs that are both successful and responsive to the Compact's unique customer population. The Compact has tailored the statewide program offerings, where necessary to better meet its customers' unique profiles and needs. The Compact's Governing Board has determined that these enhancements are necessary to continue to best serve the needs and meet the demands of the Compact's unique customer base.

1. Residential Program Enhancements

Q. Does the Compact offer any enhancements to its Residential Programs?

A. Yes, under the Residential Coordinated Delivery Program, the Compact offers 100 percent incentive for all cost effective weatherization without a cap on the incentive

amount to customers who rent their home and pay their electric bill, and residences owned/operated by governmental entities.

Q. Does the Compact offer any other enhancements to its Residential Programs?

A. No.

Q. Does the Compact propose any new enhancements to its Residential Programs for the 2019-2021 Three-Year Plan?

A. Yes, the Compact will be offering a new Behavior Initiative, which will provide customers with paper reports comparing their energy usage to their neighbors. The Compact will also offer its CVEO as part of its Three-Year Plan. See Exhibit Compact-2 at Joint Testimony of Downey, Song and Brandt (providing further information on the CVEO).

2. Commercial & Industrial Enhancements

Q. Does the Compact provide enhanced C&I program initiatives as part of its approved 2016-2018 Three-Year Plan?

A. Yes. As with its residential programming, these program departures result from the Governing Board's policy direction to continue existing programs that are both successful and responsive to the Compact's unique customer population. The Compact has tailored the statewide program offerings, where necessary to better meet its customers' unique profiles and needs.

Q. Briefly describe the Compact's approved enhancements for its municipal C&I programs?

A. All Compact municipal customers are eligible for 100% incentives for all cost-effective public projects. The Compact's Governing Board reviews any municipal project that exceeds an incentive amount of $150,000.

Q. Does the Compact offer any other enhancements to its C&I programs in the 2016-2018 Three Year Plan?

A. Yes, the Compact offers cost-effective thermal measures designed to save oil, propane and other unregulated fuels, and enhanced incentives for Direct Install measures, small business customers and not for profit corporations.

Q. Is the Compact offering any new enhancements to its C&I programs as part of the 2019-2021 Plan?

A. No, the Compact is not proposing any further enhancements.

Q. Does the Compact's 2019-2021 Three-Year Plan propose to continue these Residential and C&I program enhancements as described above?

A. Yes. Eliminating these program enhancements would result in customers being eligible for fewer energy efficiency measures than is currently the case under the Compact's programs.

D. The Compact's Potential Study

Q. Consistent with the Department's Order in D.P.U. 15-166, did the Compact direct the completion of a study to evaluate the energy efficiency potential on Cape Cod and Martha's Vineyard?

A. Yes. The Compact retained Opinion Dynamics/Dunsky to evaluate the penetration, potential and program opportunities in the Compact's service territory. The goal of this research was to determine the achievable potential from electric energy efficiency and demand response measures among residential, income eligible and C&I customers for the three-year period 2019-2021 and to inform the Compact's program and planning efforts. The outputs of the Potential Study are intended to satisfy requirements of the Department's Order, D.P.U. 15-166 (January 28, 2016) at 25 to document the penetration of energy efficiency within the Compact's service territory and develop estimates of savings potential. Exhibit Compact-1 at Appendix N.

Q. Briefly describe the results and methodology of the Potential Study.

A. The current study updates the research conducted for the 2014/2015 report to determine a territory specific approach for achievable potential of energy efficiency and demand response measures. The study estimates the Compact's total achievable energy efficiency and demand response potential for the three-year period from 2019-2021 to be 156,697 annual MWh and 83 MW. Achievable potential represents 49% of economic potential and 36% of technical potential. On average, over the three-year period, achievable energy savings represents 2.78% of the Compact's annual forecasted sales. These electric savings would be expected to cost the Compact $201.1 million (incentive and non-

incentive program costs, in 2018 dollars), an average of $67 million per year or $1.28 per annual kWh.

The detailed review and analysis done to update the current study resulted in changes to the achievable potential as compared to the prior study, primarily around the addition and removal of measures, and adjustments made to lighting measure assumptions and that the study reflects the unique characteristics of the Compact's service territory and documents the Compact's energy efficiency program and demand response penetration, as well as the technical, economic and achievable potential.

Q. How did the Compact adopt the results of the Potential Study?

A. The Compact's Three-Year Plan is built from the bottom up, with reference to the Compact's Potential Study and incorporating the latest information and statewide assumptions. The Compact's 2019-2021 planned annual savings and annual savings as a percent of sales, are lower than those computed in the Potential Study. While the Compact's planned cost per kWh saved is lower than the cost per kWh computed in the Potential Study, the planned budget is lower than the Potential Study. The Compact worked closely with the Compact Governing Board to develop the budget and savings goals and takes into consideration bill impacts in its design. Given this collaboration and with direction from the Governing Board, the Compact built a Plan that it believes it can effectively implement.

In addition to defining the penetration of the Compact's energy efficiency programs and quantifying opportunities available in the 2019-2021 timeframe, the work conducted by Opinion Dynamics/Dunsky included the delivery of an excel based model

that will allow the Compact to revise planning assumptions and recalibrate achievable potential moving forward.

E. The Compact's Energy Efficiency Surcharge Analysis

Q. In preparing its Three-Year Plan, how did the Compact determine its EES funding requirements?

A. The Compact determined its EES funding requirements by reviewing: (1) the proposed budgets for 2019-2021 by customer sector; (2) expected revenue in 2019-2021 from the SBC, the FCM, and the RGGI; and (3) any over- or under-recovery from 2018 by customer sector. The remaining amounts in each customer sector are proposed for collection through the EES rates in each year.

Q. What are the expected EES rates for each year of the Three-Year Plan?

A. The Compact expects the following EES rates for each year in 2019 through 2021, effective January 1 of each year. The current 2018 EES rates are also provided for comparison.

Expected 2019-2021 EES for Customers in the Compact's Service Territory

Customer Sector	2018 Approved EES ($/kWh)	2019 Proposed EES ($/kWh)	2020 Expected EES ($/kWh)	2021 Expected EES ($/kWh)
Residential	**$0.01859**	**$0.02113**	**$0.02879**	**$0.03252**
Low Income	**$0.00148**	**$0.00043**	**$0.00362**	**$0.00500**
C&I	**$0.00530**	**$0.00545**	**$0.02013**	**$0.02276**

Q. How do these expected EES rates impact customer's bills over the three-year term?

A. Exhibit Compact-6 provides the results of the Compact's year-to-year bill impacts analysis. Customers who participate in the energy efficiency programs will see lower bill impacts due to reduced monthly consumption. The average non-participant residential customer (R-1 rate class) will experience bill impacts ranging from 1.1 percent for 2018 to 2019 to 3.3 percent for 2019 to 2020. The average non-participant low-income customer (R-2 rate class) will experience bill impacts ranging from -0.5 percent for 2018 to 2019 to 1.5 percent for 2019 to 2020. The bill impacts for non-participant C&I customers varies by rate class and by year, with the highest impact of 9.4 percent for 2019 to 2020 (G-3) and the lowest impact of 0.04 percent for 2018 to 2019 (G-7).

VII. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

PRE-FILED TESTIMONY OF

DOUG HURLEY

ON BEHALF OF

THE CAPE LIGHT COMPACT JPE

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Doug Hurley. My business address is 485 Massachusetts Avenue, Suite 2, Cambridge, MA 02139.

Q. By whom are you employed?

A. I am employed by Synapse Energy Economics ("Synapse").

Q. Please state your current position and provide a brief job description.

A. I am a Principal Associate responsible for assisting Synapse clients in their participation in the wholesale capacity markets. As a consultant to the Cape Light Compact JPE ("Compact"), I have assisted the Compact in its participation in the forward capacity market. My resume is attached as Exhibit 2 to the Attorney Pre-Hearing Statement (October 31, 2018) filed in this proceeding.

Q. Briefly describe the purpose of your testimony in this proceeding.

A. I am offering this testimony to provide information in support of the Compact's 2019-2021 Three-Year Energy Plan ("Three-Year Plan"). Specifically, I am offering testimony in response to question 9 issued by the Department in its Procedural Memorandum (October 3, 2018).

II. RESPONSES TO THE HEARING OFFICER MEMORANDUM

Q. Please describe the process by which the Compact develops bids for the forward capacity market ("FCM") administered by ISO New England, Inc. ("ISO-NE"), including a discussion of how energy storage technologies will be incorporated into such bids.

A. With the FCM now in the midst of qualification for the 13th auction (FCA-13), ISO-NE has a regular schedule of events to qualify, participate, and then deliver upon capacity supply obligations. I will use the process for the most recent auction as an example, but this process occurs annually:

- March 2018: Existing Capacity Qualification, identifying those projects that have cleared in prior auctions and the amount of savings from those measures that will no longer produce savings for the associated commitment period (end of measure life);
- April 2018: Show of Interest, including project description and amount of savings;
- June 2018: New Capacity Qualification, identifying the types and amount of savings from measures that will be installed by the start of the commitment period that were not cleared in prior auctions;
- February 2019: Forward Capacity Auction 9 (FCA-9), which was the commitment of capacity supply obligation; and
- June 2022: Start of the associated commitment period, which lasts through the end of May 2023.

The Compact began the planning process for this commitment period in the early months of 2018, a few months before the Show of Interest deadline. At that time, the Compact assessed (a) the amount of savings currently being delivered, (b) those measures already installed that would expire and no longer produce savings as of June 2022, (c) the current projections for the total amount of savings that could be delivered by June 2022, and (d)

the amount capacity supply obligations already taken up through the most recent auction, in this case FCA-12.

The amount of savings submitted at the Show of Interest deadline is then a combination of the above items. The amount of savings submitted at the Show of Interest deadline is the incremental amount not already committed in the prior auction, based upon updated projections. These future savings projections are updated with the submittal of the New Capacity Qualification package in June, and again for participation in the FCA, in February. At each step, caution is taken to balance the ability to maximize FCM revenues while avoiding the risk of not being able to deliver upon the obligation undertaken for a 12-month period more than three years in the future.

To date, the Compact has qualified only energy efficiency measures for participation in the FCM. It has yet to participate with a resource that is comprised of energy storage technologies. The Compact could seek to qualify an energy storage resource when a minimum of 100 kW of energy storage projects are implemented. The submitted plan includes several storage projects to be implemented in the Plan Years 2020 and 2021. Determinations regarding submission of energy storage savings into the FCM will be made after the Compact has gained experience with customer participation with the technology. The opportunity to offer energy storage projects into the FCM occurs each year and will provide the Compact a yearly opportunity to evaluate how energy storage projects should participate.

III. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.

THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

PRE-FILED JOINT TESTIMONY OF

MARGARET T. DOWNEY,

MARGARET SONG AND

AUSTIN BRANDT

ON BEHALF OF

THE CAPE LIGHT COMPACT JPE

I. INTRODUCTION

Margaret T. Downey:

Q. Please state your name and business address.

A. My name is Margaret T. Downey. My business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit #4, South Yarmouth, MA 02664.

Q. By whom are you employed?

A. I am employed by the Cape Light Compact JPE (the "Compact").

Q. Please state your current position.

A. I am the Administrator for the Compact and have served in that capacity since the Compact's inception in 1997. As the Administrator, I oversee the administration of the Compact and its development and implementation of its energy efficiency plans since 2001, as well as its provision of competitive energy supply through its municipal aggregation program.

Q. Provide a brief job description for your position as Administrator for the Compact.

A. As the Compact's Administrator, I manage the Compact's activities as an Electric Energy Efficiency Program Administrator and as a municipal aggregator for residents and businesses of Cape Cod and Martha's Vineyard. Specifically, with respect to the Compact's energy efficiency activities, I oversee the administration of the Compact's annual energy efficiency program budgets that are part of the three-year statewide Department of Public Utilities ("DPU") approved plan. I also represent the Compact on the Program Administrators' Leads Committee and serve as the Compact's representative on the Energy Efficiency Advisory Council. In addition, I am also the Compact's Chief

Procurement Officer. I am responsible for local and state regulatory reporting and approvals, as well as the oversight of the participation and compliance in the ISO New England Forward Capacity Market. I regularly make presentations and report to customers, Compact staff, board members, regulatory agencies and community advocates.

Margaret Song

Q. Please state your name and business address.

A. My name is Margaret Song. My business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit #4, South Yarmouth, MA 02664.

Q. By whom are you employed?

A. I am employed by the Compact.

Q. Please state your current position and provide a brief job description.

A. I am the Commercial & Industrial ("C&I") Program Manager. I have worked in energy efficiency at the Compact since 2002. As the C&I Program Manager, I oversee the implementation of efficiency programs, and I also have worked on various grants on behalf of the Compact including the Green Affordable Homes Initiative that combined solar photovoltaic ("PV") systems and efficiency incentives.

Austin Brandt

Q. Please state your name and business address.

A. My name is Austin Brandt. My business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit #4, South Yarmouth, MA 02664.

Q. By whom are you employed?

A. I am employed by the Compact.

Q. Please state your current position and provide a brief job description.

A. I am the Senior Power Supply Planner. I oversee the Compact's provision of competitive power supply to its customers and assist with the Compact's participation in certain regulatory proceedings. I am also responsible for the development and administration of the Compact's demand response programs and offerings, including the development of the corresponding budgets and savings goals included in the Compact's energy efficiency plan. I am the Compact's representative to the Program Administrators' Demand Response Working Group ("DRWG").

Q. Briefly describe the purpose of your joint testimony in this proceeding.

A. We are offering this testimony to provide general information in support of the Compact's enhancements to the 2019-2021 Three-Year Energy Plan ("2019-2021 Plan"), specifically the Compact's proposed Cape and Vineyard Electrification Offering ("CVEO"). We also elaborate on the deployment of energy storage technology included in the Compact's active demand response efforts, which dovetails with the CVEO and includes a stand-alone storage option for customers.

II. BACKGROUND OF THE COMPACT

Q. Please describe the Compact's purposes.

A. The purposes of the Compact include, among other things, (1) to provide the basis for aggregation of all consumers on a non-discriminatory basis; (2) to negotiate the best terms and conditions and the most competitive market rates available for electricity supply and transparent pricing; (3) to provide sharing of economic savings to consumers

based on current electric rates and/or cost-of service ratemaking approved by the Department; (4) to provide full public accountability to consumers; and (5) to utilize and encourage demand side management and other forms of energy efficiency and to advance consumer awareness and adoption of a wide variety of energy efficiency measures through the implementation of an energy efficiency plan.

Q. How is the Compact different from the other utility program administrators?

A. The Compact is the only approved energy efficiency program administrator ("PA" or "Program Administrator") in Massachusetts that is a municipal aggregator with a certified energy plan (as defined by G.L. c. 164, § 134) and not an investor-owned utility. Unlike every other Department-approved energy efficiency PA, the Compact has no stockholders, has no rate of return, does not collect performance incentives, and is controlled by a Governing Board consisting of representatives of its twenty-two Members. Each Compact Member appoints a representative to the Compact Governing Board, which is responsible for setting policy and overseeing the Compact's energy efficiency programs.

III. THE CAPE AND VINEYARD ELECTRIFICATION OFFERING

Q. Please briefly describe the CVEO.

A. The CVEO is designed to optimize customers' energy usage by providing enhanced incentives for the combined installation of cold-climate air source heat pumps ("ccASHP") to heat and cool their homes (moving away from oil, propane and electric baseboard heat), solar PV, and behind-the-meter battery storage. This combination of measures is designed to reduce overall customer energy usage while offsetting increased

electric usage from ccASHPs with renewable energy generation and providing storage for demand response and resiliency purposes.

Q. Why has the Compact proposed the CVEO and energy storage as part of its 2019-2021 Plan?

A. In 2018, the Act to Advance Clean Energy, Acts of 2018, amended the Green Communities Act, G.L. c. 25, §§ 19, 21-22, to allow Program Administrators to pursue active demand reduction initiatives, including energy storage. In addition, the updates provide that the Program Administrators may pursue strategic electrification, as well as programs that result in customers switching to renewable energy sources or other clean energy technologies. To satisfy these statutory directives, the Compact designed and developed CVEO and views it as the Compact's primary strategic electrification offering.

Q. Did the Compact discuss the CVEO with other stakeholders?

A. Yes. The Compact consulted with the Department of Energy Resources ("DOER"), the Massachusetts Clean Energy Center ("CEC"), the Office of the Attorney General ("AG") and representatives from the Low-Income Energy Affordability Network ("LEAN"), before finalizing the proposed design of CVEO. The Compact's Governing Board also provided critical feedback throughout the planning process. The Compact's interactions with each organization is further discussed below.

A. Customer Participation

Q. Please describe criteria for participating in the CVEO.

A. The criteria would include, but not be limited to, technical suitability for all three of the technologies, the willingness to participate in the demand response initiative, and

property deed restrictions (for those in the low-income category receiving 100% incentives for all three measures). Technical suitability criteria include, among other considerations, a roof that is appropriate for solar PV and a house that could be converted to heat pump technology. Site reviews will be performed to determine site suitability.

Q. Please describe the Compact's target customers for the CVEO during the 2019-2021 Plan term.

A. The Compact proposes to target 700 residential customers that heat their homes with oil, propane, or electric baseboard heat. In addition, the Compact proposes to offer tiered incentives based on a customer's verified income. The Compact is targeting customers such that twenty-five percent of the customers will be low-income, twenty-five percent will fall into the 61-80 percent of area median income, twenty-five percent will fall into the 81-120 percent of area median income and twenty-five percent will be market rate customers. If customers are not already identified as income-qualified in the Compact's data system, they will receive income verification paperwork.

Q. Please describe the process the Compact undertook to determine the participant estimates over the 2019-2021 Plan term.

A. The total number of participants was determined by starting with the number of oil, propane and electric baseboard heat customers in the Compact's service area. That number was further refined by taking into consideration that not all customers may have homes suitable for the use of a heat pump for both heating and cooling. The Compact further refined its participation estimates by considering that not all homes may be suitable for solar or have a roof of suitable age and condition. Each of these

considerations reduce the overall eligible population of participants. Since the Compact has not offered a program of this nature before, actual participation may vary from the planned numbers. Nonetheless, the developed estimates utilize the best available data at this time.

Q. Please describe the Compact's plan to identify eligible participants.

A. The Compact will market the CVEO publicly through its grassroots efforts and various media avenues; including social media, radio and local community television. Additionally, each of the Governing Board members will work with their respective municipalities to aid with marketing the CVEO. Finally, the Compact will work with the various contractor and stakeholder communities to help identify applicable customers.

Q. Will participating customers be required to implement all three measures in the offering, *i.e.*, PV system, battery storage and air source heat pump?

A. Yes. Customers will be required to implement all three measures in their homes. Customers, however, that already have installed one or two of the three measures (e.g., heat pumps, or heat pumps and battery storage) can still participate in CVEO and would be eligible for the enhanced incentives for the remaining measure(s).

Q. Please describe the Compact's assessment of the financial impact to participants by income tier.

A. After discussions with key stakeholders, the Compact worked to create tiered incentives so that the customer contribution increases as the customer's ability to pay increases. Based upon the estimated costs, rebates, applicable tax credits and loans, the Compact did

an analysis of bill impacts for the moderate income and extended moderate income categories of customers. Please see Exhibit Compact-12.

B. The CVEO Design

Q. Please briefly describe the CVEO's proposed incentive levels.

A. The planned incentives vary by income category. There will be no co-pay for those customers that meet the criteria for low-income (60% of state median income) and have deed-restricted properties. For moderate income customers (61-80% of area median income), the three measures are highly subsidized with some customer costs to be potentially funded through a HEAT Loan. The subsidies decline with the customer contributing more as the customer's income passes 81% of the area median income. The table below summarizes the incentives for each CVEO component by customer type.

CVEO Component	**Low-Income (up to 60% SMI)**	**Moderate Income (61-80% AMI)**	**Extended Moderate Income (81-120% AMI)**	**Standard (121+AMI)**
ccASHP	100% covered with EE funds	100% covered with grants, EE funds and other rebates	About 70% covered with grants, EE funds and other rebates. HEAT Loan for balance.	About 45% covered with EE funds and other rebates. HEAT Loan for balance.
Solar	100% gross system cost covered with EE funds and grants	About 60% covered with grants, EE funds and tax credits. HEAT Loan for balance.	HEAT Loan for 100% of gross system cost	HEAT Loan for 100% of gross system cost
Storage	100% covered	100% covered	100% covered	100% covered

Q. Please briefly describe the Compact's process in selecting the CVEO proposed incentive levels.

A. The Compact estimated the installed costs, rebates, and applicable credits with expert input from stakeholders, including the CEC. Based upon the net costs, the Compact tiered its incentives by income level. The Compact is also working with outside agencies to secure grant funding for the low-income, moderate, and extended moderate-income customers to offset bill impacts of the CVEO. No additional funding has been procured to date.

Q. Please provide the CVEO proposed budget for the 2019-2021 Plan term for each year of the term.

A. The CVEO budget is spread throughout the statewide core initiatives. Incentives for ccASHPs and solar PV are included in the Residential Coordinated Delivery and Income Eligible Coordinated Delivery core initiatives, while battery costs are included in the Residential Active Demand Reduction and Income Eligible Active Demand Reduction core initiatives. The table below summarizes the CVEO budget within each of these core initiatives. The costs shown are for incentives; sales, technical assistance and training ("STAT"); and marketing. The ccASHP costs represent incentives only, as STAT and marketing costs are part of the broader core initiatives' efforts. Battery storage costs are for all batteries included in the Compact's active demand management efforts.

CVEO Component	2019	2020	2021	2019-2021
ccASHP	4,049,386	5,700,331	7,480,989	17,230,706
Solar	774,930	2,694,720	4,401,200	7,870,850
Storage	201,667	5,446,667	6,601,667	12,250,001

Total	5,025,983	13,841,718	18,483,856	37,351,557

Q. Briefly describe the cost-effectiveness analyses performed in relation to the CVEO.

A. The Compact worked with its consultant, Synapse Energy Economics, Inc. ("Synapse"), to analyze the cost-effectiveness of battery storage and solar PVs from a Total Resource Cost ("TRC") perspective. Additionally, the Compact worked with other PAs statewide to look at heat pumps as part of strategic electrification. Please see Exhibit Compact-12.

Q. Briefly describe the process by which the Compact will evaluate the CVEO.

A. The Compact will evaluate CVEO consistent with statewide evaluation protocols. The Compact will share its progress and results with other PAs through the DRWG and/or management committees.

Q. Briefly describe the process by which the Compact will facilitate the implementation of the CVEO.

A. The Compact intends to competitively procure the services of a qualified vendor to serve as the Program Coordinator. The Program Coordinator will be the primary point of contact for CVEO participants and will coordinate the installation of the measures via multiple Compact vendors. The Program Coordinator will communicate with the Compact regarding customer participation and any customer specific implementation issues that may come up. The Program Coordinator will also assist the customer in interfacing with the local distribution company, Eversource Energy ("Eversource"), regarding interconnection of the battery and solar PV systems.

Q. Briefly describe whether the Compact would expand the CVEO to allow for greater participation than proposed during the 2019-2021 Plan term.

A. As mentioned earlier, there may be customers that have already implemented one or two of the three measures. Once the enrollment process is complete and the site reviews have been completed, the Compact may choose to allow for greater participation during the 2019-2021 Plan term in accordance with its budget.

C. Stakeholder Input on the CVEO

Q. Briefly describe the Compact's efforts to receive input from other state agencies while it was developing the CVEO.

A. As noted above, the Compact met with staff from DOER, CEC and the AG to review the proposed offering. Additionally, the Compact met with representatives from LEAN. Each of these agencies showed initial support for CVEO and provided input with respect to incentive levels and other design elements.

Q. Will the Compact be coordinating its delivery of the CVEO with any state agency?

A. The Compact has had conversations with the CEC on coordination of energy efficiency offerings. At this time, no coordinated effort has been finalized but discussions are on-going.

Q. Has the Compact pursued any outside funding sources for the CVEO?

A. The Compact has met with both DOER and the CEC to request outside funding for low-income and moderate-income customers. At this time, discussions are on-going and no funding has yet to be secured.

Q. Please describe the Compact's Governing Board involvement in the development of the Compact's 2019-2021 Plan, specifically the CVEO and energy storage initiative.

A. The Compact's Governing Board has had multiple meetings to discuss the 2019-2021 Plan, which included the CVEO and energy storage offering. The Governing Board provided critical feedback on program elements and participation goals and reviewed key materials. In addition, the Compact has been meeting with each Member town's Board of Selectmen or Town Council to update them on the 2019-2021 Plan as well the CVEO. Please see Exhibit Compact-9, 10 and 11 for additional information on the Compact's Governing Board's involvement in the development of the 2019-2021 Plan.

Q. Did the Compact's Governing Board approve the CVEO and energy storage initiative for inclusion in the Compact's 2019-2021 Plan?

A. Yes. At the Governing Board's October 10, 2018 regularly-scheduled meeting, the Governing Board unanimously voted to approve the Compact's 2019-2021 Plan and Plan enhancements, including the CVEO and energy storage offering. See Exhibit Compact-10.

Q. Briefly describe the Compact's efforts to coordinate with the EEAC in developing the CVEO.

A. The Compact has included the CVEO as part of the Program Administrator's specific programs that are included in each of the draft 2019-2021 Three-Year Energy Efficiency Plans submitted to the EEAC for its review and comment.

Q. Briefly describe any inquiries or feedback from the Compact's customers about the CVEO.

A. Information on the CVEO has been made available through the Member towns. As a result of those meetings, the Compact has already received notice of interest from several customers. The Compact also solicited feedback on CVEO from customers through an on-line survey.

Q. Has the Compact shared and discussed the associated bill impacts with members of the public prior to including the CVEO as part of its 2019-2021 Plan?

A. The Compact shared the bill impacts with the Governing Board, and the presentation is publicly available on the Compact's website. In addition, a discussion of bill impacts is part of the Compact's presentations at the meetings with Member towns.

D. Coordination with Other Program Administrators

Q. Briefly describe the Compact's efforts to coordinate with other Program Administrators in developing the CVEO.

A. The Compact has shared the cost-effectiveness analyses and accompanying memos prepared by Synapse with other Program Administrators. The Compact also reached out to Eversource Energy, the local distribution company in the Compact's service area, to work through the Compact's implementation of CVEO and its energy storage efforts. The Compact met with Eversource staff on October 24, 2018 to discuss coordination of the implementation of the CVEO and energy storage active demand offering with the purposes of minimizing any potential impacts on the operation and reliability of the distribution system and expects coordination discussions with Eversource to continue.

Q. How is the CVEO distinct from any other Program Administrator offering?

A. CVEO is distinct from other Program Administrator offerings as it combines the three technologies (ccASHP, PV and battery storage) to provide a customer a path toward strategic electrification. The Compact is the only Program Administrator to offer PV technology as part of the Three-Year Plan. In addition, CVEO will be specifically targeting customers that use electric baseboard heat or delivered fuels to heat their homes. Additionally, due to the Compact's demographics, the Compact will target residential customers with particular focus on equity across income categories.

IV. ACTIVE DEMAND - ENERGY STORAGE

Q. Briefly describe the energy storage initiative included in the Compact's active demand management efforts.

A. The Compact proposes to install behind-the-meter battery energy storage systems in homes and businesses on Cape Cod and Martha's Vineyard as part of its active demand management efforts. The batteries will be dispatched during peak hours to reduce load as part of the Compact's demand response resource portfolio. The Compact is proposing to provide and install the batteries at no direct cost to participating customers in exchange for the participants' agreeing to allow the Compact to dispatch the batteries for demand response purposes over the warrantied life of the battery, usually 10 years.

Q. Briefly describe how the Compact's energy storage proposal will be coordinated with the CVEO.

A. The Compact is proposing to install 1,000 battery energy storage units over the 2019-2021 Term. Of those 1,000 units, 700 will be reserved for customers participating in the CVEO. Of the remaining 300 battery units, the Compact expects that 100 will be

installed at small businesses, and 200 will be installed at eligible residential customers' sites that are not participating in the CVEO. All 1,000 batteries will be incented and operated in the same manner. The only difference is customer eligibility, in that the customers installing 700 batteries as part of the CVEO also need to install ccASHP and solar PV, while the 300 non-CVEO customers do not.

Q. Briefly describe the criteria for participant eligibility in the energy storage initiative included in the Compact's active demand management efforts.

A. Eligible customers must have or be able to obtain an interconnection agreement with the distribution company. Customers must also have a suitable space to install the battery where it will not be directly exposed to weather and must maintain internet connectivity over the term of the participation agreement so that the Compact can dispatch the battery during called demand response events.

A. Energy Storage Design

Q. Is the energy storage initiative part of the Compact's demand response efforts?

A. Yes. The battery storage systems will be dispatched during peak demand hours as part of the Compact's portfolio of demand response resources.

Q. Why is an interconnection agreement necessary for a customer to participate?

A. In order for the energy storage initiative to be cost-effective for residential customers, it will likely be necessary for the battery to be able to export power to the grid. This is because most batteries on the market are capable of 4+ kW of output. However, most residential customers do not have 4 kW of on-site load for these batteries to offset, even during peak hours. Therefore, in order to achieve 4 kW of demand reduction on the

distribution system, it will be necessary for the batteries to be able to export power to the grid in addition to offsetting any on-site load. It is the Compact's understanding that an interconnection agreement with the distribution company is necessary for the batteries to be able to export power to the grid.

Q. Briefly describe the process by which the Compact will dispatch the batteries as part of its demand response efforts.

A. The Compact plans to dispatch the batteries for up to three hours per day during the hours predicted to be the ISO-NE system-wide peak hours for that day. The Compact plans to discharge the batteries in this fashion on a daily basis during the summer months (June 1 – September 30) in order to consistently reduce average summer peak loads and also provide the best chance to hit the ISO-NE system's highest load hour of the year. Consistent with the statewide plan, the Compact plans to dispatch the batteries several times in the winter, targeting peak load days and hours.

Q. Will the battery only be charged from the solar PV system?

A. The Compact does not propose to limit the batteries' ability to charge from either the grid or the customers' solar PV systems, in order to maximize the batteries' ability to be dispatched every day during the peak load season (June through September) and hit the ISO-NE system peak hour. Only allowing the batteries to charge with energy from solar PV systems would limit the batteries' ability to charge on cloudy days and therefore would inhibit or prevent daily dispatch. This would reduce the benefits and cost-effectiveness of the offering.

Q. Briefly describe whether customers can bring their own battery and participate in a demand response program offered by the Compact.

A. The Compact expects that customers interested in installing a battery will participate in the CVEO or the Compact's battery storage offering. However, consistent with the statewide plan, the Compact will offer a "bring your own battery" program if enough batteries can be enrolled to make such a program cost-effective. Generally, a critical mass of battery participation is necessary to overcome the fixed costs necessary to incorporate the ability to dispatch the batteries in to an existing demand response management system ("DRMS") or procure a different DRMS compatible with the batteries.

Q. Can customers use installed batteries for backup power in case of a power outage?

A. Yes, customers can use installed batteries for backup power during outage events provided that doing so does not interfere with the Compact's use of the battery for demand response purposes (*e.g.*, disconnecting the battery to prevent it from discharging prior to an anticipated outage event). Since most outage events occur off-peak, the Compact expects battery usage conflicts of this nature to be uncommon. During actual outage events, the Compact will be unable to use the batteries for demand response purposes since the customer will not be able to export any energy to the grid.

Q. Briefly describe any cost-effectiveness analyses the Compact has performed relative to its energy storage initiative.

A. The Compact's consultant, Synapse, evaluated the cost-effectiveness of battery storage used for demand response purposes from a TRC perspective, and prepared an accompanying memo to explain and discuss the analysis. See Exhibit Compact-12.

Q. Briefly describe the Compact's energy storage initiative incentive levels.

A. The Compact is proposing to provide the battery storage systems to all participants at no direct cost.

B. Coordination with Eversource Energy

Q. Briefly describe the Compact's efforts to coordinate the implementation of its energy storage initiative and CVEO with Eversource, the local distribution company in the Compact's service territory.

A. The Compact has coordinated with Eversource on its storage initiatives through its participation on the DWRG. Through the DRWG, the Compact has kept Eversource staff informed of the Compact's proposed storage initiatives. Additionally, the PA Leads staff have been provided periodic updates on the Compact's initiatives. The Compact also met with Eversource staff on October 24, 2018 to discuss coordination and implementation of the Compact's proposed storage initiatives. The Compact will coordinate closely with Eversource to ensure that the storage initiative does not interfere with Eversource's ability to provide safe and reliable service as the distribution company.

VII. CONCLUSION

Q. Does this conclude your joint testimony?

A. Yes, it does.

Guide to the Filing Requirements of the Green Communities Act and D.P.U. 08-50-B in the Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan For January 1, 2019 - December 31, 2021

	FILING REQUIREMENT	LOCATION
1.	**Executive Summary**	Exhibit Compact-1 **Section I**
2.	**Table of Contents**	Exhibit Compact-1 **Pages 2-5**
3.	**Pre-Hearing Statement**	Pre-Hearing Statement
4.	**Tables**	*See below*
	Funding sources	Exhibit Compact-1 **Sections V.B** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables
	Program budgets, including a comparison of the Program Administrator's Three-Year Plan budget to its previous year's budget	Exhibit Compact-1 **Section VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables IV.C.2.1, IV.C.2.2
	Bill Impacts	Exhibit Compact-6 Bill Impact Analysis
	Cost-effectiveness analyses, including (1) a comparison of the Program Administrator's costs, benefits, and savings to statewide totals; (2) a comparison of the Program Administrator's Three-Year Plan costs, benefits, and savings to the previous program year; (3) an avoided costs factors summary; (4) a comparison of each Program Administrator's distribution and transmission avoided costs factors; and (5) a comparison of the Program Administrator's Three-Year Plan distribution and transmission avoided costs factors to its previous year's plan;	Exhibit Compact-1 **Sections IV.G, VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables IV.D

	FILING REQUIREMENT	LOCATION
	Supporting information for D.P.U. 08-50 working group tables, specifically, IV.B.1; Table IV.B.3.1; Table IV.B.3.4; Table IV.D.3.1.i; Table IV.D.3.3.i; Table IV.I.2; Table V.B.1; Table VII.B.2, and Table IV.I.1; (The requested information is contained in the notes section of each table, as approved by the Department in D.P.U. 08-50-B.)	Exhibit Compact-1 **Section VI.C**
	Administrative cost information	Exhibit Compact-1 **Section V.E.1** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table IV.C.2.2.
	Three-Year Plan Monitoring and Evaluation	Exhibit Compact-1 **Sections IV.H, VI.S, VI.T, VI.U**
	Performance incentives, including a narrative description	The Compact is a public entity and does not earn performance incentives.
	Three-Year Plan Cost recovery - lost base revenues and energy efficiency surcharge	Exhibit Compact-1 **Section V** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table IV.I.1. Petition for Approval of Energy Efficiency Investment Plan during the Period January 1, 2019 through December 31, 2021
	Low-income budget allocation	Exhibit Compact-1 **Section IV.E.2** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables IV.B.1., IV.C.1, V.B.1
	Outsourced services, including a comparison of outsourced services of the Program Administrator's Three-Year Plan to its previous plan	Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables V.D.1, V.D.3

	FILING REQUIREMENT	LOCATION
	Master Summary	Exhibit Compact-1 **Section VI.C** Exhibit Compact-4 - PA-Specific Energy Efficiency Data Tables, Table VII.B.2.
5.	**Supporting Appendices**	*See below*
	Assessment of all cost-effective energy efficiency and demand reduction resources	Exhibit Compact-1 **Section IV.C**
	Detailed cost-benefit analyses and input assumptions	Exhibit Compact-1 **Sections IV.G, VI.C, VI.L** Exhibit Compact-5 - BCR Screening Model
	Bill impacts analyses for all rate classes	Exhibit Compact-6 - Bill Impact Analysis
	Avoided cost study	Exhibit Compact-1 **Sections IV.G.2, VI.H**
	Technical Reference Manual	Exhibit Compact-1 **Sections IV.B, VI.L**
	Sources for all assumptions	Exhibit Compact-1 **Sections III, IV.B, VI.H, VI.L, VI.M, VI.N, VI.O, VI.T, VI.U**
	Transmission and distribution calculations	Exhibit Compact-1 **Section VI.L**
	Documents supporting competitive procurement	Exhibit Compact-1 **Section IV.E.3, VI.Q** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table V.D.1.
	Glossary of terms	Exhibit Compact-1 **Section VI.A**

	FILING REQUIREMENT	LOCATION
	Screening tools	Exhibit Compact-1 **Sections VI.C, VI.L** Exhibit Compact-5 - BCR Screening Model
6.	**Estimated lifetime cost, reliability, and magnitude of all proposed energy efficiency and demand reduction resources.**	Exhibit Compact-1 **Sections III, IV.C, IV.D, VI.C.** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables IV.D.1, IV.D.2.2, IV.D.2.3, VII.B.2
7.	**Amount of demand resources proposed.**	Exhibit Compact-1 **Sections IV.A, VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables IV.D.3.2.i
8.	**Estimated energy cost savings, including reductions in capacity and energy costs, and increases in rate stability and affordability for low-income customers.**	Exhibit Compact-1 **Sections IV.G, VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table IV.D.3.2.
9.	**Program descriptions.**	Exhibit Compact-1 **Section III**
10.	**Proposed mechanisms for performance incentives.**	The Compact is a public entity and does not earn performance incentives.
11.	**Program budget.**	Exhibit Compact-1 **Section VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Tables IV.B.1, IV.C.1

	FILING REQUIREMENT	LOCATION
12.	**Proposed reconciling mechanism.**	Exhibit Compact-1 **Section V** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table IV.I.1. Petition for Approval of Energy Efficiency Investment Plan during the Period January 1, 2019 through December 31, 2021
13.	**Estimated peak load reduction and estimated economic benefits (including job retention, job growth, and economic development).**	Exhibit Compact-1 **Sections IV.A, IV.G.3.c, VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table IV.D.3.2.i
14.	**Data on percentage of monies collected that will be used for direct consumer benefit (incentives and technical assistance).**	Exhibit Compact-1 **Section VI.C** Exhibit Compact-4 PA-Specific Energy Efficiency Data Tables, Table IV.C.1.

Energy Efficiency Data Tables

Overview

Cape Light Compact
October 31, 2018

DATA OVERVIEW

The following data tables provide a summary of the Program Administrator's benefits, costs, savings, and cost-effectiveness for 2016 through 2021. The 2016 through 2018 planned values are consistent with each Program Administrator's 2016-2018 Three-Year Plan. The 2016 and 2017 evaluated values are consistent with each Program Administrator's 2016 and 2017 Plan-Year Reports. The 2018 year-to-date data represents the most up-to-date estimated actual values available through August 2018. The 2019-2021 planned values are consistent with each Program Administrator's 2019-2021 Three-Year Plan.

SUPPORTING INFORMATION

The data included in these tables is based on other supporting models. The primary supporting models used by the Program Administrators are the Benefit-Cost Screening model, each Program Administrator's EES calculation support documents, and the Performance Incentive model. These exhibits should be referenced when looking for more detailed analyses, such as measure level detail and EES calculations. High-level summaries for each of these models are provided below, along with information on plan details that are not summarized in the following plan tables.

Benefit-Cost Screening Models

The Benefit-Cost Screening model provides measure level savings and benefits. This model uses the avoided cost values from the 2018 Avoided Energy Supply Cost study prepared by Synapse Energy Economics.

EES Calculations

Each Program Administrator's Energy Efficiency Surcharge analysis provides supporting information on the EES rates proposed for effect in 2019-2021, including how the rates are calculated for each customer sector, and how revenue is collected from each customer sector.

Performance Incentive Model

The Performance Incentive model filed as part of the Joint Statewide Three-Year Plan provides support for the performance incentive dollars proposed for collection by the Program Administrator. Note that performance incentives are not applicable to the Cape Light Compact.

EM&V Activities

The Evaluation, Monitoring & Verification Section of the Joint Statewide Three-Year Plan describes in detail the EM&V activities planned for 2019-2021.

Other Funding

For the electric Program Administrators, "Other Funding" are those funds, private or public utility administered or otherwise, that may be available for energy efficiency or demand resources and do not include SBC Funds, FCM Revenue, or RGGI Proceeds. The electric Program Administrators assume no other funding sources for 2019-2021.

2019-2021 Plan Data Tables

Template Version: October 25, 2018

PA-Specific Information

PA FILING

Distribution Company	Electric
Program Administrator	Cape Light Compact
Date of Filing/Draft	October 31, 2018

PLAN FILINGS

Reporting Period	Filing Date	DPU Docket #
2016 Planned	December 21, 2015	D.P.U. 15-166
2016 Evaluated	May 1, 2017	D.P.U. 17-100
2017 Planned	December 21, 2015	D.P.U. 15-166
2017 Evaluated	June 8, 2018	D.P.U. 18-51
2018 Planned	December 21, 2015	D.P.U. 15-166
2018 YTD	August 2018	
2019 Planned	October 31, 2018	D.P.U. 18-116
2020 Planned	October 31, 2018	D.P.U. 18-116
2021 Planned	October 31, 2018	D.P.U. 18-116

RATES FOR ADJUSTMENTS

2017 Nominal Discount Rate	2.54%	
2018 Nominal Discount Rate	2.54%	
2020 Nominal Discount Rate	2.33%	
2021 Nominal Discount Rate	2.33%	
Effective Tax Rate	27.32%	PA-specific
MWh to MMBTU conversion	3.412	(1 MWh = 3.412 MMBTU)

PLAN YEARS

Previous Plan Year 1	2016
Previous Plan Year 2	2017
Previous Plan Year 3	2018
Current Plan Year 1	2019
Current Plan Year 2	2020
Current Plan Year 3	2021

GHG EMISSIONS REDUCTION FACTORS (Short Tons)

GHG per:	NOX	SO2	CO2
Electricity (MWh)	0.00016	0.00004	0.49400
Gas (Therm)			0.00585
Oil (MMBTU)			0.08069
Propane (MMBTU)			0.06959
Source:	File named "3-year plan EFs 8-9-		

IV.B. Electric PA Funding Sources

1. Summary Table

Cape Light Compact
October 31, 2018

2019 Total Electric Funding Sources							2019 Funding as a Percent of Total Electric Funding Sources					
Sector	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**
A - Residential	2,564,670	2,635,856	535,711	(1,430,250)	18,378,418	22,684,405	11%	12%	2%	-6%	81%	100%
B - Income Eligible	183,192	188,277	38,265	3,506,554	8,073,630	11,989,919	2%	2%	0%	29%	67%	100%
C - Commercial & Industrial	2,128,792	2,187,879	444,665	6,394,656	16,839,086	27,995,077	8%	8%	2%	23%	60%	100%
Grand Total	**4,876,654**	**5,012,012**	**1,018,641**	**8,470,960**	**43,291,134**	**62,669,402**	**8%**	**8%**	**2%**	**14%**	**69%**	**100%**

2019 Total Electric Funding Sources							2019 Funding as a Percent of Total Electric Funding Sources					
Sector	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**
A - Residential	2,566,053	1,688,663	525,701	-	25,831,793	30,612,210	8%	6%	2%	0%	84%	100%
B - Income Eligible	183,384	120,681	37,569	-	8,713,595	9,055,228	2%	1%	0%	0%	96%	100%
C - Commercial & Industrial	2,115,824	1,392,377	433,464	-	12,305,730	16,247,395	13%	9%	3%	0%	76%	100%
Grand Total	**4,865,260**	**3,201,721**	**996,734**	**-**	**46,851,118**	**55,914,834**	**9%**	**6%**	**2%**	**0%**	**84%**	**100%**

2019 Total Electric Funding Sources							2019 Funding as a Percent of Total Electric Funding Sources					
Sector	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**
A - Residential	2,559,080	1,543,708	543,317	-	28,165,403	32,811,509	8%	5%	2%	0%	86%	100%
B - Income Eligible	182,932	110,350	38,838	-	11,991,480	12,323,599	1%	1%	0%	0%	97%	100%
C - Commercial & Industrial	2,101,568	1,267,724	446,183	-	12,626,550	16,442,024	13%	8%	3%	0%	77%	100%
Grand Total	**4,843,580**	**2,921,782**	**1,028,338**	**-**	**52,783,432**	**61,577,132**	**8%**	**5%**	**2%**	**0%**	**86%**	**100%**

2019 Total Electric Funding Sources							2019 Funding as a Percent of Total Electric Funding Sources					
Sector	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**	**SBC**	**FCM**	**RGGI**	**Carryover**	**EERF**	**Total**
A - Residential	7,689,803	5,868,227	1,604,730	(1,430,250)	72,375,615	86,108,124	9%	7%	2%	-2%	84%	100%
B - Income Eligible	549,508	419,307	114,673	3,506,554	28,778,704	33,368,747	2%	1%	0%	11%	86%	100%
C - Commercial & Industrial	6,346,183	4,847,980	1,324,311	6,394,656	41,771,366	60,684,497	10%	8%	2%	11%	69%	100%
Grand Total	**14,585,494**	**11,135,515**	**3,043,714**	**8,470,960**	**142,925,684**	**180,161,368**	**8%**	**6%**	**2%**	**5%**	**79%**	**100%**

Notes:
For supporting information on SBC collections, see Table IV.B.3.1.
For supporting information on FCM revenue, see Table IV.B.3.2.
For supporting information on RGGI proceeds, see Table IV.B.3.3.
For supporting information on other funding see, Additional Sources of Information.
For supporting information on estimated carryover, see Table IV.B.3.5.
For supporting information on the EERF, see Table IV.B.3.6.
Funding sources for each year are represented in nominal dollars (2019$, 2020$, 2021$).

IV.B. Electric PA Funding Sources

3.1. System Benefit Charge Funds

Cape Light Compact

October 31, 2018

2019 System Benefit Charge Collections				
Sector	**Sales (kWh)**	**SBC Charge ($/kWh)**	**Collections**	
			($)	**(% of Total)**
A - Residential	1,025,868,003	0.0025	2,564,670	52.6%
B - Income Eligible	73,276,955	0.0025	183,192	3.8%
C - Commercial & Industrial	851,516,632	0.0025	2,128,792	43.7%
Grand Total	**1,950,661,590**		**4,876,654**	**100%**

2020 System Benefit Charge Collections				
Sector	**Sales (kWh)**	**SBC Charge ($/kWh)**	**Collections**	
			($)	**(% of Total)**
A - Residential	1,026,421,078	0.0025	2,566,053	52.7%
B - Income Eligible	73,353,445	0.0025	183,384	3.8%
C - Commercial & Industrial	846,329,575	0.0025	2,115,824	43.5%
Grand Total	**1,946,104,097**		**4,865,260**	**100%**

2021 System Benefit Charge Collections				
Sector	**Sales (kWh)**	**SBC Charge ($/kWh)**	**Collections**	
			($)	**(% of Total)**
A - Residential	1,023,632,119	0.0025	2,559,080	52.8%
B - Income Eligible	73,172,764	0.0025	182,932	3.8%
C - Commercial & Industrial	840,627,193	0.0025	2,101,568	43.4%
Grand Total	**1,937,432,076**		**4,843,580**	**100%**

2019-2021 System Benefit Charge Collections				
Sector	**Sales (kWh)**	**SBC Charge ($/kWh)**	**Collections**	
			($)	**(% of Total)**
A - Residential	3,075,921,200	0.0025	7,689,803	52.7%
B - Income Eligible	219,803,164	0.0025	549,508	3.8%
C - Commercial & Industrial	2,538,473,399	0.0025	6,346,183	43.5%
Grand Total	**5,834,197,763**		**14,585,494**	**100%**

Notes:

Collections are the sales multiplied by the SBC charge.

Consistent with the Department's Energy Efficiency Guidelines § 3.2.1.2, electric Program Administrators allocate revenue from the System Benefits Charge to the residential, low-income, and commercial and industrial customer sectors in proportion to the sector's kilowatt-hour consumption.

IV.B. Electric PA Funding Sources

3.2. Forward Capacity Market Proceeds

Cape Light Compact

October 31, 2018

2019 Forward Capacity Market Revenue									
Auction	New or Existing	Zone (NEMA, SEMA, or WCMA)	Jan 2019 - May 2019			June 2019 - Dec 2019			Total Revenue ($)
			Savings (kW)	Price ($)	Revenue ($)	Savings (kW)	Price ($)	Revenue ($)	
FCA-9	Existing	SEMA	30,377	11.08	1,682,886			-	1,682,886
FCA-9	New	SEMA	15,571	17.73	1,380,213			-	1,380,213
FCA-10	All	SEMA			-	39,604	7.03	1,948,913	1,948,913
					-			-	-
					-			-	-
					-			-	-
					-			-	-
					-			-	-
Grand Total			**45,948**	**n/a**	**3,063,099**	**39,604**	**n/a**	**1,948,913**	**5,012,012**

2020 Forward Capacity Market Revenue									
Auction	New or Existing	Zone (NEMA, SEMA, or WCMA)	Jan 2020 - May 2020			June 2020 - Dec 2020			Total Revenue ($)
			Savings (kW)	Price ($)	Revenue ($)	Savings (kW)	Price ($)	Revenue ($)	
FCA-10	All	SEMA	39,604	7.03	1,392,081			-	1,392,081
FCA-11	All	SEMA			-	48,805	5.30	1,809,641	1,809,641
					-			-	-
					-			-	-
					-			-	-
					-			-	-
					-			-	-
Grand Total			**39,604**	**n/a**	**1,392,081**	**48,805**	**n/a**	**1,809,641**	**3,201,721**

2021 Forward Capacity Market Revenue									
Auction	New or Existing	Zone (NEMA, SEMA, or WCMA)	Jan 2021 - May 2021			June 2021 - Dec 2021			Total Revenue ($)
			Savings (kW)	Price ($)	Revenue ($)	Savings (kW)	Price ($)	Revenue ($)	
FCA-11	All	SEMA	48,805	5.30	1,292,600			-	1,292,600
FCA-12	All	SEMA			-	50,257	4.63	1,629,181	1,629,181
					-			-	-
					-			-	-
					-			-	-
					-			-	-
					-			-	-
					-			-	-
Grand Total			**48,805**	**n/a**	**1,292,600**	**50,257**	**n/a**	**1,629,181**	**2,921,782**

2019-2021 Forward Capacity Market Revenue								
Sector	2019		2020		2021		2019-2021	
	FCM Revenue ($)	% of FCM Revenue	FCM Revenue ($)	% of FCM Revenue	FCM Revenue ($)	% of FCM Revenue	FCM Revenue ($)	% of FCM Revenue
A - Residential	2,635,856	52.6%	1,688,663	52.7%	1,543,708	52.8%	5,868,227	52.7%
B - Income Eligible	188,277	3.8%	120,681	3.8%	110,350	3.8%	419,307	3.8%
C - Commercial & Industrial	2,187,879	43.7%	1,392,377	43.5%	1,267,724	43.4%	4,847,980	43.5%
Grand Total	**5,012,012**	**100%**	**3,201,721**	**100%**	**2,921,782**	**100%**	**11,135,515**	**100%**

Notes:

Revenue is allocated across customer sector based on percentage allocation of kWh sales. See Table IV.B.3.1.

Each Program Administrator completes this table according to how their FCM resources have cleared in each auction.

IV.B. Electric PA Funding Sources

3.3. RGGI Proceeds

Cape Light Compact

October 31, 2018

RGGI Forecast by Calendar Year				
Calendar Year	Allowances	Clearing Price	PA Allocation	PA Proceeds
2018	9,709,728	$ 4.08	55%	$ 21,775,279
2019	8,539,575	$ 4.00	55%	$ 18,787,065
2020	8,664,089	$ 4.00	55%	$ 19,060,996
2021	9,005,661	$ 4.00	55%	$ 19,812,454

Notes:

The Allowances, Clearing Price, and PA Allocation information in the above table was provided to the Massachusetts Program Administrators by the Massachusetts Department of Energy Resources. For more information on RGGI Auctions, refer to https://www.rggi.org/auctions/about-auctions.

DOER allocates 80 percent of RGGI proceeds to energy efficiency activities. DOER first allocates proceeds to certain activities, such as its administration of RGGI, and the remaining proceeds are allocated to the Program Administrators.

The 2018 clearing price is an average of actual and forecasted clearing prices.

RGGI Forecast by Auction								
Auction	Auction Date	Revenue Year	Allowances	Clearing Price	PA Allocation	PA Proceeds	PA-Specific Allocation	PA-Specific Proceeds
42	Dec-18	2019	2,427,432	$ 4.00	55%	$ 5,340,350	5.0%	$ 278,795
43	Mar-19	2019	2,134,894	$ 4.00	55%	$ 4,696,766	5.0%	$ 246,616
44	Jun-19	2019	2,134,894	$ 4.00	55%	$ 4,696,766	5.0%	$ 246,616
45	Sep-19	2019	2,134,894	$ 4.00	55%	$ 4,696,766	5.0%	$ 246,616
46	Dec-19	2020	2,134,894	$ 4.00	55%	$ 4,696,766	5.0%	$ 246,616
47	Mar-20	2020	2,166,022	$ 4.00	55%	$ 4,765,249	5.0%	$ 250,040
48	Jun-20	2020	2,166,022	$ 4.00	55%	$ 4,765,249	5.0%	$ 250,040
49	Sep-20	2020	2,166,022	$ 4.00	55%	$ 4,765,249	5.0%	$ 250,040
50	Dec-20	2021	2,166,022	$ 4.00	55%	$ 4,765,249	5.0%	$ 250,040
51	Mar-21	2021	2,251,415	$ 4.00	55%	$ 4,953,114	5.0%	$ 259,433
52	Jun-21	2021	2,251,415	$ 4.00	55%	$ 4,953,114	5.0%	$ 259,433
53	Sep-21	2021	2,251,415	$ 4.00	55%	$ 4,953,114	5.0%	$ 259,433

Notes:

PA-Specific Allocation is based on each Program Administrator's percent of statewide sales.

RGGI Forecast by Revenue Year		
Revenue Year	PA Proceeds	PA-Specific Proceeds
2019	$ 19,430,649	$ 1,018,641
2020	$ 18,992,513	$ 996,734
2021	$ 19,624,590	$ 1,028,338
2019-2021	**$ 58,047,752**	**$ 3,043,714**

Notes:

There is an approximately three- to five-month lag between the completion of an auction and receipt of proceeds from that auction by the Program Administrators. The Program Administrators have accounted for this time lag in the table above to better reflect calendar-year energy efficiency revenue.

Program Administrator Allocation of RGGI Proceeds to Customer Sectors								
Sector	2019		2020		2021		2019-2021	
	RGGI Funds	% of Total RGGI Funds	RGGI Funds	% of Total RGGI Funds	RGGI Funds	% of Total RGGI Funds	RGGI Funds	% of Total RGGI Funds
A - Residential	$535,711	52.6%	$525,701	52.7%	$543,317	52.8%	$1,604,730	52.7%
B - Income Eligible	$38,265	3.8%	$37,569	3.8%	$38,838	3.8%	$114,673	3.8%
C - Commercial & Industrial	$444,665	43.7%	$433,464	43.5%	$446,183	43.4%	$1,324,311	43.5%
Grand Total	**$1,018,641**	**100.0%**	**$996,734**	**100.0%**	**$1,028,338**	**100.0%**	**$3,043,714**	**100.0%**

Notes:

RGGI Proceeds are allocated to each customer sector based on the sector's percentage of kWh sales. See Table IV.B.3.1.

IV.B. Program Administrator Funding Sources

3.5. Carryover

Cape Light Compact
October 31, 2018

Estimated 2018 Carryover into 2019								
Sector	2016-2018 Planned		2016-2018 Actual		2016-2018 Beginning Balance (Carryover from 2015)	2018 Ending Balance w/o Interest (Carryover from 2018)	Interest on Carryover	Total 2018 Carryover into 2019
	Funding	Budget	Revenue	Expenditures				
A - Residential	68,610,838	67,887,786	70,640,958	68,809,156	(3,293,733)	(1,461,931)	31,681	(1,430,250)
B - Income Eligible	13,466,775	13,466,775	11,055,945	8,302,439	736,090	3,489,596	16,959	3,506,554
C - Commercial & Industrial	46,046,851	45,966,511	33,582,237	30,212,893	2,964,302	6,333,646	61,010	6,394,656
Grand Total	**128,124,464**	**127,321,073**	**115,279,140**	**107,324,488**	**406,658**	**8,361,310**	**109,650**	**8,470,960**

Notes:
In 2018 funding from the SBC, FCM, and RGGI does not exceed the budget. As such, the Program Administrator does not have excess funding to carryover to the subsequent year as defined in Energy Efficiency Guideline § 3.2.1.6.1.

The above table provides an estimate of the over- or under-collection for the EERF from the 2016-2018 Three-Year Plan. The Program Administrator's actual 2016-2018 carryover for collection in 2019 will be presented in its Energy Efficiency Reconciliation Factor filing.

A positive carryover value indicates an over-collection while a negative carryover value indicates an under-collection.

IV.B. Electric PA Funding Sources

3.6. EERF

Cape Light Compact

October 31, 2018

2019 Energy Efficiency Reconciliation Factor Funds							
Sector	**Total Budget**	**Sales (kWh)**	**SBC + FCM + RGGI + Carryover**	**Interest**	**EERF Funding Required**	**Low-Income Subsidization**	**EERF Funding Collected**
A - Residential	25,470,031	1,025,868,003	4,305,987	74,875	21,238,919	441,756	21,680,675
B - Income Eligible	4,988,309	73,276,955	3,916,289	(11,499)	1,060,521	31,554	31,554
C - Commercial & Industrial	15,223,278	851,516,632	11,155,991	(17,512)	4,049,774	587,211	4,636,985
Grand Total	**45,681,618**	**1,950,661,590**	**19,378,267**	**45,864**	**26,349,214**	**1,060,521**	**26,349,214**

2020 Energy Efficiency Reconciliation Factor Funds							
Sector	**Total Budget**	**Sales (kWh)**	**SBC + FCM + RGGI + Carryover**	**Interest**	**EERF Funding Required**	**Low-Income Subsidization**	**EERF Funding Collected**
A - Residential	30,549,028	1,026,421,078	4,780,417	63,183	25,831,793	3,718,138	29,549,931
B - Income Eligible	9,036,565	73,353,445	341,634	18,664	8,713,595	265,718	265,718
C - Commercial & Industrial	16,213,827	846,329,575	3,941,665	33,568	12,305,730	4,729,739	17,035,469
Grand Total	**55,799,419**	**1,946,104,097**	**9,063,716**	**115,415**	**46,851,118**	**8,713,595**	**46,851,118**

2021 Energy Efficiency Reconciliation Factor Funds							
Sector	**Total Budget**	**Sales (kWh)**	**SBC + FCM + RGGI + Carryover**	**Interest**	**EERF Funding Required**	**Low-Income Subsidization**	**EERF Funding Collected**
A - Residential	32,743,760	1,023,632,119	4,646,106	67,749	28,165,403	5,116,742	33,282,145
B - Income Eligible	12,298,200	73,172,764	332,120	25,400	11,991,480	365,762	365,762
C - Commercial & Industrial	16,408,027	840,627,193	3,815,475	33,998	12,626,550	6,508,975	19,135,525
Grand Total	**61,449,986**	**1,937,432,076**	**8,793,700**	**127,146**	**52,783,432**	**11,991,480**	**52,783,432**

2019-2021 Energy Efficiency Reconciliation Factor Funds							
Sector	**Total Budget**	**Sales (kWh)**	**SBC + FCM + RGGI + Carryover**	**Interest**	**EERF Funding Required**	**Low-Income Subsidization**	**EERF Funding Collected**
A - Residential	88,762,818	3,075,921,200	13,732,510	205,807	75,236,115	9,066,126	84,302,241
B - Income Eligible	26,323,074	219,803,164	4,590,043	32,564	21,765,595	647,859	647,859
C - Commercial & Industrial	47,845,131	2,538,473,399	18,913,131	50,054	28,982,054	12,051,610	41,033,664
Grand Total	**162,931,023**	**5,834,197,763**	**37,235,683**	**288,425**	**125,983,764**	**21,765,595**	**125,983,764**

Notes:

For supporting information on the Total Program Administrator Budget, which includes Performance Incentives, see Table IV.C.1.3.

For supporting information on the EERF calculation, including low income subsidization. refer to the Program Administrator's EERF exhibit.

All electric Program Administrators except for the Cape Light Compact have a revenue decoupling mechanism in place and do not estimate LBR. LBR is not applicable to the Cape Light Com

IV.C. Program Administrator Budgets

1. Summary Table

Cape Light Compact
October 31, 2018

2019 Program Administrator Budget										
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant	Resource Benefit per Program Cost
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs				
A - Residential	**1,174,356**	**733,852**	**18,048,072**	**4,774,402**	**739,350**	**25,470,031**	**-**	**25,470,031**	**88**	**2.55**
A1 - Residential New Buildings	37,686	23,020	652,471	200,728	-	913,905	-	913,905	1,835	6.23
A1a - Residential New Homes & Renovations	37,686	23,020	652,471	200,728	-	913,905	-	913,905	1,835	6.23
A2 - Residential Existing Buildings	879,788	502,456	15,607,923	4,345,379	-	21,335,546	-	21,335,546	74	2.78
A2a - Residential Coordinated Delivery	468,825	196,550	8,918,618	1,785,364	-	11,369,356	-	11,369,356	3,057	3.03
A2b - Residential Conservation Services (RCS)	77,924	43,930	-	1,767,860	-	1,889,714	-	1,889,714		-
A2c - Residential Retail	286,936	240,962	5,815,495	615,028	-	6,958,422	-	6,958,422	36	3.41
A2d - Residential Behavior	35,076	8,760	787,500	19,293	-	850,629	-	850,629	9	0.85
A2e - Residential Active Demand Reduction	11,028	12,254	86,310	157,834	-	267,426	-	267,426		1.57
A3 - Residential Hard-to-Measure	256,882	208,375	1,787,678	228,295	739,350	3,220,580	-	3,220,580		
A3a - Residential Statewide Marketing	-	111,876	-	-	-	111,876	-	111,876		
A3b - Residential Statewide Database	5,589	-	-	-	-	5,589	-	5,589		
A3c - Residential DOER Assessment	145,089	-	-	-	-	145,089	-	145,089		
A3d - Residential Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
A3e - Residential Workforce Development	-	-	-	37,590	-	37,590	-	37,590		
A3f - Residential Evaluation and Market Research	-	-	-	-	739,350	739,350	-	739,350		
A3g - Residential EEAC Consultants	28,122	-	-	-	-	28,122	-	28,122		
A3h - Residential R&D and Demonstration	-	-	134,426	-	-	134,426	-	134,426		
A3i - Residential HEAT Loan	78,082	21,499	1,653,252	140,706	-	1,893,538	-	1,893,538		
A3j - Residential Education	-	75,000	-	50,000	-	125,000	-	125,000		
B - Income Eligible	**242,114**	**108,643**	**3,751,777**	**845,775**	**40,000**	**4,988,309**	**-**	**4,988,309**	**3,654**	**1.27**
B1 - Income Eligible Existing Buildings	181,909	84,444	3,751,777	820,775	-	4,838,906	-	4,838,906	3,545	1.31
B1a - Income Eligible Coordinated Delivery	181,709	84,390	3,751,777	815,714	-	4,833,591	-	4,833,591	3,541	1.31
B1b - Income Eligible Active Demand Reduction	200	54	-	5,061	-	5,315	-	5,315		-
B2 - Income Eligible Hard-to-Measure	60,205	24,199	-	25,000	40,000	149,404	-	149,404		
B2a - Income Eligible Statewide Marketing	-	24,199	-	-	-	24,199	-	24,199		
B2b - Income Eligible Statewide Database	1,237	-	-	-	-	1,237	-	1,237		
B2c - Income Eligible DOER Assessment	29,381	-	-	-	-	29,381	-	29,381		
B2d - Income Eligible Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
B2e - Income Eligible Workforce Development	-	-	-	25,000	-	25,000	-	25,000		
B2f - Income Eligible Evaluation and Market Research	-	-	-	-	40,000	40,000	-	40,000		
B2g - Income Eligible Energy Affordability Network	29,587	-	-	-	-	29,587	-	29,587		
C - Commercial & Industrial	**872,397**	**373,911**	**11,754,677**	**1,734,233**	**488,059**	**15,223,278**	**-**	**15,223,278**	**7,771**	**2.17**
C1 - C&I New Buildings	43,341	7,248	360,650	206,633	-	617,872	-	617,872	12,357	2.53
C1a - C&I New Buildings & Major Renovations	43,341	7,248	360,650	206,633	-	617,872	-	617,872	12,357	2.53
C2 - C&I Existing Buildings	708,766	290,106	11,356,527	1,499,246	-	13,854,645	-	13,854,645	7,258	2.27
C2a - C&I Existing Building Retrofit	617,114	248,356	10,055,054	1,079,995	-	12,000,519	-	12,000,519	16,086	1.98
C2b - C&I New & Replacement Equipment	69,364	36,469	914,101	361,444	-	1,381,378	-	1,381,378	1,188	3.02
C2c - C&I Active Demand Reduction	22,288	5,281	387,372	57,807	-	472,747	-	472,747		7.47
C3 - C&I Hard-to-Measure	120,290	76,557	37,500	28,354	488,059	750,761	-	750,761		
C3a - C&I Statewide Marketing	-	71,557	-	-	-	71,557	-	71,557		
C3b - C&I Statewide Database	3,774	-	-	-	-	3,774	-	3,774		
C3c - C&I DOER Assessment	97,530	-	-	-	-	97,530	-	97,530		
C3d - C&I Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
C3e - C&I Workforce Development	-	5,000	-	28,354	-	33,354	-	33,354		
C3f - C&I Evaluation and Market Research	-	-	-	-	488,059	488,059	-	488,059		
C3g - C&I EEAC Consultants	18,987	-	-	-	-	18,987	-	18,987		
C3h - C&I R&D and Demonstration	-	-	37,500	-	-	37,500	-	37,500		
Grand Total	**2,288,867**	**1,216,405**	**33,554,526**	**7,354,411**	**1,267,409**	**45,681,618**	**-**	**45,681,618**	**156**	**2.29**

IV.C. Program Administrator Budgets

1. Summary Table

Cape Light Compact
October 31, 2018

2020 Program Administrator Budget										
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant	Resource Benefit per Program Cost
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs				
A - Residential	**1,221,393**	**737,577**	**22,366,108**	**5,477,328**	**746,622**	**30,549,028**	**-**	**30,549,028**	**126**	**2.78**
A1 - Residential New Buildings	33,895	23,097	694,050	198,538	-	949,580	-	949,580	1,837	6.19
A1a - Residential New Homes & Renovations	33,895	23,097	694,050	198,538	-	949,580	-	949,580	1,837	6.19
A2 - Residential Existing Buildings	902,263	505,953	18,834,232	5,034,742	-	25,277,189	-	25,277,189	104	3.13
A2a - Residential Coordinated Delivery	442,940	185,849	9,868,399	1,911,922	-	12,409,110	-	12,409,110	3,119	3.82
A2b - Residential Conservation Services (RCS)	66,756	41,930	-	1,761,510	-	1,870,196	-	1,870,196		-
A2c - Residential Retail	212,727	215,638	4,952,982	578,271	-	5,959,618	-	5,959,618	37	3.44
A2d - Residential Behavior	25,375	6,637	665,000	13,878	-	710,890	-	710,890	9	1.64
A2e - Residential Active Demand Reduction	154,465	55,899	3,347,851	769,160	-	4,327,375	-	4,327,375	13,315	2.32
A3 - Residential Hard-to-Measure	285,235	208,527	2,837,826	244,049	746,622	4,322,259	-	4,322,259		
A3a - Residential Statewide Marketing	-	103,455	-	-	-	103,455	-	103,455		
A3b - Residential Statewide Database	5,115	-	-	-	-	5,115	-	5,115		
A3c - Residential DOER Assessment	145,089	-	-	-	-	145,089	-	145,089		
A3d - Residential Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
A3e - Residential Workforce Development	-	-	-	37,590	-	37,590	-	37,590		
A3f - Residential Evaluation and Market Research	-	-	-	-	746,622	746,622	-	746,622		
A3g - Residential EEAC Consultants	27,702	-	-	-	-	27,702	-	27,702		
A3h - Residential R&D and Demonstration	-	-	124,817	-	-	124,817	-	124,817		
A3i - Residential HEAT Loan	107,329	30,071	2,713,009	156,459	-	3,006,869	-	3,006,869		
A3j - Residential Education	-	75,000	-	50,000	-	125,000	-	125,000		
B - Income Eligible	**349,374**	**153,909**	**6,954,786**	**1,515,757**	**62,739**	**9,036,565**	**-**	**9,036,565**	**5,887**	**1.47**
B1 - Income Eligible Existing Buildings	288,505	117,915	6,954,786	1,490,757	-	8,851,963	-	8,851,963	5,767	1.50
B1a - Income Eligible Coordinated Delivery	257,430	108,315	6,204,786	1,327,961	-	7,898,491	-	7,898,491	5,410	1.40
B1b - Income Eligible Active Demand Reduction	31,076	9,600	750,000	162,796	-	953,472	-	953,472	12,713	2.27
B2 - Income Eligible Hard-to-Measure	60,868	35,994	-	25,000	62,739	184,602	-	184,602		
B2a - Income Eligible Statewide Marketing	-	35,994	-	-	-	35,994	-	35,994		
B2b - Income Eligible Statewide Database	1,900	-	-	-	-	1,900	-	1,900		
B2c - Income Eligible DOER Assessment	29,381	-	-	-	-	29,381	-	29,381		
B2d - Income Eligible Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
B2e - Income Eligible Workforce Development	-	-	-	25,000	-	25,000	-	25,000		
B2f - Income Eligible Evaluation and Market Research	-	-	-	-	62,739	62,739	-	62,739		
B2g - Income Eligible Energy Affordability Network	29,587	-	-	-	-	29,587	-	29,587		
C - Commercial & Industrial	**838,510**	**368,449**	**12,639,489**	**1,889,273**	**478,107**	**16,213,827**	**-**	**16,213,827**	**7,921**	**2.23**
C1 - C&I New Buildings	40,096	6,671	360,850	210,394	-	618,011	-	618,011	12,118	3.01
C1a - C&I New Buildings & Major Renovations	40,096	6,671	360,850	210,394	-	618,011	-	618,011	12,118	3.01
C2 - C&I Existing Buildings	677,893	288,595	12,241,139	1,650,525	-	14,858,152	-	14,858,152	7,444	2.31
C2a - C&I Existing Building Retrofit	568,576	241,823	10,426,875	1,112,045	-	12,349,319	-	12,349,319	15,812	2.08
C2b - C&I New & Replacement Equipment	62,920	35,357	925,601	377,187	-	1,401,064	-	1,401,064	1,203	2.59
C2c - C&I Active Demand Reduction	46,397	11,415	888,663	161,294	-	1,107,769	-	1,107,769	22,155	4.52
C3 - C&I Hard-to-Measure	120,521	73,183	37,500	28,354	478,107	737,664	-	737,664		
C3a - C&I Statewide Marketing	-	68,183	-	-	-	68,183	-	68,183		
C3b - C&I Statewide Database	3,584	-	-	-	-	3,584	-	3,584		
C3c - C&I DOER Assessment	97,530	-	-	-	-	97,530	-	97,530		
C3d - C&I Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
C3e - C&I Workforce Development	-	5,000	-	28,354	-	33,354	-	33,354		
C3f - C&I Evaluation and Market Research	-	-	-	-	478,107	478,107	-	478,107		
C3g - C&I EEAC Consultants	19,407	-	-	-	-	19,407	-	19,407		
C3h - C&I R&D and Demonstration	-	-	37,500	-	-	37,500	-	37,500		
Grand Total	**2,409,277**	**1,259,934**	**41,960,383**	**8,882,358**	**1,287,468**	**55,799,419**	**-**	**55,799,419**	**226**	**2.41**

IV.C. Program Administrator Budgets

1. Summary Table

Cape Light Compact
October 31, 2018

2021 Program Administrator Budget										
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant	Resource Benefit per Program Cost
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs				
A - Residential	**1,320,557**	**769,552**	**24,127,153**	**5,774,115**	**752,383**	**32,743,760**	**-**	**32,743,760**	**194**	**2.96**
A1 - Residential New Buildings	36,195	23,640	736,455	198,767	-	995,057	-	995,057	1,856	6.05
A1a - Residential New Homes & Renovations	36,195	23,640	736,455	198,767	-	995,057	-	995,057	1,856	6.05
A2 - Residential Existing Buildings	963,491	533,155	19,675,832	5,315,582	-	26,488,059	-	26,488,059	157	3.44
A2a - Residential Coordinated Delivery	494,009	202,378	10,816,962	2,067,819	-	13,581,168	-	13,581,168	3,227	4.40
A2b - Residential Conservation Services (RCS)	68,059	42,708	-	1,760,289	-	1,871,056	-	1,871,056		-
A2c - Residential Retail	186,243	214,907	4,147,049	571,938	-	5,120,137	-	5,120,137	54	3.46
A2d - Residential Behavior	23,828	6,385	612,500	12,355	-	655,068	-	655,068	9	2.00
A2e - Residential Active Demand Reduction	191,353	66,776	4,099,320	903,181	-	5,260,631	-	5,260,631	13,152	2.34
A3 - Residential Hard-to-Measure	320,871	212,758	3,714,867	259,766	752,383	5,260,644	-	5,260,644		
A3a - Residential Statewide Marketing	-	97,298	-	-	-	97,298	-	97,298		
A3b - Residential Statewide Database	4,769	-	-	-	-	4,769	-	4,769		
A3c - Residential DOER Assessment	145,089	-	-	-	-	145,089	-	145,089		
A3d - Residential Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
A3e - Residential Workforce Development	-	-	-	37,590	-	37,590	-	37,590		
A3f - Residential Evaluation and Market Research	-	-	-	-	752,383	752,383	-	752,383		
A3g - Residential EEAC Consultants	27,490	-	-	-	-	27,490	-	27,490		
A3h - Residential R&D and Demonstration	-	-	125,322	-	-	125,322	-	125,322		
A3i - Residential HEAT Loan	143,523	40,459	3,589,545	172,176	-	3,945,704	-	3,945,704		
A3j - Residential Education	-	75,000	-	50,000	-	125,000	-	125,000		
B - Income Eligible	**464,527**	**198,339**	**9,503,278**	**2,050,100**	**81,956**	**12,298,200**	**-**	**12,298,200**	**7,453**	**1.47**
B1 - Income Eligible Existing Buildings	403,132	152,987	9,503,278	2,025,100	-	12,084,497	-	12,084,497	7,324	1.50
B1a - Income Eligible Coordinated Delivery	360,776	139,919	8,503,278	1,810,838	-	10,814,811	-	10,814,811	6,977	1.41
B1b - Income Eligible Active Demand Reduction	42,356	13,068	1,000,000	214,262	-	1,269,685	-	1,269,685	12,697	2.28
B2 - Income Eligible Hard-to-Measure	61,395	45,352	-	25,000	81,956	213,703	-	213,703		
B2a - Income Eligible Statewide Marketing	-	45,352	-	-	-	45,352	-	45,352		
B2b - Income Eligible Statewide Database	2,427	-	-	-	-	2,427	-	2,427		
B2c - Income Eligible DOER Assessment	29,381	-	-	-	-	29,381	-	29,381		
B2d - Income Eligible Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
B2e - Income Eligible Workforce Development	-	-	-	25,000	-	25,000	-	25,000		
B2f - Income Eligible Evaluation and Market Research	-	-	-	-	81,956	81,956	-	81,956		
B2g - Income Eligible Energy Affordability Network	29,587	-	-	-	-	29,587	-	29,587		
C - Commercial & Industrial	**862,093**	**374,834**	**12,723,539**	**1,972,962**	**474,599**	**16,408,027**	**-**	**16,408,027**	**7,866**	**2.22**
C1 - C&I New Buildings	40,985	6,983	360,850	216,021	-	624,838	-	624,838	12,016	3.09
C1a - C&I New Buildings & Major Renovations	40,985	6,983	360,850	216,021	-	624,838	-	624,838	12,016	3.09
C2 - C&I Existing Buildings	700,555	297,870	12,325,189	1,728,587	-	15,052,201	-	15,052,201	7,400	2.29
C2a - C&I Existing Building Retrofit	596,400	251,793	10,695,285	1,176,901	-	12,720,380	-	12,720,380	15,589	2.06
C2b - C&I New & Replacement Equipment	56,585	34,197	741,081	389,768	-	1,221,630	-	1,221,630	1,046	2.65
C2c - C&I Active Demand Reduction	47,570	11,880	888,823	161,919	-	1,110,191	-	1,110,191	22,204	4.52
C3 - C&I Hard-to-Measure	120,553	69,981	37,500	28,354	474,599	730,988	-	730,988		
C3a - C&I Statewide Marketing	-	64,981	-	-	-	64,981	-	64,981		
C3b - C&I Statewide Database	3,404	-	-	-	-	3,404	-	3,404		
C3c - C&I DOER Assessment	19,619	-	-	-	-	19,619	-	19,619		
C3d - C&I Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
C3e - C&I Workforce Development	97,530	-	-	-	-	97,530	-	97,530		
C3f - C&I Evaluation and Market Research	-	-	-	-	474,599	474,599	-	474,599		
C3g - C&I EEAC Consultants	-	5,000	-	28,354	-	33,354	-	33,354		
C3h - C&I R&D and Demonstration	-	-	37,500	-	-	37,500	-	37,500		
Grand Total	**2,647,176**	**1,342,725**	**46,353,970**	**9,797,177**	**1,308,938**	**61,449,986**	**-**	**61,449,986**	**355**	**2.47**

IV.C. Program Administrator Budgets

1. Summary Table

Cape Light Compact
October 31, 2018

2019-2021 Program Administrator Budget										
Program	Program Costs						Performance Incentive	Total Program Administrator Budget	Program Cost per Participant	Resource Benefit per Program Cost
	Program Planning and Administration	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Costs				
A - Residential	**3,716,306**	**2,240,980**	**64,541,333**	**16,025,845**	**2,238,354**	**88,762,818**	**-**	**88,762,818**	**127**	**2.78**
A1 - Residential New Buildings	107,775	69,757	2,082,976	598,033	-	2,858,541	-	2,858,541	1,843	6.15
A1a - Residential New Homes & Renovations	107,775	69,757	2,082,976	598,033	-	2,858,541	-	2,858,541	1,843	6.15
A2 - Residential Existing Buildings	2,745,542	1,541,564	54,117,986	14,695,703	-	73,100,795	-	73,100,795	104	3.14
A2a - Residential Coordinated Delivery	1,405,773	584,777	29,603,978	5,765,105	-	37,359,634	-	37,359,634	3,138	3.79
A2b - Residential Conservation Services (RCS)	212,739	128,569	-	5,289,658	-	5,630,966	-	5,630,966		-
A2c - Residential Retail	685,906	671,507	14,915,526	1,765,238	-	18,038,177	-	18,038,177	40	3.43
A2d - Residential Behavior	84,279	21,781	2,065,000	45,525	-	2,216,586	-	2,216,586	9	1.44
A2e - Residential Active Demand Reduction	356,845	134,930	7,533,481	1,830,176	-	9,855,432	-	9,855,432	13,594	2.31
A3 - Residential Hard-to-Measure	862,988	629,659	8,340,371	732,110	2,238,354	12,803,482	-	12,803,482		
A3a - Residential Statewide Marketing	-	312,629	-	-	-	312,629	-	312,629		
A3b - Residential Statewide Database	15,473	-	-	-	-	15,473	-	15,473		
A3c - Residential DOER Assessment	435,267	-	-	-	-	435,267	-	435,267		
A3d - Residential Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
A3e - Residential Workforce Development	-	-	-	112,769	-	112,769	-	112,769		
A3f - Residential Evaluation and Market Research	-	-	-	-	2,238,354	2,238,354	-	2,238,354		
A3g - Residential EEAC Consultants	83,313	-	-	-	-	83,313	-	83,313		
A3h - Residential R&D and Demonstration	-	-	384,565	-	-	384,565	-	384,565		
A3i - Residential HEAT Loan	328,934	92,030	7,955,806	469,341	-	8,846,111	-	8,846,111		
A3j - Residential Education	-	225,000	-	150,000	-	375,000	-	375,000		
B - Income Eligible	**1,056,015**	**460,891**	**20,209,841**	**4,411,632**	**184,695**	**26,323,074**	**-**	**26,323,074**	**5,785**	**1.43**
B1 - Income Eligible Existing Buildings	873,546	355,346	20,209,841	4,336,632	-	25,775,366	-	25,775,366	5,665	1.46
B1a - Income Eligible Coordinated Delivery	799,915	332,624	18,459,841	3,954,514	-	23,546,894	-	23,546,894	5,382	1.39
B1b - Income Eligible Active Demand Reduction	73,632	22,722	1,750,000	382,118	-	2,228,472	-	2,228,472	12,734	2.27
B2 - Income Eligible Hard-to-Measure	182,468	105,545	-	75,000	184,695	547,708	-	547,708		
B2a - Income Eligible Statewide Marketing	-	105,545	-	-	-	105,545	-	105,545		
B2b - Income Eligible Statewide Database	5,564	-	-	-	-	5,564	-	5,564		
B2c - Income Eligible DOER Assessment	88,143	-	-	-	-	88,143	-	88,143		
B2d - Income Eligible Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
B2e - Income Eligible Workforce Development	-	-	-	75,000	-	75,000	-	75,000		
B2f - Income Eligible Evaluation and Market Research	-	-	-	-	184,695	184,695	-	184,695		
B2g - Income Eligible Energy Affordability Network	88,761	-	-	-	-	88,761	-	88,761		
C - Commercial & Industrial	**2,573,000**	**1,117,193**	**37,117,705**	**5,596,469**	**1,440,765**	**47,845,131**	**-**	**47,845,131**	**7,854**	**2.21**
C1 - C&I New Buildings	124,421	20,902	1,082,350	633,048	-	1,860,721	-	1,860,721	12,162	2.88
C1a - C&I New Buildings & Major Renovations	124,421	20,902	1,082,350	633,048	-	1,860,721	-	1,860,721	12,162	2.88
C2 - C&I Existing Buildings	2,087,214	876,570	35,922,855	4,878,358	-	43,764,997	-	43,764,997	7,369	2.29
C2a - C&I Existing Building Retrofit	1,782,091	741,972	31,177,214	3,368,941	-	37,070,217	-	37,070,217	15,822	2.04
C2b - C&I New & Replacement Equipment	188,869	106,023	2,580,783	1,128,398	-	4,004,073	-	4,004,073	1,145	2.76
C2c - C&I Active Demand Reduction	116,254	28,576	2,164,858	381,020	-	2,690,707	-	2,690,707	26,907	5.03
C3 - C&I Hard-to-Measure	361,364	219,721	112,500	85,063	1,440,765	2,219,413	-	2,219,413		
C3a - C&I Statewide Marketing	-	204,721	-	-	-	204,721	-	204,721		
C3b - C&I Statewide Database	10,761	-	-	-	-	10,761	-	10,761		
C3c - C&I DOER Assessment	214,679	-	-	-	-	214,679	-	214,679		
C3d - C&I Sponsorships & Subscriptions	-	-	-	-	-	-	-	-		
C3e - C&I Workforce Development	97,530	10,000	-	56,708	-	164,238	-	164,238		
C3f - C&I Evaluation and Market Research	-	-	-	-	1,440,765	1,440,765	-	1,440,765		
C3g - C&I EEAC Consultants	38,394	5,000	-	28,354	-	71,748	-	71,748		
C3h - C&I R&D and Demonstration	-	-	112,500	-	-	112,500	-	112,500		
Grand Total	**7,345,320**	**3,819,065**	**121,868,878**	**26,033,946**	**3,863,815**	**162,931,023**	**-**	**162,931,023**	**229**	**2.40**

Notes:
Budgets for each year are represented in nominal dollars (2019$, 2020$, 2021$).
Refer to common definitions for allocation of costs.

IV.C. Program Administrator Budgets

2.2 PA Budget Comparison Table - Three Year Plan vs. Previous Years

Cape Light Compact
October 31, 2018

2016-2021 Residential Program Administrator Budget																			
PA Budget Categories	Program Administrator Budget ($)									Budget Categories as a Percent of Total Program Administrator Budget (%)								
	2016		2017		2018		2019	2020	2021	2016		2017		2018		2019	2020	2021
	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned
Program Planning and Administration	1,268,568	1,033,401	1,171,579	1,240,416	1,193,495	681,350	1,174,356	1,221,393	1,320,557	6%	6%	5%	6%	5%	6%	5%	4%	4%
Marketing and Advertising	477,634	362,178	480,933	408,081	499,692	318,000	733,852	737,577	769,552	2%	2%	2%	2%	2%	3%	3%	2%	2%
Participant Incentive	14,566,274	11,286,416	15,335,147	15,362,780	16,195,391	7,312,418	18,048,072	22,366,108	24,127,153	67%	69%	68%	69%	68%	67%	71%	73%	74%
Sales, Technical Assistance & Training	4,559,869	3,163,053	4,801,294	4,222,961	5,032,146	2,331,477	4,774,402	5,477,328	5,774,115	21%	19%	21%	19%	21%	21%	19%	18%	18%
Evaluation and Market Research	769,948	615,390	769,394	890,763	766,421	294,081	739,350	746,622	752,383	4%	4%	3%	4%	3%	3%	3%	2%	2%
Performance Incentive	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Program Administrator Budget	**21,642,293**	**16,460,438**	**22,558,347**	**22,125,001**	**23,687,146**	**10,937,325**	**25,470,031**	**30,549,028**	**32,743,760**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

2016-2021 Income Eligible Program Administrator Budget																			
PA Budget Categories	Program Administrator Budget ($)									Budget Categories as a Percent of Total Program Administrator Budget (%)								
	2016		2017		2018		2019	2020	2021	2016		2017		2018		2019	2020	2021
	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned
Program Planning and Administration	268,783	216,965	264,628	250,267	284,526	142,865	242,114	349,374	464,527	7%	8%	6%	9%	6%	11%	5%	4%	4%
Marketing and Advertising	53,890	48,767	55,051	63,080	61,698	33,945	108,643	153,909	198,339	1%	2%	1%	2%	1%	3%	2%	2%	2%
Participant Incentive	2,845,870	2,140,346	3,201,910	2,007,738	3,564,650	806,891	3,751,777	6,954,786	9,503,278	70%	75%	72%	71%	72%	65%	75%	77%	77%
Sales, Technical Assistance & Training	718,294	381,001	783,640	357,058	897,183	198,721	845,775	1,515,757	2,050,100	18%	13%	18%	13%	18%	16%	17%	17%	17%
Evaluation and Market Research	153,661	62,084	155,687	150,150	157,304	60,787	40,000	62,739	81,956	4%	2%	3%	5%	3%	5%	1%	1%	1%
Performance Incentive	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Program Administrator Budget	**4,040,498**	**2,849,163**	**4,460,916**	**2,828,292**	**4,965,362**	**1,243,209**	**4,988,309**	**9,036,565**	**12,298,200**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

2016-2021 Commercial & Industrial Program Administrator Budget																			
PA Budget Categories	Program Administrator Budget ($)									Budget Categories as a Percent of Total Program Administrator Budget (%)								
	2016		2017		2018		2019	2020	2021	2016		2017		2018		2019	2020	2021
	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned
Program Planning and Administration	830,371	689,945	840,154	951,037	923,533	557,725	872,397	838,510	862,093	6%	9%	6%	10%	5%	15%	6%	5%	5%
Marketing and Advertising	255,539	152,256	223,154	162,555	244,437	125,030	373,911	368,449	374,834	2%	2%	1%	2%	1%	3%	2%	2%	2%
Participant Incentive	9,796,815	5,551,310	11,656,472	6,261,169	13,739,420	2,343,108	11,754,677	12,639,489	12,723,539	74%	70%	77%	68%	78%	62%	77%	78%	78%
Sales, Technical Assistance & Training	1,776,112	1,128,694	1,980,424	1,176,151	2,151,735	561,052	1,734,233	1,889,273	1,972,962	13%	14%	13%	13%	12%	15%	11%	12%	12%
Evaluation and Market Research	503,985	421,633	516,737	597,103	527,625	181,063	488,059	478,107	474,599	4%	5%	3%	7%	3%	5%	3%	3%	3%
Performance Incentive	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Program Administrator Budget	**13,162,821**	**7,943,839**	**15,216,941**	**9,148,015**	**17,586,749**	**3,767,978**	**15,223,278**	**16,213,827**	**16,408,027**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

2016-2021 Total Program Administrator Budget																			
PA Budget Categories	Program Administrator Budget ($)									Budget Categories as a Percent of Total Program Administrator Budget (%)								
	2016		2017		2018		2019	2020	2021	2016		2017		2018		2019	2020	2021
	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned	Planned	Evaluated	Planned	Evaluated	Planned	YTD	Planned	Planned	Planned
Program Planning and Administration	2,367,722	1,940,312	2,276,360	2,441,719	2,401,554	1,381,940	2,288,867	2,409,277	2,647,176	6%	7%	5%	7%	5%	9%	5%	4%	4%
Marketing and Advertising	787,063	563,202	759,138	633,715	805,827	476,975	1,216,405	1,259,934	1,342,725	2%	2%	2%	2%	2%	3%	3%	2%	2%
Participant Incentive	27,208,959	18,978,071	30,193,530	23,631,687	33,499,461	10,462,417	33,554,526	41,960,383	46,353,970	70%	70%	71%	69%	72%	66%	73%	75%	75%
Sales, Technical Assistance & Training	7,054,275	4,672,748	7,565,358	5,756,170	8,081,065	3,091,250	7,354,411	8,882,358	9,797,177	18%	17%	18%	17%	17%	19%	16%	16%	16%
Evaluation and Market Research	1,427,594	1,099,108	1,441,817	1,638,016	1,451,350	535,931	1,267,409	1,287,468	1,308,938	4%	4%	3%	5%	3%	3%	3%	2%	2%
Performance Incentive	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Program Administrator Budget	**38,845,613**	**27,253,441**	**42,236,204**	**34,101,308**	**46,239,256**	**15,948,513**	**45,681,618**	**55,799,419**	**61,449,986**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

2016-2018 planned values are from the Program Administrator's 2016-2018 Three-Year Plan, D.P.U. 15-166, in nominal dollars (2016$, 2017$, 2018$).

2016 evaluated values are from the Program Administrator's 2016 Plan Year Report, D.P.U. 17-100, in 2016$.

2017 evaluated values are from the Program Administrator's 2017 Plan Year Report, D.P.U. 18-51, in 2017$.

2018 YTD values are estimated actual cost through August 2018, in 2018$.

For supporting information on the 2019-2021 values, see Table IV.C.1. Budgets for each year are represented in nominal dollars (2019$, 2020$, 2021$).

The Program Administrators have better aligned cost allocations across Program Administrators for this Three-Year Plan, consistent with the Department's directives in the 2016-2018 Three-Year Plan Order (January 31, 2016). As a result, historical budget categories may not be directly comparable for each Program Administrator.

IV.C. Program Administrator Budgets

3. Program Planning and Administration

Cape Light Compact

October 31, 2018

Program Planning and Administration Expenditures							
Year	Internal Costs	External Costs					Total Program Planning and Administration
	Labor, benefits, employee expenses, materials, and overhead	Legal Services	Assessments	Other Vendor Services	Hard to Measure Sponsorships & Subscriptions	Total External Costs	
2019	$ 1,408,338	$ 74,432	$ 348,696	$ 457,401	$ -	$ 880,529	$ 2,288,867
2020	$ 1,443,748	$ 74,432	$ 348,696	$ 542,401	$ -	$ 965,529	$ 2,409,277
2021	$ 1,481,647	$ 74,432	$ 348,696	$ 742,401	$ -	$ 1,165,529	$ 2,647,176
Grand Total	**$ 4,333,733**	**$ 223,296**	**$ 1,046,088**	**$ 1,742,204**	**$ -**	**$ 3,011,587**	**$ 7,345,320**

Notes:

• Assessments include costs associated with the Department of Energy Resource (DOER), Residential Conservation Services (RCS), Energy Efficiency Advisory Council (EEAC) Consultants, and the Low-Income Energy Affordability Network (LEAN). Note that the electric Program Administrators do not budget for the EEAC Consultant fees as these costs are paid by the DOER using RGGI proceeds.

• Other Vendor Services include costs associated with third-party consultants that assist with program planning and administration.

• The data included in the Hard to Measure Sponsorship and Subscriptions column is consistent with the hard-to-measure Sponsorships & Subscriptions lines in the Budget table.

• This table is included pursuant to Department directives (D.P.U. 15-160 through D.P.U. 15-169, at 42).

IV.D. Cost-Effectiveness

1. Summary Table

Cape Light Compact
October 31, 2018

2019 Total Resource Cost Test (2019$)										
Program	With GWSA Benefits			Without GWSA Benefits			Costs			
	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
A - Residential	**2.09**	**37,279,437**	**71,633,806**	**1.90**	**31,039,560**	**65,393,930**	**25,470,031**	**-**	**8,884,339**	**34,354,370**
A1 - Residential New Buildings	4.39	4,616,658	5,980,496	4.05	4,164,880	5,528,718	913,905	-	449,933	1,363,838
A1a - Residential New Homes & Renovations	4.39	4,616,658	5,980,496	4.05	4,164,880	5,528,718	913,905	-	449,933	1,363,838
A2 - Residential Existing Buildings	2.21	35,883,359	65,653,310	2.01	30,095,260	59,865,212	21,335,546	-	8,434,405	29,769,952
A2a - Residential Coordinated Delivery	2.49	23,890,702	39,922,185	2.27	20,411,820	36,443,303	11,369,356	-	4,662,127	16,031,483
A2b - Residential Conservation Services (RCS)	0.00	(1,889,714)	-	0.00	(1,889,714)	-	1,889,714	-	-	1,889,714
A2c - Residential Retail	2.29	13,859,656	24,590,356	2.09	11,673,791	22,404,491	6,958,422	-	3,772,279	10,730,700
A2d - Residential Behavior	0.85	(129,134)	721,495	0.70	(252,485)	598,144	850,629	-	-	850,629
A2e - Residential Active Demand Reduction	1.57	151,848	419,274	1.57	151,848	419,274	267,426	-	-	267,426
A3 - Residential Hard-to-Measure	0.00	(3,220,580)	-	0.00	(3,220,580)	-	3,220,580	-	-	3,220,580
B - Income Eligible	**2.28**	**6,390,159**	**11,378,609**	**2.15**	**5,748,363**	**10,736,812**	**4,988,309**	**-**	**140**	**4,988,449**
B1 - Income Eligible Existing Buildings	2.35	6,539,563	11,378,609	2.22	5,897,767	10,736,812	4,838,906	-	140	4,839,046
B1a - Income Eligible Coordinated Delivery	2.35	6,544,878	11,378,609	2.22	5,903,082	10,736,812	4,833,591	-	140	4,833,731
B1b - Income Eligible Active Demand Reduction	0.00	(5,315)	-	0.00	(5,315)	-	5,315	-	-	5,315
B2 - Income Eligible Hard-to-Measure	0.00	(149,404)	-	0.00	(149,404)	-	149,404	-	-	149,404
C - Commercial & Industrial	**2.81**	**29,838,483**	**46,293,266**	**2.61**	**26,429,960**	**42,884,743**	**15,223,278**	**-**	**1,231,505**	**16,454,783**
C1 - C&I New Buildings	2.35	921,938	1,603,030	2.02	695,466	1,376,559	617,872	-	63,220	681,092
C1a - C&I New Buildings & Major Renovations	2.35	921,938	1,603,030	2.02	695,466	1,376,559	617,872	-	63,220	681,092
C2 - C&I Existing Buildings	2.97	29,667,306	44,690,235	2.76	26,485,254	41,508,184	13,854,645	-	1,168,285	15,022,930
C2a - C&I Existing Building Retrofit	2.87	24,063,284	36,930,884	2.66	21,333,440	34,201,040	12,000,519	-	867,081	12,867,600
C2b - C&I New & Replacement Equipment	2.51	2,546,829	4,229,411	2.24	2,094,621	3,777,204	1,381,378	-	301,204	1,682,582
C2c - C&I Active Demand Reduction	7.47	3,057,193	3,529,940	7.47	3,057,193	3,529,940	472,747	-	-	472,747
C3 - C&I Hard-to-Measure	0.00	(750,761)	-	0.00	(750,761)	-	750,761	-	-	750,761
Grand Total	**2.32**	**73,508,078**	**129,305,680**	**2.13**	**63,217,883**	**119,015,485**	**45,681,618**	**-**	**10,115,984**	**55,797,602**

IV.D. Cost-Effectiveness

1. Summary Table

Cape Light Compact
October 31, 2018

2020 Total Resource Cost Test (2019$)										
Program	With GWSA Benefits			Without GWSA Benefits			Costs			
	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
A - Residential	**2.19**	**49,630,605**	**91,362,492**	**2.05**	**43,708,001**	**85,439,888**	**29,853,442**	**-**	**11,878,445**	**41,731,887**
A1 - Residential New Buildings	4.57	4,826,536	6,177,936	4.26	4,399,109	5,750,510	927,958	-	423,442	1,351,401
A1a - Residential New Homes & Renovations	4.57	4,826,536	6,177,936	4.26	4,399,109	5,750,510	927,958	-	423,442	1,351,401
A2 - Residential Existing Buildings	2.36	49,027,912	85,184,556	2.20	43,532,734	79,689,378	24,701,641	-	11,455,002	36,156,643
A2a - Residential Coordinated Delivery	2.63	32,726,061	52,850,483	2.44	29,051,115	49,175,537	12,126,561	-	7,997,861	20,124,423
A2b - Residential Conservation Services (RCS)	0.00	(1,827,613)	-	0.00	(1,827,613)	-	1,827,613	-	-	1,827,613
A2c - Residential Retail	2.28	11,857,450	21,138,512	2.10	10,171,797	19,452,859	5,823,921	-	3,457,141	9,281,062
A2d - Residential Behavior	1.68	470,445	1,165,148	1.47	324,232	1,018,935	694,703	-	-	694,703
A2e - Residential Active Demand Reduction	2.37	5,801,570	10,030,413	2.37	5,813,203	10,042,046	4,228,843	-	-	4,228,843
A3 - Residential Hard-to-Measure	0.00	(4,223,843)	-	0.00	(4,223,843)	-	4,223,843	-	-	4,223,843
B - Income Eligible	**2.14**	**10,040,933**	**18,871,877**	**2.05**	**9,233,000**	**18,063,944**	**8,830,807**	**-**	**137**	**8,830,944**
B1 - Income Eligible Existing Buildings	2.18	10,221,332	18,871,877	2.09	9,413,398	18,063,944	8,650,409	-	137	8,650,545
B1a - Income Eligible Coordinated Delivery	2.16	8,986,795	16,705,579	2.06	8,176,177	15,894,961	7,718,647	-	137	7,718,784
B1b - Income Eligible Active Demand Reduction	2.32	1,234,537	2,166,298	2.33	1,237,221	2,168,983	931,762	-	-	931,762
B2 - Income Eligible Hard-to-Measure	0.00	(180,398)	-	0.00	(180,398)	-	180,398	-	-	180,398
C - Commercial & Industrial	**2.86**	**32,146,702**	**49,402,552**	**2.67**	**28,889,688**	**46,145,538**	**15,844,647**	**-**	**1,411,203**	**17,255,850**
C1 - C&I New Buildings	2.85	1,229,154	1,894,823	2.45	968,206	1,633,875	603,939	-	61,729	665,668
C1a - C&I New Buildings & Major Renovations	2.85	1,229,154	1,894,823	2.45	968,206	1,633,875	603,939	-	61,729	665,668
C2 - C&I Existing Buildings	2.99	31,638,416	47,507,729	2.80	28,642,349	44,511,663	14,519,840	-	1,349,474	15,869,314
C2a - C&I Existing Building Retrofit	2.96	25,705,109	38,833,413	2.76	23,072,312	36,200,616	12,068,131	-	1,060,173	13,128,304
C2b - C&I New & Replacement Equipment	2.21	2,013,973	3,672,437	1.99	1,649,482	3,307,946	1,369,163	-	289,301	1,658,464
C2c - C&I Active Demand Reduction	4.62	3,919,334	5,001,879	4.62	3,920,556	5,003,101	1,082,545	-	-	1,082,545
C3 - C&I Hard-to-Measure	0.00	(720,868)	-	0.00	(720,868)	-	720,868	-	-	720,868
Grand Total	**2.35**	**91,818,241**	**159,636,921**	**2.21**	**81,830,688**	**149,649,369**	**54,528,896**	**-**	**13,289,785**	**67,818,681**

IV.D. Cost-Effectiveness

1. Summary Table

Cape Light Compact
October 31, 2018

2021 Total Resource Cost Test (2019$)										
Program	With GWSA Benefits			Without GWSA Benefits			Costs			
	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
A - Residential	**2.26**	**57,639,019**	**103,298,868**	**2.13**	**51,707,106**	**97,366,954**	**31,269,619**	**-**	**14,390,229**	**45,659,848**
A1 - Residential New Buildings	4.68	4,979,062	6,331,157	4.38	4,570,041	5,922,136	950,259	-	401,836	1,352,095
A1a - Residential New Homes & Renovations	4.68	4,979,062	6,331,157	4.38	4,570,041	5,922,136	950,259	-	401,836	1,352,095
A2 - Residential Existing Buildings	2.47	57,683,764	96,967,711	2.33	52,160,872	91,444,818	25,295,554	-	13,988,393	39,283,947
A2a - Residential Coordinated Delivery	2.74	41,470,352	65,235,884	2.57	37,406,245	61,171,777	12,969,737	-	10,795,795	23,765,532
A2b - Residential Conservation Services (RCS)	0.00	(1,786,820)	-	0.00	(1,786,820)	-	1,786,820	-	-	1,786,820
A2c - Residential Retail	2.24	10,043,620	18,125,844	2.08	8,730,451	16,812,675	4,889,626	-	3,192,598	8,082,224
A2d - Residential Behavior	2.09	682,810	1,308,386	1.84	523,388	1,148,964	625,576	-	-	625,576
A2e - Residential Active Demand Reduction	2.45	7,273,802	12,297,597	2.45	7,287,608	12,311,402	5,023,795	-	-	5,023,795
A3 - Residential Hard-to-Measure	0.00	(5,023,807)	-	0.00	(5,023,807)	-	5,023,807	-	-	5,023,807
B - Income Eligible	**2.07**	**12,557,478**	**24,302,140**	**1.99**	**11,591,077**	**23,335,740**	**11,744,529**	**-**	**134**	**11,744,662**
B1 - Income Eligible Existing Buildings	2.11	12,761,560	24,302,140	2.02	11,795,159	23,335,740	11,540,447	-	134	11,540,581
B1a - Income Eligible Coordinated Delivery	2.07	11,084,619	21,412,677	1.98	10,114,767	20,442,824	10,327,923	-	134	10,328,057
B1b - Income Eligible Active Demand Reduction	2.38	1,676,940	2,889,464	2.39	1,680,392	2,892,915	1,212,524	-	-	1,212,524
B2 - Income Eligible Hard-to-Measure	0.00	(204,082)	-	0.00	(204,082)	-	204,082	-	-	204,082
C - Commercial & Industrial	**2.88**	**32,316,181**	**49,496,763**	**2.70**	**29,255,095**	**46,435,677**	**15,669,329**	**-**	**1,511,252**	**17,180,582**
C1 - C&I New Buildings	2.99	1,309,453	1,966,485	2.59	1,047,814	1,704,845	596,708	-	60,324	657,032
C1a - C&I New Buildings & Major Renovations	2.99	1,309,453	1,966,485	2.59	1,047,814	1,704,845	596,708	-	60,324	657,032
C2 - C&I Existing Buildings	3.00	31,704,806	47,530,278	2.83	28,905,360	44,730,832	14,374,543	-	1,450,929	15,825,472
C2a - C&I Existing Building Retrofit	2.95	25,928,410	39,246,944	2.76	23,441,027	36,759,560	12,147,702	-	1,170,831	13,318,533
C2b - C&I New & Replacement Equipment	2.26	1,823,506	3,270,235	2.04	1,510,264	2,956,994	1,166,631	-	280,098	1,446,729
C2c - C&I Active Demand Reduction	4.73	3,952,890	5,013,100	4.73	3,954,068	5,014,278	1,060,210	-	-	1,060,210
C3 - C&I Hard-to-Measure	0.00	(698,078)	-	0.00	(698,078)	-	698,078	-	-	698,078
Grand Total	**2.37**	**102,512,679**	**177,097,771**	**2.24**	**92,553,278**	**167,138,370**	**58,683,477**	**-**	**15,901,615**	**74,585,092**

IV.D. Cost-Effectiveness

1. Summary Table

Cape Light Compact
October 31, 2018

2019-2021 Total Resource Cost Test (2019$)										
Program	With GWSA Benefits			Without GWSA Benefits			Costs			
	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Benefit-Cost Ratio	Net Benefits	Total TRC Test Benefits	Total Program Costs	Performance Incentive	Participant Costs	Total TRC Test Costs
A - Residential	**2.19**	**144,549,061**	**266,295,166**	**2.04**	**126,454,667**	**248,200,772**	**86,593,093**	**-**	**35,153,012**	**121,746,105**
A1 - Residential New Buildings	4.55	14,422,255	18,489,589	4.23	13,134,030	17,201,363	2,792,122	-	1,275,212	4,067,334
A1a - Residential New Homes & Renovations	4.55	14,422,255	18,489,589	4.23	13,134,030	17,201,363	2,792,122	-	1,275,212	4,067,334
A2 - Residential Existing Buildings	2.36	142,595,036	247,805,577	2.20	125,788,866	230,999,408	71,332,741	-	33,877,801	105,210,542
A2a - Residential Coordinated Delivery	2.64	98,087,115	158,008,552	2.45	86,869,180	146,790,617	36,465,654	-	23,455,783	59,921,437
A2b - Residential Conservation Services (RCS)	0.00	(5,504,147)	-	0.00	(5,504,147)	-	5,504,147	-	-	5,504,147
A2c - Residential Retail	2.27	35,760,727	63,854,713	2.09	30,576,039	58,670,025	17,671,968	-	10,422,017	28,093,986
A2d - Residential Behavior	1.47	1,024,120	3,195,028	1.27	595,134	2,766,042	2,170,908	-	-	2,170,908
A2e - Residential Active Demand Reduction	2.39	13,227,220	22,747,284	2.39	13,252,659	22,772,723	9,520,064	-	-	9,520,064
A3 - Residential Hard-to-Measure	0.00	(12,468,230)	-	0.00	(12,468,230)	-	12,468,230	-	-	12,468,230
B - Income Eligible	**2.13**	**28,988,571**	**54,552,626**	**2.04**	**26,572,440**	**52,136,496**	**25,563,645**	**-**	**411**	**25,564,055**
B1 - Income Eligible Existing Buildings	2.18	29,522,454	54,552,626	2.08	27,106,324	52,136,496	25,029,761	-	411	25,030,172
B1a - Income Eligible Coordinated Delivery	2.16	26,616,292	49,496,864	2.06	24,194,026	47,074,597	22,880,161	-	411	22,880,571
B1b - Income Eligible Active Demand Reduction	2.35	2,906,162	5,055,762	2.35	2,912,298	5,061,898	2,149,600	-	-	2,149,600
B2 - Income Eligible Hard-to-Measure	0.00	(533,884)	-	0.00	(533,884)	-	533,884	-	-	533,884
C - Commercial & Industrial	**2.85**	**94,301,366**	**145,192,581**	**2.66**	**84,574,742**	**135,465,957**	**46,737,254**	**-**	**4,153,961**	**50,891,215**
C1 - C&I New Buildings	2.73	3,460,545	5,464,338	2.35	2,711,486	4,715,279	1,818,519	-	185,273	2,003,792
C1a - C&I New Buildings & Major Renovations	2.73	3,460,545	5,464,338	2.35	2,711,486	4,715,279	1,818,519	-	185,273	2,003,792
C2 - C&I Existing Buildings	2.99	93,010,528	139,728,243	2.80	84,032,963	130,750,678	42,749,027	-	3,968,688	46,717,715
C2a - C&I Existing Building Retrofit	2.93	75,696,804	115,011,241	2.73	67,846,779	107,161,216	36,216,352	-	3,098,085	39,314,437
C2b - C&I New & Replacement Equipment	2.33	6,384,307	11,172,083	2.10	5,254,368	10,042,143	3,917,173	-	870,603	4,787,775
C2c - C&I Active Demand Reduction	5.18	10,929,417	13,544,919	5.18	10,931,817	13,547,319	2,615,503	-	-	2,615,503
C3 - C&I Hard-to-Measure	0.00	(2,169,707)	-	0.00	(2,169,707)	-	2,169,707	-	-	2,169,707
Grand Total	**2.35**	**267,838,998**	**466,040,372**	**2.20**	**237,601,849**	**435,803,224**	**158,893,991**	**-**	**39,307,384**	**198,201,375**

Notes:

The Benefit-Cost Ratio is the Total TRC Test Benefits divided by the Total TRC Test Costs.

The Net Benefits are the Total TRC Test Benefits minus the Total TRC Test Costs.

For supporting information on the Total TRC Test Benefits, see Table IV.D.3.1.i.

For supporting information on the Total Program Costs, see Table IV.C.1.

For supporting information on the Performance Incentive, refer to the Performance Incentive Model.

The Total TRC Costs are the sum of the Total Program Costs, Performance Incentives, and Participant Costs.

IV.D Cost-Effectiveness

2.3 Cost Comparison Table - Three-Year Plan vs. Previous Years

Cape Light Compact

October 31, 2018

2016-2021 TRC Costs												
TRC Costs Categories	TRC Costs						TRC Cost Categories as a Percent of Total TRC Costs (%)					
	2016 Evaluated	2017 Evaluated	2018 Planned	2019 Planned	2020 Planned	2021 Planned	2016 Evaluated	2017 Evaluated	2018 Planned	2019 Planned	2020 Planned	2021 Planned
A - Residential												
PA Budget	16,460,438	21,576,946	22,528,180	25,470,031	29,853,442	31,269,619	78%	76%	83%	74%	72%	68%
Participant Cost	4,532,918	6,768,821	4,611,470	8,884,339	11,878,445	14,390,229	22%	24%	17%	26%	28%	32%
Residential Total TRC Costs	20,993,356	28,345,768	27,139,650	34,354,370	41,731,887	45,659,848	100%	100%	100%	100%	100%	100%
B - Income Eligible												
PA Budget	2,849,163	2,758,233	4,722,416	4,988,309	8,830,807	11,744,529	100%	100%	100%	100%	100%	100%
Participant Cost	-	-	-	140	137	134	0%	0%	0%	0%	0%	0%
Low-Income Total TRC Costs	2,849,163	2,758,233	4,722,416	4,988,449	8,830,944	11,744,662	100%	100%	100%	100%	100%	100%
C - Commercial & Industrial												
PA Budget	7,943,839	8,921,411	16,726,264	15,223,278	15,844,647	15,669,329	58%	72%	77%	93%	92%	91%
Participant Cost	5,857,753	3,403,243	5,021,131	1,231,505	1,411,203	1,511,252	42%	28%	23%	7%	8%	9%
C&I Total TRC Costs	13,801,592	12,324,655	21,747,394	16,454,783	17,255,850	17,180,582	100%	100%	100%	100%	100%	100%
Grand Total												
PA Budget	27,253,441	33,256,590	43,976,860	45,681,618	54,528,896	58,683,477	72%	77%	82%	82%	80%	79%
Participant Cost	10,390,671	10,172,064	9,632,601	10,115,984	13,289,785	15,901,615	28%	23%	18%	18%	20%	21%
Grand Total TRC Costs	37,644,112	43,428,655	53,609,461	55,797,602	67,818,681	74,585,092	100%	100%	100%	100%	100%	100%

Notes:

2016 values are from the Program Administrator's 2016 Plan Year Report D.P.U. 17-100, in 2016$.
2017 values are from the Program Administrator's 2017 Plan Year Report D.P.U. 18-51, in 2016$.
2018 values are from the Program Administrator's 2016-2018 Three-Year Plan, D.P.U. 15-166, in 2016$.
For supporting information on the 2019-2021 values, see Table IV.D.1. The 2019-2021 values are in 2019$.

IV.D Cost-Effectiveness

3.1.i. Benefits Summary Table

Cape Light Compact
October 31, 2018

2019 Benefits

Program	Electric									
	Capacity						Electric Energy			
	Summer Generation	Capacity DRIPE	Transmission	Distribution	Reliability	Total Capacity	Electric Energy	Electric Energy DRIPE	Electric Energy GWSA	Total Electric Energy
A - Residential	**2,019,290**	**222,570**	**2,551,556**	**5,374,555**	**52,301**	**10,220,273**	**7,777,583**	**2,774,720**	**2,464,951**	**13,017,255**
A1 - Residential New Buildings	85,499	1,617	103,180	217,336	1,476	409,109	902,860	197,811	229,480	1,330,150
A1a - Residential New Homes & Renovations	85,499	1,617	103,180	217,336	1,476	409,109	902,860	197,811	229,480	1,330,150
A2 - Residential Existing Buildings	1,933,791	220,953	2,448,377	5,157,219	50,825	9,811,164	6,874,724	2,576,909	2,235,472	11,687,104
A2a - Residential Coordinated Delivery	1,011,166	25,512	1,128,461	2,376,972	13,760	4,555,871	3,848,783	992,865	1,080,332	5,921,980
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	863,045	37,408	1,168,314	2,460,916	21,261	4,550,943	2,793,870	1,503,047	1,031,788	5,328,706
A2d - Residential Behavior	49,642	75,324	50,827	107,061	2,222	285,076	232,071	80,998	123,351	436,419
A2e - Residential Active Demand Reduction	9,938	82,709	100,775	212,271	13,582	419,274	-	-	-	-
B - Income Eligible	**341,823**	**8,045**	**390,144**	**821,792**	**4,864**	**1,566,668**	**1,302,251**	**386,631**	**393,676**	**2,082,558**
B1 - Income Eligible Existing Buildings	341,823	8,045	390,144	821,792	4,864	1,566,668	1,302,251	386,631	393,676	2,082,558
B1a - Income Eligible Coordinated Delivery	341,823	8,045	390,144	821,792	4,864	1,566,668	1,302,251	386,631	393,676	2,082,558
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**2,586,924**	**724,442**	**3,937,024**	**8,292,881**	**148,029**	**15,689,301**	**11,642,440**	**3,881,485**	**3,701,511**	**19,225,436**
C1 - C&I New Buildings	76,077	1,075	91,397	192,518	1,280	362,347	837,134	195,292	236,230	1,268,656
C1a - C&I New Buildings & Major Renovations	76,077	1,075	91,397	192,518	1,280	362,347	837,134	195,292	236,230	1,268,656
C2 - C&I Existing Buildings	2,510,847	723,367	3,845,627	8,100,363	146,749	15,326,954	10,805,306	3,686,193	3,465,281	17,956,780
C2a - C&I Existing Building Retrofit	2,049,152	130,911	2,485,855	5,236,162	36,131	9,938,211	9,408,997	3,170,622	3,003,303	15,582,922
C2b - C&I New & Replacement Equipment	367,558	31,926	467,222	984,148	7,948	1,858,802	1,396,309	515,571	461,978	2,373,858
C2c - C&I Active Demand Reduction	94,136	560,530	892,551	1,880,053	102,669	3,529,940	-	-	-	-
Grand Total	**4,948,038**	**955,057**	**6,878,724**	**14,489,228**	**205,194**	**27,476,242**	**20,722,274**	**7,042,837**	**6,560,138**	**34,325,249**

2020 Benefits

Program	Electric									
	Capacity						Electric Energy			
	Summer Generation	Capacity DRIPE	Transmission	Distribution	Reliability	Total Capacity	Electric Energy	Electric Energy DRIPE	Electric Energy GWSA	Total Electric Energy
A - Residential	**4,928,897**	**4,648,579**	**5,364,280**	**11,299,228**	**172,048**	**26,413,032**	**8,191,588**	**2,226,036**	**2,043,508**	**12,461,132**
A1 - Residential New Buildings	81,589	1,429	99,811	210,240	1,375	394,445	921,914	189,047	210,576	1,321,537
A1a - Residential New Homes & Renovations	81,589	1,429	99,811	210,240	1,375	394,445	921,914	189,047	210,576	1,321,537
A2 - Residential Existing Buildings	4,847,309	4,647,150	5,264,469	11,088,987	170,673	26,018,588	7,269,674	2,036,989	1,832,932	11,139,595
A2a - Residential Coordinated Delivery	2,804,560	90,387	2,989,003	6,295,986	27,408	12,207,343	4,986,932	887,526	1,095,458	6,969,916
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	621,942	35,843	865,055	1,822,137	15,655	3,360,632	1,815,522	1,006,314	602,895	3,424,731
A2d - Residential Behavior	61,738	126,860	85,602	180,311	3,743	458,255	424,264	136,416	146,212	706,893
A2e - Residential Active Demand Reduction	1,359,069	4,394,060	1,324,808	2,790,554	123,867	9,992,358	42,956	6,733	(11,633)	38,055
B - Income Eligible	**1,273,741**	**1,007,959**	**1,312,297**	**2,764,199**	**33,851**	**6,392,047**	**1,877,250**	**425,900**	**452,214**	**2,755,364**
B1 - Income Eligible Existing Buildings	1,273,741	1,007,959	1,312,297	2,764,199	33,851	6,392,047	1,877,250	425,900	452,214	2,755,364
B1a - Income Eligible Coordinated Delivery	963,627	23,222	1,042,243	2,195,364	10,074	4,234,531	1,867,337	424,347	454,899	2,746,582
B1b - Income Eligible Active Demand Reduction	310,113	984,737	270,053	568,836	23,777	2,157,516	9,913	1,554	(2,685)	8,782
C - Commercial & Industrial	**3,051,899**	**1,395,037**	**4,384,669**	**9,235,791**	**166,743**	**18,234,138**	**12,248,102**	**3,977,514**	**3,530,528**	**19,756,144**
C1 - C&I New Buildings	76,380	1,092	91,515	192,766	1,282	363,035	1,063,604	235,991	271,873	1,571,469
C1a - C&I New Buildings & Major Renovations	76,380	1,092	91,515	192,766	1,282	363,035	1,063,604	235,991	271,873	1,571,469
C2 - C&I Existing Buildings	2,975,519	1,393,945	4,293,154	9,043,026	165,461	17,871,104	11,184,497	3,741,523	3,258,655	18,184,675
C2a - C&I Existing Building Retrofit	2,363,727	135,307	2,810,034	5,919,008	39,114	11,267,189	9,958,469	3,267,976	2,887,827	16,114,272
C2b - C&I New & Replacement Equipment	310,323	36,700	404,544	852,124	7,019	1,610,710	1,217,168	472,511	372,049	2,061,728
C2c - C&I Active Demand Reduction	301,469	1,221,937	1,078,576	2,271,894	119,328	4,993,205	8,861	1,036	(1,222)	8,675
Grand Total	**9,254,537**	**7,051,575**	**11,061,245**	**23,299,219**	**372,642**	**51,039,218**	**22,316,939**	**6,629,451**	**6,026,250**	**34,972,640**

IV.D Cost-Effectiveness

3.1.i. Benefits Summary Table

Cape Light Compact
October 31, 2018

2021 Benefits										
Program	Electric									
	Capacity						Electric Energy			
	Summer Generation	Capacity DRIPE	Transmission	Distribution	Reliability	Total Capacity	Electric Energy	Electric Energy DRIPE	Electric Energy GWSA	Total Electric Energy
A - Residential	**6,761,116**	**5,627,428**	**7,041,838**	**14,832,807**	**205,738**	**34,468,927**	**8,901,968**	**1,794,431**	**1,909,613**	**12,606,012**
A1 - Residential New Buildings	75,505	1,793	88,105	185,582	1,142	352,126	907,401	163,724	191,406	1,262,531
A1a - Residential New Homes & Renovations	75,505	1,793	88,105	185,582	1,142	352,126	907,401	163,724	191,406	1,262,531
A2 - Residential Existing Buildings	6,685,611	5,625,635	6,953,733	14,647,225	204,596	34,116,801	7,994,567	1,630,708	1,718,206	11,343,481
A2a - Residential Coordinated Delivery	4,540,759	56,493	4,700,621	9,901,308	40,527	19,239,709	6,859,255	1,077,154	1,370,315	9,306,724
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	417,015	28,562	538,721	1,134,753	9,084	2,128,135	585,664	391,794	202,274	1,179,732
A2d - Residential Behavior	56,365	142,722	96,306	202,857	4,211	502,462	493,028	153,473	159,422	805,924
A2e - Residential Active Demand Reduction	1,671,472	5,397,858	1,618,085	3,408,307	150,774	12,246,495	56,620	8,287	(13,806)	51,101
B - Income Eligible	**1,966,222**	**1,331,907**	**1,985,046**	**4,181,266**	**46,463**	**9,510,904**	**2,542,156**	**507,148**	**553,045**	**3,602,349**
B1 - Income Eligible Existing Buildings	1,966,222	1,331,907	1,985,046	4,181,266	46,463	9,510,904	2,542,156	507,148	553,045	3,602,349
B1a - Income Eligible Coordinated Delivery	1,552,737	18,925	1,624,975	3,422,819	14,761	6,634,216	2,528,001	505,076	556,497	3,589,573
B1b - Income Eligible Active Demand Reduction	413,485	1,312,983	360,071	758,447	31,703	2,876,688	14,155	2,072	(3,451)	12,775
C - Commercial & Industrial	**3,277,142**	**1,410,420**	**4,532,781**	**9,547,774**	**167,624**	**18,935,741**	**12,042,225**	**3,941,647**	**3,314,631**	**19,298,503**
C1 - C&I New Buildings	78,376	1,092	91,515	192,766	1,282	365,031	1,132,308	245,825	273,320	1,651,453
C1a - C&I New Buildings & Major Renovations	78,376	1,092	91,515	192,766	1,282	365,031	1,132,308	245,825	273,320	1,651,453
C2 - C&I Existing Buildings	3,198,766	1,409,328	4,441,266	9,355,008	166,342	18,570,710	10,909,916	3,695,822	3,041,312	17,647,050
C2a - C&I Existing Building Retrofit	2,609,147	150,732	2,997,469	6,313,817	40,359	12,111,524	9,808,353	3,281,368	2,723,083	15,812,804
C2b - C&I New & Replacement Equipment	287,895	34,545	362,647	763,874	6,308	1,455,270	1,092,237	413,418	319,407	1,825,062
C2c - C&I Active Demand Reduction	301,723	1,224,050	1,081,150	2,277,317	119,675	5,003,916	9,326	1,036	(1,178)	9,184
Grand Total	**12,004,480**	**8,369,755**	**13,559,665**	**28,561,847**	**419,825**	**62,915,572**	**23,486,349**	**6,243,226**	**5,777,289**	**35,506,864**

2019-2021 Benefits										
Program	Electric									
	Capacity						Electric Energy			
	Summer Generation	Capacity DRIPE	Transmission	Distribution	Reliability	Total Capacity	Electric Energy	Electric Energy DRIPE	Electric Energy GWSA	Total Electric Energy
A - Residential	**13,709,304**	**10,498,576**	**14,957,674**	**31,506,590**	**430,088**	**71,102,232**	**24,871,139**	**6,795,187**	**6,418,072**	**38,084,399**
A1 - Residential New Buildings	242,593	4,839	291,095	613,159	3,994	1,155,679	2,732,175	550,582	631,462	3,914,218
A1a - Residential New Homes & Renovations	242,593	4,839	291,095	613,159	3,994	1,155,679	2,732,175	550,582	631,462	3,914,218
A2 - Residential Existing Buildings	13,466,711	10,493,738	14,666,579	30,893,432	426,094	69,946,553	22,138,964	6,244,606	5,786,610	34,170,180
A2a - Residential Coordinated Delivery	8,356,485	172,392	8,818,086	18,574,266	81,695	36,002,923	15,694,970	2,957,544	3,546,105	22,198,619
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	1,902,002	101,813	2,572,090	5,417,806	46,000	10,039,710	5,195,055	2,901,155	1,836,958	9,933,168
A2d - Residential Behavior	167,745	344,906	232,735	490,229	10,177	1,245,792	1,149,363	370,887	428,986	1,949,236
A2e - Residential Active Demand Reduction	3,040,479	9,874,627	3,043,668	6,411,131	288,222	22,658,127	99,576	15,020	(25,439)	89,157
B - Income Eligible	**3,581,786**	**2,347,912**	**3,687,486**	**7,767,257**	**85,179**	**17,469,620**	**5,721,656**	**1,319,679**	**1,398,935**	**8,440,271**
B1 - Income Eligible Existing Buildings	3,581,786	2,347,912	3,687,486	7,767,257	85,179	17,469,620	5,721,656	1,319,679	1,398,935	8,440,271
B1a - Income Eligible Coordinated Delivery	2,858,188	50,192	3,057,362	6,439,974	29,699	12,435,415	5,697,588	1,316,054	1,405,071	8,418,714
B1b - Income Eligible Active Demand Reduction	723,598	2,297,720	630,124	1,327,283	55,480	5,034,205	24,068	3,625	(6,136)	21,557
C - Commercial & Industrial	**8,915,966**	**3,529,899**	**12,854,474**	**27,076,446**	**482,395**	**52,859,180**	**35,932,767**	**11,800,647**	**10,546,670**	**58,280,083**
C1 - C&I New Buildings	230,833	3,259	274,427	578,049	3,844	1,090,413	3,033,047	677,108	781,423	4,491,578
C1a - C&I New Buildings & Major Renovations	230,833	3,259	274,427	578,049	3,844	1,090,413	3,033,047	677,108	781,423	4,491,578
C2 - C&I Existing Buildings	8,685,132	3,526,639	12,580,047	26,498,397	478,552	51,768,768	32,899,720	11,123,538	9,765,247	53,788,505
C2a - C&I Existing Building Retrofit	7,022,027	416,950	8,293,357	17,468,987	115,604	33,316,925	29,175,819	9,719,966	8,614,213	47,509,998
C2b - C&I New & Replacement Equipment	965,776	103,172	1,234,413	2,600,146	21,275	4,924,782	3,705,714	1,401,501	1,153,434	6,260,648
C2c - C&I Active Demand Reduction	697,329	3,006,518	3,052,277	6,429,264	341,673	13,527,061	18,187	2,072	(2,400)	17,859
Grand Total	**26,207,055**	**16,376,387**	**31,499,634**	**66,350,294**	**997,662**	**141,431,032**	**66,525,562**	**19,915,513**	**18,363,678**	**104,804,753**

IV.D Cost-Effectiveness

3.1.i. Benefits Summary Table

Cape Light Compact
October 31, 2018

Program	2019 Benefits										
	Natural Gas				Oil				Propane Benefits		
	Natural Gas	Natural Gas DRIPE	Natural Gas GWSA	Total Natural Gas	Oil	Oil DRIPE	Oil GWSA	Total Oil	Propane	Propane GWSA	Total Propane Benefits
A - Residential	**4,122,566**	**332,858**	**731,573**	**5,186,996**	**21,544,627**	**61,233**	**2,284,628**	**23,890,489**	**11,588,802**	**758,725**	**12,347,526**
A1 - Residential New Buildings	-	-	-	-	10,261	32	984	11,277	3,719,106	221,315	3,940,421
A1a - Residential New Homes & Renovations	-	-	-	-	10,261	32	984	11,277	3,719,106	221,315	3,940,421
A2 - Residential Existing Buildings	4,122,566	332,858	731,573	5,186,996	21,534,367	61,201	2,283,645	23,879,212	7,869,696	537,410	8,407,105
A2a - Residential Coordinated Delivery	4,566,545	499,595	856,401	5,922,541	12,624,435	36,779	1,306,571	13,967,785	3,505,816	235,577	3,741,393
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	(443,979)	(166,737)	(124,829)	(735,545)	8,909,931	24,422	977,074	9,911,427	4,363,880	301,832	4,665,712
A2d - Residential Behavior	-	-	-	-	-	-	-	-	-	-	-
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**-**	**-**	**-**	**-**	**1,869,186**	**5,188**	**206,387**	**2,080,761**	**576,167**	**41,733**	**617,900**
B1 - Income Eligible Existing Buildings	-	-	-	-	1,869,186	5,188	206,387	2,080,761	576,167	41,733	617,900
B1a - Income Eligible Coordinated Delivery	-	-	-	-	1,869,186	5,188	206,387	2,080,761	576,167	41,733	617,900
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(516,221)**	**(119,794)**	**(135,618)**	**(771,633)**	**(964,321)**	**(2,150)**	**(158,180)**	**(1,124,651)**	**8,895**	**810**	**9,705**
C1 - C&I New Buildings	(27,469)	(3,850)	(6,068)	(37,386)	(24,018)	(63)	(3,691)	(27,772)	-	-	-
C1a - C&I New Buildings & Major Renovations	(27,469)	(3,850)	(6,068)	(37,386)	(24,018)	(63)	(3,691)	(27,772)	-	-	-
C2 - C&I Existing Buildings	(488,753)	(115,944)	(129,550)	(734,246)	(940,303)	(2,087)	(154,489)	(1,096,880)	8,895	810	9,705
C2a - C&I Existing Building Retrofit	(478,828)	(113,186)	(126,851)	(718,865)	(898,906)	(1,992)	(147,417)	(1,048,315)	8,895	810	9,705
C2b - C&I New & Replacement Equipment	(9,925)	(2,758)	(2,698)	(15,381)	(41,397)	(95)	(7,072)	(48,564)	-	-	-
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**3,606,345**	**213,064**	**595,955**	**4,415,364**	**22,449,492**	**64,271**	**2,332,835**	**24,846,598**	**12,173,863**	**801,267**	**12,975,131**

Program	2020 Benefits										
	Natural Gas				Oil				Propane Benefits		
	Natural Gas	Natural Gas DRIPE	Natural Gas GWSA	Total Natural Gas	Oil	Oil DRIPE	Oil GWSA	Total Oil	Propane	Propane GWSA	Total Propane Benefits
A - Residential	**4,302,391**	**316,279**	**725,307**	**5,343,977**	**24,141,316**	**70,613**	**2,365,728**	**26,577,657**	**12,995,808**	**788,060**	**13,783,868**
A1 - Residential New Buildings	-	-	-	-	10,880	35	959	11,873	3,935,558	215,891	4,151,449
A1a - Residential New Homes & Renovations	-	-	-	-	10,880	35	959	11,873	3,935,558	215,891	4,151,449
A2 - Residential Existing Buildings	4,302,391	316,279	725,307	5,343,977	24,130,436	70,578	2,364,769	26,565,784	9,060,250	572,169	9,632,419
A2a - Residential Coordinated Delivery	4,595,635	414,533	797,847	5,808,014	15,395,921	45,765	1,478,872	16,920,558	4,847,432	302,770	5,150,202
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	(293,244)	(98,254)	(72,539)	(464,037)	8,734,515	24,813	885,897	9,645,226	4,212,817	269,400	4,482,217
A2d - Residential Behavior	-	-	-	-	-	-	-	-	-	-	-
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**-**	**-**	**-**	**-**	**2,868,513**	**7,977**	**297,084**	**3,173,574**	**874,416**	**58,636**	**933,052**
B1 - Income Eligible Existing Buildings	-	-	-	-	2,868,513	7,977	297,084	3,173,574	874,416	58,636	933,052
B1a - Income Eligible Coordinated Delivery	-	-	-	-	2,868,513	7,977	297,084	3,173,574	874,416	58,636	933,052
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(540,879)**	**(101,607)**	**(128,351)**	**(770,837)**	**(995,160)**	**(2,331)**	**(145,907)**	**(1,143,397)**	**9,218**	**744**	**9,962**
C1 - C&I New Buildings	(37,157)	(4,197)	(7,515)	(48,869)	(24,640)	(69)	(3,410)	(28,120)	-	-	-
C1a - C&I New Buildings & Major Renovations	(37,157)	(4,197)	(7,515)	(48,869)	(24,640)	(69)	(3,410)	(28,120)	-	-	-
C2 - C&I Existing Buildings	(503,722)	(97,410)	(120,836)	(721,967)	(970,519)	(2,262)	(142,496)	(1,115,278)	9,218	744	9,962
C2a - C&I Existing Building Retrofit	(495,490)	(95,343)	(118,819)	(709,652)	(934,640)	(2,180)	(136,955)	(1,073,775)	9,218	744	9,962
C2b - C&I New & Replacement Equipment	(8,231)	(2,067)	(2,017)	(12,315)	(35,879)	(82)	(5,541)	(41,502)	-	-	-
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**3,761,512**	**214,672**	**596,956**	**4,573,140**	**26,014,669**	**76,259**	**2,516,905**	**28,607,833**	**13,879,442**	**847,440**	**14,726,883**

IV.D Cost-Effectiveness

3.1.i. Benefits Summary Table

Cape Light Compact
October 31, 2018

Program	2021 Benefits										
	Natural Gas				Oil				Propane Benefits		
	Natural Gas	Natural Gas DRIPE	Natural Gas GWSA	Total Natural Gas	Oil	Oil DRIPE	Oil GWSA	Total Oil	Propane	Propane GWSA	Total Propane Benefits
A - Residential	**4,510,371**	**290,240**	**738,788**	**5,539,400**	**26,391,496**	**79,426**	**2,454,678**	**28,925,600**	**14,376,662**	**828,834**	**15,205,496**
A1 - Residential New Buildings	-	-	-	-	11,566	38	963	12,566	4,177,787	216,652	4,394,438
A1a - Residential New Homes & Renovations	-	-	-	-	11,566	38	963	12,566	4,177,787	216,652	4,394,438
A2 - Residential Existing Buildings	4,510,371	290,240	738,788	5,539,400	26,379,931	79,388	2,453,716	28,913,034	10,198,875	612,183	10,811,058
A2a - Residential Coordinated Delivery	4,613,808	321,810	763,544	5,699,162	17,364,081	52,982	1,582,514	18,999,577	5,853,746	347,734	6,201,480
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	(103,437)	(31,570)	(24,755)	(159,763)	9,015,850	26,406	871,201	9,913,457	4,345,129	264,449	4,609,578
A2d - Residential Behavior	-	-	-	-	-	-	-	-	-	-	-
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**-**	**-**	**-**	**-**	**3,509,847**	**10,072**	**344,460**	**3,864,379**	**1,086,197**	**68,895**	**1,155,092**
B1 - Income Eligible Existing Buildings	-	-	-	-	3,509,847	10,072	344,460	3,864,379	1,086,197	68,895	1,155,092
B1a - Income Eligible Coordinated Delivery	-	-	-	-	3,509,847	10,072	344,460	3,864,379	1,086,197	68,895	1,155,092
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(520,334)**	**(79,731)**	**(118,789)**	**(718,853)**	**(976,138)**	**(2,381)**	**(135,475)**	**(1,113,994)**	**9,494**	**718**	**10,212**
C1 - C&I New Buildings	(39,489)	(3,430)	(7,599)	(50,519)	(32,607)	(102)	(4,081)	(36,790)	-	-	-
C1a - C&I New Buildings & Major Renovations	(39,489)	(3,430)	(7,599)	(50,519)	(32,607)	(102)	(4,081)	(36,790)	-	-	-
C2 - C&I Existing Buildings	(480,845)	(76,300)	(111,189)	(668,334)	(943,531)	(2,279)	(131,394)	(1,077,205)	9,494	718	10,212
C2a - C&I Existing Building Retrofit	(474,145)	(74,963)	(109,650)	(658,758)	(911,309)	(2,207)	(126,767)	(1,040,283)	9,494	718	10,212
C2b - C&I New & Replacement Equipment	(6,700)	(1,338)	(1,539)	(9,577)	(32,222)	(72)	(4,627)	(36,921)	-	-	-
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**3,990,038**	**210,510**	**620,000**	**4,820,547**	**28,925,205**	**87,116**	**2,663,664**	**31,675,985**	**15,472,352**	**898,448**	**16,370,800**

Program	2019-2021 Benefits										
	Natural Gas				Oil				Propane Benefits		
	Natural Gas	Natural Gas DRIPE	Natural Gas GWSA	Total Natural Gas	Oil	Oil DRIPE	Oil GWSA	Total Oil	Propane	Propane GWSA	Total Propane Benefits
A - Residential	**12,935,328**	**939,377**	**2,195,668**	**16,070,373**	**72,077,440**	**211,272**	**7,105,035**	**79,393,746**	**38,961,271**	**2,375,620**	**41,336,891**
A1 - Residential New Buildings	-	-	-	-	32,706	104	2,905	35,716	11,832,451	653,858	12,486,309
A1a - Residential New Homes & Renovations	-	-	-	-	32,706	104	2,905	35,716	11,832,451	653,858	12,486,309
A2 - Residential Existing Buildings	12,935,328	939,377	2,195,668	16,070,373	72,044,734	211,168	7,102,129	79,358,030	27,128,820	1,721,762	28,850,582
A2a - Residential Coordinated Delivery	13,775,988	1,235,938	2,417,792	17,429,718	45,384,437	135,526	4,367,957	49,887,920	14,206,994	886,081	15,093,075
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	(840,660)	(296,562)	(222,123)	(1,359,345)	26,660,296	75,642	2,734,172	29,470,110	12,921,826	835,681	13,757,507
A2d - Residential Behavior	-	-	-	-	-	-	-	-	-	-	-
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**-**	**-**	**-**	**-**	**8,247,546**	**23,237**	**847,931**	**9,118,713**	**2,536,780**	**169,264**	**2,706,044**
B1 - Income Eligible Existing Buildings	-	-	-	-	8,247,546	23,237	847,931	9,118,713	2,536,780	169,264	2,706,044
B1a - Income Eligible Coordinated Delivery	-	-	-	-	8,247,546	23,237	847,931	9,118,713	2,536,780	169,264	2,706,044
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(1,577,434)**	**(301,131)**	**(382,757)**	**(2,261,322)**	**(2,935,619)**	**(6,862)**	**(439,562)**	**(3,382,043)**	**27,607**	**2,272**	**29,879**
C1 - C&I New Buildings	(104,115)	(11,477)	(21,182)	(136,774)	(81,265)	(234)	(11,182)	(92,681)	-	-	-
C1a - C&I New Buildings & Major Renovations	(104,115)	(11,477)	(21,182)	(136,774)	(81,265)	(234)	(11,182)	(92,681)	-	-	-
C2 - C&I Existing Buildings	(1,473,319)	(289,654)	(361,575)	(2,124,548)	(2,854,354)	(6,628)	(428,380)	(3,289,362)	27,607	2,272	29,879
C2a - C&I Existing Building Retrofit	(1,448,463)	(283,491)	(355,321)	(2,087,275)	(2,744,856)	(6,379)	(411,139)	(3,162,374)	27,607	2,272	29,879
C2b - C&I New & Replacement Equipment	(24,857)	(6,162)	(6,254)	(37,273)	(109,498)	(249)	(17,241)	(126,988)	-	-	-
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**11,357,894**	**638,246**	**1,812,911**	**13,809,051**	**77,389,367**	**227,646**	**7,513,404**	**85,130,417**	**41,525,658**	**2,547,156**	**44,072,814**

IV.D Cost-Effectiveness

3.1.i. Benefits Summary Table

Cape Light Compact
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	2019 Benefits							
Program	**Wood**	**Water**	**Total Resource Benefits**	**Total GWSA Benefits**	**Non-Energy Impacts**	**Total TRC Test Benefits**	**Total TRC Test Benefits w/o GWSA**	**Total Resource Benefits per Participant**
A - Residential	**-**	**319,395**	**64,981,934**	**6,239,877**	**6,651,873**	**71,633,806**	**65,393,930**	**225**
A1 - Residential New Buildings	-	-	5,690,956	451,778	289,540	5,980,496	5,528,718	11,428
A1a - Residential New Homes & Renovations	-	-	5,690,956	451,778	289,540	5,980,496	5,528,718	11,428
A2 - Residential Existing Buildings	-	319,395	59,290,977	5,788,098	6,362,333	65,653,310	59,865,212	205
A2a - Residential Coordinated Delivery	-	288,778	34,398,349	3,478,882	5,523,836	39,922,185	36,443,303	9,249
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	
A2c - Residential Retail	-	30,617	23,751,860	2,185,865	838,497	24,590,356	22,404,491	122
A2d - Residential Behavior	-	-	721,495	123,351	-	721,495	598,144	8
A2e - Residential Active Demand Reduction	-	-	419,274	-	-	419,274	419,274	
B - Income Eligible	**-**	**-**	**6,347,887**	**641,796**	**5,030,722**	**11,378,609**	**10,736,812**	**4,650**
B1 - Income Eligible Existing Buildings	-	-	6,347,887	641,796	5,030,722	11,378,609	10,736,812	4,650
B1a - Income Eligible Coordinated Delivery	-	-	6,347,887	641,796	5,030,722	11,378,609	10,736,812	4,650
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	
C - Commercial & Industrial	**-**	**31,915**	**33,060,073**	**3,408,523**	**13,233,192**	**46,293,266**	**42,884,743**	**16,876**
C1 - C&I New Buildings	-	456	1,566,301	226,472	36,729	1,603,030	1,376,559	31,326
C1a - C&I New Buildings & Major Renovations	-	456	1,566,301	226,472	36,729	1,603,030	1,376,559	31,326
C2 - C&I Existing Buildings	-	31,459	31,493,772	3,182,051	13,196,464	44,690,235	41,508,184	16,498
C2a - C&I Existing Building Retrofit	-	29,207	23,792,865	2,729,844	13,138,019	36,930,884	34,201,040	31,894
C2b - C&I New & Replacement Equipment	-	2,252	4,170,967	452,208	58,444	4,229,411	3,777,204	3,586
C2c - C&I Active Demand Reduction	-	-	3,529,940	-	-	3,529,940	3,529,940	
Grand Total	**-**	**351,310**	**104,389,894**	**10,290,196**	**24,915,787**	**129,305,680**	**119,015,485**	**357**

	2020 Benefits							
Program	**Wood**	**Water**	**Total Resource Benefits**	**Total GWSA Benefits**	**Non-Energy Impacts**	**Total TRC Test Benefits**	**Total TRC Test Benefits w/o GWSA**	**Total Resource Benefits per Participant**
A - Residential	**-**	**319,395**	**84,899,061**	**5,922,604**	**6,463,431**	**91,362,492**	**85,439,888**	**349**
A1 - Residential New Buildings	-	-	5,879,304	427,426	298,632	6,177,936	5,750,510	11,372
A1a - Residential New Homes & Renovations	-	-	5,879,304	427,426	298,632	6,177,936	5,750,510	11,372
A2 - Residential Existing Buildings	-	319,395	79,019,757	5,495,178	6,164,799	85,184,556	79,689,378	325
A2a - Residential Coordinated Delivery	-	288,778	47,344,811	3,674,946	5,505,672	52,850,483	49,175,537	11,902
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	
A2c - Residential Retail	-	30,617	20,479,385	1,685,653	659,127	21,138,512	19,452,859	126
A2d - Residential Behavior	-	-	1,165,148	146,212	-	1,165,148	1,018,935	15
A2e - Residential Active Demand Reduction	-	-	10,030,413	(11,633)	-	10,030,413	10,042,046	30,863
B - Income Eligible	**-**	**-**	**13,254,037**	**807,933**	**5,617,840**	**18,871,877**	**18,063,944**	**8,635**
B1 - Income Eligible Existing Buildings	-	-	13,254,037	807,933	5,617,840	18,871,877	18,063,944	8,635
B1a - Income Eligible Coordinated Delivery	-	-	11,087,739	810,618	5,617,840	16,705,579	15,894,961	7,594
B1b - Income Eligible Active Demand Reduction	-	-	2,166,298	(2,685)	-	2,166,298	2,168,983	28,884
C - Commercial & Industrial	**-**	**33,520**	**36,119,531**	**3,257,015**	**13,283,021**	**49,402,552**	**46,145,538**	**17,645**
C1 - C&I New Buildings	-	684	1,858,199	260,948	36,624	1,894,823	1,633,875	36,435
C1a - C&I New Buildings & Major Renovations	-	684	1,858,199	260,948	36,624	1,894,823	1,633,875	36,435
C2 - C&I Existing Buildings	-	32,836	34,261,333	2,996,067	13,246,397	47,507,729	44,511,663	17,165
C2a - C&I Existing Building Retrofit	-	29,458	25,637,454	2,632,797	13,195,959	38,833,413	36,200,616	32,826
C2b - C&I New & Replacement Equipment	-	3,378	3,621,999	364,491	50,438	3,672,437	3,307,946	3,109
C2c - C&I Active Demand Reduction	-	-	5,001,879	(1,222)	-	5,001,879	5,003,101	100,038
Grand Total	**-**	**352,915**	**134,272,630**	**9,987,552**	**25,364,291**	**159,636,921**	**149,649,369**	**544**

IV.D Cost-Effectiveness

3.1.i. Benefits Summary Table

Cape Light Compact
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	2021 Benefits							
Program	**Wood**	**Water**	**Total Resource Benefits**	**Total GWSA Benefits**	**Non-Energy Impacts**	**Total TRC Test Benefits**	**Total TRC Test Benefits w/o GWSA**	**Total Resource Benefits per Participant**
A - Residential	**-**	**319,395**	**97,064,830**	**5,931,914**	**6,234,037**	**103,298,868**	**97,366,954**	**574**
A1 - Residential New Buildings	-	-	6,021,662	409,021	309,495	6,331,157	5,922,136	11,234
A1a - Residential New Homes & Renovations	-	-	6,021,662	409,021	309,495	6,331,157	5,922,136	11,234
A2 - Residential Existing Buildings	-	319,395	91,043,169	5,522,893	5,924,542	96,967,711	91,444,818	540
A2a - Residential Coordinated Delivery	-	288,778	59,735,431	4,064,107	5,500,454	65,235,884	61,171,777	14,196
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	
A2c - Residential Retail	-	30,617	17,701,756	1,313,169	424,089	18,125,844	16,812,675	188
A2d - Residential Behavior	-	-	1,308,386	159,422	-	1,308,386	1,148,964	19
A2e - Residential Active Demand Reduction	-	-	12,297,597	(13,806)	-	12,297,597	12,311,402	30,744
B - Income Eligible	**-**	**-**	**18,132,724**	**966,401**	**6,169,417**	**24,302,140**	**23,335,740**	**10,990**
B1 - Income Eligible Existing Buildings	-	-	18,132,724	966,401	6,169,417	24,302,140	23,335,740	10,990
B1a - Income Eligible Coordinated Delivery	-	-	15,243,260	969,852	6,169,417	21,412,677	20,442,824	9,834
B1b - Income Eligible Active Demand Reduction	-	-	2,889,464	(3,451)	-	2,889,464	2,892,915	28,895
C - Commercial & Industrial	**-**	**35,899**	**36,447,508**	**3,061,086**	**13,049,255**	**49,496,763**	**46,435,677**	**17,472**
C1 - C&I New Buildings	-	684	1,929,861	261,640	36,624	1,966,485	1,704,845	37,113
C1a - C&I New Buildings & Major Renovations	-	684	1,929,861	261,640	36,624	1,966,485	1,704,845	37,113
C2 - C&I Existing Buildings	-	35,214	34,517,647	2,799,447	13,012,631	47,530,278	44,730,832	16,970
C2a - C&I Existing Building Retrofit	-	30,710	26,266,209	2,487,384	12,980,734	39,246,944	36,759,560	32,189
C2b - C&I New & Replacement Equipment	-	4,504	3,238,338	313,241	31,897	3,270,235	2,956,994	2,773
C2c - C&I Active Demand Reduction	-	-	5,013,100	(1,178)	-	5,013,100	5,014,278	100,262
Grand Total	**-**	**355,294**	**151,645,062**	**9,959,401**	**25,452,709**	**177,097,771**	**167,138,370**	**877**

	2019-2021 Benefits							
Program	**Wood**	**Water**	**Total Resource Benefits**	**Total GWSA Benefits**	**Non-Energy Impacts**	**Total TRC Test Benefits**	**Total TRC Test Benefits w/o GWSA**	**Total Resource Benefits per Participant**
A - Residential	**-**	**958,184**	**246,945,825**	**18,094,394**	**19,349,341**	**266,295,166**	**248,200,772**	**352**
A1 - Residential New Buildings	-	-	17,591,922	1,288,225	897,666	18,489,589	17,201,363	11,342
A1a - Residential New Homes & Renovations	-	-	17,591,922	1,288,225	897,666	18,489,589	17,201,363	11,342
A2 - Residential Existing Buildings	-	958,184	229,353,903	16,806,169	18,451,674	247,805,577	230,999,408	328
A2a - Residential Coordinated Delivery	-	866,334	141,478,590	11,217,935	16,529,962	158,008,552	146,790,617	11,884
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	
A2c - Residential Retail	-	91,850	61,933,000	5,184,687	1,921,712	63,854,713	58,670,025	137
A2d - Residential Behavior	-	-	3,195,028	428,986	-	3,195,028	2,766,042	14
A2e - Residential Active Demand Reduction	-	-	22,747,284	(25,439)	-	22,747,284	22,772,723	31,376
B - Income Eligible	**-**	**-**	**37,734,648**	**2,416,130**	**16,817,978**	**54,552,626**	**52,136,496**	**8,293**
B1 - Income Eligible Existing Buildings	-	-	37,734,648	2,416,130	16,817,978	54,552,626	52,136,496	8,293
B1a - Income Eligible Coordinated Delivery	-	-	32,678,886	2,422,266	16,817,978	49,496,864	47,074,597	7,469
B1b - Income Eligible Active Demand Reduction	-	-	5,055,762	(6,136)	-	5,055,762	5,061,898	28,890
C - Commercial & Industrial	**-**	**101,334**	**105,627,112**	**9,726,624**	**39,565,468**	**145,192,581**	**135,465,957**	**17,339**
C1 - C&I New Buildings	-	1,825	5,354,361	749,059	109,976	5,464,338	4,715,279	34,996
C1a - C&I New Buildings & Major Renovations	-	1,825	5,354,361	749,059	109,976	5,464,338	4,715,279	34,996
C2 - C&I Existing Buildings	-	99,509	100,272,751	8,977,565	39,455,492	139,728,243	130,750,678	16,884
C2a - C&I Existing Building Retrofit	-	89,376	75,696,528	7,850,025	39,314,713	115,011,241	107,161,216	32,308
C2b - C&I New & Replacement Equipment	-	10,133	11,031,304	1,129,939	140,779	11,172,083	10,042,143	3,155
C2c - C&I Active Demand Reduction	-	-	13,544,919	(2,400)	-	13,544,919	13,547,319	135,449
Grand Total	**-**	**1,059,519**	**390,307,585**	**30,237,149**	**75,732,787**	**466,040,372**	**435,803,224**	**548**

IV.D Cost-Effectiveness

3.1.iii. Benefits Comparison Table - Three Year Plan vs. Previous Years

Cape Light Compact
October 31, 2018

2016-2021 Benefits								
Sector	Electric Benefits							
	Capacity					Electric Energy		
	Summer Generation	Transmission	Distribution	Capacity DRIPE	Total Capacity Benefits	Electric Energy	Electric Energy DRIPE	Total Electric Energy Benefits
A - Residential	**29,925,081**	**19,016,398**	**45,099,371**	**10,498,576**	**104,969,514**	**77,911,349**	**13,565,646**	**97,895,067**
2016 Evaluated	4,413,821	1,205,697	4,037,912	-	9,657,431	15,231,347	3,359,549	18,590,895
2017 Evaluated	6,420,554	1,610,962	5,395,156	-	13,426,673	21,425,201	2,708,287	24,133,488
2018 Planned	5,381,401	1,242,065	4,159,712	-	10,783,178	16,383,662	702,623	17,086,285
2019 Planned	2,019,290	2,551,556	5,374,555	222,570	10,220,273	7,777,583	2,774,720	13,017,255
2020 Planned	4,928,897	5,364,280	11,299,228	4,648,579	26,413,032	8,191,588	2,226,036	12,461,132
2021 Planned	6,761,116	7,041,838	14,832,807	5,627,428	34,468,927	8,901,968	1,794,431	12,606,012
B - Income Eligible	**5,011,107**	**4,043,556**	**8,959,748**	**2,347,912**	**20,447,502**	**9,706,893**	**1,773,847**	**12,879,676**
2016 Evaluated	448,344	120,017	401,942	-	970,303	1,119,182	228,567	1,347,749
2017 Evaluated	372,632	93,845	314,290	-	780,767	1,206,513	148,289	1,354,802
2018 Planned	608,346	142,208	476,258	-	1,226,812	1,659,541	77,312	1,736,853
2019 Planned	341,823	390,144	821,792	8,045	1,566,668	1,302,251	386,631	2,082,558
2020 Planned	1,273,741	1,312,297	2,764,199	1,007,959	6,392,047	1,877,250	425,900	2,755,364
2021 Planned	1,966,222	1,985,046	4,181,266	1,331,907	9,510,904	2,542,156	507,148	3,602,349
C - Commercial & Industrial	**30,815,060**	**18,275,785**	**45,232,569**	**3,529,899**	**98,335,708**	**93,757,602**	**17,834,543**	**122,138,815**
2016 Evaluated	4,726,873	1,330,758	4,456,745	-	10,514,375	16,171,963	3,470,067	19,642,031
2017 Evaluated	6,047,292	1,446,581	4,844,640	-	12,338,513	12,945,815	1,107,625	14,053,440
2018 Planned	11,124,929	2,643,972	8,854,737	-	22,623,639	28,707,057	1,456,204	30,163,261
2019 Planned	2,586,924	3,937,024	8,292,881	724,442	15,689,301	11,642,440	3,881,485	19,225,436
2020 Planned	3,051,899	4,384,669	9,235,791	1,395,037	18,234,138	12,248,102	3,977,514	19,756,144
2021 Planned	3,277,142	4,532,781	9,547,774	1,410,420	18,935,741	12,042,225	3,941,647	19,298,503
Grand Total	**65,751,248**	**41,335,740**	**99,291,687**	**16,376,387**	**223,752,723**	**181,375,844**	**33,174,036**	**232,913,558**
2016 Evaluated	9,589,038	2,656,472	8,896,599	-	21,142,109	32,522,491	7,058,183	39,580,675
2017 Evaluated	12,840,478	3,151,388	10,554,087	-	26,545,953	35,577,530	3,964,201	39,541,731
2018 Planned	17,114,677	4,028,245	13,490,707	-	34,633,630	46,750,260	2,236,139	48,986,399
2019 Planned	4,948,038	6,878,724	14,489,228	955,057	27,476,242	20,722,274	7,042,837	34,325,249
2020 Planned	9,254,537	11,061,245	23,299,219	7,051,575	51,039,218	22,316,939	6,629,451	34,972,640
2021 Planned	12,004,480	13,559,665	28,561,847	8,369,755	62,915,572	23,486,349	6,243,226	35,506,864

IV.D Cost-Effectiveness

3.1.iii. Benefits Comparison Table - Three Year Plan vs. Previous Years

Cape Light Compact

October 31, 2018

2016-2021 Benefits, Percent of Total TRC Test Benefits								
Sector	Electric Benefits							
	Capacity					Electric Energy		
	Summer Generation	Transmission	Distribution	Capacity DRIPE	Total Capacity Benefits	Electric Energy	Electric Energy DRIPE	Total Electric Energy Benefits
A - Residential	**6.8%**	**4.3%**	**10.2%**	**2.4%**	**23.8%**	**17.7%**	**3.1%**	**22.2%**
2016 Evaluated	9.3%	2.5%	8.5%	0.0%	20.3%	32.0%	7.1%	39.1%
2017 Evaluated	10.1%	2.5%	8.5%	0.0%	21.1%	33.7%	4.3%	38.0%
2018 Planned	8.4%	1.9%	6.5%	0.0%	16.9%	25.7%	1.1%	26.8%
2019 Planned	2.8%	3.6%	7.5%	0.3%	14.3%	10.9%	3.9%	18.2%
2020 Planned	5.4%	5.9%	12.4%	5.1%	28.9%	9.0%	2.4%	13.6%
2021 Planned	6.5%	6.8%	14.4%	5.4%	33.4%	8.6%	1.7%	12.2%
B - Income Eligible	**6.3%**	**5.1%**	**11.3%**	**3.0%**	**25.8%**	**12.2%**	**2.2%**	**16.3%**
2016 Evaluated	5.9%	1.6%	5.3%	0.0%	12.7%	14.7%	3.0%	17.7%
2017 Evaluated	7.1%	1.8%	6.0%	0.0%	14.9%	23.1%	2.8%	25.9%
2018 Planned	5.1%	1.2%	4.0%	0.0%	10.4%	14.0%	0.7%	14.7%
2019 Planned	3.0%	3.4%	7.2%	0.1%	13.8%	11.4%	3.4%	18.3%
2020 Planned	6.7%	7.0%	14.6%	5.3%	33.9%	9.9%	2.3%	14.6%
2021 Planned	8.1%	8.2%	17.2%	5.5%	39.1%	10.5%	2.1%	14.8%
C - Commercial & Industrial	**11.1%**	**6.6%**	**16.3%**	**1.3%**	**35.4%**	**33.7%**	**6.4%**	**43.9%**
2016 Evaluated	13.2%	3.7%	12.4%	0.0%	29.3%	45.1%	9.7%	54.7%
2017 Evaluated	20.3%	4.9%	16.3%	0.0%	41.4%	43.5%	3.7%	47.2%
2018 Planned	16.6%	3.9%	13.2%	0.0%	33.7%	42.7%	2.2%	44.9%
2019 Planned	5.6%	8.5%	17.9%	1.6%	33.9%	25.1%	8.4%	41.5%
2020 Planned	6.2%	8.9%	18.7%	2.8%	36.9%	24.8%	8.1%	40.0%
2021 Planned	6.6%	9.2%	19.3%	2.8%	38.3%	24.3%	8.0%	39.0%
Grand Total	**8.2%**	**5.2%**	**12.4%**	**2.1%**	**28.0%**	**22.7%**	**4.2%**	**29.2%**
2016 Evaluated	10.5%	2.9%	9.8%	0.0%	23.2%	35.7%	7.7%	43.5%
2017 Evaluated	13.0%	3.2%	10.7%	0.0%	26.9%	36.1%	4.0%	40.1%
2018 Planned	12.0%	2.8%	9.5%	0.0%	24.3%	32.8%	1.6%	34.3%
2019 Planned	3.8%	5.3%	11.2%	0.7%	21.2%	16.0%	5.4%	26.5%
2020 Planned	5.8%	6.9%	14.6%	4.4%	32.0%	14.0%	4.2%	21.9%
2021 Planned	6.8%	7.7%	16.1%	4.7%	35.5%	13.3%	3.5%	20.0%

Notes:

2016 values are from the Program Administrator's 2016 Plan Year Report D.P.U. 17-100, in 2016$.

2017 values are from the Program Administrator's 2017 Plan Year Report D.P.U. 18-51, in 2016$.

2018 values are from the Program Administrator's 2016-2018 Three-Year Plan, D.P.U. 15-166, in 2016$.

For supporting information on the 2019-2021 values, see Table IV.D.3.1.i. The 2019-2021 values are in 2019$.

IV.D Cost-Effectiveness

3.1.iii. Benefits Comparison

Cape Light Compact
October 31, 2018

Sector	2016-2021 Benefits								
	Natural Gas Benefits			Deliverable Fuel Benefits		Other Benefits	Total Energy Benefits	Non-Energy Impacts	Total TRC Test Benefits
	Natural Gas	Natural Gas DRIPE	Total Gas Benefits	Oil	Propane	Water			
A - Residential	**15,768,479**	**839,638**	**18,803,785**	**115,577,031**	**48,824,248**	**1,914,168**	**397,675,738**	**43,455,439**	**441,131,177**
2016 Evaluated	308,598	(139,278)	169,320	8,505,581	2,443,375	202,985	39,569,586	7,988,870	47,558,456
2017 Evaluated	3,285,910	85,978	3,371,888	10,068,102	3,650,805	237,454	54,888,409	8,667,281	63,555,689
2018 Planned	(761,357)	(46,439)	(807,796)	24,925,909	3,768,797	515,545	56,271,918	7,449,948	63,721,865
2019 Planned	4,122,566	332,858	5,186,996	21,544,627	11,588,802	319,395	64,981,934	6,651,873	71,633,806
2020 Planned	4,302,391	316,279	5,343,977	24,141,316	12,995,808	319,395	84,899,061	6,463,431	91,362,492
2021 Planned	4,510,371	290,240	5,539,400	26,391,496	14,376,662	319,395	97,064,830	6,234,037	103,298,868
B - Income Eligible	**116**	**19**	**135**	**17,761,662**	**3,596,183**	**432,178**	**56,157,767**	**23,100,422**	**79,258,189**
2016 Evaluated	-	-	-	1,979,582	502,545	164,911	4,965,091	2,667,407	7,632,498
2017 Evaluated	116	19	135	1,026,849	123,839	108,974	3,395,367	1,831,017	5,226,385
2018 Planned	-	-	-	6,507,685	433,019	158,293	10,062,661	1,784,019	11,846,681
2019 Planned	-	-	-	1,869,186	576,167	-	6,347,887	5,030,722	11,378,609
2020 Planned	-	-	-	2,868,513	874,416	-	13,254,037	5,617,840	18,871,877
2021 Planned	-	-	-	3,509,847	1,086,197	-	18,132,724	6,169,417	24,302,140
C - Commercial & Industrial	**(4,678,652)**	**(628,982)**	**(5,690,392)**	**(411,303)**	**2,224,715**	**184,198**	**216,337,590**	**61,676,841**	**278,014,431**
2016 Evaluated	(704,158)	(147,368)	(851,526)	(675,125)	30,836	35,041	28,695,633	7,188,675	35,884,308
2017 Evaluated	(1,001,312)	(91,338)	(1,092,650)	(616,246)	838,593	27,189	25,548,840	4,222,592	29,771,431
2018 Planned	(1,395,748)	(89,146)	(1,484,894)	3,815,687	1,327,678	20,634	56,466,004	10,700,106	67,166,111
2019 Planned	(516,221)	(119,794)	(771,633)	(964,321)	8,895	31,915	33,060,073	13,233,192	46,293,266
2020 Planned	(540,879)	(101,607)	(770,837)	(995,160)	9,218	33,520	36,119,531	13,283,021	49,402,552
2021 Planned	(520,334)	(79,731)	(718,853)	(976,138)	9,494	35,899	36,447,508	13,049,255	49,496,763
Grand Total	**11,089,943**	**210,674**	**13,113,528**	**132,927,389**	**54,645,146**	**2,530,545**	**670,171,095**	**128,232,702**	**798,403,796**
2016 Evaluated	(395,560)	(286,646)	(682,206)	9,810,038	2,976,757	402,938	73,230,310	17,844,952	91,075,262
2017 Evaluated	2,284,714	(5,341)	2,279,373	10,478,705	4,613,237	373,617	83,832,615	14,720,890	98,553,505
2018 Planned	(2,157,105)	(135,585)	(2,292,690)	35,249,280	5,529,494	694,471	122,800,584	19,934,073	142,734,656
2019 Planned	3,606,345	213,064	4,415,364	22,449,492	12,173,863	351,310	104,389,894	24,915,787	129,305,680
2020 Planned	3,761,512	214,672	4,573,140	26,014,669	13,879,442	352,915	134,272,630	25,364,291	159,636,921
2021 Planned	3,990,038	210,510	4,820,547	28,925,205	15,472,352	355,294	151,645,062	25,452,709	177,097,771

IV.D Cost-Effectiveness

3.1.iii. Benefits Comparison

Cape Light Compact

October 31, 2018

Sector	2016-2021 Benefits, Percent of Total TRC Test Benefits								
	Natural Gas Benefits			Deliverable Fuel Benefits		Other Benefits	Total Energy Benefits	Non-Energy Impacts	Total TRC Test Benefits
	Natural Gas	Natural Gas DRIPE	Total Gas Benefits	Oil	Propane	Water			
A - Residential	**3.6%**	**0.2%**	**4.3%**	**26.2%**	**11.1%**	**0.4%**	**90.1%**	**9.9%**	**100%**
2016 Evaluated	0.6%	-0.3%	0.4%	17.9%	5.1%	0.4%	83.2%	16.8%	100%
2017 Evaluated	5.2%	0.1%	5.3%	15.8%	5.7%	0.4%	86.4%	13.6%	100%
2018 Planned	-1.2%	-0.1%	-1.3%	39.1%	5.9%	0.8%	88.3%	11.7%	100%
2019 Planned	5.8%	0.5%	7.2%	30.1%	16.2%	0.4%	90.7%	9.3%	100%
2020 Planned	4.7%	0.3%	5.8%	26.4%	14.2%	0.3%	92.9%	7.1%	100%
2021 Planned	4.4%	0.3%	5.4%	25.5%	13.9%	0.3%	94.0%	6.0%	100%
B - Income Eligible	**0.0%**	**0.0%**	**0.0%**	**22.4%**	**4.5%**	**0.5%**	**70.9%**	**29.1%**	**100%**
2016 Evaluated	0.0%	0.0%	0.0%	25.9%	6.6%	2.2%	65.1%	34.9%	100%
2017 Evaluated	0.0%	0.0%	0.0%	19.6%	2.4%	2.1%	65.0%	35.0%	100%
2018 Planned	0.0%	0.0%	0.0%	54.9%	3.7%	1.3%	84.9%	15.1%	100%
2019 Planned	0.0%	0.0%	0.0%	16.4%	5.1%	0.0%	55.8%	44.2%	100%
2020 Planned	0.0%	0.0%	0.0%	15.2%	4.6%	0.0%	70.2%	29.8%	100%
2021 Planned	0.0%	0.0%	0.0%	14.4%	4.5%	0.0%	74.6%	25.4%	100%
C - Commercial & Industrial	**-1.7%**	**-0.2%**	**-2.0%**	**-0.1%**	**0.8%**	**0.1%**	**77.8%**	**22.2%**	**100%**
2016 Evaluated	-2.0%	-0.4%	-2.4%	-1.9%	0.1%	0.1%	80.0%	20.0%	100%
2017 Evaluated	-3.4%	-0.3%	-3.7%	-2.1%	2.8%	0.1%	85.8%	14.2%	100%
2018 Planned	-2.1%	-0.1%	-2.2%	5.7%	2.0%	0.0%	84.1%	15.9%	100%
2019 Planned	-1.1%	-0.3%	-1.7%	-2.1%	0.0%	0.1%	71.4%	28.6%	100%
2020 Planned	-1.1%	-0.2%	-1.6%	-2.0%	0.0%	0.1%	73.1%	26.9%	100%
2021 Planned	-1.1%	-0.2%	-1.5%	-2.0%	0.0%	0.1%	73.6%	26.4%	100%
Grand Total	**1.4%**	**0.0%**	**1.6%**	**16.6%**	**6.8%**	**0.3%**	**83.9%**	**16.1%**	**100%**
2016 Evaluated	-0.4%	-0.3%	-0.7%	10.8%	3.3%	0.4%	80.4%	19.6%	100%
2017 Evaluated	2.3%	0.0%	2.3%	10.6%	4.7%	0.4%	85.1%	14.9%	100%
2018 Planned	-1.5%	-0.1%	-1.6%	24.7%	3.9%	0.5%	86.0%	14.0%	100%
2019 Planned	2.8%	0.2%	3.4%	17.4%	9.4%	0.3%	80.7%	19.3%	100%
2020 Planned	2.4%	0.1%	2.9%	16.3%	8.7%	0.2%	84.1%	15.9%	100%
2021 Planned	2.3%	0.1%	2.7%	16.3%	8.7%	0.2%	85.6%	14.4%	100%

Notes:

2016 values are from the Program Admin

2017 values are from the Program Admin

2018 values are from the Program Admin

For supporting information on the 2019-

IV.D. Cost-Effectiveness

3.2.i. Savings Summary Table

Cape Light Compact
October 31, 2018

2019 Net Savings									
Program	# of Participants	Electric						Natural Gas	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**289,141**	**3,643**	**4,893**	**21,472**	**120,623**	**73,261**	**411,566**	**142,071**	**4,496,539**
A1 - Residential New Buildings	498	125	220	1,064	13,800	3,632	47,087	-	-
A1a - Residential New Homes & Renovations	498	125	220	1,064	13,800	3,632	47,087	-	-
A2 - Residential Existing Buildings	288,643	3,518	4,673	20,407	106,823	69,629	364,479	142,071	4,496,539
A2a - Residential Coordinated Delivery	3,719	1,206	1,849	7,682	59,283	26,210	202,275	233,891	4,997,098
A2b - Residential Conservation Services (RCS)		-	-	-	-	-	-	-	-
A2c - Residential Retail	194,924	1,780	2,002	8,773	43,587	29,934	148,720	(91,821)	(500,559)
A2d - Residential Behavior	90,000	532	822	3,952	3,952	13,484	13,484	-	-
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-
B - Income Eligible	**1,365**	**379**	**536**	**2,344**	**20,681**	**7,996**	**70,564**	**-**	**-**
B1 - Income Eligible Existing Buildings	1,365	379	536	2,344	20,681	7,996	70,564	-	-
B1a - Income Eligible Coordinated Delivery	1,365	379	536	2,344	20,681	7,996	70,564	-	-
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**1,959**	**2,664**	**2,279**	**16,785**	**194,988**	**57,270**	**665,301**	**(56,991)**	**(625,375)**
C1 - C&I New Buildings	50	70	63	814	14,033	2,776	47,881	(1,803)	(32,889)
C1a - C&I New Buildings & Major Renovations	50	70	63	814	14,033	2,776	47,881	(1,803)	(32,889)
C2 - C&I Existing Buildings	1,909	2,594	2,216	15,971	180,955	54,494	617,420	(55,187)	(592,486)
C2a - C&I Existing Building Retrofit	746	2,088	1,902	13,558	157,436	46,262	537,173	(53,748)	(580,483)
C2b - C&I New & Replacement Equipment	1,163	505	314	2,413	23,519	8,232	80,247	(1,439)	(12,003)
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-
Grand Total	**292,465**	**6,687**	**7,708**	**40,600**	**336,293**	**138,527**	**1,147,431**	**85,080**	**3,871,164**

2020 Net Savings									
Program	# of Participants	Electric						Natural Gas	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**243,294**	**5,431**	**6,787**	**20,662**	**121,269**	**70,705**	**415,849**	**168,202**	**4,653,634**
A1 - Residential New Buildings	517	115	213	1,008	13,850	3,439	47,255	-	-
A1a - Residential New Homes & Renovations	517	115	213	1,008	13,850	3,439	47,255	-	-
A2 - Residential Existing Buildings	242,777	5,317	6,574	19,654	107,420	67,266	368,594	168,202	4,653,634
A2a - Residential Coordinated Delivery	3,978	1,852	2,452	6,814	73,902	23,248	252,153	232,334	4,973,736
A2b - Residential Conservation Services (RCS)		-	-	-	-	-	-	-	-
A2c - Residential Retail	162,474	1,319	1,486	6,245	27,471	21,308	93,731	(64,132)	(320,102)
A2d - Residential Behavior	76,000	896	1,385	6,656	6,656	22,710	22,710	-	-
A2e - Residential Active Demand Reduction	325	1,250	1,250	(61)	(609)	-	-	-	-
B - Income Eligible	**1,535**	**944**	**1,125**	**2,490**	**28,408**	**8,545**	**97,406**	**-**	**-**
B1 - Income Eligible Existing Buildings	1,535	944	1,125	2,490	28,408	8,545	97,406	-	-
B1a - Income Eligible Coordinated Delivery	1,460	655	836	2,504	28,548	8,545	97,406	-	-
B1b - Income Eligible Active Demand Reduction	75	289	289	(14)	(141)	-	-	-	-
C - Commercial & Industrial	**2,047**	**2,981**	**2,614**	**17,139**	**201,906**	**58,512**	**689,117**	**(57,994)**	**(640,491)**
C1 - C&I New Buildings	51	71	63	985	17,434	3,361	59,483	(2,355)	(43,863)
C1a - C&I New Buildings & Major Renovations	51	71	63	985	17,434	3,361	59,483	(2,355)	(43,863)
C2 - C&I Existing Buildings	1,996	2,911	2,551	16,155	184,472	55,151	629,634	(55,639)	(596,628)
C2a - C&I Existing Building Retrofit	781	2,256	2,073	13,963	164,248	47,640	560,414	(54,399)	(586,996)
C2b - C&I New & Replacement Equipment	1,165	463	285	2,201	20,287	7,511	69,220	(1,240)	(9,632)
C2c - C&I Active Demand Reduction	50	192	192	(9)	(63)	-	-	-	-
Grand Total	**246,876**	**9,356**	**10,526**	**40,291**	**351,582**	**137,762**	**1,202,372**	**110,208**	**4,013,143**

IV.D. Cost-Effectiveness

3.2.i. Savings Summary Table

Cape Light Compact
October 31, 2018

2021 Net Savings									
Program	# of Participants	Electric						Natural Gas	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**169,200**	**5,832**	**7,227**	**17,848**	**127,738**	**61,155**	**438,400**	**203,213**	**4,845,655**
A1 - Residential New Buildings	536	101	205	935	13,395	3,190	45,705	-	-
A1a - Residential New Homes & Renovations	536	101	205	935	13,395	3,190	45,705	-	-
A2 - Residential Existing Buildings	168,664	5,731	7,022	16,913	114,343	57,964	392,695	203,213	4,845,655
A2a - Residential Coordinated Delivery	4,208	2,438	3,097	6,595	99,705	22,501	340,194	231,181	4,956,447
A2b - Residential Conservation Services (RCS)		-	-	-	-	-	-	-	-
A2c - Residential Retail	94,056	746	828	2,905	7,899	9,914	26,952	(27,968)	(110,793)
A2d - Residential Behavior	70,000	1,008	1,558	7,488	7,488	25,550	25,550	-	-
A2e - Residential Active Demand Reduction	400	1,539	1,539	(75)	(750)	-	-	-	-
B - Income Eligible	**1,650**	**1,280**	**1,508**	**2,732**	**37,577**	**9,384**	**128,852**	**-**	**-**
B1 - Income Eligible Existing Buildings	1,650	1,280	1,508	2,732	37,577	9,384	128,852	-	-
B1a - Income Eligible Coordinated Delivery	1,550	895	1,123	2,750	37,764	9,384	128,852	-	-
B1b - Income Eligible Active Demand Reduction	100	385	385	(19)	(187)	-	-	-	-
C - Commercial & Industrial	**2,086**	**3,070**	**2,733**	**17,088**	**196,610**	**58,338**	**671,048**	**(58,827)**	**(607,566)**
C1 - C&I New Buildings	52	71	63	1,026	18,260	3,502	62,304	(2,471)	(46,191)
C1a - C&I New Buildings & Major Renovations	52	71	63	1,026	18,260	3,502	62,304	(2,471)	(46,191)
C2 - C&I Existing Buildings	2,034	3,000	2,670	16,062	178,349	54,836	608,744	(56,356)	(561,375)
C2a - C&I Existing Building Retrofit	816	2,387	2,221	14,082	160,310	48,048	546,978	(55,313)	(553,754)
C2b - C&I New & Replacement Equipment	1,168	420	257	1,989	18,103	6,788	61,766	(1,043)	(7,621)
C2c - C&I Active Demand Reduction	50	192	192	(9)	(63)	-	-	-	-
Grand Total	**172,936**	**10,182**	**11,468**	**37,668**	**361,925**	**128,876**	**1,238,300**	**144,387**	**4,238,088**

2019-2021 Net Savings									
Program	# of Participants	Electric						Natural Gas	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		(Therms)	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**701,635**	**14,907**	**18,907**	**59,981**	**369,631**	**205,120**	**1,265,816**	**513,486**	**13,995,828**
A1 - Residential New Buildings	1,551	341	638	3,007	41,046	10,261	140,048	-	-
A1a - Residential New Homes & Renovations	1,551	341	638	3,007	41,046	10,261	140,048	-	-
A2 - Residential Existing Buildings	700,084	14,566	18,270	56,974	328,585	194,860	1,125,768	513,486	13,995,828
A2a - Residential Coordinated Delivery	11,905	5,495	7,398	21,090	232,890	71,960	794,622	697,406	14,927,281
A2b - Residential Conservation Services (RCS)		-	-	-	-	-	-	-	-
A2c - Residential Retail	451,454	3,845	4,317	17,924	78,957	61,156	269,402	(183,920)	(931,454)
A2d - Residential Behavior	236,000	2,436	3,765	18,096	18,096	61,744	61,744	-	-
A2e - Residential Active Demand Reduction	725	2,789	2,789	(136)	(1,359)	-	-	-	-
B - Income Eligible	**4,550**	**2,603**	**3,169**	**7,565**	**86,666**	**25,925**	**296,822**	**-**	**-**
B1 - Income Eligible Existing Buildings	4,550	2,603	3,169	7,565	86,666	25,925	296,822	-	-
B1a - Income Eligible Coordinated Delivery	4,375	1,929	2,496	7,598	86,993	25,925	296,822	-	-
B1b - Income Eligible Active Demand Reduction	175	673	673	(33)	(328)	-	-	-	-
C - Commercial & Industrial	**6,092**	**8,716**	**7,626**	**51,013**	**593,504**	**174,119**	**2,025,465**	**(173,811)**	**(1,873,433)**
C1 - C&I New Buildings	153	211	189	2,825	49,727	9,638	169,668	(6,629)	(122,943)
C1a - C&I New Buildings & Major Renovations	153	211	189	2,825	49,727	9,638	169,668	(6,629)	(122,943)
C2 - C&I Existing Buildings	5,939	8,504	7,437	48,188	543,777	164,481	1,855,797	(167,182)	(1,750,490)
C2a - C&I Existing Building Retrofit	2,343	6,731	6,197	41,603	481,994	141,950	1,644,564	(163,460)	(1,721,233)
C2b - C&I New & Replacement Equipment	3,496	1,389	855	6,603	61,909	22,531	211,233	(3,722)	(29,256)
C2c - C&I Active Demand Reduction	100	385	385	(19)	(126)	-	-	-	-
Grand Total	**712,277**	**26,225**	**29,702**	**118,559**	**1,049,800**	**405,164**	**3,588,103**	**339,675**	**12,122,395**

IV.D. Cost-Effectiveness

3.2.i. Savings Summary Table

Cape Light Compact
October 31, 2018

2019 Net Savings												
Program	Deliverable Fuels				Other				Total Savings		Electric Energy, no Fuel Switching or ADR (MWh)	
	Oil (MMBTU)		Propane (MMBTU)		Wood (MMBTU)		Water (Gallons)		MMBTU			
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**44,980**	**930,079**	**17,285**	**361,703**	**-**	**-**	**2,701,602**	**19,586,572**	**149,732**	**2,153,002**	**23,819**	**162,138**
A1 - Residential New Buildings	18	436	4,637	114,470	-	-	-	-	8,287	161,993	1,064	13,800
A1a - Residential New Homes & Renovations	18	436	4,637	114,470	-	-	-	-	8,287	161,993	1,064	13,800
A2 - Residential Existing Buildings	44,962	929,643	12,647	247,232	-	-	2,701,602	19,586,572	141,445	1,991,008	22,755	148,337
A2a - Residential Coordinated Delivery	26,695	543,580	5,820	109,924	-	-	2,433,883	17,712,542	82,114	1,355,489	7,825	61,812
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	18,267	386,063	6,828	137,308	-	-	267,719	1,874,030	45,847	622,036	10,978	82,573
A2d - Residential Behavior	-	-	-	-	-	-	-	-	13,484	13,484	3,952	3,952
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**4,409**	**81,359**	**1,108**	**18,293**	**-**	**-**	**-**	**-**	**13,514**	**170,216**	**2,394**	**21,435**
B1 - Income Eligible Existing Buildings	4,409	81,359	1,108	18,293	-	-	-	-	13,514	170,216	2,394	21,435
B1a - Income Eligible Coordinated Delivery	4,409	81,359	1,108	18,293	-	-	-	-	13,514	170,216	2,394	21,435
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(4,672)**	**(53,227)**	**35**	**296**	**-**	**-**	**234,596**	**1,960,762**	**46,934**	**549,832**	**16,785**	**194,988**
C1 - C&I New Buildings	(97)	(1,300)	-	-	-	-	3,499	27,994	2,499	43,292	814	14,033
C1a - C&I New Buildings & Major Renovations	(97)	(1,300)	-	-	-	-	3,499	27,994	2,499	43,292	814	14,033
C2 - C&I Existing Buildings	(4,575)	(51,928)	35	296	-	-	231,097	1,932,768	44,435	506,540	15,971	180,955
C2a - C&I Existing Building Retrofit	(4,331)	(49,605)	35	296	-	-	216,097	1,794,195	36,590	429,816	13,558	157,436
C2b - C&I New & Replacement Equipment	(244)	(2,323)	-	-	-	-	15,000	138,574	7,845	76,724	2,413	23,519
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**44,718**	**958,211**	**18,428**	**380,292**	**-**	**-**	**2,936,198**	**21,547,334**	**210,180**	**2,873,050**	**42,998**	**378,561**

2020 Net Savings												
Program	Deliverable Fuels				Other				Total Savings		Electric Energy, no Fuel Switching or ADR (MWh)	
	Oil (MMBTU)		Propane (MMBTU)		Wood (MMBTU)		Water (Gallons)		MMBTU			
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**51,127**	**1,020,407**	**19,589**	**398,338**	**-**	**-**	**2,701,602**	**19,586,572**	**158,241**	**2,299,958**	**23,487**	**170,805**
A1 - Residential New Buildings	19	453	4,820	118,992	-	-	-	-	8,277	166,700	1,008	13,850
A1a - Residential New Homes & Renovations	19	453	4,820	118,992	-	-	-	-	8,277	166,700	1,008	13,850
A2 - Residential Existing Buildings	51,109	1,019,954	14,769	279,347	-	-	2,701,602	19,586,572	149,964	2,133,258	22,479	156,956
A2a - Residential Coordinated Delivery	32,658	649,416	8,072	149,231	-	-	2,433,883	17,712,542	87,212	1,548,173	7,523	86,476
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	18,451	370,538	6,697	130,116	-	-	267,719	1,874,030	40,042	562,374	8,300	63,824
A2d - Residential Behavior	-	-	-	-	-	-	-	-	22,710	22,710	6,656	6,656
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**7,085**	**122,401**	**1,702**	**27,201**	**-**	**-**	**-**	**-**	**17,332**	**247,008**	**2,755**	**32,303**
B1 - Income Eligible Existing Buildings	7,085	122,401	1,702	27,201	-	-	-	-	17,332	247,008	2,755	32,303
B1a - Income Eligible Coordinated Delivery	7,085	122,401	1,702	27,201	-	-	-	-	17,332	247,008	2,755	32,303
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(4,655)**	**(52,922)**	**35**	**296**	**-**	**-**	**245,770**	**2,059,439**	**48,092**	**572,442**	**17,149**	**201,969**
C1 - C&I New Buildings	(97)	(1,290)	-	-	-	-	5,249	41,991	3,028	53,807	985	17,434
C1a - C&I New Buildings & Major Renovations	(97)	(1,290)	-	-	-	-	5,249	41,991	3,028	53,807	985	17,434
C2 - C&I Existing Buildings	(4,558)	(51,632)	35	296	-	-	240,521	2,017,448	45,064	518,635	16,164	184,535
C2a - C&I Existing Building Retrofit	(4,339)	(49,688)	35	296	-	-	218,021	1,809,588	37,896	452,322	13,963	164,248
C2b - C&I New & Replacement Equipment	(218)	(1,944)	-	-	-	-	22,500	207,860	7,169	66,313	2,201	20,287
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**53,558**	**1,089,885**	**21,326**	**425,836**	**-**	**-**	**2,947,372**	**21,646,011**	**223,666**	**3,119,408**	**43,390**	**405,077**

IV.D. Cost-Effectiveness

3.2.i. Savings Summary Table

Cape Light Compact
October 31, 2018

2021 Net Savings												
Program	Deliverable Fuels				Other				Total Savings		Electric Energy, no Fuel Switching or ADR (MWh)	
	Oil (MMBTU)		Propane (MMBTU)		Wood (MMBTU)		Water (Gallons)		MMBTU			
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**56,815**	**1,094,551**	**21,928**	**433,368**	**-**	**-**	**2,701,602**	**19,586,572**	**160,219**	**2,450,886**	**21,005**	**183,039**
A1 - Residential New Buildings	20	473	5,036	124,323	-	-	-	-	8,246	170,502	935	13,395
A1a - Residential New Homes & Renovations	20	473	5,036	124,323	-	-	-	-	8,246	170,502	935	13,395
A2 - Residential Existing Buildings	56,796	1,094,078	16,891	309,045	-	-	2,701,602	19,586,572	151,973	2,280,384	20,070	169,644
A2a - Residential Coordinated Delivery	36,589	718,607	9,709	177,114	-	-	2,433,883	17,712,542	91,918	1,731,559	7,659	118,566
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	20,206	375,471	7,182	131,931	-	-	267,719	1,874,030	34,505	523,275	4,923	43,590
A2d - Residential Behavior	-	-	-	-	-	-	-	-	25,550	25,550	7,488	7,488
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**8,646**	**146,625**	**2,089**	**33,139**	**-**	**-**	**-**	**-**	**20,120**	**308,616**	**3,125**	**43,391**
B1 - Income Eligible Existing Buildings	8,646	146,625	2,089	33,139	-	-	-	-	20,120	308,616	3,125	43,391
B1a - Income Eligible Coordinated Delivery	8,646	146,625	2,089	33,139	-	-	-	-	20,120	308,616	3,125	43,391
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(4,658)**	**(50,457)**	**35**	**296**	**-**	**-**	**262,875**	**2,205,561**	**47,831**	**560,130**	**17,098**	**196,673**
C1 - C&I New Buildings	(115)	(1,648)	-	-	-	-	5,249	41,991	3,140	56,036	1,026	18,260
C1a - C&I New Buildings & Major Renovations	(115)	(1,648)	-	-	-	-	5,249	41,991	3,140	56,036	1,026	18,260
C2 - C&I Existing Buildings	(4,543)	(48,808)	35	296	-	-	257,626	2,163,571	44,692	504,094	16,071	178,413
C2a - C&I Existing Building Retrofit	(4,350)	(47,125)	35	296	-	-	227,626	1,886,424	38,202	444,773	14,082	160,310
C2b - C&I New & Replacement Equipment	(194)	(1,683)	-	-	-	-	30,000	277,147	6,490	59,321	1,989	18,103
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**60,803**	**1,190,719**	**24,052**	**466,804**	**-**	**-**	**2,964,476**	**21,792,133**	**228,170**	**3,319,632**	**41,228**	**423,103**

2019-2021 Net Savings												
Program	Deliverable Fuels				Other				Total Savings		Electric Energy, no Fuel Switching or ADR (MWh)	
	Oil (MMBTU)		Propane (MMBTU)		Wood (MMBTU)		Water (Gallons)		MMBTU			
	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**152,922**	**3,045,037**	**58,802**	**1,193,409**	**-**	**-**	**8,104,805**	**58,759,716**	**468,193**	**6,903,845**	**68,311**	**515,982**
A1 - Residential New Buildings	56	1,362	14,494	357,785	-	-	-	-	24,811	499,195	3,007	41,046
A1a - Residential New Homes & Renovations	56	1,362	14,494	357,785	-	-	-	-	24,811	499,195	3,007	41,046
A2 - Residential Existing Buildings	152,866	3,043,675	44,308	835,624	-	-	8,104,805	58,759,716	443,382	6,404,650	65,304	474,936
A2a - Residential Coordinated Delivery	95,942	1,911,602	23,601	436,269	-	-	7,301,649	53,137,625	261,243	4,635,221	23,006	266,854
A2b - Residential Conservation Services (RCS)	-	-	-	-	-	-	-	-	-	-	-	-
A2c - Residential Retail	56,924	1,132,073	20,707	399,355	-	-	803,156	5,622,091	120,395	1,707,685	24,201	189,986
A2d - Residential Behavior	-	-	-	-	-	-	-	-	61,744	61,744	18,096	18,096
A2e - Residential Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
B - Income Eligible	**20,141**	**350,384**	**4,900**	**78,634**	**-**	**-**	**-**	**-**	**50,966**	**725,840**	**8,274**	**97,129**
B1 - Income Eligible Existing Buildings	20,141	350,384	4,900	78,634	-	-	-	-	50,966	725,840	8,274	97,129
B1a - Income Eligible Coordinated Delivery	20,141	350,384	4,900	78,634	-	-	-	-	50,966	725,840	8,274	97,129
B1b - Income Eligible Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
C - Commercial & Industrial	**(13,985)**	**(156,606)**	**104**	**888**	**-**	**-**	**743,241**	**6,225,762**	**142,857**	**1,682,405**	**51,031**	**593,630**
C1 - C&I New Buildings	(309)	(4,238)	-	-	-	-	13,997	111,975	8,666	153,136	2,825	49,727
C1a - C&I New Buildings & Major Renovations	(309)	(4,238)	-	-	-	-	13,997	111,975	8,666	153,136	2,825	49,727
C2 - C&I Existing Buildings	(13,676)	(152,368)	104	888	-	-	729,244	6,113,787	134,191	1,529,269	48,207	543,903
C2a - C&I Existing Building Retrofit	(13,020)	(146,419)	104	888	-	-	661,743	5,490,206	112,688	1,326,911	41,603	481,994
C2b - C&I New & Replacement Equipment	(656)	(5,950)	-	-	-	-	67,501	623,581	21,503	202,358	6,603	61,909
C2c - C&I Active Demand Reduction	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total	**159,079**	**3,238,816**	**63,806**	**1,272,931**	**-**	**-**	**8,848,046**	**64,985,479**	**662,016**	**9,312,089**	**127,616**	**1,206,741**

IV.D. Cost-Effectiveness

3.2.i. Savings Summary Table, Active Demand Reduction Measures

Cape Light Compact

October 31, 2018

2019 Net Savings									
Program	# of Participants	Electric						Total Savings	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		MMBTU	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**1,370**	**1,055**	**-**						
A2 - Residential Existing Buildings	1,370	1,055	-						
A2e - Residential Active Demand Reduction	1,370	1,055	-						
B - Income Eligible	**-**	**-**	**-**						
B1 - Income Eligible Existing Buildings	-	-	-						
B1b - Income Eligible Active Demand Reduction	-	-	-						
C - Commercial & Industrial	**153**	**5,798**	**-**						
C2 - C&I Existing Buildings	153	5,798	-						
C2c - C&I Active Demand Reduction	153	5,798	-						
Grand Total	**1,523**	**6,853**	**-**						

2020 Net Savings									
Program	# of Participants	Electric						Total Savings	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		MMBTU	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**2,101**	**1,618**	**-**						
A2 - Residential Existing Buildings	2,101	1,618	-						
A2e - Residential Active Demand Reduction	2,101	1,618	-						
B - Income Eligible	**-**	**-**	**-**						
B1 - Income Eligible Existing Buildings	-	-	-						
B1b - Income Eligible Active Demand Reduction	-	-	-						
C - Commercial & Industrial	**235**	**5,861**	**-**						
C2 - C&I Existing Buildings	235	5,861	-						
C2c - C&I Active Demand Reduction	235	5,861	-						
Grand Total	**2,336**	**7,479**	**-**						

2021 Net Savings									
Program	# of Participants	Electric						Total Savings	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		MMBTU	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**2,417**	**1,861**	**-**						
A2 - Residential Existing Buildings	2,417	1,861	-						
A2e - Residential Active Demand Reduction	2,417	1,861	-						
B - Income Eligible	**-**	**-**	**-**						
B1 - Income Eligible Existing Buildings	-	-	-						
B1b - Income Eligible Active Demand Reduction	-	-	-						
C - Commercial & Industrial	**270**	**5,888**	**-**						
C2 - C&I Existing Buildings	270	5,888	-						
C2c - C&I Active Demand Reduction	270	5,888	-						
Grand Total	**2,687**	**7,749**	**-**						

Notes:

The above tables reflect only demand response measures in the active demand reduction core initiatives. These savings cannot be summed across years, so are shown here for each individual year.

The active demand reduction core initiatives include other, non-demand response measures such as storage that are included in the previous savings table.

IV.D. Cost-Effectiveness

3.2.ii. Savings Comparison Table - Three Year Plan vs. Previous Years

Cape Light Compact

October 31, 2018

2016-2021 Net Savings																	
Sector	# of Participants	Electric						Natural Gas		Deliverable Fuels				Other		Total Savings	
		Annual Capacity (kW)		Electric Energy (MWh)		Electric Energy (MMBTU)		(Therms)		Oil (MMBTU)		Propane (MMBTU)		Water (Gallons)		MMBTU	
		Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
A - Residential	**1,025,268**	**25,753**	**31,842**	**135,482**	**1,040,569**	**462,728**	**3,555,057**	**324,985**	**16,999,351**	**235,102**	**5,089,051**	**81,319**	**1,705,458**	**18,520,019**	**148,837,981**	**811,648**	**12,049,502**
2016 Evaluated	84,183	3,405	4,033	24,337	196,860	83,039	671,685	(117,572)	270,856	10,631	403,959	5,637	128,668	2,562,146	19,057,903	87,549	1,231,398
2017 Evaluated	162,105	4,957	5,481	33,952	278,956	115,845	951,796	13,763	3,627,491	13,619	470,725	7,364	189,350	2,793,581	22,336,807	138,204	1,974,620
2018 Planned	77,345	2,485	3,420	17,211	195,123	58,724	665,760	(84,691)	(894,824)	57,929	1,169,331	9,517	194,031	5,059,487	48,683,555	117,701	1,939,639
2019 Planned	289,141	3,643	4,893	21,472	120,623	73,261	411,566	142,071	4,496,539	44,980	930,079	17,285	361,703	2,701,602	19,586,572	149,732	2,153,002
2020 Planned	243,294	5,431	6,787	20,662	121,269	70,705	415,849	168,202	4,653,634	51,127	1,020,407	19,589	398,338	2,701,602	19,586,572	158,241	2,299,958
2021 Planned	169,200	5,832	7,227	17,848	127,738	61,155	438,400	203,213	4,845,655	56,815	1,094,551	21,928	433,368	2,701,602	19,586,572	160,219	2,450,886
B - Income Eligible	**9,048**	**3,523**	**4,688**	**13,046**	**137,914**	**44,624**	**471,681**	**21**	**163**	**40,850**	**799,175**	**7,702**	**134,008**	**8,056,058**	**40,334,860**	**93,177**	**1,404,880**
2016 Evaluated	1,347	310	519	1,668	14,667	5,692	50,043	-	-	4,840	96,762	1,330	26,583	3,078,103	15,390,515	11,862	173,387
2017 Evaluated	2,031	294	358	1,888	16,039	6,440	54,724	21	163	2,472	49,240	335	6,458	2,023,395	10,171,545	9,248	110,438
2018 Planned	1,120	317	642	1,925	20,543	6,566	70,093	-	-	13,398	302,789	1,137	22,334	2,954,560	14,772,800	21,101	395,215
2019 Planned	1,365	379	536	2,344	20,681	7,996	70,564	-	-	4,409	81,359	1,108	18,293	-	-	13,514	170,216
2020 Planned	1,535	944	1,125	2,490	28,408	8,545	97,406	-	-	7,085	122,401	1,702	27,201	-	-	17,332	247,008
2021 Planned	1,650	1,280	1,508	2,732	37,577	9,384	128,852	-	-	8,646	146,625	2,089	33,139	-	-	20,120	308,616
C - Commercial & Industrial	**11,925**	**23,669**	**19,484**	**128,937**	**1,355,017**	**451,483**	**4,823,247**	**(507,876)**	**(5,847,176)**	**(19,129)**	**(32,972)**	**9,848**	**116,149**	**2,167,851**	**14,088,392**	**391,415**	**4,321,706**
2016 Evaluated	1,806	4,273	3,248	24,906	217,880	86,301	763,224	(100,162)	(938,576)	(9,620)	(41,581)	141	1,665	452,825	3,356,442	66,806	629,450
2017 Evaluated	1,276	3,140	2,771	13,645	171,504	51,281	656,047	(90,123)	(1,291,494)	(2,316)	(33,074)	4,197	44,444	545,691	2,562,765	44,150	538,268
2018 Planned	2,751	7,540	5,840	39,373	372,130	139,782	1,378,510	(143,780)	(1,743,673)	6,792	198,289	5,405	69,152	426,095	1,943,422	137,601	1,471,584
2019 Planned	1,959	2,664	2,279	16,785	194,988	57,270	665,301	(56,991)	(625,375)	(4,672)	(53,227)	35	296	234,596	1,960,762	46,934	549,832
2020 Planned	2,047	2,981	2,614	17,139	201,906	58,512	689,117	(57,994)	(640,491)	(4,655)	(52,922)	35	296	245,770	2,059,439	48,092	572,442
2021 Planned	2,086	3,070	2,733	17,088	196,610	58,338	671,048	(58,827)	(607,566)	(4,658)	(50,457)	35	296	262,875	2,205,561	47,831	560,130
Grand Total	**1,046,241**	**52,945**	**56,013**	**277,465**	**2,533,500**	**958,835**	**8,849,985**	**(182,869)**	**11,152,338**	**256,823**	**5,855,255**	**98,869**	**1,955,615**	**28,743,928**	**203,261,233**	**1,296,240**	**17,776,088**
2016 Evaluated	87,336	7,988	7,800	50,912	429,406	175,032	1,484,952	(217,733)	(667,720)	5,850	459,140	7,109	156,915	6,093,074	37,804,860	166,217	2,034,235
2017 Evaluated	165,412	8,391	8,610	49,484	466,498	173,566	1,662,568	(76,339)	2,336,160	13,775	486,890	11,895	240,252	5,362,666	35,071,117	191,602	2,623,326
2018 Planned	81,216	10,341	9,902	58,509	587,796	205,073	2,114,363	(228,471)	(2,638,497)	78,119	1,670,409	16,060	285,516	8,440,142	65,399,777	276,404	3,806,438
2019 Planned	292,465	6,687	7,708	40,600	336,293	138,527	1,147,431	85,080	3,871,164	44,718	958,211	18,428	380,292	2,936,198	21,547,334	210,180	2,873,050
2020 Planned	246,876	9,356	10,526	40,291	351,582	137,762	1,202,372	110,208	4,013,143	53,558	1,089,885	21,326	425,836	2,947,372	21,646,011	223,666	3,119,408
2021 Planned	172,936	10,182	11,468	37,668	361,925	128,876	1,238,300	144,387	4,238,088	60,803	1,190,719	24,052	466,804	2,964,476	21,792,133	228,170	3,319,632

Notes:

2016 values are from the Program Administrator's 2016 Plan Year Report D.P.U. 17-100.

2017 values are from the Program Administrator's 2017 Plan Year Report D.P.U. 18-51.

2018 values are from the Program Administrator's 2016-2018 Three-Year Plan, D.P.U. 15-166.

For supporting information on the 2019-2021 values, see Table IV.D.3.2.i.

The Progam Administrators have developed new participant definitions through the common assumptions working group for this Three-Year Plan. Historical participant numbers may not be comparable.

IV.D. Cost-Effectiveness

3.3.iii. T&D Avoided Costs Comparison Table - Three Year Plan vs. Previous Years

Cape Light Compact

October 31, 2018

Avoided Cost Factors ($/kW)		
Plan Term	**Distribution**	**Transmission**
2016 - 2018	$122.34	$36.53
2019 - 2021	$198.00	$94.00

Notes:

2016 values are from the Program Administrator's 2016 Plan Year Report D.P.U. 17-100, in 2016$.

2017 values are from the Program Administrator's 2017 Plan Year Report D.P.U. 18-51, in 2016$.

2018 values are from the Program Administrator's 2016-2018 Three-Year Plan, D.P.U. 15-166, in 2016$.

For supporting information on the 2019-2021 values, refer to the Program Administrator's Benefit-Cost Screening Model. The 2019-2021 values are in 2019$.

IV.H. Performance Incentive

1. Summary Table

Cape Light Compact
October 31, 2018

2019 Performance Incentives					
Sector	Total Program Costs	Pre-Tax		After-Tax	
		Performance Incentives	% of Program Costs	Performance Incentives	% of Program Costs
A - Residential	25,470,031	-	0%	-	0%
B - Income Eligible	4,988,309	-	0%	-	0%
C - Commercial & Industrial	15,223,278	-	0%	-	0%
Grand Total	**45,681,618**	**-**	**0%**	**-**	**0%**

2020 Performance Incentives					
Sector	Total Program Costs	Pre-Tax		After-Tax	
		Performance Incentives	% of Program Costs	Performance Incentives	% of Program Costs
A - Residential	30,549,028	-	0%	-	0%
B - Income Eligible	9,036,565	-	0%	-	0%
C - Commercial & Industrial	16,213,827	-	0%	-	0%
Grand Total	**55,799,419**	**-**	**0%**	**-**	**0%**

2021 Performance Incentives					
Sector	Total Program Costs	Pre-Tax		After-Tax	
		Performance Incentives	% of Program Costs	Performance Incentives	% of Program Costs
A - Residential	32,743,760	-	0%	-	0%
B - Income Eligible	12,298,200	-	0%	-	0%
C - Commercial & Industrial	16,408,027	-	0%	-	0%
Grand Total	**61,449,986**	**-**	**0%**	**-**	**0%**

2019-2021 Performance Incentives					
Sector	Total Program Costs	Pre-Tax		After-Tax	
		Performance Incentives	% of Program Costs	Performance Incentives	% of Program Costs
A - Residential	88,762,818	-	0%	-	0%
B - Income Eligible	26,323,074	-	0%	-	0%
C - Commercial & Industrial	47,845,131	-	0%	-	0%
Grand Total	**162,931,023**	**-**	**0%**	**-**	**0%**

Notes:
Performance Incentives for each year are represented in nominal dollars (2019$, 2020$, 2021$).
For supporting information on the Performance Incentive, refer to the Performance Incentive Model.
Performance Incentives are not applicable to the Cape Light Compact.

V.B. Allocation of Funds

1. Low-Income Minimum

Cape Light Compact
October 31, 2018

2019 Sector Cost Allocation		
Sector	**Program Budget**	
	($)	**(% of Total)**
A - Residential	25,470,031	55.8%
B - Income Eligible	4,988,309	10.92%
C - Commercial & Industrial	15,223,278	33.3%
Grand Total	**45,681,618**	**100%**

2020 Sector Cost Allocation		
Sector	**Program Budget**	
	($)	**(% of Total)**
A - Residential	30,549,028	54.7%
B - Income Eligible	9,036,565	16.19%
C - Commercial & Industrial	16,213,827	29.1%
Grand Total	**55,799,419**	**100%**

2021 Sector Cost Allocation		
Sector	**Program Budget**	
	($)	**(% of Total)**
A - Residential	32,743,760	53.3%
B - Income Eligible	12,298,200	20.01%
C - Commercial & Industrial	16,408,027	26.7%
Grand Total	**61,449,986**	**100%**

2019-2021 Sector Cost Allocation		
Sector	**Program Budget**	
	($)	**(% of Total)**
A - Residential	88,762,818	54.5%
B - Income Eligible	26,323,074	16.16%
C - Commercial & Industrial	47,845,131	29.4%
Grand Total	**162,931,023**	**100%**

Notes:
General Laws c. 25, § 19(c) requires that at least 10 percent of the amount expended for electric energy efficiency programs and at least 20 percent of the amount expended for gas energy efficiency programs be spent on low-income programs.

V.D. Outsourced/Competitively Procured Services

1. Summary Table

Cape Light Compact

October 31, 2018

2019-2021 Competitively Procured Services										
Sector	Competitively Procured Services Costs ($)					Competitively Procured Services Costs as a Percent of Total Sector Costs (%)				
	Total Cost of Services	In-House Activities	Outsourced Activities			Total Cost of Services	In-House Activities	Outsourced Activities		
			Total Outsourced	Competitively Procured	Non-Competitively Procured			Total Outsourced	Competitively Procured	Non-Competitively Procured
2019	**11,778,396**	**2,414,713**	**9,363,683**	**9,066,539**	**297,145**	**100%**	**21%**	**79%**	**77%**	**3%**
A - Residential	7,248,748	1,236,922	6,011,826	5,813,221	198,605	100%	17%	83%	80%	3%
B - Income Eligible	1,177,564	177,227	1,000,337	986,369	13,968	100%	15%	85%	84%	1%
C - Commercial & Industrial	3,352,084	1,000,564	2,351,520	2,266,949	84,571	100%	30%	70%	68%	3%
2020	**13,490,341**	**2,559,601**	**10,930,739**	**10,633,594**	**297,145**	**100%**	**19%**	**81%**	**79%**	**2%**
A - Residential	8,010,129	1,293,962	6,716,167	6,519,226	196,941	100%	16%	84%	81%	2%
B - Income Eligible	2,022,811	279,603	1,743,208	1,722,393	20,815	100%	14%	86%	85%	1%
C - Commercial & Industrial	3,457,401	986,037	2,471,364	2,391,975	79,389	100%	29%	71%	69%	2%
2021	**14,747,320**	**2,724,776**	**12,022,544**	**11,725,399**	**297,145**	**100%**	**18%**	**82%**	**80%**	**2%**
A - Residential	8,444,028	1,351,137	7,092,891	6,898,016	194,875	100%	16%	84%	82%	2%
B - Income Eligible	2,735,954	369,333	2,366,621	2,340,809	25,812	100%	13%	87%	86%	1%
C - Commercial & Industrial	3,567,339	1,004,306	2,563,033	2,486,575	76,458	100%	28%	72%	70%	2%
Grand Total	**40,016,057**	**7,699,090**	**32,316,967**	**31,425,532**	**891,435**	**100%**	**19%**	**81%**	**79%**	**2%**
A - Residential	23,702,905	3,882,021	19,820,884	19,230,463	590,421	100%	16%	84%	81%	2%
B - Income Eligible	5,936,329	826,163	5,110,166	5,049,571	60,595	100%	14%	86%	85%	1%
C - Commercial & Industrial	10,376,823	2,990,906	7,385,917	7,145,499	240,418	100%	29%	71%	69%	2%

Notes:

General Laws c. 25, § 19(b) requires the Department to ensure that energy efficiency programs use competitive procurement processes to the fullest extent practicable.

Costs for the Competitively Procured Services analysis include Program Planning and Administration; Marketing and Advertising; Sales, Technical Assistance & Training; and Evaluation and Market Research.

Costs for each year in 2016-2018 are represented in nominal dollars (2016$, 2017$, 2018$).

V.D. Outsourced/Competitively Procured Services

3. Comparison Table - Three Year Plan vs. Previous Years

Cape Light Compact

October 31, 2018

2016-2021 Competitively Procured Services										
Sector	Competitively Procured Services Costs ($)					Competitively Procured Services Costs as a Percent of Total Sector Costs (%)				
	Total Cost of Services	In-House Activities	Outsourced Activities			Total Cost of Services	In-House Activities	Outsourced Activities		
			Total Outsourced	Competitively Procured	Non-Competitively Procured			Total Outsourced	Competitively Procured	Non-Competitively Procured
A - Residential	**45,493,879**	**7,516,887**	**37,976,991**	**36,418,618**	**1,558,374**	**100%**	**17%**	**83%**	**80%**	**3%**
2016	7,076,019	1,202,144	5,873,876	5,547,487	326,389	100%	17%	83%	78%	5%
2017	7,223,199	1,209,704	6,013,495	5,699,834	313,661	100%	17%	83%	79%	4%
2018	7,491,755	1,223,018	6,268,736	5,940,834	327,902	100%	16%	84%	79%	4%
2019	7,248,748	1,236,922	6,011,826	5,813,221	198,605	100%	17%	83%	80%	3%
2020	8,010,129	1,293,962	6,716,167	6,519,226	196,941	100%	16%	84%	81%	2%
2021	8,444,028	1,351,137	7,092,891	6,898,016	194,875	100%	16%	84%	82%	2%
B - Income Eligible	**9,790,674**	**1,239,259**	**8,551,414**	**8,175,566**	**375,849**	**100%**	**13%**	**87%**	**84%**	**4%**
2016	1,194,628	133,722	1,060,906	962,657	98,249	100%	11%	89%	81%	8%
2017	1,259,006	137,463	1,121,543	1,018,502	103,041	100%	11%	89%	81%	8%
2018	1,400,712	141,912	1,258,800	1,144,836	113,964	100%	10%	90%	82%	8%
2019	1,177,564	177,227	1,000,337	986,369	13,968	100%	15%	85%	84%	1%
2020	2,022,811	279,603	1,743,208	1,722,393	20,815	100%	14%	86%	85%	1%
2021	2,735,954	369,333	2,366,621	2,340,809	25,812	100%	13%	87%	86%	1%
C - Commercial & Industrial	**21,150,627**	**5,679,824**	**15,470,803**	**14,584,582**	**886,221**	**100%**	**27%**	**73%**	**69%**	**4%**
2016	3,366,006	852,456	2,513,550	2,316,862	196,688	100%	25%	75%	69%	6%
2017	3,560,469	895,529	2,664,940	2,455,668	209,272	100%	25%	75%	69%	6%
2018	3,847,329	940,933	2,906,396	2,666,552	239,844	100%	24%	76%	69%	6%
2019	3,352,084	1,000,564	2,351,520	2,266,949	84,571	100%	30%	70%	68%	3%
2020	3,457,401	986,037	2,471,364	2,391,975	79,389	100%	29%	71%	69%	2%
2021	3,567,339	1,004,306	2,563,033	2,486,575	76,458	100%	28%	72%	70%	2%
Grand Total	**76,435,180**	**14,435,971**	**61,999,209**	**59,178,765**	**2,820,444**	**100%**	**19%**	**81%**	**77%**	**4%**
2016	11,636,653	2,188,321	9,448,332	8,827,006	621,326	100%	19%	81%	76%	5%
2017	12,042,674	2,242,696	9,799,978	9,174,004	625,973	100%	19%	81%	76%	5%
2018	12,739,795	2,305,864	10,433,932	9,752,222	681,710	100%	18%	82%	77%	5%
2019	11,778,396	2,414,713	9,363,683	9,066,539	297,145	100%	21%	79%	77%	3%
2020	13,490,341	2,559,601	10,930,739	10,633,594	297,145	100%	19%	81%	79%	2%
2021	14,747,320	2,724,776	12,022,544	11,725,399	297,145	100%	18%	82%	80%	2%

Notes:

General Laws c. 25, § 19(b) requires the Department to ensure that energy efficiency programs use competitive procurement processes to the fullest extent practicable.

Costs for the Competitively Procured Services analysis include Program Planning and Administration; Marketing and Advertising; Sales, Technical Assistance & Training; and Evaluation and Market Research.

The 2016-2018 costs are from the Program Administrator's 2016-2018 Three-Year Plan, D.P.U. 15-166, in nominal dollars (2016$, 2017$, 2018$).

For supporting information on the 2019-2021 values, see Table V.D.1. Costs for each year are represented in nominal dollars (2019$, 2020$, 2021$).

VII. Appendix

B.2. Summary of Activities

Cape Light Compact
October 31, 2018

2019-2021 Summary								
Sector	Net Annual Savings							
	Summer Capacity (kW)	Electric Energy (MWh)	Natural Gas (Therms)	Oil (MMBTU)	Propane (MMBTU)	Wood (MMBTU)	Water (Gallons)	Total Savings (MMBTU)
2019	**6,687**	**40,600**	**85,080**	**44,718**	**18,428**	**-**	**2,936,198**	**210,180**
A - Residential	3,643	21,472	142,071	44,980	17,285	-	2,701,602	149,732
B - Income Eligible	379	2,344	-	4,409	1,108	-	-	13,514
C - Commercial & Industrial	2,664	16,785	(56,991)	(4,672)	35	-	234,596	46,934
2020	**9,356**	**40,291**	**110,208**	**53,558**	**21,326**	**-**	**2,947,372**	**223,666**
A - Residential	5,431	20,662	168,202	51,127	19,589	-	2,701,602	158,241
B - Income Eligible	944	2,490	-	7,085	1,702	-	-	17,332
C - Commercial & Industrial	2,981	17,139	(57,994)	(4,655)	35	-	245,770	48,092
2021	**10,182**	**37,668**	**144,387**	**60,803**	**24,052**	**-**	**2,964,476**	**228,170**
A - Residential	5,832	17,848	203,213	56,815	21,928	-	2,701,602	160,219
B - Income Eligible	1,280	2,732	-	8,646	2,089	-	-	20,120
C - Commercial & Industrial	3,070	17,088	(58,827)	(4,658)	35	-	262,875	47,831
Grand Total	**26,225**	**118,559**	**339,675**	**159,079**	**63,806**	**-**	**8,848,046**	**662,016**
A - Residential	14,907	59,981	513,486	152,922	58,802	-	8,104,805	468,193
B - Income Eligible	2,603	7,565	-	20,141	4,900	-	-	50,966
C - Commercial & Industrial	8,716	51,013	(173,811)	(13,985)	104	-	743,241	142,857

2019-2021 Summary									
Sector	TRC Benefits (2019$)						TRC Costs (2019$)		
	Capacity	Electric Energy	Natural Gas	Deliverable Fuels & Other	Non-Energy Impacts	Total Benefits	PA Budget	Participant Costs	Total TRC Test Costs
2019	**27,476,242**	**34,325,249**	**4,415,364**	**38,173,039**	**24,915,787**	**129,305,680**	**45,681,618**	**10,115,984**	**55,797,602**
A - Residential	10,220,273	13,017,255	5,186,996	36,557,410	6,651,873	71,633,806	25,470,031	8,884,339	34,354,370
B - Income Eligible	1,566,668	2,082,558	-	2,698,660	5,030,722	11,378,609	4,988,309	140	4,988,449
C - Commercial & Industrial	15,689,301	19,225,436	(771,633)	(1,083,031)	13,233,192	46,293,266	15,223,278	1,231,505	16,454,783
2020	**51,039,218**	**34,972,640**	**4,573,140**	**43,687,631**	**25,364,291**	**159,636,921**	**54,528,896**	**13,289,785**	**67,818,681**
A - Residential	26,413,032	12,461,132	5,343,977	40,680,920	6,463,431	91,362,492	29,853,442	11,878,445	41,731,887
B - Income Eligible	6,392,047	2,755,364	-	4,106,626	5,617,840	18,871,877	8,830,807	137	8,830,944
C - Commercial & Industrial	18,234,138	19,756,144	(770,837)	(1,099,915)	13,283,021	49,402,552	15,844,647	1,411,203	17,255,850
2021	**62,915,572**	**35,506,864**	**4,820,547**	**48,402,079**	**25,452,709**	**177,097,771**	**58,683,477**	**15,901,615**	**74,585,092**
A - Residential	34,468,927	12,606,012	5,539,400	44,450,491	6,234,037	103,298,868	31,269,619	14,390,229	45,659,848
B - Income Eligible	9,510,904	3,602,349	-	5,019,471	6,169,417	24,302,140	11,744,529	134	11,744,662
C - Commercial & Industrial	18,935,741	19,298,503	(718,853)	(1,067,883)	13,049,255	49,496,763	15,669,329	1,511,252	17,180,582
Grand Total	**141,431,032**	**104,804,753**	**13,809,051**	**130,262,749**	**75,732,787**	**466,040,372**	**158,893,991**	**39,307,384**	**198,201,375**
A - Residential	71,102,232	38,084,399	16,070,373	121,688,821	19,349,341	266,295,166	86,593,093	35,153,012	121,746,105
B - Income Eligible	17,469,620	8,440,271	-	11,824,757	16,817,978	54,552,626	25,563,645	411	25,564,055
C - Commercial & Industrial	52,859,180	58,280,083	(2,261,322)	(3,250,829)	39,565,468	145,192,581	46,737,254	4,153,961	50,891,215

VII. Appendix

B.2. Summary of Activities

Cape Light Compact
October 31, 2018

2019-2021 Summary											
Sector	TRC Cost-Effectiveness		Cost of Saved Energy (PA Budget per annual savings unit)				Participants	Avg Measure Life (yrs.)	Annual Emissions Reductions (Short Tons)		
	B/C Ratio	Net Benefits	Summer Capacity ($/kW)	Electric Energy ($/MWh)	Natural Gas Costs ($/Therm)	Total Savings ($/MMBTU)			NOX	SO2	CO2
2019	**2.32**	**73,508,078**	**6,832**	**1,125**	**537**	**217**	**292,465**	**14**	**9.48**	**2.45**	**31,905**
A - Residential	2.09	37,279,437	6,991	1,186	179	170	289,141	14	6.01	1.55	21,826
B - Income Eligible	2.28	6,390,159	13,148	2,129		369	1,365	13	0.39	0.10	1,591
C - Commercial & Industrial	2.81	29,838,483	5,714	907	(267)	324	1,959	12	3.08	0.80	8,488
2020	**2.35**	**91,818,241**	**5,828**	**1,353**	**495**	**244**	**246,876**	**14**	**9.23**	**2.38**	**32,494**
A - Residential	2.19	49,630,605	5,496	1,445	177	189	243,294	15	5.64	1.45	21,791
B - Income Eligible	2.14	10,040,933	9,359	3,546		510	1,535	14	0.41	0.11	1,920
C - Commercial & Industrial	2.86	32,146,702	5,314	924	(273)	329	2,047	12	3.18	0.82	8,783
2021	**2.37**	**102,512,679**	**5,763**	**1,558**	**406**	**257**	**172,936**	**15**	**8.09**	**2.09**	**30,720**
A - Residential	2.26	57,639,019	5,362	1,752	154	195	169,200	15	4.43	1.14	19,673
B - Income Eligible	2.07	12,557,478	9,177	4,300		584	1,650	15	0.45	0.12	2,192
C - Commercial & Industrial	2.88	32,316,181	5,104	917	(266)	328	2,086	12	3.21	0.83	8,855
Grand Total	**2.35**	**267,838,998**	**6,059**	**1,340**	**468**	**240**	**712,277**	**14**	**26.80**	**6.92**	**95,119**
A - Residential	2.18	144,549,061	5,950	1,461	170	185	701,635	15	16.08	4.15	63,290
B - Income Eligible	2.16	28,988,571	10,561	3,325	-	487	4,550	14	1.24	0.32	5,704
C - Commercial & Industrial	2.85	94,301,366	5,377	916	(269)	327	6,092	12	9.48	2.45	26,126

Notes:
GHG reductions are provided for information purposes only. They are not included in the TRC test.

VII. Appendix

GHG reductions are provided for information purposes only. They are not included in the TRC test.

Cape Light Compact

October 31, 2018

2019 Greenhouse Gas Reductions							
Sector	Adjusted Gross Annual Savings				Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	Propane (MMBTU)	NOX	SO2	CO2
A - Residential	36,546	(39,124)	35,699	16,109	6.01	1.55	21,826
B - Income Eligible	2,344	-	4,409	1,108	0.39	0.10	1,591
C - Commercial & Industrial	18,764	(62,570)	(5,175)	32	3.08	0.80	8,488
Grand Total	**57,653**	**(101,693)**	**34,933**	**17,249**	**9.48**	**2.45**	**31,905**

2020 Greenhouse Gas Reductions							
Sector	Adjusted Gross Annual Savings				Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	Propane (MMBTU)	NOX	SO2	CO2
A - Residential	34,291	5,701	43,443	18,861	5.64	1.45	21,791
B - Income Eligible	2,490	-	7,085	1,702	0.41	0.11	1,920
C - Commercial & Industrial	19,376	(63,769)	(5,182)	32	3.18	0.82	8,783
Grand Total	**56,157**	**(58,068)**	**45,346**	**20,595**	**9.23**	**2.38**	**32,494**

2021 Greenhouse Gas Reductions							
Sector	Adjusted Gross Annual Savings				Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	Propane (MMBTU)	NOX	SO2	CO2
A - Residential	26,967	94,462	52,738	22,172	4.43	1.14	19,673
B - Income Eligible	2,732	-	8,646	2,089	0.45	0.12	2,192
C - Commercial & Industrial	19,539	(64,816)	(5,210)	32	3.21	0.83	8,855
Grand Total	**49,238**	**29,646**	**56,174**	**24,293**	**8.09**	**2.09**	**30,720**

2019-2021 Greenhouse Gas Reductions							
Sector	Adjusted Gross Annual Savings				Annual Emissions Reductions (Short Tons)		
	Electric Energy (MWh)	Natural Gas (Therm)	Oil (MMBTU)	Propane (MMBTU)	NOX	SO2	CO2
A - Residential	97,803	61,039	131,880	57,142	16.08	4.15	63,290
B - Income Eligible	7,565	-	20,141	4,900	1.24	0.32	5,704
C - Commercial & Industrial	57,679	(191,154)	(15,567)	96	9.48	2.45	26,126
Grand Total	**163,048**	**(130,115)**	**136,454**	**62,137**	**26.80**	**6.92**	**95,119**

Notes:

The Program Administrators have worked with DEP to properly capture the full impact of energy efficiency measures on GHG emissions. These reductions are calculated using factors prepared by DEP, which are based on adjusted gross annual electric energy, natural gas, oil, and propane savings. For projected emissions reductions in future years for the electric sector, Program Administrators are using values that are consistent with the values used in the Massachusetts Clean Energy and Climate Plan for 2020, as provided by DEP.

Cape Light Compact JPE
Average Customer Use
October 2018 Delivery Rates. September 2018 Supply Rates.

Rate Class Information					Total Bill Comparison	
Rate		Load Fact	Avg Kwh	Avg Kw	2018 vs. 2019 Change in Total Bill Amount	%
Rate R-1 Residential	R-1		516		1.31	1.09%
Rate R-2 Residential Assistance	R-2		488		(0.33)	-0.49%
Rate R-3 Residential Space Heating	R-3		740		1.88	1.16%
Rate R-4 Residential Assistance Space Heating	R-4		874		(0.59)	-0.53%
Rate G-1 Small General Service	G-1	0.200	400	2	0.06	0.07%
Rate G-1 Small General Service	G-1	0.300	5,700	19	0.86	0.08%
Rate G-1 Small General Service	G-1	0.400	10,800	27	1.62	0.08%
Rate G-1 Seasonal Small General Service	G-1S	0.050	450	9	0.07	0.06%
Rate G-1 Seasonal Small General Service	G-1S	0.150	1,200	8	0.18	0.06%
Rate G-1 Seasonal Small General Service	G-1S	0.300	2,700	9	0.41	0.07%
Rate G-2 Medium General Time-of-Use	G-2	0.300	61,500	205	9.22	0.08%
Rate G-2 Medium General Time-of-Use	G-2	0.400	85,600	214	12.84	0.09%
Rate G-2 Medium General Time-of-Use	G-2	0.500	126,500	253	18.98	0.09%
Rate G-3 Large General Time-Of-Use	G-3	0.350	373,100	1,066	55.96	0.09%
Rate G-3 Large General Time-Of-Use	G-3	0.450	354,600	788	53.19	0.09%
Rate G-3 Large General Time-Of-Use	G-3	0.550	614,900	1,118	92.23	0.10%
Rate G-4 General Power	G-4	0.150	7,800	52	1.17	0.08%
Rate G-4 General Power	G-4	0.250	6,750	27	1.01	0.09%
Rate G-4 General Power	G-4	0.350	9,450	27	1.41	0.09%
Rate G-5 Commercial Space Heating	G-5		1,472		0.22	0.07%
Rate G-6 All Electric Schools	G-6		60,748		9.12	0.09%
Rate G-7 Optional General Time-of-Use	G-7	0.350	7,000	20	1.05	0.08%
Rate G-7 Optional General Time-of-Use	G-7	0.500	15,500	31	2.33	0.09%
Rate G-7 Optional General Time-of-Use	G-7	0.650	11,700	18	1.75	0.09%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.050	450	9	0.06	0.04%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.150	1,500	10	0.23	0.07%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.300	3,900	13	0.58	0.07%

The 2018 EES rates rates are effective January 1, 2018 through December 31, 2018, and were approved by the Department on December 22, 201
The 2019 EES rates are proposed for effect January 1, 2019 through December 31, 2019.
All rates include the most up to date information as of the date of filing. Refer to the Cape Light Compact JPE's 2019-2021 Three-Year Plan for inf

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-1 Residential

		Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		100	$18.30	$10.60	$28.90	$18.56	$10.60	$29.16	$0.26	0.9%
		200	$29.60	$21.20	$50.80	$30.11	$21.20	$51.31	$0.51	1.0%
		300	$40.90	$31.80	$72.70	$41.67	$31.80	$73.47	$0.77	1.1%
		400	$52.20	$42.40	$94.60	$53.22	$42.40	$95.62	$1.02	1.1%
		500	$63.51	$53.00	$116.51	$64.78	$53.00	$117.78	$1.27	1.1%
		600	$74.81	$63.60	$138.41	$76.33	$63.60	$139.93	$1.52	1.1%
		700	$86.11	$74.20	$160.31	$87.89	$74.20	$162.09	$1.78	1.1%
		800	$97.41	$84.80	$182.21	$99.44	$84.80	$184.24	$2.03	1.1%
		900	$108.71	$95.40	$204.11	$111.00	$95.40	$206.40	$2.29	1.1%
		1,000	$120.01	$106.00	$226.01	$122.55	$106.00	$228.55	$2.54	1.1%
		1,250	$148.26	$132.50	$280.76	$151.44	$132.50	$283.94	$3.18	1.1%
		1,500	$176.52	$159.00	$335.52	$180.33	$159.00	$339.33	$3.81	1.1%
		2,000	$233.02	$212.00	$445.02	$238.10	$212.00	$450.10	$5.08	1.1%
	Avg	516	$65.31	$54.70	$120.01	$66.62	$54.70	$121.32	$1.31	1.1%

		2018 In Effect Rates	2019 Planned Rates	Change
	Customer Charge	$7.00	$7.00	$0.00
	Distribution Energy	$0.04372	$0.04372	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00004	$0.00004	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.03058	$0.03058	$0.00000
	Energy Efficiency Reconciliation Factor	$0.01859	$0.02113	$0.00254
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-2 Residential Assistance

		Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$10.62	$6.78	$17.40	$10.55	$6.78	$17.33	($0.07)	-0.4%
4		200	$16.76	$13.57	$30.33	$16.62	$13.57	$30.19	($0.14)	-0.5%
5		300	$22.89	$20.35	$43.24	$22.69	$20.35	$43.04	($0.20)	-0.5%
6		400	$29.03	$27.14	$56.17	$28.76	$27.14	$55.90	($0.27)	-0.5%
7		500	$35.17	$33.92	$69.09	$34.83	$33.92	$68.75	($0.34)	-0.5%
8		600	$41.31	$40.70	$82.01	$40.90	$40.70	$81.60	($0.41)	-0.5%
9		700	$47.44	$47.49	$94.93	$46.97	$47.49	$94.46	($0.47)	-0.5%
10		800	$53.58	$54.27	$107.85	$53.04	$54.27	$107.31	($0.54)	-0.5%
11		900	$59.72	$61.06	$120.78	$59.11	$61.06	$120.17	($0.61)	-0.5%
12		1,000	$65.86	$67.84	$133.70	$65.18	$67.84	$133.02	($0.68)	-0.5%
13		1,250	$81.20	$84.80	$166.00	$80.36	$84.80	$165.16	($0.84)	-0.5%
14		1,500	$96.54	$101.76	$198.30	$95.54	$101.76	$197.30	($1.00)	-0.5%
15		2,000	$127.23	$135.68	$262.91	$125.89	$135.68	$261.57	($1.34)	-0.5%
16	Avg	488	$34.43	$33.11	$67.54	$34.10	$33.11	$67.21	($0.33)	-0.5%

		2018 In Effect Rates	2019 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.04372	$0.04372	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
23	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
24	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00004	$0.00004	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
28	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.03058	$0.03058	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.00148	$0.00043	($0.00105)
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000
38	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-3 Residential Space Heating

		Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$17.27	$10.60	$27.87	$17.53	$10.60	$28.13	$0.26	0.9%
4		200	$27.54	$21.20	$48.74	$28.05	$21.20	$49.25	$0.51	1.0%
5		300	$37.82	$31.80	$69.62	$38.58	$31.80	$70.38	$0.76	1.1%
6		400	$48.09	$42.40	$90.49	$49.10	$42.40	$91.50	$1.01	1.1%
7		500	$58.36	$53.00	$111.36	$59.63	$53.00	$112.63	$1.27	1.1%
8		600	$68.63	$63.60	$132.23	$70.16	$63.60	$133.76	$1.53	1.2%
9		700	$78.90	$74.20	$153.10	$80.68	$74.20	$154.88	$1.78	1.2%
10		800	$89.18	$84.80	$173.98	$91.21	$84.80	$176.01	$2.03	1.2%
11		900	$99.45	$95.40	$194.85	$101.73	$95.40	$197.13	$2.28	1.2%
12		1,000	$109.72	$106.00	$215.72	$112.26	$106.00	$218.26	$2.54	1.2%
13		1,250	$135.40	$132.50	$267.90	$138.58	$132.50	$271.08	$3.18	1.2%
14		1,500	$161.08	$159.00	$320.08	$164.89	$159.00	$323.89	$3.81	1.2%
15		2,000	$212.44	$212.00	$424.44	$217.52	$212.00	$429.52	$5.08	1.2%
16	Avg	740	$83.01	$78.44	$161.45	$84.89	$78.44	$163.33	$1.88	1.2%

		2018 In Effect Rates	2019 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.03835	$0.03835	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
23	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
24	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00003	$0.00003	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
28	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.02896	$0.02896	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.01859	$0.02113	$0.00254
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-4 Residential Assistance Space Heating

		Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		100	$9.96	$6.78	$16.74	$9.89	$6.78	$16.67	($0.07)	-0.4%
		200	$15.44	$13.57	$29.01	$15.30	$13.57	$28.87	($0.14)	-0.5%
		300	$20.92	$20.35	$41.27	$20.72	$20.35	$41.07	($0.20)	-0.5%
		400	$26.40	$27.14	$53.54	$26.13	$27.14	$53.27	($0.27)	-0.5%
		500	$31.88	$33.92	$65.80	$31.54	$33.92	$65.46	($0.34)	-0.5%
		600	$37.35	$40.70	$78.05	$36.95	$40.70	$77.65	($0.40)	-0.5%
		700	$42.83	$47.49	$90.32	$42.36	$47.49	$89.85	($0.47)	-0.5%
		800	$48.31	$54.27	$102.58	$47.77	$54.27	$102.04	($0.54)	-0.5%
		900	$53.79	$61.06	$114.85	$53.19	$61.06	$114.25	($0.60)	-0.5%
		1,000	$59.27	$67.84	$127.11	$58.60	$67.84	$126.44	($0.67)	-0.5%
		1,250	$72.97	$84.80	$157.77	$72.13	$84.80	$156.93	($0.84)	-0.5%
		1,500	$86.67	$101.76	$188.43	$85.66	$101.76	$187.42	($1.01)	-0.5%
		2,000	$114.06	$135.68	$249.74	$112.72	$135.68	$248.40	($1.34)	-0.5%
	Avg	874	$52.37	$59.29	$111.66	$51.78	$59.29	$111.07	($0.59)	-0.5%

		2018 In Effect Rates	2019 Planned Rates	Change
	Customer Charge	$7.00	$7.00	$0.00
	Distribution Energy	$0.03835	$0.03835	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00003	$0.00003	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02896	$0.02896	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00148	$0.00043	($0.00105)
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.10600	$0.10600	$0.00000
	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Small General Service

		Monthly	Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 200									
		5	1,000	$92.50	$110.75	$203.25	$92.65	$110.75	$203.40	$0.15	0.1%
		10	2,000	$179.00	$221.50	$400.50	$179.30	$221.50	$400.80	$0.30	0.1%
		15	3,000	$269.00	$332.25	$601.25	$269.45	$332.25	$601.70	$0.45	0.1%
		25	5,000	$431.20	$553.75	$984.95	$431.95	$553.75	$985.70	$0.75	0.1%
		50	10,000	$836.70	$1,107.50	$1,944.20	$838.20	$1,107.50	$1,945.70	$1.50	0.1%
		100	20,000	$1,647.70	$2,215.00	$3,862.70	$1,650.70	$2,215.00	$3,865.70	$3.00	0.1%
	Avg	2	400	$40.60	$44.30	$84.90	$40.66	$44.30	$84.96	$0.06	0.1%
		Hours Use: 300									
		5	1,500	$135.75	$166.13	$301.88	$135.98	$166.13	$302.11	$0.23	0.1%
		10	3,000	$244.75	$332.25	$577.00	$245.20	$332.25	$577.45	$0.45	0.1%
		15	4,500	$354.27	$498.38	$852.65	$354.95	$498.38	$853.33	$0.68	0.1%
		25	7,500	$573.32	$830.63	$1,403.95	$574.45	$830.63	$1,405.08	$1.13	0.1%
		50	15,000	$1,120.95	$1,661.25	$2,782.20	$1,123.20	$1,661.25	$2,784.45	$2.25	0.1%
		100	30,000	$2,216.20	$3,322.50	$5,538.70	$2,220.70	$3,322.50	$5,543.20	$4.50	0.1%
	Avg	19	5,700	$441.89	$631.28	$1,073.17	$442.75	$631.28	$1,074.03	$0.86	0.1%
		Hours Use: 400									
		5	2,000	$179.00	$221.50	$400.50	$179.30	$221.50	$400.80	$0.30	0.1%
		10	4,000	$301.60	$443.00	$744.60	$302.20	$443.00	$745.20	$0.60	0.1%
		15	6,000	$439.55	$664.50	$1,104.05	$440.45	$664.50	$1,104.95	$0.90	0.1%
		25	10,000	$715.45	$1,107.50	$1,822.95	$716.95	$1,107.50	$1,824.45	$1.50	0.1%
		50	20,000	$1,405.20	$2,215.00	$3,620.20	$1,408.20	$2,215.00	$3,623.20	$3.00	0.1%
		100	40,000	$2,784.70	$4,430.00	$7,214.70	$2,790.70	$4,430.00	$7,220.70	$6.00	0.1%
	Avg	27	10,800	$770.63	$1,196.10	$1,966.73	$772.25	$1,196.10	$1,968.35	$1.62	0.1%

		2018 In Effect	2019 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
	Distribution Demand >10 kW	$4.85	$4.85	$0.00
	Distribution Energy <=2,300 kWh	$0.04067	$0.04067	$0.00000
	Distribution Energy >2,300 kWh	$0.01102	$0.01102	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02636	$0.02636	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Seasonal Small General Service

		Monthly kW	Monthly kWh	2018 In Effect Delivery	2018 In Effect Supplier	2018 In Effect Total	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 50									
		5	250	$36.22	$27.69	$63.91	$36.26	$27.69	$63.95	$0.04	0.1%
		10	500	$66.45	$55.38	$121.83	$66.52	$55.38	$121.90	$0.07	0.1%
		20	1,000	$169.39	$110.75	$280.14	$169.54	$110.75	$280.29	$0.15	0.1%
		50	2,500	$442.38	$276.88	$719.26	$442.75	$276.88	$719.63	$0.37	0.1%
	Avg	9	450	$60.40	$49.84	$110.24	$60.47	$49.84	$110.31	$0.07	0.1%
		Hours Use: 150									
		5	750	$96.67	$83.06	$179.73	$96.78	$83.06	$179.84	$0.11	0.1%
		10	1,500	$187.34	$166.13	$353.47	$187.56	$166.13	$353.69	$0.22	0.1%
		20	3,000	$349.72	$332.25	$681.97	$350.17	$332.25	$682.42	$0.45	0.1%
		50	7,500	$790.78	$830.63	$1,621.41	$791.90	$830.63	$1,622.53	$1.12	0.1%
	Avg	8	1,200	$151.07	$132.90	$283.97	$151.25	$132.90	$284.15	$0.18	0.1%
		Hours Use: 300									
		5	1,500	$187.34	$166.13	$353.47	$187.56	$166.13	$353.69	$0.22	0.1%
		10	3,000	$307.22	$332.25	$639.47	$307.67	$332.25	$639.92	$0.45	0.1%
		20	6,000	$558.76	$664.50	$1,223.26	$559.66	$664.50	$1,224.16	$0.90	0.1%
		50	15,000	$1,313.38	$1,661.25	$2,974.63	$1,315.63	$1,661.25	$2,976.88	$2.25	0.1%
	Avg	9	2,700	$286.31	$299.03	$585.34	$286.72	$299.03	$585.75	$0.41	0.1%

		2018 In Effect Rates	2019 Planned Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
	Distribution Demand >10 kW	$4.25	$4.25	$0.00
	Distribution Energy <=1,800 kWh	$0.07506	$0.07506	$0.00000
	Distribution Energy >1,800 kWh	$0.02385	$0.02385	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02636	$0.02636	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-2 Medium General Time-of-Use

		Monthly kVA	Monthly kWh	2018 In Effect Delivery	2018 In Effect Supplier	2018 In Effect Total	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 300									
		100	30,000	$2,287.66	$3,404.40	$5,692.06	$2,292.16	$3,404.40	$5,696.56	$4.50	0.1%
		150	45,000	$3,246.49	$5,106.60	$8,353.09	$3,253.24	$5,106.60	$8,359.84	$6.75	0.1%
		200	60,000	$4,205.32	$6,808.80	$11,014.12	$4,214.32	$6,808.80	$11,023.12	$9.00	0.1%
		300	90,000	$6,122.98	$10,213.20	$16,336.18	$6,136.48	$10,213.20	$16,349.68	$13.50	0.1%
		500	150,000	$9,958.31	$17,022.00	$26,980.31	$9,980.81	$17,022.00	$27,002.81	$22.50	0.1%
	Avg	205	61,500	$4,301.21	$6,979.02	$11,280.23	$4,310.43	$6,979.02	$11,289.45	$9.22	0.1%
		Hours Use: 400									
		100	40,000	$2,604.55	$4,539.20	$7,143.75	$2,610.55	$4,539.20	$7,149.75	$6.00	0.1%
		150	60,000	$3,721.82	$6,808.80	$10,530.62	$3,730.82	$6,808.80	$10,539.62	$9.00	0.1%
		200	80,000	$4,839.10	$9,078.40	$13,917.50	$4,851.10	$9,078.40	$13,929.50	$12.00	0.1%
		300	120,000	$7,073.64	$13,617.60	$20,691.24	$7,091.64	$13,617.60	$20,709.24	$18.00	0.1%
		500	200,000	$11,542.74	$22,696.00	$34,238.74	$11,572.74	$22,696.00	$34,268.74	$30.00	0.1%
	Avg	214	85,600	$5,151.93	$9,713.89	$14,865.82	$5,164.77	$9,713.89	$14,878.66	$12.84	0.1%
		Hours Use: 500									
		100	50,000	$2,921.44	$5,674.00	$8,595.44	$2,928.94	$5,674.00	$8,602.94	$7.50	0.1%
		150	75,000	$4,197.15	$8,511.00	$12,708.15	$4,208.40	$8,511.00	$12,719.40	$11.25	0.1%
		200	100,000	$5,472.87	$11,348.00	$16,820.87	$5,487.87	$11,348.00	$16,835.87	$15.00	0.1%
		300	150,000	$8,024.31	$17,022.00	$25,046.31	$8,046.81	$17,022.00	$25,068.81	$22.50	0.1%
		500	250,000	$13,127.18	$28,370.00	$41,497.18	$13,164.68	$28,370.00	$41,534.68	$37.50	0.1%
	Avg	253	126,500	$6,825.13	$14,355.22	$21,180.35	$6,844.11	$14,355.22	$21,199.33	$18.98	0.1%

		2018 In Effect Rates	2019 Planned Rates	2019 Planned Change
	Customer Charge	$370.00	$370.00	$0.00
	Distribution Demand	$1.51	$1.51	$0.00
	Transmission Demand	$8.16	$8.16	$0.00
	Distribution Energy - Peak	$0.01769	$0.01769	$0.00000
	Distribution Energy - Low A	$0.01488	$0.01488	$0.00000
	Distribution Energy - Low B	$0.00965	$0.00965	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00138	$0.00138	$0.00000
	Pension Adjustment Factor	($0.00005)	($0.00005)	$0.00000
	Net Metering Recovery Surcharge	$0.00273	$0.00273	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00085	$0.00085	$0.00000
	Basic Service Cost True Up Factor	$0.00074	$0.00074	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00277	$0.00277	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11348	$0.11348	$0.00000

	Peak Use:	28%
	Low A Use:	25%
	Low B Use:	47%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-3 Large General Time-Of-Use

		Monthly	Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kVA	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 350									
		500	175,000	$9,637.41	$19,859.00	$29,496.41	$9,663.66	$19,859.00	$29,522.66	$26.25	0.1%
		750	262,500	$13,991.12	$29,788.50	$43,779.62	$14,030.49	$29,788.50	$43,818.99	$39.37	0.1%
		1,000	350,000	$18,344.82	$39,718.00	$58,062.82	$18,397.32	$39,718.00	$58,115.32	$52.50	0.1%
		2,000	700,000	$35,759.64	$79,436.00	$115,195.64	$35,864.64	$79,436.00	$115,300.64	$105.00	0.1%
		3,000	1,050,000	$53,174.46	$119,154.00	$172,328.46	$53,331.96	$119,154.00	$172,485.96	$157.50	0.1%
	Avg	1,066	373,100	$19,494.20	$42,339.39	$61,833.59	$19,550.16	$42,339.39	$61,889.55	$55.96	0.1%
		Hours Use: 450									
		500	225,000	$10,826.67	$25,533.00	$36,359.67	$10,860.42	$25,533.00	$36,393.42	$33.75	0.1%
		750	337,500	$15,775.01	$38,299.50	$54,074.51	$15,825.63	$38,299.50	$54,125.13	$50.62	0.1%
		1,000	450,000	$20,723.34	$51,066.00	$71,789.34	$20,790.84	$51,066.00	$71,856.84	$67.50	0.1%
		2,000	900,000	$40,516.68	$102,132.00	$142,648.68	$40,651.68	$102,132.00	$142,783.68	$135.00	0.1%
		3,000	1,350,000	$60,310.02	$153,198.00	$213,508.02	$60,512.52	$153,198.00	$213,710.52	$202.50	0.1%
	Avg	788	354,600	$16,527.15	$40,240.01	$56,767.16	$16,580.34	$40,240.01	$56,820.35	$53.19	0.1%
		Hours Use: 550									
		500	275,000	$12,015.93	$31,207.00	$43,222.93	$12,057.18	$31,207.00	$43,264.18	$41.25	0.1%
		750	412,500	$17,558.90	$46,810.50	$64,369.40	$17,620.77	$46,810.50	$64,431.27	$61.87	0.1%
		1,000	550,000	$23,101.86	$62,414.00	$85,515.86	$23,184.36	$62,414.00	$85,598.36	$82.50	0.1%
		2,000	1,100,000	$45,273.72	$124,828.00	$170,101.72	$45,438.72	$124,828.00	$170,266.72	$165.00	0.1%
		3,000	1,650,000	$67,445.58	$187,242.00	$254,687.58	$67,693.08	$187,242.00	$254,935.08	$247.50	0.1%
	Avg	1,118	614,900	$25,718.14	$69,778.85	$95,496.99	$25,810.37	$69,778.85	$95,589.22	$92.23	0.1%

		2018 In Effect	2019 Planned	
		Rates	Rates	Change
	Customer Charge	$930.00	$930.00	$0.00
	Distribution Demand	$0.87	$0.87	$0.00
	Transmission Demand	$8.22	$8.22	$0.00
	Distribution Energy - Peak	$0.01242	$0.01242	$0.00000
	Distribution Energy - Low A	$0.01142	$0.01142	$0.00000
	Distribution Energy - Low B	$0.00791	$0.00791	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00091	$0.00091	$0.00000
	Pension Adjustment Factor	($0.00004)	($0.00004)	$0.00000
	Net Metering Recovery Surcharge	$0.00180	$0.00180	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00056	$0.00056	$0.00000
	Basic Service Cost True Up Factor	$0.00049	$0.00049	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00000	$0.00000	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11348	$0.11348	$0.00000

	Peak Use:	27%
	Low A Use:	25%
	Low B Use:	48%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-4 General Power

		Monthly	Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
Hours Use: 150											
		20	3,000	$219.31	$332.25	$551.56	$219.76	$332.25	$552.01	$0.45	0.1%
		30	4,500	$325.97	$498.38	$824.35	$326.64	$498.38	$825.02	$0.67	0.1%
		40	6,000	$432.62	$664.50	$1,097.12	$433.52	$664.50	$1,098.02	$0.90	0.1%
		70	10,500	$752.59	$1,162.88	$1,915.47	$754.16	$1,162.88	$1,917.04	$1.57	0.1%
		100	15,000	$1,072.55	$1,661.25	$2,733.80	$1,074.80	$1,661.25	$2,736.05	$2.25	0.1%
Avg		52	7,800	$560.61	$863.85	$1,424.46	$561.78	$863.85	$1,425.63	$1.17	0.1%
Hours Use: 250											
		20	5,000	$302.45	$553.75	$856.20	$303.20	$553.75	$856.95	$0.75	0.1%
		30	7,500	$450.68	$830.63	$1,281.31	$451.80	$830.63	$1,282.43	$1.12	0.1%
		40	10,000	$598.90	$1,107.50	$1,706.40	$600.40	$1,107.50	$1,707.90	$1.50	0.1%
		70	17,500	$1,043.58	$1,938.13	$2,981.71	$1,046.20	$1,938.13	$2,984.33	$2.62	0.1%
		100	25,000	$1,488.25	$2,768.75	$4,257.00	$1,492.00	$2,768.75	$4,260.75	$3.75	0.1%
Avg		27	6,750	$406.21	$747.56	$1,153.77	$407.22	$747.56	$1,154.78	$1.01	0.1%
Hours Use: 350											
		20	7,000	$385.59	$775.25	$1,160.84	$386.64	$775.25	$1,161.89	$1.05	0.1%
		30	10,500	$575.39	$1,162.88	$1,738.27	$576.96	$1,162.88	$1,739.84	$1.57	0.1%
		40	14,000	$765.18	$1,550.50	$2,315.68	$767.28	$1,550.50	$2,317.78	$2.10	0.1%
		70	24,500	$1,334.57	$2,713.38	$4,047.95	$1,338.24	$2,713.38	$4,051.62	$3.67	0.1%
		100	35,000	$1,903.95	$3,876.25	$5,780.20	$1,909.20	$3,876.25	$5,785.45	$5.25	0.1%
Avg		27	9,450	$518.45	$1,046.59	$1,565.04	$519.86	$1,046.59	$1,566.45	$1.41	0.1%

		2018 In Effect	2019 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand	$1.74	$1.74	$0.00
	Transmission Demand	$2.69	$2.69	$0.00
	Distribution Energy	$0.01998	$0.01998	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00202	$0.00202	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00399	$0.00399	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00125	$0.00125	$0.00000
	Basic Service Cost True Up Factor	$0.00108	$0.00108	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00326	$0.00326	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-5 Commercial Space Heating

		Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		100	$14.83	$11.08	$25.91	$14.85	$11.08	$25.93	$0.02	0.1%
		200	$23.67	$22.15	$45.82	$23.70	$22.15	$45.85	$0.03	0.1%
		300	$32.50	$33.23	$65.73	$32.55	$33.23	$65.78	$0.05	0.1%
		500	$50.17	$55.38	$105.55	$50.25	$55.38	$105.63	$0.08	0.1%
		750	$72.26	$83.06	$155.32	$72.37	$83.06	$155.43	$0.11	0.1%
		1,000	$94.34	$110.75	$205.09	$94.49	$110.75	$205.24	$0.15	0.1%
		1,500	$138.51	$166.13	$304.64	$138.74	$166.13	$304.87	$0.23	0.1%
		3,000	$271.02	$332.25	$603.27	$271.47	$332.25	$603.72	$0.45	0.1%
		5,000	$447.70	$553.75	$1,001.45	$448.45	$553.75	$1,002.20	$0.75	0.1%
	Avg	1,472	$136.04	$163.02	$299.06	$136.26	$163.02	$299.28	$0.22	0.1%

		2018 In Effect Rates	2019 Planned Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Energy	$0.03563	$0.03563	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00245	$0.00245	$0.00000
	Pension Adjustment Factor	($0.00014)	($0.00014)	$0.00000
	Net Metering Recovery Surcharge	$0.00483	$0.00483	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00003	$0.00003	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00151	$0.00151	$0.00000
	Basic Service Cost True Up Factor	$0.00131	$0.00131	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.03267	$0.03267	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-6 All Electric Schools

		Monthly	2018 In Effect			2019 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		25,000	$1,472.00	$2,768.75	$4,240.75	$1,475.75	$2,768.75	$4,244.50	$3.75	0.1%
		40,000	$2,337.20	$4,430.00	$6,767.20	$2,343.20	$4,430.00	$6,773.20	$6.00	0.1%
		50,000	$2,914.00	$5,537.50	$8,451.50	$2,921.50	$5,537.50	$8,459.00	$7.50	0.1%
		60,000	$3,490.80	$6,645.00	$10,135.80	$3,499.80	$6,645.00	$10,144.80	$9.00	0.1%
		150,000	$8,682.00	$16,612.50	$25,294.50	$8,704.50	$16,612.50	$25,317.00	$22.50	0.1%
	Avg	60,748	$3,533.94	$6,727.84	$10,261.78	$3,543.06	$6,727.84	$10,270.90	$9.12	0.1%

		2018 In Effect Rates	2019 Planned Rates	Change
	Customer Charge	$30.00	$30.00	$0.00
	Distribution Energy	$0.01633	$0.01633	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00114	$0.00114	$0.00000
	Pension Adjustment Factor	($0.00007)	($0.00007)	$0.00000
	Net Metering Recovery Surcharge	$0.00225	$0.00225	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00070	$0.00070	$0.00000
	Basic Service Cost True Up Factor	$0.00061	$0.00061	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02666	$0.02666	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.00545	$0.00015
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional General Time-of-Use

		Monthly kVA	Monthly kWh	2018 In Effect Delivery	2018 In Effect Supplier	2018 In Effect Total	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 350									
		5	1,750	$144.82	$193.81	$338.63	$145.09	$193.81	$338.90	$0.27	0.1%
		10	3,500	$279.65	$387.63	$667.28	$280.17	$387.63	$667.80	$0.52	0.1%
		20	7,000	$549.29	$775.25	$1,324.54	$550.34	$775.25	$1,325.59	$1.05	0.1%
		50	17,500	$1,358.24	$1,938.13	$3,296.37	$1,360.86	$1,938.13	$3,298.99	$2.62	0.1%
		75	26,250	$2,032.36	$2,907.19	$4,939.55	$2,036.29	$2,907.19	$4,943.48	$3.93	0.1%
	Avg	20	7,000	$549.29	$775.25	$1,324.54	$550.34	$775.25	$1,325.59	$1.05	0.1%
		Hours Use: 500									
		5	2,500	$172.69	$276.88	$449.57	$173.07	$276.88	$449.95	$0.38	0.1%
		10	5,000	$335.38	$553.75	$889.13	$336.13	$553.75	$889.88	$0.75	0.1%
		20	10,000	$660.76	$1,107.50	$1,768.26	$662.26	$1,107.50	$1,769.76	$1.50	0.1%
		50	25,000	$1,636.91	$2,768.75	$4,405.66	$1,640.66	$2,768.75	$4,409.41	$3.75	0.1%
		75	37,500	$2,450.37	$4,153.13	$6,603.50	$2,455.99	$4,153.13	$6,609.12	$5.62	0.1%
	Avg	31	15,500	$1,018.68	$1,716.63	$2,735.31	$1,021.01	$1,716.63	$2,737.64	$2.33	0.1%
		Hours Use: 650									
		5	3,250	$200.56	$359.94	$560.50	$201.05	$359.94	$560.99	$0.49	0.1%
		10	6,500	$391.12	$719.88	$1,111.00	$392.09	$719.88	$1,111.97	$0.97	0.1%
		20	13,000	$772.23	$1,439.75	$2,211.98	$774.18	$1,439.75	$2,213.93	$1.95	0.1%
		50	32,500	$1,915.58	$3,599.38	$5,514.96	$1,920.46	$3,599.38	$5,519.84	$4.88	0.1%
		75	48,750	$2,868.37	$5,399.06	$8,267.43	$2,875.69	$5,399.06	$8,274.75	$7.32	0.1%
	Avg	18	11,700	$696.01	$1,295.78	$1,991.79	$697.76	$1,295.78	$1,993.54	$1.75	0.1%

			2018 In Effect Rates	2019 Planned Rates	2019 Planned Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.33	$3.33	$0.00
	Transmission Demand		$10.63	$10.63	$0.00
	Distribution Energy - Peak		$0.02290	$0.02290	$0.00000
	Distribution Energy - Low Load		$0.01604	$0.01604	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.00530	$0.00545	$0.00015
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	24%			
	Low A Use:	76%			

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional Seasonal General Time-of-Use

		Monthly kVA	Monthly kWh	2018 In Effect Delivery	2018 In Effect Supplier	2018 In Effect Total	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 50									
		5	250	$66.24	$27.69	$93.93	$66.27	$27.69	$93.96	$0.03	0.0%
		10	500	$122.47	$55.38	$177.85	$122.55	$55.38	$177.93	$0.08	0.0%
		20	1,000	$234.95	$110.75	$345.70	$235.10	$110.75	$345.85	$0.15	0.0%
		50	2,500	$572.37	$276.88	$849.25	$572.75	$276.88	$849.63	$0.38	0.0%
		75	3,750	$853.56	$415.31	$1,268.87	$854.12	$415.31	$1,269.43	$0.56	0.0%
	Avg	9	450	$111.23	$49.84	$161.07	$111.29	$49.84	$161.13	$0.06	0.0%
		Hours Use: 150									
		5	750	$95.51	$83.06	$178.57	$95.62	$83.06	$178.68	$0.11	0.1%
		10	1,500	$181.02	$166.13	$347.15	$181.25	$166.13	$347.38	$0.23	0.1%
		20	3,000	$352.05	$332.25	$684.30	$352.50	$332.25	$684.75	$0.45	0.1%
		50	7,500	$865.11	$830.63	$1,695.74	$866.24	$830.63	$1,696.87	$1.13	0.1%
		75	11,250	$1,292.67	$1,245.94	$2,538.61	$1,294.36	$1,245.94	$2,540.30	$1.69	0.1%
	Avg	10	1,500	$181.02	$166.13	$347.15	$181.25	$166.13	$347.38	$0.23	0.1%
		Hours Use: 300									
		5	1,500	$139.42	$166.13	$305.55	$139.65	$166.13	$305.78	$0.23	0.1%
		10	3,000	$268.85	$332.25	$601.10	$269.30	$332.25	$601.55	$0.45	0.1%
		20	6,000	$527.69	$664.50	$1,192.19	$528.59	$664.50	$1,193.09	$0.90	0.1%
		50	15,000	$1,304.23	$1,661.25	$2,965.48	$1,306.48	$1,661.25	$2,967.73	$2.25	0.1%
		75	22,500	$1,951.34	$2,491.88	$4,443.22	$1,954.71	$2,491.88	$4,446.59	$3.37	0.1%
	Avg	13	3,900	$346.50	$431.93	$778.43	$347.08	$431.93	$779.01	$0.58	0.1%

			2018 In Effect Rates	2019 Planned Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.36	$3.36	$0.00
	Transmission Demand		$4.96	$4.96	$0.00
	Distribution Energy - Peak		$0.04453	$0.04453	$0.00000
	Distribution Energy - Low Load		$0.03745	$0.03745	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.00530	$0.00545	$0.00015
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	23%			
	Low A Use:	77%			

Cape Light Compact JPE
Average Customer Use
October 2018 Delivery Rates. September 2018 Supply Rates.

Rate Class Information					Total Bill Comparison	
Rate		Load Fact	Avg Kwh	Avg Kw	2019 vs. 2020 Change in Total Bill Amount	%
Rate R-1 Residential	R-1		516		3.96	3.26%
Rate R-2 Residential Assistance	R-2		488		1.00	1.49%
Rate R-3 Residential Space Heating	R-3		740		5.67	3.47%
Rate R-4 Residential Assistance Space Heating	R-4		874		1.78	1.60%
Rate G-1 Small General Service	G-1	0.200	400	2	5.87	6.91%
Rate G-1 Small General Service	G-1	0.300	5,700	19	83.67	7.79%
Rate G-1 Small General Service	G-1	0.400	10,800	27	158.54	8.05%
Rate G-1 Seasonal Small General Service	G-1S	0.050	450	9	6.60	5.98%
Rate G-1 Seasonal Small General Service	G-1S	0.150	1,200	8	17.61	6.20%
Rate G-1 Seasonal Small General Service	G-1S	0.300	2,700	9	39.64	6.77%
Rate G-2 Medium General Time-of-Use	G-2	0.300	61,500	205	902.82	8.00%
Rate G-2 Medium General Time-of-Use	G-2	0.400	85,600	214	1,256.61	8.45%
Rate G-2 Medium General Time-of-Use	G-2	0.500	126,500	253	1,857.02	8.76%
Rate G-3 Large General Time-Of-Use	G-3	0.350	373,100	1,066	5,477.11	8.85%
Rate G-3 Large General Time-Of-Use	G-3	0.450	354,600	788	5,205.53	9.16%
Rate G-3 Large General Time-Of-Use	G-3	0.550	614,900	1,118	9,026.74	9.44%
Rate G-4 General Power	G-4	0.150	7,800	52	114.50	8.03%
Rate G-4 General Power	G-4	0.250	6,750	27	99.09	8.58%
Rate G-4 General Power	G-4	0.350	9,450	27	138.73	8.86%
Rate G-5 Commercial Space Heating	G-5		1,472		21.61	7.22%
Rate G-6 All Electric Schools	G-6		60,748		891.78	8.68%
Rate G-7 Optional General Time-of-Use	G-7	0.350	7,000	20	102.76	7.75%
Rate G-7 Optional General Time-of-Use	G-7	0.500	15,500	31	227.54	8.31%
Rate G-7 Optional General Time-of-Use	G-7	0.650	11,700	18	171.76	8.62%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.050	450	9	6.61	4.10%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.150	1,500	10	22.02	6.34%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.300	3,900	13	57.26	7.35%

The 2019 EES rates are proposed for effect January 1, 2019 through December 31, 2019.
The 2020 EES rates are estimated for effect January 1, 2020 through December 31, 2020.
All rates include the most up to date information as of the date of filing. Refer to the Cape Light Compact JPE's 2019-2021 Three-Year Plan for inf

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-1 Residential

		Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$18.56	$10.60	$29.16	$19.32	$10.60	$29.92	$0.76	2.6%
4		200	$30.11	$21.20	$51.31	$31.64	$21.20	$52.84	$1.53	3.0%
5		300	$41.67	$31.80	$73.47	$43.96	$31.80	$75.76	$2.29	3.1%
6		400	$53.22	$42.40	$95.62	$56.28	$42.40	$98.68	$3.06	3.2%
7		500	$64.78	$53.00	$117.78	$68.61	$53.00	$121.61	$3.83	3.3%
8		600	$76.33	$63.60	$139.93	$80.93	$63.60	$144.53	$4.60	3.3%
9		700	$87.89	$74.20	$162.09	$93.25	$74.20	$167.45	$5.36	3.3%
10		800	$99.44	$84.80	$184.24	$105.57	$84.80	$190.37	$6.13	3.3%
11		900	$111.00	$95.40	$206.40	$117.89	$95.40	$213.29	$6.89	3.3%
12		1,000	$122.55	$106.00	$228.55	$130.21	$106.00	$236.21	$7.66	3.4%
13		1,250	$151.44	$132.50	$283.94	$161.01	$132.50	$293.51	$9.57	3.4%
14		1,500	$180.33	$159.00	$339.33	$191.82	$159.00	$350.82	$11.49	3.4%
15		2,000	$238.10	$212.00	$450.10	$253.42	$212.00	$465.42	$15.32	3.4%
16	Avg	516	$66.62	$54.70	$121.32	$70.58	$54.70	$125.28	$3.96	3.3%

		2019 Planned Rates	2020 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.04372	$0.04372	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
23	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
24	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00004	$0.00004	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
28	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.03058	$0.03058	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.02113	$0.02879	$0.00766
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-2 Residential Assistance

		Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$10.55	$6.78	$17.33	$10.75	$6.78	$17.53	$0.20	1.2%
4		200	$16.62	$13.57	$30.19	$17.03	$13.57	$30.60	$0.41	1.4%
5		300	$22.69	$20.35	$43.04	$23.30	$20.35	$43.65	$0.61	1.4%
6		400	$28.76	$27.14	$55.90	$29.58	$27.14	$56.72	$0.82	1.5%
7		500	$34.83	$33.92	$68.75	$35.85	$33.92	$69.77	$1.02	1.5%
8		600	$40.90	$40.70	$81.60	$42.13	$40.70	$82.83	$1.23	1.5%
9		700	$46.97	$47.49	$94.46	$48.40	$47.49	$95.89	$1.43	1.5%
10		800	$53.04	$54.27	$107.31	$54.68	$54.27	$108.95	$1.64	1.5%
11		900	$59.11	$61.06	$120.17	$60.95	$61.06	$122.01	$1.84	1.5%
12		1,000	$65.18	$67.84	$133.02	$67.23	$67.84	$135.07	$2.05	1.5%
13		1,250	$80.36	$84.80	$165.16	$82.91	$84.80	$167.71	$2.55	1.5%
14		1,500	$95.54	$101.76	$197.30	$98.60	$101.76	$200.36	$3.06	1.6%
15		2,000	$125.89	$135.68	$261.57	$129.97	$135.68	$265.65	$4.08	1.6%
16	Avg	488	$34.10	$33.11	$67.21	$35.10	$33.11	$68.21	$1.00	1.5%

		2019 Planned Rates	2020 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.04372	$0.04372	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
23	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
24	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00004	$0.00004	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
28	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.03058	$0.03058	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.00043	$0.00362	$0.00319
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000
38	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-3 Residential Space Heating

		Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$17.53	$10.60	$28.13	$18.29	$10.60	$28.89	$0.76	2.7%
4		200	$28.05	$21.20	$49.25	$29.58	$21.20	$50.78	$1.53	3.1%
5		300	$38.58	$31.80	$70.38	$40.88	$31.80	$72.68	$2.30	3.3%
6		400	$49.10	$42.40	$91.50	$52.17	$42.40	$94.57	$3.07	3.4%
7		500	$59.63	$53.00	$112.63	$63.46	$53.00	$116.46	$3.83	3.4%
8		600	$70.16	$63.60	$133.76	$74.75	$63.60	$138.35	$4.59	3.4%
9		700	$80.68	$74.20	$154.88	$86.04	$74.20	$160.24	$5.36	3.5%
10		800	$91.21	$84.80	$176.01	$97.34	$84.80	$182.14	$6.13	3.5%
11		900	$101.73	$95.40	$197.13	$108.63	$95.40	$204.03	$6.90	3.5%
12		1,000	$112.26	$106.00	$218.26	$119.92	$106.00	$225.92	$7.66	3.5%
13		1,250	$138.58	$132.50	$271.08	$148.15	$132.50	$280.65	$9.57	3.5%
14		1,500	$164.89	$159.00	$323.89	$176.38	$159.00	$335.38	$11.49	3.5%
15		2,000	$217.52	$212.00	$429.52	$232.84	$212.00	$444.84	$15.32	3.6%
16	Avg	740	$84.89	$78.44	$163.33	$90.56	$78.44	$169.00	$5.67	3.5%

		2019 Planned Rates	2020 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.03835	$0.03835	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
23	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
24	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00003	$0.00003	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
28	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.02896	$0.02896	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.02113	$0.02879	$0.00766
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-4 Residential Assistance Space Heating

		Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$9.89	$6.78	$16.67	$10.10	$6.78	$16.88	$0.21	1.3%
4		200	$15.30	$13.57	$28.87	$15.71	$13.57	$29.28	$0.41	1.4%
5		300	$20.72	$20.35	$41.07	$21.33	$20.35	$41.68	$0.61	1.5%
6		400	$26.13	$27.14	$53.27	$26.94	$27.14	$54.08	$0.81	1.5%
7		500	$31.54	$33.92	$65.46	$32.56	$33.92	$66.48	$1.02	1.6%
8		600	$36.95	$40.70	$77.65	$38.18	$40.70	$78.88	$1.23	1.6%
9		700	$42.36	$47.49	$89.85	$43.79	$47.49	$91.28	$1.43	1.6%
10		800	$47.77	$54.27	$102.04	$49.41	$54.27	$103.68	$1.64	1.6%
11		900	$53.19	$61.06	$114.25	$55.02	$61.06	$116.08	$1.83	1.6%
12		1,000	$58.60	$67.84	$126.44	$60.64	$67.84	$128.48	$2.04	1.6%
13		1,250	$72.13	$84.80	$156.93	$74.68	$84.80	$159.48	$2.55	1.6%
14		1,500	$85.66	$101.76	$187.42	$88.72	$101.76	$190.48	$3.06	1.6%
15		2,000	$112.72	$135.68	$248.40	$116.80	$135.68	$252.48	$4.08	1.6%
16	Avg	874	$51.78	$59.29	$111.07	$53.56	$59.29	$112.85	$1.78	1.6%

		2019 Planned Rates	2020 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.03835	$0.03835	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
23	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
24	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00003	$0.00003	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
28	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.02896	$0.02896	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.00043	$0.00362	$0.00319
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000
38	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Small General Service

		Monthly	Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 200									
		5	1,000	$92.65	$110.75	$203.40	$107.33	$110.75	$218.08	$14.68	7.2%
		10	2,000	$179.30	$221.50	$400.80	$208.66	$221.50	$430.16	$29.36	7.3%
		15	3,000	$269.45	$332.25	$601.70	$313.49	$332.25	$645.74	$44.04	7.3%
		25	5,000	$431.95	$553.75	$985.70	$505.35	$553.75	$1,059.10	$73.40	7.4%
		50	10,000	$838.20	$1,107.50	$1,945.70	$985.00	$1,107.50	$2,092.50	$146.80	7.5%
		100	20,000	$1,650.70	$2,215.00	$3,865.70	$1,944.30	$2,215.00	$4,159.30	$293.60	7.6%
	Avg	2	400	$40.66	$44.30	$84.96	$46.53	$44.30	$90.83	$5.87	6.9%
		Hours Use: 300									
		5	1,500	$135.98	$166.13	$302.11	$158.00	$166.13	$324.13	$22.02	7.3%
		10	3,000	$245.20	$332.25	$577.45	$289.24	$332.25	$621.49	$44.04	7.6%
		15	4,500	$354.95	$498.38	$853.33	$421.01	$498.38	$919.39	$66.06	7.7%
		25	7,500	$574.45	$830.63	$1,405.08	$684.55	$830.63	$1,515.18	$110.10	7.8%
		50	15,000	$1,123.20	$1,661.25	$2,784.45	$1,343.40	$1,661.25	$3,004.65	$220.20	7.9%
		100	30,000	$2,220.70	$3,322.50	$5,543.20	$2,661.10	$3,322.50	$5,983.60	$440.40	7.9%
	Avg	19	5,700	$442.75	$631.28	$1,074.03	$526.42	$631.28	$1,157.70	$83.67	7.8%
		Hours Use: 400									
		5	2,000	$179.30	$221.50	$400.80	$208.66	$221.50	$430.16	$29.36	7.3%
		10	4,000	$302.20	$443.00	$745.20	$360.92	$443.00	$803.92	$58.72	7.9%
		15	6,000	$440.45	$664.50	$1,104.95	$528.53	$664.50	$1,193.03	$88.08	8.0%
		25	10,000	$716.95	$1,107.50	$1,824.45	$863.75	$1,107.50	$1,971.25	$146.80	8.0%
		50	20,000	$1,408.20	$2,215.00	$3,623.20	$1,701.80	$2,215.00	$3,916.80	$293.60	8.1%
		100	40,000	$2,790.70	$4,430.00	$7,220.70	$3,377.90	$4,430.00	$7,807.90	$587.20	8.1%
	Avg	27	10,800	$772.25	$1,196.10	$1,968.35	$930.79	$1,196.10	$2,126.89	$158.54	8.1%

		2019 Planned	2020 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
	Distribution Demand >10 kW	$4.85	$4.85	$0.00
	Distribution Energy <=2,300 kWh	$0.04067	$0.04067	$0.00000
	Distribution Energy >2,300 kWh	$0.01102	$0.01102	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02636	$0.02636	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Seasonal Small General Service

		Monthly	Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		Hours Use: 50									
4		5	250	$36.26	$27.69	$63.95	$39.93	$27.69	$67.62	$3.67	5.7%
5		10	500	$66.52	$55.38	$121.90	$73.86	$55.38	$129.24	$7.34	6.0%
6		20	1,000	$169.54	$110.75	$280.29	$184.22	$110.75	$294.97	$14.68	5.2%
7		50	2,500	$442.75	$276.88	$719.63	$479.45	$276.88	$756.33	$36.70	5.1%
8	Avg	9	450	$60.47	$49.84	$110.31	$67.07	$49.84	$116.91	$6.60	6.0%
9		Hours Use: 150									
10		5	750	$96.78	$83.06	$179.84	$107.79	$83.06	$190.85	$11.01	6.1%
11		10	1,500	$187.56	$166.13	$353.69	$209.58	$166.13	$375.71	$22.02	6.2%
12		20	3,000	$350.17	$332.25	$682.42	$394.21	$332.25	$726.46	$44.04	6.5%
13		50	7,500	$791.90	$830.63	$1,622.53	$902.00	$830.63	$1,732.63	$110.10	6.8%
14	Avg	8	1,200	$151.25	$132.90	$284.15	$168.86	$132.90	$301.76	$17.61	6.2%
15		Hours Use: 300									
16		5	1,500	$187.56	$166.13	$353.69	$209.58	$166.13	$375.71	$22.02	6.2%
17		10	3,000	$307.67	$332.25	$639.92	$351.71	$332.25	$683.96	$44.04	6.9%
18		20	6,000	$559.66	$664.50	$1,224.16	$647.74	$664.50	$1,312.24	$88.08	7.2%
19		50	15,000	$1,315.63	$1,661.25	$2,976.88	$1,535.83	$1,661.25	$3,197.08	$220.20	7.4%
20	Avg	9	2,700	$286.72	$299.03	$585.75	$326.36	$299.03	$625.39	$39.64	6.8%

		2019 Planned Rates	2020 Planned Rates	Change
23	Customer Charge	$6.00	$6.00	$0.00
24	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
25	Distribution Demand >10 kW	$4.25	$4.25	$0.00
26	Distribution Energy <=1,800 kWh	$0.07506	$0.07506	$0.00000
27	Distribution Energy >1,800 kWh	$0.02385	$0.02385	$0.00000
28	Revenue Decoupling	$0.00000	$0.00000	$0.00000
29	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
30	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
31	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
32	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
33	AG Consulting Expense	$0.00002	$0.00002	$0.00000
34	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
35	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
36	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
37	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
38	Vegetation Management	$0.00000	$0.00000	$0.00000
39	Transition	($0.00061)	($0.00061)	$0.00000
40	Transmission Energy	$0.02636	$0.02636	$0.00000
41	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
42	System Benefits Charge	$0.00250	$0.00250	$0.00000
43	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
44	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-2 Medium General Time-of-Use

		Monthly kVA	Monthly kWh	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 300									
		100	30,000	$2,292.16	$3,404.40	$5,696.56	$2,732.56	$3,404.40	$6,136.96	$440.40	7.7%
		150	45,000	$3,253.24	$5,106.60	$8,359.84	$3,913.84	$5,106.60	$9,020.44	$660.60	7.9%
		200	60,000	$4,214.32	$6,808.80	$11,023.12	$5,095.12	$6,808.80	$11,903.92	$880.80	8.0%
		300	90,000	$6,136.48	$10,213.20	$16,349.68	$7,457.68	$10,213.20	$17,670.88	$1,321.20	8.1%
		500	150,000	$9,980.81	$17,022.00	$27,002.81	$12,182.81	$17,022.00	$29,204.81	$2,202.00	8.2%
	Avg	205	61,500	$4,310.43	$6,979.02	$11,289.45	$5,213.25	$6,979.02	$12,192.27	$902.82	8.0%
		Hours Use: 400									
		100	40,000	$2,610.55	$4,539.20	$7,149.75	$3,197.75	$4,539.20	$7,736.95	$587.20	8.2%
		150	60,000	$3,730.82	$6,808.80	$10,539.62	$4,611.62	$6,808.80	$11,420.42	$880.80	8.4%
		200	80,000	$4,851.10	$9,078.40	$13,929.50	$6,025.50	$9,078.40	$15,103.90	$1,174.40	8.4%
		300	120,000	$7,091.64	$13,617.60	$20,709.24	$8,853.24	$13,617.60	$22,470.84	$1,761.60	8.5%
		500	200,000	$11,572.74	$22,696.00	$34,268.74	$14,508.74	$22,696.00	$37,204.74	$2,936.00	8.6%
	Avg	214	85,600	$5,164.77	$9,713.89	$14,878.66	$6,421.38	$9,713.89	$16,135.27	$1,256.61	8.4%
		Hours Use: 500									
		100	50,000	$2,928.94	$5,674.00	$8,602.94	$3,662.94	$5,674.00	$9,336.94	$734.00	8.5%
		150	75,000	$4,208.40	$8,511.00	$12,719.40	$5,309.40	$8,511.00	$13,820.40	$1,101.00	8.7%
		200	100,000	$5,487.87	$11,348.00	$16,835.87	$6,955.87	$11,348.00	$18,303.87	$1,468.00	8.7%
		300	150,000	$8,046.81	$17,022.00	$25,068.81	$10,248.81	$17,022.00	$27,270.81	$2,202.00	8.8%
		500	250,000	$13,164.68	$28,370.00	$41,534.68	$16,834.68	$28,370.00	$45,204.68	$3,670.00	8.8%
	Avg	253	126,500	$6,844.11	$14,355.22	$21,199.33	$8,701.13	$14,355.22	$23,056.35	$1,857.02	8.8%

		2019 Planned Rates	2020 Planned Rates	Change
	Customer Charge	$370.00	$370.00	$0.00
	Distribution Demand	$1.51	$1.51	$0.00
	Transmission Demand	$8.16	$8.16	$0.00
	Distribution Energy - Peak	$0.01769	$0.01769	$0.00000
	Distribution Energy - Low A	$0.01488	$0.01488	$0.00000
	Distribution Energy - Low B	$0.00965	$0.00965	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00138	$0.00138	$0.00000
	Pension Adjustment Factor	($0.00005)	($0.00005)	$0.00000
	Net Metering Recovery Surcharge	$0.00273	$0.00273	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00085	$0.00085	$0.00000
	Basic Service Cost True Up Factor	$0.00074	$0.00074	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00277	$0.00277	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11348	$0.11348	$0.00000

	Peak Use:	28%
	Low A Use:	25%
	Low B Use:	47%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-3 Large General Time-Of-Use

		Monthly	Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kVA	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		Hours Use: 350									
4		500	175,000	$9,663.66	$19,859.00	$29,522.66	$12,232.66	$19,859.00	$32,091.66	$2,569.00	8.7%
5		750	262,500	$14,030.49	$29,788.50	$43,818.99	$17,883.99	$29,788.50	$47,672.49	$3,853.50	8.8%
6		1,000	350,000	$18,397.32	$39,718.00	$58,115.32	$23,535.32	$39,718.00	$63,253.32	$5,138.00	8.8%
7		2,000	700,000	$35,864.64	$79,436.00	$115,300.64	$46,140.64	$79,436.00	$125,576.64	$10,276.00	8.9%
8		3,000	1,050,000	$53,331.96	$119,154.00	$172,485.96	$68,745.96	$119,154.00	$187,899.96	$15,414.00	8.9%
9	Avg	1,066	373,100	$19,550.16	$42,339.39	$61,889.55	$25,027.27	$42,339.39	$67,366.66	$5,477.11	8.8%
10		Hours Use: 450									
11		500	225,000	$10,860.42	$25,533.00	$36,393.42	$14,163.42	$25,533.00	$39,696.42	$3,303.00	9.1%
12		750	337,500	$15,825.63	$38,299.50	$54,125.13	$20,780.13	$38,299.50	$59,079.63	$4,954.50	9.2%
13		1,000	450,000	$20,790.84	$51,066.00	$71,856.84	$27,396.84	$51,066.00	$78,462.84	$6,606.00	9.2%
14		2,000	900,000	$40,651.68	$102,132.00	$142,783.68	$53,863.68	$102,132.00	$155,995.68	$13,212.00	9.3%
15		3,000	1,350,000	$60,512.52	$153,198.00	$213,710.52	$80,330.52	$153,198.00	$233,528.52	$19,818.00	9.3%
16	Avg	788	354,600	$16,580.34	$40,240.01	$56,820.35	$21,785.87	$40,240.01	$62,025.88	$5,205.53	9.2%
17		Hours Use: 550									
18		500	275,000	$12,057.18	$31,207.00	$43,264.18	$16,094.18	$31,207.00	$47,301.18	$4,037.00	9.3%
19		750	412,500	$17,620.77	$46,810.50	$64,431.27	$23,676.27	$46,810.50	$70,486.77	$6,055.50	9.4%
20		1,000	550,000	$23,184.36	$62,414.00	$85,598.36	$31,258.36	$62,414.00	$93,672.36	$8,074.00	9.4%
21		2,000	1,100,000	$45,438.72	$124,828.00	$170,266.72	$61,586.72	$124,828.00	$186,414.72	$16,148.00	9.5%
22		3,000	1,650,000	$67,693.08	$187,242.00	$254,935.08	$91,915.08	$187,242.00	$279,157.08	$24,222.00	9.5%
23	Avg	1,118	614,900	$25,810.37	$69,778.85	$95,589.22	$34,837.11	$69,778.85	$104,615.96	$9,026.74	9.4%

		2019 Planned Rates	2020 Planned Rates	Change
26	Customer Charge	$930.00	$930.00	$0.00
27	Distribution Demand	$0.87	$0.87	$0.00
28	Transmission Demand	$8.22	$8.22	$0.00
29	Distribution Energy - Peak	$0.01242	$0.01242	$0.00000
30	Distribution Energy - Low A	$0.01142	$0.01142	$0.00000
31	Distribution Energy - Low B	$0.00791	$0.00791	$0.00000
32	Revenue Decoupling	$0.00000	$0.00000	$0.00000
33	Residential Assistance Adjustment Factor	$0.00091	$0.00091	$0.00000
34	Pension Adjustment Factor	($0.00004)	($0.00004)	$0.00000
35	Net Metering Recovery Surcharge	$0.00180	$0.00180	$0.00000
36	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
37	AG Consulting Expense	$0.00001	$0.00001	$0.00000
38	Storm Cost Recovery Adjustment Factor	$0.00056	$0.00056	$0.00000
39	Basic Service Cost True Up Factor	$0.00049	$0.00049	$0.00000
40	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
41	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
42	Vegetation Management	$0.00000	$0.00000	$0.00000
43	Transition	($0.00061)	($0.00061)	$0.00000
44	Transmission Energy	$0.00000	$0.00000	$0.00000
45	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
46	System Benefits Charge	$0.00250	$0.00250	$0.00000
47	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
48	Basic Service Charge	$0.11348	$0.11348	$0.00000

49	Peak Use:	27%
50	Low A Use:	25%
51	Low B Use:	48%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-4 General Power

		Monthly	Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 150									
		20	3,000	$219.76	$332.25	$552.01	$263.80	$332.25	$596.05	$44.04	8.0%
		30	4,500	$326.64	$498.38	$825.02	$392.70	$498.38	$891.08	$66.06	8.0%
		40	6,000	$433.52	$664.50	$1,098.02	$521.60	$664.50	$1,186.10	$88.08	8.0%
		70	10,500	$754.16	$1,162.88	$1,917.04	$908.30	$1,162.88	$2,071.18	$154.14	8.0%
		100	15,000	$1,074.80	$1,661.25	$2,736.05	$1,295.00	$1,661.25	$2,956.25	$220.20	8.0%
	Avg	52	7,800	$561.78	$863.85	$1,425.63	$676.28	$863.85	$1,540.13	$114.50	8.0%
		Hours Use: 250									
		20	5,000	$303.20	$553.75	$856.95	$376.60	$553.75	$930.35	$73.40	8.6%
		30	7,500	$451.80	$830.63	$1,282.43	$561.90	$830.63	$1,392.53	$110.10	8.6%
		40	10,000	$600.40	$1,107.50	$1,707.90	$747.20	$1,107.50	$1,854.70	$146.80	8.6%
		70	17,500	$1,046.20	$1,938.13	$2,984.33	$1,303.10	$1,938.13	$3,241.23	$256.90	8.6%
		100	25,000	$1,492.00	$2,768.75	$4,260.75	$1,859.00	$2,768.75	$4,627.75	$367.00	8.6%
	Avg	27	6,750	$407.22	$747.56	$1,154.78	$506.31	$747.56	$1,253.87	$99.09	8.6%
		Hours Use: 350									
		20	7,000	$386.64	$775.25	$1,161.89	$489.40	$775.25	$1,264.65	$102.76	8.8%
		30	10,500	$576.96	$1,162.88	$1,739.84	$731.10	$1,162.88	$1,893.98	$154.14	8.9%
		40	14,000	$767.28	$1,550.50	$2,317.78	$972.80	$1,550.50	$2,523.30	$205.52	8.9%
		70	24,500	$1,338.24	$2,713.38	$4,051.62	$1,697.90	$2,713.38	$4,411.28	$359.66	8.9%
		100	35,000	$1,909.20	$3,876.25	$5,785.45	$2,423.00	$3,876.25	$6,299.25	$513.80	8.9%
	Avg	27	9,450	$519.86	$1,046.59	$1,566.45	$658.59	$1,046.59	$1,705.18	$138.73	8.9%

		2019 Planned	2020 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand	$1.74	$1.74	$0.00
	Transmission Demand	$2.69	$2.69	$0.00
	Distribution Energy	$0.01998	$0.01998	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00202	$0.00202	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00399	$0.00399	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00125	$0.00125	$0.00000
	Basic Service Cost True Up Factor	$0.00108	$0.00108	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00326	$0.00326	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-5 Commercial Space Heating

		Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		100	$14.85	$11.08	$25.93	$16.32	$11.08	$27.40	$1.47	5.7%
		200	$23.70	$22.15	$45.85	$26.63	$22.15	$48.78	$2.93	6.4%
		300	$32.55	$33.23	$65.78	$36.95	$33.23	$70.18	$4.40	6.7%
		500	$50.25	$55.38	$105.63	$57.59	$55.38	$112.97	$7.34	6.9%
		750	$72.37	$83.06	$155.43	$83.38	$83.06	$166.44	$11.01	7.1%
		1,000	$94.49	$110.75	$205.24	$109.17	$110.75	$219.92	$14.68	7.2%
		1,500	$138.74	$166.13	$304.87	$160.76	$166.13	$326.89	$22.02	7.2%
		3,000	$271.47	$332.25	$603.72	$315.51	$332.25	$647.76	$44.04	7.3%
		5,000	$448.45	$553.75	$1,002.20	$521.85	$553.75	$1,075.60	$73.40	7.3%
	Avg	1,472	$136.26	$163.02	$299.28	$157.87	$163.02	$320.89	$21.61	7.2%

		2019 Planned Rates	2020 Planned Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Energy	$0.03563	$0.03563	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00245	$0.00245	$0.00000
	Pension Adjustment Factor	($0.00014)	($0.00014)	$0.00000
	Net Metering Recovery Surcharge	$0.00483	$0.00483	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00003	$0.00003	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00151	$0.00151	$0.00000
	Basic Service Cost True Up Factor	$0.00131	$0.00131	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.03267	$0.03267	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-6 All Electric Schools

		Monthly	2019 Planned			2020 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		25,000	$1,475.75	$2,768.75	$4,244.50	$1,842.75	$2,768.75	$4,611.50	$367.00	8.6%
		40,000	$2,343.20	$4,430.00	$6,773.20	$2,930.40	$4,430.00	$7,360.40	$587.20	8.7%
		50,000	$2,921.50	$5,537.50	$8,459.00	$3,655.50	$5,537.50	$9,193.00	$734.00	8.7%
		60,000	$3,499.80	$6,645.00	$10,144.80	$4,380.60	$6,645.00	$11,025.60	$880.80	8.7%
		150,000	$8,704.50	$16,612.50	$25,317.00	$10,906.50	$16,612.50	$27,519.00	$2,202.00	8.7%
	Avg	60,748	$3,543.06	$6,727.84	$10,270.90	$4,434.84	$6,727.84	$11,162.68	$891.78	8.7%

		2019 Planned Rates	2020 Planned Rates	Change
	Customer Charge	$30.00	$30.00	$0.00
	Distribution Energy	$0.01633	$0.01633	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00114	$0.00114	$0.00000
	Pension Adjustment Factor	($0.00007)	($0.00007)	$0.00000
	Net Metering Recovery Surcharge	$0.00225	$0.00225	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00070	$0.00070	$0.00000
	Basic Service Cost True Up Factor	$0.00061	$0.00061	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02666	$0.02666	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00545	$0.02013	$0.01468
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional General Time-of-Use

		Monthly kVA	Monthly kWh	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 350									
		5	1,750	$145.09	$193.81	$338.90	$170.78	$193.81	$364.59	$25.69	7.6%
		10	3,500	$280.17	$387.63	$667.80	$331.55	$387.63	$719.18	$51.38	7.7%
		20	7,000	$550.34	$775.25	$1,325.59	$653.10	$775.25	$1,428.35	$102.76	7.8%
		50	17,500	$1,360.86	$1,938.13	$3,298.99	$1,617.76	$1,938.13	$3,555.89	$256.90	7.8%
		75	26,250	$2,036.29	$2,907.19	$4,943.48	$2,421.64	$2,907.19	$5,328.83	$385.35	7.8%
	Avg	20	7,000	$550.34	$775.25	$1,325.59	$653.10	$775.25	$1,428.35	$102.76	7.8%
		Hours Use: 500									
		5	2,500	$173.07	$276.88	$449.95	$209.77	$276.88	$486.65	$36.70	8.2%
		10	5,000	$336.13	$553.75	$889.88	$409.53	$553.75	$963.28	$73.40	8.2%
		20	10,000	$662.26	$1,107.50	$1,769.76	$809.06	$1,107.50	$1,916.56	$146.80	8.3%
		50	25,000	$1,640.66	$2,768.75	$4,409.41	$2,007.66	$2,768.75	$4,776.41	$367.00	8.3%
		75	37,500	$2,455.99	$4,153.13	$6,609.12	$3,006.49	$4,153.13	$7,159.62	$550.50	8.3%
	Avg	31	15,500	$1,021.01	$1,716.63	$2,737.64	$1,248.55	$1,716.63	$2,965.18	$227.54	8.3%
		Hours Use: 650									
		5	3,250	$201.05	$359.94	$560.99	$248.76	$359.94	$608.70	$47.71	8.5%
		10	6,500	$392.09	$719.88	$1,111.97	$487.51	$719.88	$1,207.39	$95.42	8.6%
		20	13,000	$774.18	$1,439.75	$2,213.93	$965.02	$1,439.75	$2,404.77	$190.84	8.6%
		50	32,500	$1,920.46	$3,599.38	$5,519.84	$2,397.56	$3,599.38	$5,996.94	$477.10	8.6%
		75	48,750	$2,875.69	$5,399.06	$8,274.75	$3,591.34	$5,399.06	$8,990.40	$715.65	8.6%
	Avg	18	11,700	$697.76	$1,295.78	$1,993.54	$869.52	$1,295.78	$2,165.30	$171.76	8.6%

			2019 Planned Rates	2020 Planned Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.33	$3.33	$0.00
	Transmission Demand		$10.63	$10.63	$0.00
	Distribution Energy - Peak		$0.02290	$0.02290	$0.00000
	Distribution Energy - Low Load		$0.01604	$0.01604	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.00545	$0.02013	$0.01468
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	24%			
	Low A Use:	76%			

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional Seasonal General Time-of-Use

		Monthly kVA	Monthly kWh	2019 Planned Delivery	2019 Planned Supplier	2019 Planned Total	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 50									
		5	250	$66.27	$27.69	$93.96	$69.94	$27.69	$97.63	$3.67	3.9%
		10	500	$122.55	$55.38	$177.93	$129.89	$55.38	$185.27	$7.34	4.1%
		20	1,000	$235.10	$110.75	$345.85	$249.78	$110.75	$360.53	$14.68	4.2%
		50	2,500	$572.75	$276.88	$849.63	$609.45	$276.88	$886.33	$36.70	4.3%
		75	3,750	$854.12	$415.31	$1,269.43	$909.17	$415.31	$1,324.48	$55.05	4.3%
	Avg	9	450	$111.29	$49.84	$161.13	$117.90	$49.84	$167.74	$6.61	4.1%
		Hours Use: 150									
		5	750	$95.62	$83.06	$178.68	$106.63	$83.06	$189.69	$11.01	6.2%
		10	1,500	$181.25	$166.13	$347.38	$203.27	$166.13	$369.40	$22.02	6.3%
		20	3,000	$352.50	$332.25	$684.75	$396.54	$332.25	$728.79	$44.04	6.4%
		50	7,500	$866.24	$830.63	$1,696.87	$976.34	$830.63	$1,806.97	$110.10	6.5%
		75	11,250	$1,294.36	$1,245.94	$2,540.30	$1,459.51	$1,245.94	$2,705.45	$165.15	6.5%
	Avg	10	1,500	$181.25	$166.13	$347.38	$203.27	$166.13	$369.40	$22.02	6.3%
		Hours Use: 300									
		5	1,500	$139.65	$166.13	$305.78	$161.67	$166.13	$327.80	$22.02	7.2%
		10	3,000	$269.30	$332.25	$601.55	$313.34	$332.25	$645.59	$44.04	7.3%
		20	6,000	$528.59	$664.50	$1,193.09	$616.67	$664.50	$1,281.17	$88.08	7.4%
		50	15,000	$1,306.48	$1,661.25	$2,967.73	$1,526.68	$1,661.25	$3,187.93	$220.20	7.4%
		75	22,500	$1,954.71	$2,491.88	$4,446.59	$2,285.01	$2,491.88	$4,776.89	$330.30	7.4%
	Avg	13	3,900	$347.08	$431.93	$779.01	$404.34	$431.93	$836.27	$57.26	7.4%

			2019 Planned Rates	2020 Planned Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.36	$3.36	$0.00
	Transmission Demand		$4.96	$4.96	$0.00
	Distribution Energy - Peak		$0.04453	$0.04453	$0.00000
	Distribution Energy - Low Load		$0.03745	$0.03745	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.00545	$0.02013	$0.01468
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	23%			
	Low A Use:	77%			

Cape Light Compact JPE
Average Customer Use
October 2018 Delivery Rates. September 2018 Supply Rates.

Rate Class Information					Total Bill Comparison	
Rate		Load Fact	Avg Kwh	Avg Kw	2020 vs. 2021 Change in Total Bill Amount	%
Rate R-1 Residential	R-1		516		1.92	1.53%
Rate R-2 Residential Assistance	R-2		488		0.43	0.63%
Rate R-3 Residential Space Heating	R-3		740		2.76	1.63%
Rate R-4 Residential Assistance Space Heating	R-4		874		0.78	0.69%
Rate G-1 Small General Service	G-1	0.200	400	2	1.05	1.16%
Rate G-1 Small General Service	G-1	0.300	5,700	19	14.99	1.29%
Rate G-1 Small General Service	G-1	0.400	10,800	27	28.40	1.34%
Rate G-1 Seasonal Small General Service	G-1S	0.050	450	9	1.19	1.02%
Rate G-1 Seasonal Small General Service	G-1S	0.150	1,200	8	3.16	1.05%
Rate G-1 Seasonal Small General Service	G-1S	0.300	2,700	9	7.10	1.14%
Rate G-2 Medium General Time-of-Use	G-2	0.300	61,500	205	161.75	1.33%
Rate G-2 Medium General Time-of-Use	G-2	0.400	85,600	214	225.13	1.40%
Rate G-2 Medium General Time-of-Use	G-2	0.500	126,500	253	332.69	1.44%
Rate G-3 Large General Time-Of-Use	G-3	0.350	373,100	1,066	981.25	1.46%
Rate G-3 Large General Time-Of-Use	G-3	0.450	354,600	788	932.60	1.50%
Rate G-3 Large General Time-Of-Use	G-3	0.550	614,900	1,118	1,617.18	1.55%
Rate G-4 General Power	G-4	0.150	7,800	52	20.51	1.33%
Rate G-4 General Power	G-4	0.250	6,750	27	17.75	1.42%
Rate G-4 General Power	G-4	0.350	9,450	27	24.85	1.46%
Rate G-5 Commercial Space Heating	G-5		1,472		3.87	1.21%
Rate G-6 All Electric Schools	G-6		60,748		159.76	1.43%
Rate G-7 Optional General Time-of-Use	G-7	0.350	7,000	20	18.41	1.29%
Rate G-7 Optional General Time-of-Use	G-7	0.500	15,500	31	40.76	1.37%
Rate G-7 Optional General Time-of-Use	G-7	0.650	11,700	18	30.77	1.42%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.050	450	9	1.18	0.70%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.150	1,500	10	3.94	1.07%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.300	3,900	13	10.25	1.23%

The 2020 EES rates are estimated for effect January 1, 2020 through December 31, 2020.
The 2021 EES rates are estimated for effect January 1, 2021 through December 31, 2021.
All rates include the most up to date information as of the date of filing. Refer to the Cape Light Compact JPE's 2019-2021 Three-Year Plan for inf

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-1 Residential

		Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$19.32	$10.60	$29.92	$19.69	$10.60	$30.29	$0.37	1.2%
4		200	$31.64	$21.20	$52.84	$32.39	$21.20	$53.59	$0.75	1.4%
5		300	$43.96	$31.80	$75.76	$45.08	$31.80	$76.88	$1.12	1.5%
6		400	$56.28	$42.40	$98.68	$57.78	$42.40	$100.18	$1.50	1.5%
7		500	$68.61	$53.00	$121.61	$70.47	$53.00	$123.47	$1.86	1.5%
8		600	$80.93	$63.60	$144.53	$83.16	$63.60	$146.76	$2.23	1.5%
9		700	$93.25	$74.20	$167.45	$95.86	$74.20	$170.06	$2.61	1.6%
10		800	$105.57	$84.80	$190.37	$108.55	$84.80	$193.35	$2.98	1.6%
11		900	$117.89	$95.40	$213.29	$121.25	$95.40	$216.65	$3.36	1.6%
12		1,000	$130.21	$106.00	$236.21	$133.94	$106.00	$239.94	$3.73	1.6%
13		1,250	$161.01	$132.50	$293.51	$165.68	$132.50	$298.18	$4.67	1.6%
14		1,500	$191.82	$159.00	$350.82	$197.41	$159.00	$356.41	$5.59	1.6%
15		2,000	$253.42	$212.00	$465.42	$260.88	$212.00	$472.88	$7.46	1.6%
16	Avg	516	$70.58	$54.70	$125.28	$72.50	$54.70	$127.20	$1.92	1.5%

		2020 Planned Rates	2021 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.04372	$0.04372	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
23	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
24	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00004	$0.00004	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
28	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.03058	$0.03058	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.02879	$0.03252	$0.00373
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-2 Residential Assistance

		Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$10.75	$6.78	$17.53	$10.84	$6.78	$17.62	$0.09	0.5%
4		200	$17.03	$13.57	$30.60	$17.21	$13.57	$30.78	$0.18	0.6%
5		300	$23.30	$20.35	$43.65	$23.57	$20.35	$43.92	$0.27	0.6%
6		400	$29.58	$27.14	$56.72	$29.93	$27.14	$57.07	$0.35	0.6%
7		500	$35.85	$33.92	$69.77	$36.29	$33.92	$70.21	$0.44	0.6%
8		600	$42.13	$40.70	$82.83	$42.66	$40.70	$83.36	$0.53	0.6%
9		700	$48.40	$47.49	$95.89	$49.02	$47.49	$96.51	$0.62	0.6%
10		800	$54.68	$54.27	$108.95	$55.38	$54.27	$109.65	$0.70	0.6%
11		900	$60.95	$61.06	$122.01	$61.75	$61.06	$122.81	$0.80	0.7%
12		1,000	$67.23	$67.84	$135.07	$68.11	$67.84	$135.95	$0.88	0.7%
13		1,250	$82.91	$84.80	$167.71	$84.02	$84.80	$168.82	$1.11	0.7%
14		1,500	$98.60	$101.76	$200.36	$99.92	$101.76	$201.68	$1.32	0.7%
15		2,000	$129.97	$135.68	$265.65	$131.74	$135.68	$267.42	$1.77	0.7%
16	Avg	488	$35.10	$33.11	$68.21	$35.53	$33.11	$68.64	$0.43	0.6%

		2020 Planned Rates	2021 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.04372	$0.04372	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
23	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
24	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00004	$0.00004	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
28	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.03058	$0.03058	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.00362	$0.00500	$0.00138
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000
38	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-3 Residential Space Heating

		Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
1		100	$18.29	$10.60	$28.89	$18.67	$10.60	$29.27	$0.38	1.3%
2		200	$29.58	$21.20	$50.78	$30.33	$21.20	$51.53	$0.75	1.5%
3		300	$40.88	$31.80	$72.68	$42.00	$31.80	$73.80	$1.12	1.5%
4		400	$52.17	$42.40	$94.57	$53.66	$42.40	$96.06	$1.49	1.6%
5		500	$63.46	$53.00	$116.46	$65.33	$53.00	$118.33	$1.87	1.6%
6		600	$74.75	$63.60	$138.35	$76.99	$63.60	$140.59	$2.24	1.6%
7		700	$86.04	$74.20	$160.24	$88.66	$74.20	$162.86	$2.62	1.6%
8		800	$97.34	$84.80	$182.14	$100.32	$84.80	$185.12	$2.98	1.6%
9		900	$108.63	$95.40	$204.03	$111.99	$95.40	$207.39	$3.36	1.6%
10		1,000	$119.92	$106.00	$225.92	$123.65	$106.00	$229.65	$3.73	1.7%
11		1,250	$148.15	$132.50	$280.65	$152.81	$132.50	$285.31	$4.66	1.7%
12		1,500	$176.38	$159.00	$335.38	$181.98	$159.00	$340.98	$5.60	1.7%
13		2,000	$232.84	$212.00	$444.84	$240.30	$212.00	$452.30	$7.46	1.7%
14	Avg	740	$90.56	$78.44	$169.00	$93.32	$78.44	$171.76	$2.76	1.6%

		2020 Planned Rates	2021 Planned Rates	Change
15	Customer Charge	$7.00	$7.00	$0.00
16	Distribution Energy	$0.03835	$0.03835	$0.00000
17	Revenue Decoupling	$0.00000	$0.00000	$0.00000
18	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
19	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
20	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
21	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
22	AG Consulting Expense	$0.00003	$0.00003	$0.00000
23	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
24	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
25	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
26	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
27	Vegetation Management	$0.00000	$0.00000	$0.00000
28	Transition	($0.00061)	($0.00061)	$0.00000
29	Transmission Energy	$0.02896	$0.02896	$0.00000
30	Energy Efficiency Reconciliation Factor	$0.02879	$0.03252	$0.00373
31	System Benefits Charge	$0.00250	$0.00250	$0.00000
32	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
33	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-4 Residential Assistance Space Heating

		Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$10.10	$6.78	$16.88	$10.18	$6.78	$16.96	$0.08	0.5%
4		200	$15.71	$13.57	$29.28	$15.89	$13.57	$29.46	$0.18	0.6%
5		300	$21.33	$20.35	$41.68	$21.59	$20.35	$41.94	$0.26	0.6%
6		400	$26.94	$27.14	$54.08	$27.30	$27.14	$54.44	$0.36	0.7%
7		500	$32.56	$33.92	$66.48	$33.00	$33.92	$66.92	$0.44	0.7%
8		600	$38.18	$40.70	$78.88	$38.71	$40.70	$79.41	$0.53	0.7%
9		700	$43.79	$47.49	$91.28	$44.41	$47.49	$91.90	$0.62	0.7%
10		800	$49.41	$54.27	$103.68	$50.11	$54.27	$104.38	$0.70	0.7%
11		900	$55.02	$61.06	$116.08	$55.82	$61.06	$116.88	$0.80	0.7%
12		1,000	$60.64	$67.84	$128.48	$61.52	$67.84	$129.36	$0.88	0.7%
13		1,250	$74.68	$84.80	$159.48	$75.78	$84.80	$160.58	$1.10	0.7%
14		1,500	$88.72	$101.76	$190.48	$90.04	$101.76	$191.80	$1.32	0.7%
15		2,000	$116.80	$135.68	$252.48	$118.57	$135.68	$254.25	$1.77	0.7%
16	Avg	874	$53.56	$59.29	$112.85	$54.34	$59.29	$113.63	$0.78	0.7%

		2020 Planned Rates	2021 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.03835	$0.03835	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
23	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
24	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00003	$0.00003	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
28	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.02896	$0.02896	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.00362	$0.00500	$0.00138
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000
38	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Small General Service

		Monthly	Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 200									
		5	1,000	$107.33	$110.75	$218.08	$109.96	$110.75	$220.71	$2.63	1.2%
		10	2,000	$208.66	$221.50	$430.16	$213.92	$221.50	$435.42	$5.26	1.2%
		15	3,000	$313.49	$332.25	$645.74	$321.38	$332.25	$653.63	$7.89	1.2%
		25	5,000	$505.35	$553.75	$1,059.10	$518.50	$553.75	$1,072.25	$13.15	1.2%
		50	10,000	$985.00	$1,107.50	$2,092.50	$1,011.30	$1,107.50	$2,118.80	$26.30	1.3%
		100	20,000	$1,944.30	$2,215.00	$4,159.30	$1,996.90	$2,215.00	$4,211.90	$52.60	1.3%
	Avg	2	400	$46.53	$44.30	$90.83	$47.58	$44.30	$91.88	$1.05	1.2%
		Hours Use: 300									
		5	1,500	$158.00	$166.13	$324.13	$161.94	$166.13	$328.07	$3.94	1.2%
		10	3,000	$289.24	$332.25	$621.49	$297.13	$332.25	$629.38	$7.89	1.3%
		15	4,500	$421.01	$498.38	$919.39	$432.84	$498.38	$931.22	$11.83	1.3%
		25	7,500	$684.55	$830.63	$1,515.18	$704.27	$830.63	$1,534.90	$19.72	1.3%
		50	15,000	$1,343.40	$1,661.25	$3,004.65	$1,382.85	$1,661.25	$3,044.10	$39.45	1.3%
		100	30,000	$2,661.10	$3,322.50	$5,983.60	$2,740.00	$3,322.50	$6,062.50	$78.90	1.3%
	Avg	19	5,700	$526.42	$631.28	$1,157.70	$541.41	$631.28	$1,172.69	$14.99	1.3%
		Hours Use: 400									
		5	2,000	$208.66	$221.50	$430.16	$213.92	$221.50	$435.42	$5.26	1.2%
		10	4,000	$360.92	$443.00	$803.92	$371.44	$443.00	$814.44	$10.52	1.3%
		15	6,000	$528.53	$664.50	$1,193.03	$544.31	$664.50	$1,208.81	$15.78	1.3%
		25	10,000	$863.75	$1,107.50	$1,971.25	$890.05	$1,107.50	$1,997.55	$26.30	1.3%
		50	20,000	$1,701.80	$2,215.00	$3,916.80	$1,754.40	$2,215.00	$3,969.40	$52.60	1.3%
		100	40,000	$3,377.90	$4,430.00	$7,807.90	$3,483.10	$4,430.00	$7,913.10	$105.20	1.3%
	Avg	27	10,800	$930.79	$1,196.10	$2,126.89	$959.19	$1,196.10	$2,155.29	$28.40	1.3%

		2020 Planned	2021 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
	Distribution Demand >10 kW	$4.85	$4.85	$0.00
	Distribution Energy <=2,300 kWh	$0.04067	$0.04067	$0.00000
	Distribution Energy >2,300 kWh	$0.01102	$0.01102	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02636	$0.02636	$0.00000
	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Seasonal Small General Service

		Monthly	Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 50									
		5	250	$39.93	$27.69	$67.62	$40.59	$27.69	$68.28	$0.66	1.0%
		10	500	$73.86	$55.38	$129.24	$75.18	$55.38	$130.56	$1.32	1.0%
		20	1,000	$184.22	$110.75	$294.97	$186.85	$110.75	$297.60	$2.63	0.9%
		50	2,500	$479.45	$276.88	$756.33	$486.03	$276.88	$762.91	$6.58	0.9%
	Avg	9	450	$67.07	$49.84	$116.91	$68.26	$49.84	$118.10	$1.19	1.0%
		Hours Use: 150									
		5	750	$107.79	$83.06	$190.85	$109.76	$83.06	$192.82	$1.97	1.0%
		10	1,500	$209.58	$166.13	$375.71	$213.53	$166.13	$379.66	$3.95	1.1%
		20	3,000	$394.21	$332.25	$726.46	$402.10	$332.25	$734.35	$7.89	1.1%
		50	7,500	$902.00	$830.63	$1,732.63	$921.73	$830.63	$1,752.36	$19.73	1.1%
	Avg	8	1,200	$168.86	$132.90	$301.76	$172.02	$132.90	$304.92	$3.16	1.0%
		Hours Use: 300									
		5	1,500	$209.58	$166.13	$375.71	$213.53	$166.13	$379.66	$3.95	1.1%
		10	3,000	$351.71	$332.25	$683.96	$359.60	$332.25	$691.85	$7.89	1.2%
		20	6,000	$647.74	$664.50	$1,312.24	$663.52	$664.50	$1,328.02	$15.78	1.2%
		50	15,000	$1,535.83	$1,661.25	$3,197.08	$1,575.28	$1,661.25	$3,236.53	$39.45	1.2%
	Avg	9	2,700	$326.36	$299.03	$625.39	$333.46	$299.03	$632.49	$7.10	1.1%

		2020 Planned Rates	2021 Planned Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
	Distribution Demand >10 kW	$4.25	$4.25	$0.00
	Distribution Energy <=1,800 kWh	$0.07506	$0.07506	$0.00000
	Distribution Energy >1,800 kWh	$0.02385	$0.02385	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02636	$0.02636	$0.00000
	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-2 Medium General Time-of-Use

		Monthly kVA	Monthly kWh	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	2021 Planned Delivery	2021 Planned Supplier	2021 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
		Hours Use: 300									
		100	30,000	$2,732.56	$3,404.40	$6,136.96	$2,811.46	$3,404.40	$6,215.86	$78.90	1.3%
		150	45,000	$3,913.84	$5,106.60	$9,020.44	$4,032.19	$5,106.60	$9,138.79	$118.35	1.3%
		200	60,000	$5,095.12	$6,808.80	$11,903.92	$5,252.92	$6,808.80	$12,061.72	$157.80	1.3%
		300	90,000	$7,457.68	$10,213.20	$17,670.88	$7,694.38	$10,213.20	$17,907.58	$236.70	1.3%
		500	150,000	$12,182.81	$17,022.00	$29,204.81	$12,577.31	$17,022.00	$29,599.31	$394.50	1.4%
	Avg	205	61,500	$5,213.25	$6,979.02	$12,192.27	$5,375.00	$6,979.02	$12,354.02	$161.75	1.3%
		Hours Use: 400									
		100	40,000	$3,197.75	$4,539.20	$7,736.95	$3,302.95	$4,539.20	$7,842.15	$105.20	1.4%
		150	60,000	$4,611.62	$6,808.80	$11,420.42	$4,769.42	$6,808.80	$11,578.22	$157.80	1.4%
		200	80,000	$6,025.50	$9,078.40	$15,103.90	$6,235.90	$9,078.40	$15,314.30	$210.40	1.4%
		300	120,000	$8,853.24	$13,617.60	$22,470.84	$9,168.84	$13,617.60	$22,786.44	$315.60	1.4%
		500	200,000	$14,508.74	$22,696.00	$37,204.74	$15,034.74	$22,696.00	$37,730.74	$526.00	1.4%
	Avg	214	85,600	$6,421.38	$9,713.89	$16,135.27	$6,646.51	$9,713.89	$16,360.40	$225.13	1.4%
		Hours Use: 500									
		100	50,000	$3,662.94	$5,674.00	$9,336.94	$3,794.44	$5,674.00	$9,468.44	$131.50	1.4%
		150	75,000	$5,309.40	$8,511.00	$13,820.40	$5,506.65	$8,511.00	$14,017.65	$197.25	1.4%
		200	100,000	$6,955.87	$11,348.00	$18,303.87	$7,218.87	$11,348.00	$18,566.87	$263.00	1.4%
		300	150,000	$10,248.81	$17,022.00	$27,270.81	$10,643.31	$17,022.00	$27,665.31	$394.50	1.4%
		500	250,000	$16,834.68	$28,370.00	$45,204.68	$17,492.18	$28,370.00	$45,862.18	$657.50	1.5%
	Avg	253	126,500	$8,701.13	$14,355.22	$23,056.35	$9,033.82	$14,355.22	$23,389.04	$332.69	1.4%

		2020 Planned Rates	2021 Planned Rates	Change
	Customer Charge	$370.00	$370.00	$0.00
	Distribution Demand	$1.51	$1.51	$0.00
	Transmission Demand	$8.16	$8.16	$0.00
	Distribution Energy - Peak	$0.01769	$0.01769	$0.00000
	Distribution Energy - Low A	$0.01488	$0.01488	$0.00000
	Distribution Energy - Low B	$0.00965	$0.00965	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00138	$0.00138	$0.00000
	Pension Adjustment Factor	($0.00005)	($0.00005)	$0.00000
	Net Metering Recovery Surcharge	$0.00273	$0.00273	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00085	$0.00085	$0.00000
	Basic Service Cost True Up Factor	$0.00074	$0.00074	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00277	$0.00277	$0.00000
	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11348	$0.11348	$0.00000

	Peak Use:	28%
	Low A Use:	25%
	Low B Use:	47%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-3 Large General Time-Of-Use

		Monthly kVA	Monthly kWh	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	2021 Planned Delivery	2021 Planned Supplier	2021 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
3		Hours Use: 350									
4		500	175,000	$12,232.66	$19,859.00	$32,091.66	$12,692.91	$19,859.00	$32,551.91	$460.25	1.4%
5		750	262,500	$17,883.99	$29,788.50	$47,672.49	$18,574.37	$29,788.50	$48,362.87	$690.38	1.4%
6		1,000	350,000	$23,535.32	$39,718.00	$63,253.32	$24,455.82	$39,718.00	$64,173.82	$920.50	1.5%
7		2,000	700,000	$46,140.64	$79,436.00	$125,576.64	$47,981.64	$79,436.00	$127,417.64	$1,841.00	1.5%
8		3,000	1,050,000	$68,745.96	$119,154.00	$187,899.96	$71,507.46	$119,154.00	$190,661.46	$2,761.50	1.5%
9	Avg	1,066	373,100	$25,027.27	$42,339.39	$67,366.66	$26,008.52	$42,339.39	$68,347.91	$981.25	1.5%
10		Hours Use: 450									
11		500	225,000	$14,163.42	$25,533.00	$39,696.42	$14,755.17	$25,533.00	$40,288.17	$591.75	1.5%
12		750	337,500	$20,780.13	$38,299.50	$59,079.63	$21,667.76	$38,299.50	$59,967.26	$887.63	1.5%
13		1,000	450,000	$27,396.84	$51,066.00	$78,462.84	$28,580.34	$51,066.00	$79,646.34	$1,183.50	1.5%
14		2,000	900,000	$53,863.68	$102,132.00	$155,995.68	$56,230.68	$102,132.00	$158,362.68	$2,367.00	1.5%
15		3,000	1,350,000	$80,330.52	$153,198.00	$233,528.52	$83,881.02	$153,198.00	$237,079.02	$3,550.50	1.5%
16	Avg	788	354,600	$21,785.87	$40,240.01	$62,025.88	$22,718.47	$40,240.01	$62,958.48	$932.60	1.5%
17		Hours Use: 550									
18		500	275,000	$16,094.18	$31,207.00	$47,301.18	$16,817.43	$31,207.00	$48,024.43	$723.25	1.5%
19		750	412,500	$23,676.27	$46,810.50	$70,486.77	$24,761.15	$46,810.50	$71,571.65	$1,084.88	1.5%
20		1,000	550,000	$31,258.36	$62,414.00	$93,672.36	$32,704.86	$62,414.00	$95,118.86	$1,446.50	1.5%
21		2,000	1,100,000	$61,586.72	$124,828.00	$186,414.72	$64,479.72	$124,828.00	$189,307.72	$2,893.00	1.6%
22		3,000	1,650,000	$91,915.08	$187,242.00	$279,157.08	$96,254.58	$187,242.00	$283,496.58	$4,339.50	1.6%
23	Avg	1,118	614,900	$34,837.11	$69,778.85	$104,615.96	$36,454.29	$69,778.85	$106,233.14	$1,617.18	1.5%

		2020 Planned Rates	2021 Planned Rates	Change
25				
26	Customer Charge	$930.00	$930.00	$0.00
27	Distribution Demand	$0.87	$0.87	$0.00
28	Transmission Demand	$8.22	$8.22	$0.00
29	Distribution Energy - Peak	$0.01242	$0.01242	$0.00000
30	Distribution Energy - Low A	$0.01142	$0.01142	$0.00000
31	Distribution Energy - Low B	$0.00791	$0.00791	$0.00000
32	Revenue Decoupling	$0.00000	$0.00000	$0.00000
33	Residential Assistance Adjustment Factor	$0.00091	$0.00091	$0.00000
34	Pension Adjustment Factor	($0.00004)	($0.00004)	$0.00000
35	Net Metering Recovery Surcharge	$0.00180	$0.00180	$0.00000
36	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
37	AG Consulting Expense	$0.00001	$0.00001	$0.00000
38	Storm Cost Recovery Adjustment Factor	$0.00056	$0.00056	$0.00000
39	Basic Service Cost True Up Factor	$0.00049	$0.00049	$0.00000
40	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
41	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
42	Vegetation Management	$0.00000	$0.00000	$0.00000
43	Transition	($0.00061)	($0.00061)	$0.00000
44	Transmission Energy	$0.00000	$0.00000	$0.00000
45	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
46	System Benefits Charge	$0.00250	$0.00250	$0.00000
47	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
48	Basic Service Charge	$0.11348	$0.11348	$0.00000

49	Peak Use:	27%
50	Low A Use:	25%
51	Low B Use:	48%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-4 General Power

		Monthly	Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 150									
		20	3,000	$263.80	$332.25	$596.05	$271.69	$332.25	$603.94	$7.89	1.3%
		30	4,500	$392.70	$498.38	$891.08	$404.54	$498.38	$902.92	$11.84	1.3%
		40	6,000	$521.60	$664.50	$1,186.10	$537.38	$664.50	$1,201.88	$15.78	1.3%
		70	10,500	$908.30	$1,162.88	$2,071.18	$935.92	$1,162.88	$2,098.80	$27.62	1.3%
		100	15,000	$1,295.00	$1,661.25	$2,956.25	$1,334.45	$1,661.25	$2,995.70	$39.45	1.3%
	Avg	52	7,800	$676.28	$863.85	$1,540.13	$696.79	$863.85	$1,560.64	$20.51	1.3%
		Hours Use: 250									
		20	5,000	$376.60	$553.75	$930.35	$389.75	$553.75	$943.50	$13.15	1.4%
		30	7,500	$561.90	$830.63	$1,392.53	$581.63	$830.63	$1,412.26	$19.73	1.4%
		40	10,000	$747.20	$1,107.50	$1,854.70	$773.50	$1,107.50	$1,881.00	$26.30	1.4%
		70	17,500	$1,303.10	$1,938.13	$3,241.23	$1,349.13	$1,938.13	$3,287.26	$46.03	1.4%
		100	25,000	$1,859.00	$2,768.75	$4,627.75	$1,924.75	$2,768.75	$4,693.50	$65.75	1.4%
	Avg	27	6,750	$506.31	$747.56	$1,253.87	$524.06	$747.56	$1,271.62	$17.75	1.4%
		Hours Use: 350									
		20	7,000	$489.40	$775.25	$1,264.65	$507.81	$775.25	$1,283.06	$18.41	1.5%
		30	10,500	$731.10	$1,162.88	$1,893.98	$758.72	$1,162.88	$1,921.60	$27.62	1.5%
		40	14,000	$972.80	$1,550.50	$2,523.30	$1,009.62	$1,550.50	$2,560.12	$36.82	1.5%
		70	24,500	$1,697.90	$2,713.38	$4,411.28	$1,762.34	$2,713.38	$4,475.72	$64.44	1.5%
		100	35,000	$2,423.00	$3,876.25	$6,299.25	$2,515.05	$3,876.25	$6,391.30	$92.05	1.5%
	Avg	27	9,450	$658.59	$1,046.59	$1,705.18	$683.44	$1,046.59	$1,730.03	$24.85	1.5%

		2020 Planned	2021 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand	$1.74	$1.74	$0.00
	Transmission Demand	$2.69	$2.69	$0.00
	Distribution Energy	$0.01998	$0.01998	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00202	$0.00202	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00399	$0.00399	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00125	$0.00125	$0.00000
	Basic Service Cost True Up Factor	$0.00108	$0.00108	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00326	$0.00326	$0.00000
	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-5 Commercial Space Heating

		Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$16.32	$11.08	$27.40	$16.58	$11.08	$27.66	$0.26	0.9%
4		200	$26.63	$22.15	$48.78	$27.16	$22.15	$49.31	$0.53	1.1%
5		300	$36.95	$33.23	$70.18	$37.74	$33.23	$70.97	$0.79	1.1%
6		500	$57.59	$55.38	$112.97	$58.90	$55.38	$114.28	$1.31	1.2%
7		750	$83.38	$83.06	$166.44	$85.35	$83.06	$168.41	$1.97	1.2%
8		1,000	$109.17	$110.75	$219.92	$111.80	$110.75	$222.55	$2.63	1.2%
9		1,500	$160.76	$166.13	$326.89	$164.70	$166.13	$330.83	$3.94	1.2%
10		3,000	$315.51	$332.25	$647.76	$323.40	$332.25	$655.65	$7.89	1.2%
11		5,000	$521.85	$553.75	$1,075.60	$535.00	$553.75	$1,088.75	$13.15	1.2%
12	Avg	1,472	$157.87	$163.02	$320.89	$161.74	$163.02	$324.76	$3.87	1.2%

		2020 Planned Rates	2021 Planned Rates	Change
15	Customer Charge	$6.00	$6.00	$0.00
16	Distribution Energy	$0.03563	$0.03563	$0.00000
17	Revenue Decoupling	$0.00000	$0.00000	$0.00000
18	Residential Assistance Adjustment Factor	$0.00245	$0.00245	$0.00000
19	Pension Adjustment Factor	($0.00014)	($0.00014)	$0.00000
20	Net Metering Recovery Surcharge	$0.00483	$0.00483	$0.00000
21	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
22	AG Consulting Expense	$0.00003	$0.00003	$0.00000
23	Storm Cost Recovery Adjustment Factor	$0.00151	$0.00151	$0.00000
24	Basic Service Cost True Up Factor	$0.00131	$0.00131	$0.00000
25	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
26	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
27	Vegetation Management	$0.00000	$0.00000	$0.00000
28	Transition	($0.00061)	($0.00061)	$0.00000
29	Transmission Energy	$0.03267	$0.03267	$0.00000
30	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
31	System Benefits Charge	$0.00250	$0.00250	$0.00000
32	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
33	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-6 All Electric Schools

		Monthly	2020 Planned			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		25,000	$1,842.75	$2,768.75	$4,611.50	$1,908.50	$2,768.75	$4,677.25	$65.75	1.4%
		40,000	$2,930.40	$4,430.00	$7,360.40	$3,035.60	$4,430.00	$7,465.60	$105.20	1.4%
		50,000	$3,655.50	$5,537.50	$9,193.00	$3,787.00	$5,537.50	$9,324.50	$131.50	1.4%
		60,000	$4,380.60	$6,645.00	$11,025.60	$4,538.40	$6,645.00	$11,183.40	$157.80	1.4%
		150,000	$10,906.50	$16,612.50	$27,519.00	$11,301.00	$16,612.50	$27,913.50	$394.50	1.4%
	Avg	60,748	$4,434.84	$6,727.84	$11,162.68	$4,594.60	$6,727.84	$11,322.44	$159.76	1.4%

		2020 Planned Rates	2021 Planned Rates	Change
	Customer Charge	$30.00	$30.00	$0.00
	Distribution Energy	$0.01633	$0.01633	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00114	$0.00114	$0.00000
	Pension Adjustment Factor	($0.00007)	($0.00007)	$0.00000
	Net Metering Recovery Surcharge	$0.00225	$0.00225	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00070	$0.00070	$0.00000
	Basic Service Cost True Up Factor	$0.00061	$0.00061	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02666	$0.02666	$0.00000
	Energy Efficiency Reconciliation Factor	$0.02013	$0.02276	$0.00263
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional General Time-of-Use

		Monthly kVA	Monthly kWh	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	2021 Planned Delivery	2021 Planned Supplier	2021 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
Hours Use: 350											
		5	1,750	$170.78	$193.81	$364.59	$175.38	$193.81	$369.19	$4.60	1.3%
		10	3,500	$331.55	$387.63	$719.18	$340.76	$387.63	$728.39	$9.21	1.3%
		20	7,000	$653.10	$775.25	$1,428.35	$671.51	$775.25	$1,446.76	$18.41	1.3%
		50	17,500	$1,617.76	$1,938.13	$3,555.89	$1,663.79	$1,938.13	$3,601.92	$46.03	1.3%
		75	26,250	$2,421.64	$2,907.19	$5,328.83	$2,490.68	$2,907.19	$5,397.87	$69.04	1.3%
Avg		20	7,000	$653.10	$775.25	$1,428.35	$671.51	$775.25	$1,446.76	$18.41	1.3%
Hours Use: 500											
		5	2,500	$209.77	$276.88	$486.65	$216.34	$276.88	$493.22	$6.57	1.4%
		10	5,000	$409.53	$553.75	$963.28	$422.68	$553.75	$976.43	$13.15	1.4%
		20	10,000	$809.06	$1,107.50	$1,916.56	$835.36	$1,107.50	$1,942.86	$26.30	1.4%
		50	25,000	$2,007.66	$2,768.75	$4,776.41	$2,073.41	$2,768.75	$4,842.16	$65.75	1.4%
		75	37,500	$3,006.49	$4,153.13	$7,159.62	$3,105.12	$4,153.13	$7,258.25	$98.63	1.4%
Avg		31	15,500	$1,248.55	$1,716.63	$2,965.18	$1,289.31	$1,716.63	$3,005.94	$40.76	1.4%
Hours Use: 650											
		5	3,250	$248.76	$359.94	$608.70	$257.30	$359.94	$617.24	$8.54	1.4%
		10	6,500	$487.51	$719.88	$1,207.39	$504.61	$719.88	$1,224.49	$17.10	1.4%
		20	13,000	$965.02	$1,439.75	$2,404.77	$999.21	$1,439.75	$2,438.96	$34.19	1.4%
		50	32,500	$2,397.56	$3,599.38	$5,996.94	$2,483.03	$3,599.38	$6,082.41	$85.47	1.4%
		75	48,750	$3,591.34	$5,399.06	$8,990.40	$3,719.55	$5,399.06	$9,118.61	$128.21	1.4%
Avg		18	11,700	$869.52	$1,295.78	$2,165.30	$900.29	$1,295.78	$2,196.07	$30.77	1.4%

			2020 Planned Rates	2021 Planned Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.33	$3.33	$0.00
	Transmission Demand		$10.63	$10.63	$0.00
	Distribution Energy - Peak		$0.02290	$0.02290	$0.00000
	Distribution Energy - Low Load		$0.01604	$0.01604	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.02013	$0.02276	$0.00263
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	24%			
	Low A Use:	76%			

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional Seasonal General Time-of-Use

		Monthly kVA	Monthly kWh	2020 Planned Delivery	2020 Planned Supplier	2020 Planned Total	2021 Planned Delivery	2021 Planned Supplier	2021 Planned Total	Total Bill Impact Change	Total Bill Impact % Change
Hours Use: 50											
		5	250	$69.94	$27.69	$97.63	$70.60	$27.69	$98.29	$0.66	0.7%
		10	500	$129.89	$55.38	$185.27	$131.20	$55.38	$186.58	$1.31	0.7%
		20	1,000	$249.78	$110.75	$360.53	$252.41	$110.75	$363.16	$2.63	0.7%
		50	2,500	$609.45	$276.88	$886.33	$616.02	$276.88	$892.90	$6.57	0.7%
		75	3,750	$909.17	$415.31	$1,324.48	$919.03	$415.31	$1,334.34	$9.86	0.7%
Avg		9	450	$117.90	$49.84	$167.74	$119.08	$49.84	$168.92	$1.18	0.7%
Hours Use: 150											
		5	750	$106.63	$83.06	$189.69	$108.61	$83.06	$191.67	$1.98	1.0%
		10	1,500	$203.27	$166.13	$369.40	$207.21	$166.13	$373.34	$3.94	1.1%
		20	3,000	$396.54	$332.25	$728.79	$404.43	$332.25	$736.68	$7.89	1.1%
		50	7,500	$976.34	$830.63	$1,806.97	$996.06	$830.63	$1,826.69	$19.72	1.1%
		75	11,250	$1,459.51	$1,245.94	$2,705.45	$1,489.09	$1,245.94	$2,735.03	$29.58	1.1%
Avg		10	1,500	$203.27	$166.13	$369.40	$207.21	$166.13	$373.34	$3.94	1.1%
Hours Use: 300											
		5	1,500	$161.67	$166.13	$327.80	$165.61	$166.13	$331.74	$3.94	1.2%
		10	3,000	$313.34	$332.25	$645.59	$321.23	$332.25	$653.48	$7.89	1.2%
		20	6,000	$616.67	$664.50	$1,281.17	$632.45	$664.50	$1,296.95	$15.78	1.2%
		50	15,000	$1,526.68	$1,661.25	$3,187.93	$1,566.13	$1,661.25	$3,227.38	$39.45	1.2%
		75	22,500	$2,285.01	$2,491.88	$4,776.89	$2,344.19	$2,491.88	$4,836.07	$59.18	1.2%
Avg		13	3,900	$404.34	$431.93	$836.27	$414.59	$431.93	$846.52	$10.25	1.2%

			2020 Planned Rates	2021 Planned Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.36	$3.36	$0.00
	Transmission Demand		$4.96	$4.96	$0.00
	Distribution Energy - Peak		$0.04453	$0.04453	$0.00000
	Distribution Energy - Low Load		$0.03745	$0.03745	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.02013	$0.02276	$0.00263
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	23%			
	Low A Use:	77%			

Cape Light Compact JPE

Average Customer Use

October 2018 Delivery Rates. September 2018 Supply Rates.

Rate Class Information					Total Bill Comparison	
Rate		Load Fact	Avg Kwh	Avg Kw	2018 vs. 2021 Change in Total Bill Amount	%
Rate R-1 Residential	R-1		516		7.19	5.99%
Rate R-2 Residential Assistance	R-2		488		1.10	1.63%
Rate R-3 Residential Space Heating	R-3		740		10.31	6.39%
Rate R-4 Residential Assistance Space Heating	R-4		874		1.97	1.76%
Rate G-1 Small General Service	G-1	0.200	400	2	6.98	8.22%
Rate G-1 Small General Service	G-1	0.300	5,700	19	99.52	9.27%
Rate G-1 Small General Service	G-1	0.400	10,800	27	188.56	9.59%
Rate G-1 Seasonal Small General Service	G-1S	0.050	450	9	7.86	7.13%
Rate G-1 Seasonal Small General Service	G-1S	0.150	1,200	8	20.95	7.38%
Rate G-1 Seasonal Small General Service	G-1S	0.300	2,700	9	47.15	8.06%
Rate G-2 Medium General Time-of-Use	G-2	0.300	61,500	205	1,073.79	9.52%
Rate G-2 Medium General Time-of-Use	G-2	0.400	85,600	214	1,494.58	10.05%
Rate G-2 Medium General Time-of-Use	G-2	0.500	126,500	253	2,208.69	10.43%
Rate G-3 Large General Time-Of-Use	G-3	0.350	373,100	1,066	6,514.32	10.54%
Rate G-3 Large General Time-Of-Use	G-3	0.450	354,600	788	6,191.32	10.91%
Rate G-3 Large General Time-Of-Use	G-3	0.550	614,900	1,118	10,736.15	11.24%
Rate G-4 General Power	G-4	0.150	7,800	52	136.18	9.56%
Rate G-4 General Power	G-4	0.250	6,750	27	117.85	10.21%
Rate G-4 General Power	G-4	0.350	9,450	27	164.99	10.54%
Rate G-5 Commercial Space Heating	G-5		1,472		25.70	8.59%
Rate G-6 All Electric Schools	G-6		60,748		1,060.66	10.34%
Rate G-7 Optional General Time-of-Use	G-7	0.350	7,000	20	122.22	9.23%
Rate G-7 Optional General Time-of-Use	G-7	0.500	15,500	31	270.63	9.89%
Rate G-7 Optional General Time-of-Use	G-7	0.650	11,700	18	204.28	10.26%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.050	450	9	7.85	4.87%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.150	1,500	10	26.19	7.54%
Rate G-7 Optional Seasonal General Time-of-Use	G-7S	0.300	3,900	13	68.09	8.75%

The 2018 EES rates rates are effective January 1, 2018 through December 31, 2018, and were approved by the Department on December 22, 2017. S
The 2021 EES rates are estimated for effect January 1, 2021 through December 31, 2021.
All rates include the most up to date information as of the date of filing. Refer to the Cape Light Compact JPE's 2019-2021 Three-Year Plan for inform
The bill analysis for the 2018 EES rates compared to the 2021 EES rates is provided consistent with D.P.U. 08-50-D.

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-1 Residential

		Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		100	$18.30	$10.60	$28.90	$19.69	$10.60	$30.29	$1.39	4.8%
		200	$29.60	$21.20	$50.80	$32.39	$21.20	$53.59	$2.79	5.5%
		300	$40.90	$31.80	$72.70	$45.08	$31.80	$76.88	$4.18	5.7%
		400	$52.20	$42.40	$94.60	$57.78	$42.40	$100.18	$5.58	5.9%
		500	$63.51	$53.00	$116.51	$70.47	$53.00	$123.47	$6.96	6.0%
		600	$74.81	$63.60	$138.41	$83.16	$63.60	$146.76	$8.35	6.0%
		700	$86.11	$74.20	$160.31	$95.86	$74.20	$170.06	$9.75	6.1%
		800	$97.41	$84.80	$182.21	$108.55	$84.80	$193.35	$11.14	6.1%
		900	$108.71	$95.40	$204.11	$121.25	$95.40	$216.65	$12.54	6.1%
		1,000	$120.01	$106.00	$226.01	$133.94	$106.00	$239.94	$13.93	6.2%
		1,250	$148.26	$132.50	$280.76	$165.68	$132.50	$298.18	$17.42	6.2%
		1,500	$176.52	$159.00	$335.52	$197.41	$159.00	$356.41	$20.89	6.2%
		2,000	$233.02	$212.00	$445.02	$260.88	$212.00	$472.88	$27.86	6.3%
	Avg	516	$65.31	$54.70	$120.01	$72.50	$54.70	$127.20	$7.19	6.0%

		2018 In Effect Rates	2021 Planned Rates	Change
	Customer Charge	$7.00	$7.00	$0.00
	Distribution Energy	$0.04372	$0.04372	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00004	$0.00004	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.03058	$0.03058	$0.00000
	Energy Efficiency Reconciliation Factor	$0.01859	$0.03252	$0.01393
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-2 Residential Assistance

		Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$10.62	$6.78	$17.40	$10.84	$6.78	$17.62	$0.22	1.3%
4		200	$16.76	$13.57	$30.33	$17.21	$13.57	$30.78	$0.45	1.5%
5		300	$22.89	$20.35	$43.24	$23.57	$20.35	$43.92	$0.68	1.6%
6		400	$29.03	$27.14	$56.17	$29.93	$27.14	$57.07	$0.90	1.6%
7		500	$35.17	$33.92	$69.09	$36.29	$33.92	$70.21	$1.12	1.6%
8		600	$41.31	$40.70	$82.01	$42.66	$40.70	$83.36	$1.35	1.6%
9		700	$47.44	$47.49	$94.93	$49.02	$47.49	$96.51	$1.58	1.7%
10		800	$53.58	$54.27	$107.85	$55.38	$54.27	$109.65	$1.80	1.7%
11		900	$59.72	$61.06	$120.78	$61.75	$61.06	$122.81	$2.03	1.7%
12		1,000	$65.86	$67.84	$133.70	$68.11	$67.84	$135.95	$2.25	1.7%
13		1,250	$81.20	$84.80	$166.00	$84.02	$84.80	$168.82	$2.82	1.7%
14		1,500	$96.54	$101.76	$198.30	$99.92	$101.76	$201.68	$3.38	1.7%
15		2,000	$127.23	$135.68	$262.91	$131.74	$135.68	$267.42	$4.51	1.7%
16	Avg	488	$34.43	$33.11	$67.54	$35.53	$33.11	$68.64	$1.10	1.6%

		2018 In Effect Rates	2021 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.04372	$0.04372	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00375	$0.00375	$0.00000
23	Pension Adjustment Factor	($0.00011)	($0.00011)	$0.00000
24	Net Metering Recovery Surcharge	$0.00738	$0.00738	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00004	$0.00004	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00231	$0.00231	$0.00000
28	Basic Service Cost True Up Factor	$0.00200	$0.00200	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.03058	$0.03058	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.00148	$0.00500	$0.00352
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000
38	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-3 Residential Space Heating

		Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$17.27	$10.60	$27.87	$18.67	$10.60	$29.27	$1.40	5.0%
4		200	$27.54	$21.20	$48.74	$30.33	$21.20	$51.53	$2.79	5.7%
5		300	$37.82	$31.80	$69.62	$42.00	$31.80	$73.80	$4.18	6.0%
6		400	$48.09	$42.40	$90.49	$53.66	$42.40	$96.06	$5.57	6.2%
7		500	$58.36	$53.00	$111.36	$65.33	$53.00	$118.33	$6.97	6.3%
8		600	$68.63	$63.60	$132.23	$76.99	$63.60	$140.59	$8.36	6.3%
9		700	$78.90	$74.20	$153.10	$88.66	$74.20	$162.86	$9.76	6.4%
10		800	$89.18	$84.80	$173.98	$100.32	$84.80	$185.12	$11.14	6.4%
11		900	$99.45	$95.40	$194.85	$111.99	$95.40	$207.39	$12.54	6.4%
12		1,000	$109.72	$106.00	$215.72	$123.65	$106.00	$229.65	$13.93	6.5%
13		1,250	$135.40	$132.50	$267.90	$152.81	$132.50	$285.31	$17.41	6.5%
14		1,500	$161.08	$159.00	$320.08	$181.98	$159.00	$340.98	$20.90	6.5%
15		2,000	$212.44	$212.00	$424.44	$240.30	$212.00	$452.30	$27.86	6.6%
16	Avg	740	$83.01	$78.44	$161.45	$93.32	$78.44	$171.76	$10.31	6.4%

		2018 In Effect Rates	2021 Planned Rates	Change
19	Customer Charge	$7.00	$7.00	$0.00
20	Distribution Energy	$0.03835	$0.03835	$0.00000
21	Revenue Decoupling	$0.00000	$0.00000	$0.00000
22	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
23	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
24	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
25	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
26	AG Consulting Expense	$0.00003	$0.00003	$0.00000
27	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
28	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
29	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
30	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
31	Vegetation Management	$0.00000	$0.00000	$0.00000
32	Transition	($0.00061)	($0.00061)	$0.00000
33	Transmission Energy	$0.02896	$0.02896	$0.00000
34	Energy Efficiency Reconciliation Factor	$0.01859	$0.03252	$0.01393
35	System Benefits Charge	$0.00250	$0.00250	$0.00000
36	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
37	Basic Service Charge	$0.10600	$0.10600	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

Rate R-4 Residential Assistance Space Heating

		Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		100	$9.96	$6.78	$16.74	$10.18	$6.78	$16.96	$0.22	1.3%
		200	$15.44	$13.57	$29.01	$15.89	$13.57	$29.46	$0.45	1.6%
		300	$20.92	$20.35	$41.27	$21.59	$20.35	$41.94	$0.67	1.6%
		400	$26.40	$27.14	$53.54	$27.30	$27.14	$54.44	$0.90	1.7%
		500	$31.88	$33.92	$65.80	$33.00	$33.92	$66.92	$1.12	1.7%
		600	$37.35	$40.70	$78.05	$38.71	$40.70	$79.41	$1.36	1.7%
		700	$42.83	$47.49	$90.32	$44.41	$47.49	$91.90	$1.58	1.7%
		800	$48.31	$54.27	$102.58	$50.11	$54.27	$104.38	$1.80	1.8%
		900	$53.79	$61.06	$114.85	$55.82	$61.06	$116.88	$2.03	1.8%
		1,000	$59.27	$67.84	$127.11	$61.52	$67.84	$129.36	$2.25	1.8%
		1,250	$72.97	$84.80	$157.77	$75.78	$84.80	$160.58	$2.81	1.8%
		1,500	$86.67	$101.76	$188.43	$90.04	$101.76	$191.80	$3.37	1.8%
		2,000	$114.06	$135.68	$249.74	$118.57	$135.68	$254.25	$4.51	1.8%
	Avg	874	$52.37	$59.29	$111.66	$54.34	$59.29	$113.63	$1.97	1.8%

		2018 In Effect Rates	2021 Planned Rates	Change
	Customer Charge	$7.00	$7.00	$0.00
	Distribution Energy	$0.03835	$0.03835	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00295	$0.00295	$0.00000
	Pension Adjustment Factor	($0.00010)	($0.00010)	$0.00000
	Net Metering Recovery Surcharge	$0.00580	$0.00580	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00003	$0.00003	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00182	$0.00182	$0.00000
	Basic Service Cost True Up Factor	$0.00157	$0.00157	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02896	$0.02896	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00148	$0.00500	$0.00352
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.10600	$0.10600	$0.00000
	Low Income Discount	36%	36%	0%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Small General Service

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 200									
		5	1,000	$92.50	$110.75	$203.25	$109.96	$110.75	$220.71	$17.46	8.6%
		10	2,000	$179.00	$221.50	$400.50	$213.92	$221.50	$435.42	$34.92	8.7%
		15	3,000	$269.00	$332.25	$601.25	$321.38	$332.25	$653.63	$52.38	8.7%
		25	5,000	$431.20	$553.75	$984.95	$518.50	$553.75	$1,072.25	$87.30	8.9%
		50	10,000	$836.70	$1,107.50	$1,944.20	$1,011.30	$1,107.50	$2,118.80	$174.60	9.0%
		100	20,000	$1,647.70	$2,215.00	$3,862.70	$1,996.90	$2,215.00	$4,211.90	$349.20	9.0%
	Avg	2	400	$40.60	$44.30	$84.90	$47.58	$44.30	$91.88	$6.98	8.2%
		Hours Use: 300									
		5	1,500	$135.75	$166.13	$301.88	$161.94	$166.13	$328.07	$26.19	8.7%
		10	3,000	$244.75	$332.25	$577.00	$297.13	$332.25	$629.38	$52.38	9.1%
		15	4,500	$354.27	$498.38	$852.65	$432.84	$498.38	$931.22	$78.57	9.2%
		25	7,500	$573.32	$830.63	$1,403.95	$704.27	$830.63	$1,534.90	$130.95	9.3%
		50	15,000	$1,120.95	$1,661.25	$2,782.20	$1,382.85	$1,661.25	$3,044.10	$261.90	9.4%
		100	30,000	$2,216.20	$3,322.50	$5,538.70	$2,740.00	$3,322.50	$6,062.50	$523.80	9.5%
	Avg	19	5,700	$441.89	$631.28	$1,073.17	$541.41	$631.28	$1,172.69	$99.52	9.3%
		Hours Use: 400									
		5	2,000	$179.00	$221.50	$400.50	$213.92	$221.50	$435.42	$34.92	8.7%
		10	4,000	$301.60	$443.00	$744.60	$371.44	$443.00	$814.44	$69.84	9.4%
		15	6,000	$439.55	$664.50	$1,104.05	$544.31	$664.50	$1,208.81	$104.76	9.5%
		25	10,000	$715.45	$1,107.50	$1,822.95	$890.05	$1,107.50	$1,997.55	$174.60	9.6%
		50	20,000	$1,405.20	$2,215.00	$3,620.20	$1,754.40	$2,215.00	$3,969.40	$349.20	9.6%
		100	40,000	$2,784.70	$4,430.00	$7,214.70	$3,483.10	$4,430.00	$7,913.10	$698.40	9.7%
	Avg	27	10,800	$770.63	$1,196.10	$1,966.73	$959.19	$1,196.10	$2,155.29	$188.56	9.6%

		2018 In Effect	2021 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand <=10 kW	$0.00	$0.00	$0.00
	Distribution Demand >10 kW	$4.85	$4.85	$0.00
	Distribution Energy <=2,300 kWh	$0.04067	$0.04067	$0.00000
	Distribution Energy >2,300 kWh	$0.01102	$0.01102	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor	$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02636	$0.02636	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.02276	$0.01746
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-1 Seasonal Small General Service

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
Hours Use: 50											
		5	250	$36.22	$27.69	$63.91	$40.59	$27.69	$68.28	$4.37	6.8%
		10	500	$66.45	$55.38	$121.83	$75.18	$55.38	$130.56	$8.73	7.2%
		20	1,000	$169.39	$110.75	$280.14	$186.85	$110.75	$297.60	$17.46	6.2%
		50	2,500	$442.38	$276.88	$719.26	$486.03	$276.88	$762.91	$43.65	6.1%
Avg		9	450	$60.40	$49.84	$110.24	$68.26	$49.84	$118.10	$7.86	7.1%
Hours Use: 150											
		5	750	$96.67	$83.06	$179.73	$109.76	$83.06	$192.82	$13.09	7.3%
		10	1,500	$187.34	$166.13	$353.47	$213.53	$166.13	$379.66	$26.19	7.4%
		20	3,000	$349.72	$332.25	$681.97	$402.10	$332.25	$734.35	$52.38	7.7%
		50	7,500	$790.78	$830.63	$1,621.41	$921.73	$830.63	$1,752.36	$130.95	8.1%
Avg		8	1,200	$151.07	$132.90	$283.97	$172.02	$132.90	$304.92	$20.95	7.4%
Hours Use: 300											
		5	1,500	$187.34	$166.13	$353.47	$213.53	$166.13	$379.66	$26.19	7.4%
		10	3,000	$307.22	$332.25	$639.47	$359.60	$332.25	$691.85	$52.38	8.2%
		20	6,000	$558.76	$664.50	$1,223.26	$663.52	$664.50	$1,328.02	$104.76	8.6%
		50	15,000	$1,313.38	$1,661.25	$2,974.63	$1,575.28	$1,661.25	$3,236.53	$261.90	8.8%
Avg		9	2,700	$286.31	$299.03	$585.34	$333.46	$299.03	$632.49	$47.15	8.1%

		2018 In Effect Rates	2021 Planned Rates	Change
Customer Charge		$6.00	$6.00	$0.00
Distribution Demand <=10 kW		$0.00	$0.00	$0.00
Distribution Demand >10 kW		$4.25	$4.25	$0.00
Distribution Energy <=1,800 kWh		$0.07506	$0.07506	$0.00000
Distribution Energy >1,800 kWh		$0.02385	$0.02385	$0.00000
Revenue Decoupling		$0.00000	$0.00000	$0.00000
Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
AG Consulting Expense		$0.00002	$0.00002	$0.00000
Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
Vegetation Management		$0.00000	$0.00000	$0.00000
Transition		($0.00061)	($0.00061)	$0.00000
Transmission Energy		$0.02636	$0.02636	$0.00000
Energy Efficiency Reconciliation Factor		$0.00530	$0.02276	$0.01746
System Benefits Charge		$0.00250	$0.00250	$0.00000
Renewable Energy Charge		$0.00050	$0.00050	$0.00000
Basic Service Charge		$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-2 Medium General Time-of-Use

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kVA	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 300									
		100	30,000	$2,287.66	$3,404.40	$5,692.06	$2,811.46	$3,404.40	$6,215.86	$523.80	9.2%
		150	45,000	$3,246.49	$5,106.60	$8,353.09	$4,032.19	$5,106.60	$9,138.79	$785.70	9.4%
		200	60,000	$4,205.32	$6,808.80	$11,014.12	$5,252.92	$6,808.80	$12,061.72	$1,047.60	9.5%
		300	90,000	$6,122.98	$10,213.20	$16,336.18	$7,694.38	$10,213.20	$17,907.58	$1,571.40	9.6%
		500	150,000	$9,958.31	$17,022.00	$26,980.31	$12,577.31	$17,022.00	$29,599.31	$2,619.00	9.7%
	Avg	205	61,500	$4,301.21	$6,979.02	$11,280.23	$5,375.00	$6,979.02	$12,354.02	$1,073.79	9.5%
		Hours Use: 400									
		100	40,000	$2,604.55	$4,539.20	$7,143.75	$3,302.95	$4,539.20	$7,842.15	$698.40	9.8%
		150	60,000	$3,721.82	$6,808.80	$10,530.62	$4,769.42	$6,808.80	$11,578.22	$1,047.60	9.9%
		200	80,000	$4,839.10	$9,078.40	$13,917.50	$6,235.90	$9,078.40	$15,314.30	$1,396.80	10.0%
		300	120,000	$7,073.64	$13,617.60	$20,691.24	$9,168.84	$13,617.60	$22,786.44	$2,095.20	10.1%
		500	200,000	$11,542.74	$22,696.00	$34,238.74	$15,034.74	$22,696.00	$37,730.74	$3,492.00	10.2%
	Avg	214	85,600	$5,151.93	$9,713.89	$14,865.82	$6,646.51	$9,713.89	$16,360.40	$1,494.58	10.1%
		Hours Use: 500									
		100	50,000	$2,921.44	$5,674.00	$8,595.44	$3,794.44	$5,674.00	$9,468.44	$873.00	10.2%
		150	75,000	$4,197.15	$8,511.00	$12,708.15	$5,506.65	$8,511.00	$14,017.65	$1,309.50	10.3%
		200	100,000	$5,472.87	$11,348.00	$16,820.87	$7,218.87	$11,348.00	$18,566.87	$1,746.00	10.4%
		300	150,000	$8,024.31	$17,022.00	$25,046.31	$10,643.31	$17,022.00	$27,665.31	$2,619.00	10.5%
		500	250,000	$13,127.18	$28,370.00	$41,497.18	$17,492.18	$28,370.00	$45,862.18	$4,365.00	10.5%
	Avg	253	126,500	$6,825.13	$14,355.22	$21,180.35	$9,033.82	$14,355.22	$23,389.04	$2,208.69	10.4%

		2018 In Effect	2021 Planned	
		Rates	Rates	Change
	Customer Charge	$370.00	$370.00	$0.00
	Distribution Demand	$1.51	$1.51	$0.00
	Transmission Demand	$8.16	$8.16	$0.00
	Distribution Energy - Peak	$0.01769	$0.01769	$0.00000
	Distribution Energy - Low A	$0.01488	$0.01488	$0.00000
	Distribution Energy - Low B	$0.00965	$0.00965	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00138	$0.00138	$0.00000
	Pension Adjustment Factor	($0.00005)	($0.00005)	$0.00000
	Net Metering Recovery Surcharge	$0.00273	$0.00273	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00085	$0.00085	$0.00000
	Basic Service Cost True Up Factor	$0.00074	$0.00074	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00277	$0.00277	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.02276	$0.01746
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11348	$0.11348	$0.00000

	Peak Use:	28%
	Low A Use:	25%
	Low B Use:	47%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-3 Large General Time-Of-Use

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kVA	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 350									
		500	175,000	$9,637.41	$19,859.00	$29,496.41	$12,692.91	$19,859.00	$32,551.91	$3,055.50	10.4%
		750	262,500	$13,991.12	$29,788.50	$43,779.62	$18,574.37	$29,788.50	$48,362.87	$4,583.25	10.5%
		1,000	350,000	$18,344.82	$39,718.00	$58,062.82	$24,455.82	$39,718.00	$64,173.82	$6,111.00	10.5%
		2,000	700,000	$35,759.64	$79,436.00	$115,195.64	$47,981.64	$79,436.00	$127,417.64	$12,222.00	10.6%
		3,000	1,050,000	$53,174.46	$119,154.00	$172,328.46	$71,507.46	$119,154.00	$190,661.46	$18,333.00	10.6%
	Avg	1,066	373,100	$19,494.20	$42,339.39	$61,833.59	$26,008.52	$42,339.39	$68,347.91	$6,514.32	10.5%
		Hours Use: 450									
		500	225,000	$10,826.67	$25,533.00	$36,359.67	$14,755.17	$25,533.00	$40,288.17	$3,928.50	10.8%
		750	337,500	$15,775.01	$38,299.50	$54,074.51	$21,667.76	$38,299.50	$59,967.26	$5,892.75	10.9%
		1,000	450,000	$20,723.34	$51,066.00	$71,789.34	$28,580.34	$51,066.00	$79,646.34	$7,857.00	10.9%
		2,000	900,000	$40,516.68	$102,132.00	$142,648.68	$56,230.68	$102,132.00	$158,362.68	$15,714.00	11.0%
		3,000	1,350,000	$60,310.02	$153,198.00	$213,508.02	$83,881.02	$153,198.00	$237,079.02	$23,571.00	11.0%
	Avg	788	354,600	$16,527.15	$40,240.01	$56,767.16	$22,718.47	$40,240.01	$62,958.48	$6,191.32	10.9%
		Hours Use: 550									
		500	275,000	$12,015.93	$31,207.00	$43,222.93	$16,817.43	$31,207.00	$48,024.43	$4,801.50	11.1%
		750	412,500	$17,558.90	$46,810.50	$64,369.40	$24,761.15	$46,810.50	$71,571.65	$7,202.25	11.2%
		1,000	550,000	$23,101.86	$62,414.00	$85,515.86	$32,704.86	$62,414.00	$95,118.86	$9,603.00	11.2%
		2,000	1,100,000	$45,273.72	$124,828.00	$170,101.72	$64,479.72	$124,828.00	$189,307.72	$19,206.00	11.3%
		3,000	1,650,000	$67,445.58	$187,242.00	$254,687.58	$96,254.58	$187,242.00	$283,496.58	$28,809.00	11.3%
	Avg	1,118	614,900	$25,718.14	$69,778.85	$95,496.99	$36,454.29	$69,778.85	$106,233.14	$10,736.15	11.2%

		2018 In Effect	2021 Planned	
		Rates	Rates	Change
	Customer Charge	$930.00	$930.00	$0.00
	Distribution Demand	$0.87	$0.87	$0.00
	Transmission Demand	$8.22	$8.22	$0.00
	Distribution Energy - Peak	$0.01242	$0.01242	$0.00000
	Distribution Energy - Low A	$0.01142	$0.01142	$0.00000
	Distribution Energy - Low B	$0.00791	$0.00791	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00091	$0.00091	$0.00000
	Pension Adjustment Factor	($0.00004)	($0.00004)	$0.00000
	Net Metering Recovery Surcharge	$0.00180	$0.00180	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00056	$0.00056	$0.00000
	Basic Service Cost True Up Factor	$0.00049	$0.00049	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00000	$0.00000	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.02276	$0.01746
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11348	$0.11348	$0.00000

	Peak Use:	27%
	Low A Use:	25%
	Low B Use:	48%

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-4 General Power

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kW	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 150									
		20	3,000	$219.31	$332.25	$551.56	$271.69	$332.25	$603.94	$52.38	9.5%
		30	4,500	$325.97	$498.38	$824.35	$404.54	$498.38	$902.92	$78.57	9.5%
		40	6,000	$432.62	$664.50	$1,097.12	$537.38	$664.50	$1,201.88	$104.76	9.5%
		70	10,500	$752.59	$1,162.88	$1,915.47	$935.92	$1,162.88	$2,098.80	$183.33	9.6%
		100	15,000	$1,072.55	$1,661.25	$2,733.80	$1,334.45	$1,661.25	$2,995.70	$261.90	9.6%
	Avg	52	7,800	$560.61	$863.85	$1,424.46	$696.79	$863.85	$1,560.64	$136.18	9.6%
		Hours Use: 250									
		20	5,000	$302.45	$553.75	$856.20	$389.75	$553.75	$943.50	$87.30	10.2%
		30	7,500	$450.68	$830.63	$1,281.31	$581.63	$830.63	$1,412.26	$130.95	10.2%
		40	10,000	$598.90	$1,107.50	$1,706.40	$773.50	$1,107.50	$1,881.00	$174.60	10.2%
		70	17,500	$1,043.58	$1,938.13	$2,981.71	$1,349.13	$1,938.13	$3,287.26	$305.55	10.2%
		100	25,000	$1,488.25	$2,768.75	$4,257.00	$1,924.75	$2,768.75	$4,693.50	$436.50	10.3%
	Avg	27	6,750	$406.21	$747.56	$1,153.77	$524.06	$747.56	$1,271.62	$117.85	10.2%
		Hours Use: 350									
		20	7,000	$385.59	$775.25	$1,160.84	$507.81	$775.25	$1,283.06	$122.22	10.5%
		30	10,500	$575.39	$1,162.88	$1,738.27	$758.72	$1,162.88	$1,921.60	$183.33	10.5%
		40	14,000	$765.18	$1,550.50	$2,315.68	$1,009.62	$1,550.50	$2,560.12	$244.44	10.6%
		70	24,500	$1,334.57	$2,713.38	$4,047.95	$1,762.34	$2,713.38	$4,475.72	$427.77	10.6%
		100	35,000	$1,903.95	$3,876.25	$5,780.20	$2,515.05	$3,876.25	$6,391.30	$611.10	10.6%
	Avg	27	9,450	$518.45	$1,046.59	$1,565.04	$683.44	$1,046.59	$1,730.03	$164.99	10.5%

		2018 In Effect	2021 Planned	
		Rates	Rates	Change
	Customer Charge	$6.00	$6.00	$0.00
	Distribution Demand	$1.74	$1.74	$0.00
	Transmission Demand	$2.69	$2.69	$0.00
	Distribution Energy	$0.01998	$0.01998	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00202	$0.00202	$0.00000
	Pension Adjustment Factor	($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge	$0.00399	$0.00399	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00125	$0.00125	$0.00000
	Basic Service Cost True Up Factor	$0.00108	$0.00108	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.00326	$0.00326	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.02276	$0.01746
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-5 Commercial Space Heating

		Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
3		100	$14.83	$11.08	$25.91	$16.58	$11.08	$27.66	$1.75	6.8%
4		200	$23.67	$22.15	$45.82	$27.16	$22.15	$49.31	$3.49	7.6%
5		300	$32.50	$33.23	$65.73	$37.74	$33.23	$70.97	$5.24	8.0%
6		500	$50.17	$55.38	$105.55	$58.90	$55.38	$114.28	$8.73	8.3%
7		750	$72.26	$83.06	$155.32	$85.35	$83.06	$168.41	$13.09	8.4%
8		1,000	$94.34	$110.75	$205.09	$111.80	$110.75	$222.55	$17.46	8.5%
9		1,500	$138.51	$166.13	$304.64	$164.70	$166.13	$330.83	$26.19	8.6%
10		3,000	$271.02	$332.25	$603.27	$323.40	$332.25	$655.65	$52.38	8.7%
11		5,000	$447.70	$553.75	$1,001.45	$535.00	$553.75	$1,088.75	$87.30	8.7%
12	Avg	1,472	$136.04	$163.02	$299.06	$161.74	$163.02	$324.76	$25.70	8.6%

		2018 In Effect Rates	2021 Planned Rates	Change
15	Customer Charge	$6.00	$6.00	$0.00
16	Distribution Energy	$0.03563	$0.03563	$0.00000
17	Revenue Decoupling	$0.00000	$0.00000	$0.00000
18	Residential Assistance Adjustment Factor	$0.00245	$0.00245	$0.00000
19	Pension Adjustment Factor	($0.00014)	($0.00014)	$0.00000
20	Net Metering Recovery Surcharge	$0.00483	$0.00483	$0.00000
21	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
22	AG Consulting Expense	$0.00003	$0.00003	$0.00000
23	Storm Cost Recovery Adjustment Factor	$0.00151	$0.00151	$0.00000
24	Basic Service Cost True Up Factor	$0.00131	$0.00131	$0.00000
25	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
26	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
27	Vegetation Management	$0.00000	$0.00000	$0.00000
28	Transition	($0.00061)	($0.00061)	$0.00000
29	Transmission Energy	$0.03267	$0.03267	$0.00000
30	Energy Efficiency Reconciliation Factor	$0.00530	$0.02276	$0.01746
31	System Benefits Charge	$0.00250	$0.00250	$0.00000
32	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
33	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-6 All Electric Schools

		Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		25,000	$1,472.00	$2,768.75	$4,240.75	$1,908.50	$2,768.75	$4,677.25	$436.50	10.3%
		40,000	$2,337.20	$4,430.00	$6,767.20	$3,035.60	$4,430.00	$7,465.60	$698.40	10.3%
		50,000	$2,914.00	$5,537.50	$8,451.50	$3,787.00	$5,537.50	$9,324.50	$873.00	10.3%
		60,000	$3,490.80	$6,645.00	$10,135.80	$4,538.40	$6,645.00	$11,183.40	$1,047.60	10.3%
		150,000	$8,682.00	$16,612.50	$25,294.50	$11,301.00	$16,612.50	$27,913.50	$2,619.00	10.4%
	Avg	60,748	$3,533.94	$6,727.84	$10,261.78	$4,594.60	$6,727.84	$11,322.44	$1,060.66	10.3%

		2018 In Effect Rates	2021 Planned Rates	Change
	Customer Charge	$30.00	$30.00	$0.00
	Distribution Energy	$0.01633	$0.01633	$0.00000
	Revenue Decoupling	$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor	$0.00114	$0.00114	$0.00000
	Pension Adjustment Factor	($0.00007)	($0.00007)	$0.00000
	Net Metering Recovery Surcharge	$0.00225	$0.00225	$0.00000
	Long Term Renewable Contract Adjustment	$0.00236	$0.00236	$0.00000
	AG Consulting Expense	$0.00001	$0.00001	$0.00000
	Storm Cost Recovery Adjustment Factor	$0.00070	$0.00070	$0.00000
	Basic Service Cost True Up Factor	$0.00061	$0.00061	$0.00000
	Solar Program Cost Adjustment Factor	$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor	$0.00000	$0.00000	$0.00000
	Vegetation Management	$0.00000	$0.00000	$0.00000
	Transition	($0.00061)	($0.00061)	$0.00000
	Transmission Energy	$0.02666	$0.02666	$0.00000
	Energy Efficiency Reconciliation Factor	$0.00530	$0.02276	$0.01746
	System Benefits Charge	$0.00250	$0.00250	$0.00000
	Renewable Energy Charge	$0.00050	$0.00050	$0.00000
	Basic Service Charge	$0.11075	$0.11075	$0.00000

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional General Time-of-Use

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kVA	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 350									
		5	1,750	$144.82	$193.81	$338.63	$175.38	$193.81	$369.19	$30.56	9.0%
		10	3,500	$279.65	$387.63	$667.28	$340.76	$387.63	$728.39	$61.11	9.2%
		20	7,000	$549.29	$775.25	$1,324.54	$671.51	$775.25	$1,446.76	$122.22	9.2%
		50	17,500	$1,358.24	$1,938.13	$3,296.37	$1,663.79	$1,938.13	$3,601.92	$305.55	9.3%
		75	26,250	$2,032.36	$2,907.19	$4,939.55	$2,490.68	$2,907.19	$5,397.87	$458.32	9.3%
	Avg	20	7,000	$549.29	$775.25	$1,324.54	$671.51	$775.25	$1,446.76	$122.22	9.2%
		Hours Use: 500									
		5	2,500	$172.69	$276.88	$449.57	$216.34	$276.88	$493.22	$43.65	9.7%
		10	5,000	$335.38	$553.75	$889.13	$422.68	$553.75	$976.43	$87.30	9.8%
		20	10,000	$660.76	$1,107.50	$1,768.26	$835.36	$1,107.50	$1,942.86	$174.60	9.9%
		50	25,000	$1,636.91	$2,768.75	$4,405.66	$2,073.41	$2,768.75	$4,842.16	$436.50	9.9%
		75	37,500	$2,450.37	$4,153.13	$6,603.50	$3,105.12	$4,153.13	$7,258.25	$654.75	9.9%
	Avg	31	15,500	$1,018.68	$1,716.63	$2,735.31	$1,289.31	$1,716.63	$3,005.94	$270.63	9.9%
		Hours Use: 650									
		5	3,250	$200.56	$359.94	$560.50	$257.30	$359.94	$617.24	$56.74	10.1%
		10	6,500	$391.12	$719.88	$1,111.00	$504.61	$719.88	$1,224.49	$113.49	10.2%
		20	13,000	$772.23	$1,439.75	$2,211.98	$999.21	$1,439.75	$2,438.96	$226.98	10.3%
		50	32,500	$1,915.58	$3,599.38	$5,514.96	$2,483.03	$3,599.38	$6,082.41	$567.45	10.3%
		75	48,750	$2,868.37	$5,399.06	$8,267.43	$3,719.55	$5,399.06	$9,118.61	$851.18	10.3%
	Avg	18	11,700	$696.01	$1,295.78	$1,991.79	$900.29	$1,295.78	$2,196.07	$204.28	10.3%

			2018 In Effect	2021 Planned	
			Rates	Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.33	$3.33	$0.00
	Transmission Demand		$10.63	$10.63	$0.00
	Distribution Energy - Peak		$0.02290	$0.02290	$0.00000
	Distribution Energy - Low Load		$0.01604	$0.01604	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.00530	$0.02276	$0.01746
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	24%			
	Low A Use:	76%			

Cape Light Compact JPE
Calculation of Monthly Typical Bill
Proposed January 1, 2019

South Shore, Cape Cod, and Martha's Vineyard Service Area
Rate G-7 Optional Seasonal General Time-of-Use

		Monthly	Monthly	2018 In Effect			2021 Planned			Total Bill Impact	
		kVA	kWh	Delivery	Supplier	Total	Delivery	Supplier	Total	Change	% Change
		Hours Use: 50									
		5	250	$66.24	$27.69	$93.93	$70.60	$27.69	$98.29	$4.36	4.6%
		10	500	$122.47	$55.38	$177.85	$131.20	$55.38	$186.58	$8.73	4.9%
		20	1,000	$234.95	$110.75	$345.70	$252.41	$110.75	$363.16	$17.46	5.1%
		50	2,500	$572.37	$276.88	$849.25	$616.02	$276.88	$892.90	$43.65	5.1%
		75	3,750	$853.56	$415.31	$1,268.87	$919.03	$415.31	$1,334.34	$65.47	5.2%
	Avg	9	450	$111.23	$49.84	$161.07	$119.08	$49.84	$168.92	$7.85	4.9%
		Hours Use: 150									
		5	750	$95.51	$83.06	$178.57	$108.61	$83.06	$191.67	$13.10	7.3%
		10	1,500	$181.02	$166.13	$347.15	$207.21	$166.13	$373.34	$26.19	7.5%
		20	3,000	$352.05	$332.25	$684.30	$404.43	$332.25	$736.68	$52.38	7.7%
		50	7,500	$865.11	$830.63	$1,695.74	$996.06	$830.63	$1,826.69	$130.95	7.7%
		75	11,250	$1,292.67	$1,245.94	$2,538.61	$1,489.09	$1,245.94	$2,735.03	$196.42	7.7%
	Avg	10	1,500	$181.02	$166.13	$347.15	$207.21	$166.13	$373.34	$26.19	7.5%
		Hours Use: 300									
		5	1,500	$139.42	$166.13	$305.55	$165.61	$166.13	$331.74	$26.19	8.6%
		10	3,000	$268.85	$332.25	$601.10	$321.23	$332.25	$653.48	$52.38	8.7%
		20	6,000	$527.69	$664.50	$1,192.19	$632.45	$664.50	$1,296.95	$104.76	8.8%
		50	15,000	$1,304.23	$1,661.25	$2,965.48	$1,566.13	$1,661.25	$3,227.38	$261.90	8.8%
		75	22,500	$1,951.34	$2,491.88	$4,443.22	$2,344.19	$2,491.88	$4,836.07	$392.85	8.8%
	Avg	13	3,900	$346.50	$431.93	$778.43	$414.59	$431.93	$846.52	$68.09	8.7%

			2018 In Effect	2021 Planned	
			Rates	Rates	Change
	Customer Charge		$10.00	$10.00	$0.00
	Distribution Demand		$3.36	$3.36	$0.00
	Transmission Demand		$4.96	$4.96	$0.00
	Distribution Energy - Peak		$0.04453	$0.04453	$0.00000
	Distribution Energy - Low Load		$0.03745	$0.03745	$0.00000
	Revenue Decoupling		$0.00000	$0.00000	$0.00000
	Residential Assistance Adjustment Factor		$0.00230	$0.00230	$0.00000
	Pension Adjustment Factor		($0.00008)	($0.00008)	$0.00000
	Net Metering Recovery Surcharge		$0.00453	$0.00453	$0.00000
	Long Term Renewable Contract Adjustment		$0.00236	$0.00236	$0.00000
	AG Consulting Expense		$0.00002	$0.00002	$0.00000
	Storm Cost Recovery Adjustment Factor		$0.00142	$0.00142	$0.00000
	Basic Service Cost True Up Factor		$0.00123	$0.00123	$0.00000
	Solar Program Cost Adjustment Factor		$0.00000	$0.00000	$0.00000
	Solar Expansion Cost Recovery Factor		$0.00000	$0.00000	$0.00000
	Vegetation Management		$0.00000	$0.00000	$0.00000
	Transition		($0.00061)	($0.00061)	$0.00000
	Energy Efficiency Reconciliation Factor		$0.00530	$0.02276	$0.01746
	System Benefits Charge		$0.00250	$0.00250	$0.00000
	Renewable Energy Charge		$0.00050	$0.00050	$0.00000
	Basic Service Charge		$0.11075	$0.11075	$0.00000
	Peak Use:	23%			
	Low A Use:	77%			

Cape Light Compact JPE
2019-2021 Residential Energy Efficiency Reconciliation Factor
$ in Thousands

Year	EE Expenses	EE Charge Revenues	FCM, RGGI, & Other Revenues	Past Period Reconciliation with Interest	Interest on Deferral	Total EERF	Billed Distribution (GWH)	EE Reconciliation Factor (cents/kWh)	Low Income Reconciliation Factor (cents/kWh)	EE Reconciliation Factor (cents/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K
	EEE	EEC	OR	PPRA	I		FkWh		$EERF_{LI}$	$EERF_{R}$
2019	$ 25,470.031	$ (2,564.670)	$ (3,171.567)	$ 1,430.250	$ 74.875	$ 21,238.919	1,025.868	2.070	0.043	2.113
2020	$ 30,549.028	$ (2,566.053)	$ (2,214.364)	$ (0.000)	$ 63.183	$ 25,831.793	1,026.421	2.517	0.362	2.879
2021	$ 32,743.760	$ (2,559.080)	$ (2,087.025)	$ 0.000	$ 67.749	$ 28,165.403	1,023.632	2.752	0.500	3.252

Col. A: Effective year (January 1, 2019 - December 31, 2019), (January 1, 2020 - December 31, 2020), (January 1, 2021 - December 31, 2021).
Col. B: Consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.
Col. C: 2019-2021 Residential Monthly Deferral, Lines 1, Cols. N.
Col. D: 2019-2021 Residential Monthly Deferral, Lines 3, Cols. N + Lines 4, Cols. N + Lines 5, Cols. N.
Col. E: 2019-2021 Residential Monthly Deferral, Lines 10, Cols. A.
Col. F: 2019-2021 Residential Monthly Deferral, Lines 9, Cols. N.
Col. G: Col. B + Col. C + Col. D + Col. E + Col. F.
Col. H: Eversource forecast of Cape Light Compact JPE sales through December 31, 2021. Residential sales only.
Col. I: Col. G/Col. H divided by 10.
Col. J: Low-Income Energy Efficiency Reconciliation Factor, Cols. J.
Col. K: Col. I + Col. J.

Note that per D.P.U. 10-06, at 2-3 (June 24, 2010), lost base revenue is not applicable to the Cape Light Compact JPE.

Cape Light Compact JPE
2018 Residential Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Actual Dec-17	Col. B Actual Jan-18	Col. C Actual Feb-18	Col. D Actual Mar-18	Col. E Actual Apr-18	Col. F Actual May-18	Col. G Actual Jun-18	Col. H Actual Jul-18	Col. I Actual Aug-18	Col. J Actual Sep-18	Col. K Planned Oct-18	Col. L Planned Nov-18	Col. M Planned Dec-18	Col. N Total
1	SBC Revenues		$ -	$ -	$ (444.997)	$ (222.499)	$ (222.499)	$ (222.499)	$ (222.499)	$ (222.499)	$ (222.499)	$ (222.499)	$ (222.499)	$ (444.997)	$ (2,669.984)
2	EES Revenues		$ -	$ -	$ (2,881.629)	$ (1,440.814)	$ (1,440.814)	$ (1,440.814)	$ (1,440.814)	$ (1,440.814)	$ (1,440.814)	$ (1,440.814)	$ (1,440.814)	$ (2,881.629)	$ (17,289.772)
3	FCM Revenues*		$ -	$ -	$ (313.653)	$ (152.450)	$ (153.724)	$ (155.554)	$ (338.190)	$ (342.492)	$ (337.720)	$ (367.426)	$ (367.426)	$ (367.426)	$ (2,896.062)
4	RGGI Revenues*		$ -	$ -	$ -	$ (55.473)	$ -	$ -	$ -	$ (75.337)	$ (85.440)	$ -	$ -	$ (107.217)	$ (323.468)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ -	$ (3,640.279)	$ (1,871.236)	$ (1,817.037)	$ (1,818.867)	$ (2,001.503)	$ (2,081.142)	$ (2,086.474)	$ (2,030.739)	$ (2,030.739)	$ (3,801.269)	$ (23,179.285)
7	Total Energy Efficiency Expenses**		$ 45.403	$ 4.489	$ 3,951.660	$ 1,252.965	$ 1,055.683	$ 2,035.197	$ 2,097.675	$ 812.992	$ 3,280.928	$ 5,051.818	$ 5,051.818	$ 5,051.818	$ 29,692.445
8	Deferral (Over)/Under Recovery		$ 45.403	$ 4.489	$ 311.381	$ (618.272)	$ (761.354)	$ 216.331	$ 96.171	$ (1,268.150)	$ 1,194.454	$ 3,021.079	$ 3,021.079	$ 1,250.548	
9	Interest on Deferral Balance		$ 0.820	$ -	$ 0.621	$ 0.128	$ 0.164	$ 0.196	$ 0.197	$ 0.233	$ 0.228	$ (1.088)	$ (0.333)	$ 0.838	$ 2.003
10	(Over)/Under Ending Balance	$ (5,084.913)	$ (5,038.689)	$ (5,034.200)	$ (4,722.198)	$ (5,340.343)	$ (6,101.533)	$ (5,885.006)	$ (5,788.639)	$ (7,056.555)	$ (5,861.873)	$ (2,841.882)	$ 178.864	$ 1,430.250	
11	Surplus Revenue Annual Interest Rate		0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	
12	Borrowing Annual Interest Rate		1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	

*Sector portion of revenues are allocated based on 2018 planned kWh sales.
**2018 Expenditures are based on actual results through September, and are forecasted for October through December using the most up-to-date data available.

Cape Light Compact JPE
2019 Residential Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-18	Col. B Planned Jan-19	Col. C Planned Feb-19	Col. D Planned Mar-19	Col. E Planned Apr-19	Col. F Planned May-19	Col. G Planned Jun-19	Col. H Planned Jul-19	Col. I Planned Aug-19	Col. J Planned Sep-19	Col. K Planned Oct-19	Col. L Planned Nov-19	Col. M Planned Dec-19	Col. N Total
1	SBC Revenues		$ -	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (213.723)	$ (427.445)	$ (2,564.670)
2	EES Revenues		$ -	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (1,769.910)	$ (3,539.820)	$ (21,238.919)
3	FCM Revenues*		$ -	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (219.655)	$ (439.309)	$ (2,635.856)
4	RGGI Revenues*		$ -	$ -	$ (146.620)	$ -	$ -	$ (129.697)	$ -	$ -	$ (129.697)	$ -	$ -	$ (129.697)	$ (535.711)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (2,203.287)	$ (2,349.907)	$ (2,203.287)	$ (2,203.287)	$ (2,332.984)	$ (2,203.287)	$ (2,203.287)	$ (2,332.984)	$ (2,203.287)	$ (2,203.287)	$ (4,536.271)	$ (26,975.156)
7	Total Energy Efficiency Expenses**		$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 2,122.503	$ 25,470.031
8	Deferral (Over)/Under Recovery		$ 2,122.503	$ (80.784)	$ (227.405)	$ (80.784)	$ (80.784)	$ (210.481)	$ (80.784)	$ (80.784)	$ (210.481)	$ (80.784)	$ (80.784)	$ (2,413.769)	
9	Interest on Deferral Balance		$ 5.606	$ 7.915	$ 7.587	$ 7.257	$ 7.091	$ 6.780	$ 6.467	$ 6.300	$ 5.987	$ 5.672	$ 5.503	$ 2.709	$ 74.875
10	(Over)/Under Ending Balance	$ 1,430.250	$ 3,558.358	$ 3,485.489	$ 3,265.671	$ 3,192.144	$ 3,118.450	$ 2,914.749	$ 2,840.432	$ 2,765.947	$ 2,561.452	$ 2,486.340	$ 2,411.059	$ (0.000)	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

*Sector portion of revenues are allocated based on 2019 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2020 Residential Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-19	Col. B Planned Jan-20	Col. C Planned Feb-20	Col. D Planned Mar-20	Col. E Planned Apr-20	Col. F Planned May-20	Col. G Planned Jun-20	Col. H Planned Jul-20	Col. I Planned Aug-20	Col. J Planned Sep-20	Col. K Planned Oct-20	Col. L Planned Nov-20	Col. M Planned Dec-20	Col. N Total
1	SBC Revenues		$ -	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (213.838)	$ (427.675)	$ (2,566.053)
2	EES Revenues		$ -	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (2,152.649)	$ (4,305.299)	$ (25,831.793)
3	FCM Revenues*		$ -	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (140.722)	$ (281.444)	$ (1,688.663)
4	RGGI Revenues*		$ -	$ -	$ (130.071)	$ -	$ -	$ (131.877)	$ -	$ -	$ (131.877)	$ -	$ -	$ (131.877)	$ (525.701)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (2,507.209)	$ (2,637.280)	$ (2,507.209)	$ (2,507.209)	$ (2,639.086)	$ (2,507.209)	$ (2,507.209)	$ (2,639.086)	$ (2,507.209)	$ (2,507.209)	$ (5,146.295)	$ (30,612.210)
7	Total Energy Efficiency Expenses**		$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 2,545.752	$ 30,549.028
8	Deferral (Over)/Under Recovery		$ 2,545.752	$ 38.543	$ (91.528)	$ 38.543	$ 38.543	$ (93.334)	$ 38.543	$ 38.543	$ (93.334)	$ 38.543	$ 38.543	$ (2,600.543)	
9	Interest on Deferral Balance		$ 2.864	$ 5.778	$ 5.731	$ 5.684	$ 5.784	$ 5.735	$ 5.687	$ 5.786	$ 5.737	$ 5.689	$ 5.788	$ 2.919	$ 63.183
10	(Over)/Under Ending Balance	$ (0.000)	$ 2,548.616	$ 2,592.937	$ 2,507.141	$ 2,551.368	$ 2,595.696	$ 2,508.097	$ 2,552.327	$ 2,596.656	$ 2,509.060	$ 2,553.292	$ 2,597.624	$ 0.000	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

*Sector portion of revenues are allocated based on 2020 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2021 Residential Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-20	Col. B Planned Jan-21	Col. C Planned Feb-21	Col. D Planned Mar-21	Col. E Planned Apr-21	Col. F Planned May-21	Col. G Planned Jun-21	Col. H Planned Jul-21	Col. I Planned Aug-21	Col. J Planned Sep-21	Col. K Planned Oct-21	Col. L Planned Nov-21	Col. M Planned Dec-21	Col. N Total
1	SBC Revenues		$ -	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (213.257)	$ (426.513)	$ (2,559.080)
2	EES Revenues		$ -	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (2,347.117)	$ (4,694.234)	$ (28,165.403)
3	FCM Revenues*		$ -	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (128.642)	$ (257.285)	$ (1,543.708)
4	RGGI Revenues*		$ -	$ -	$ (132.107)	$ -	$ -	$ (137.070)	$ -	$ -	$ (137.070)	$ -	$ -	$ (137.070)	$ (543.317)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (2,689.016)	$ (2,821.123)	$ (2,689.016)	$ (2,689.016)	$ (2,826.086)	$ (2,689.016)	$ (2,689.016)	$ (2,826.086)	$ (2,689.016)	$ (2,689.016)	$ (5,515.102)	$ (32,811.509)
7	Total Energy Efficiency Expenses**		$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 2,728.647	$ 32,743.760
8	Deferral (Over)/Under Recovery		$ 2,728.647	$ 39.631	$ (92.476)	$ 39.631	$ 39.631	$ (97.439)	$ 39.631	$ 39.631	$ (97.439)	$ 39.631	$ 39.631	$ (2,786.455)	
9	Interest on Deferral Balance		$ 3.070	$ 6.191	$ 6.145	$ 6.100	$ 6.203	$ 6.152	$ 6.100	$ 6.203	$ 6.152	$ 6.101	$ 6.204	$ 3.128	$ 67.749
10	(Over)/Under Ending Balance	$ 0.000	$ 2,731.716	$ 2,777.538	$ 2,691.207	$ 2,736.937	$ 2,782.771	$ 2,691.483	$ 2,737.214	$ 2,783.048	$ 2,691.761	$ 2,737.493	$ 2,783.328	$ (0.000)	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

*Sector portion of revenues are allocated based on 2021 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2019-2021 Low-Income Energy Efficiency Reconciliation Factor
$ in Thousands

Year	EE Expenses	EE Charge Revenues	FCM, RGGI, & Other Revenues	Past Period Reconciliation with Interest	Interest on Deferral	Total EERF	Billed Distribution (GWH)	Res-LI Rev. Req. Allocation	EE Reconciliation Factor (cents/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J
	EEE	EEC	OR	PPRA	I		FkWh		$EERF_{LI}$
2019	$ 4,988.309	$ (183.192)	$ (226.543)	$ (3,506.554)	$ (11.499)	$ 1,060.521	1,099.145	$ 473.31	0.043
2020	$ 9,036.565	$ (183.384)	$ (158.250)	$ (0.000)	$ 18.664	$ 8,713.595	1,099.775	$ 3,983.86	0.362
2021	$ 12,298.200	$ (182.932)	$ (149.188)	$ 0.000	$ 25.400	$ 11,991.480	1,096.805	$ 5,482.50	0.500

Col. A: Effective year (January 1, 2019 - December 31, 2019), (January 1, 2020 - December 31, 2020), (January 1, 2021 - December 31, 2021).
Col. B: Consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.
Col. C: 2018 Low-Income Monthly Deferral, Lines 1, Cols. N.
Col. D: 2018 Low-Income Monthly Deferral, Lines 3, Cols. N + Lines 4, Cols. N + Lines 5, Cols. N.
Col. E: 2018 Low-Income Monthly Deferral, Lines 10, Cols. A.
Col. F: 2018 Low-Income Monthly Deferral, Lines 9, Cols. N.
Col. G: Col. B + Col. C + Col. D + Col. E + Col. F.
Col. H: Eversource forecast of Cape Light Compact JPE sales through December 31, 2018. Sum of residential and low-income sales.
Col. I: Consistent with Eversource's rate making practices, 44.63% of Col. G in 2019, and 45.72% of Col. G in 2020 an 2021.
Col. J: Col. I/Col. H divided by 10.

Note that per D.P.U. 10-06, at 2-3 (June 24, 2010), lost base revenue is not applicable to the Cape Light Compact JPE.

Cape Light Compact JPE
2018 Low-Income Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Actual Dec-17	Col. B Actual Jan-18	Col. C Actual Feb-18	Col. D Actual Mar-18	Col. E Actual Apr-18	Col. F Actual May-18	Col. G Actual Jun-18	Col. H Actual Jul-18	Col. I Actual Aug-18	Col. J Actual Sep-18	Col. K Planned Oct-18	Col. L Planned Nov-18	Col. M Planned Dec-18	Col. N Total
1	SBC Revenues		$ -	$ -	$ (29.483)	$ (14.741)	$ (14.741)	$ (14.741)	$ (14.741)	$ (14.741)	$ (14.741)	$ (14.741)	$ (14.741)	$ (29.483)	$ (176.896)
2	EES Revenues		$ -	$ -	$ (596.051)	$ (298.025)	$ (298.025)	$ (298.025)	$ (298.025)	$ (298.025)	$ (298.025)	$ (298.025)	$ (298.025)	$ (596.051)	$ (3,576.303)
3	FCM Revenues*		$ -	$ -	$ (18.809)	$ (9.142)	$ (9.219)	$ (9.328)	$ (20.281)	$ (20.539)	$ (20.253)	$ (22.034)	$ (22.034)	$ (22.034)	$ (173.673)
4	RGGI Revenues*		$ -	$ -	$ -	$ (3.327)	$ -	$ -	$ -	$ (4.518)	$ (5.124)	$ -	$ -	$ (6.430)	$ (19.398)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ -	$ (644.343)	$ (325.236)	$ (321.985)	$ (322.095)	$ (333.047)	$ (337.823)	$ (338.143)	$ (334.801)	$ (334.801)	$ (653.997)	$ (3,946.270)
7	Total Energy Efficiency Expenses**		$ 4.722	$ 0.963	$ 458.532	$ 149.630	$ 89.226	$ 215.894	$ 290.764	$ 33.477	$ 419.206	$ 320.856	$ 320.856	$ 320.856	$ 2,624.984
8	Deferral (Over)/Under Recovery		$ 4.722	$ 0.963	$ (185.810)	$ (175.605)	$ (232.759)	$ (106.201)	$ (42.284)	$ (304.346)	$ 81.063	$ (13.944)	$ (13.944)	$ (333.141)	
9	Interest on Deferral Balance		$ (1.446)	$ -	$ (1.095)	$ (0.225)	$ (0.290)	$ (0.345)	$ (0.347)	$ (0.412)	$ (0.401)	$ (0.788)	$ (0.791)	$ (0.835)	$ (6.973)
10	(Over)/Under Ending Balance	$ (2,178.295)	$ (2,175.019)	$ (2,174.056)	$ (2,360.961)	$ (2,536.791)	$ (2,769.839)	$ (2,876.385)	$ (2,919.015)	$ (3,223.773)	$ (3,143.112)	$ (3,157.843)	$ (3,172.579)	$ (3,506.554)	
11	Surplus Revenue Annual Interest Rate		0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	
12	Borrowing Annual Interest Rate		1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	

*Sector portion of revenues are allocated based on 2018 planned kWh sales.
**2018 Expenditures are based on actual results through September, and are forecasted for October through December using the most up-to-date data available.

Cape Light Compact JPE
2019 Low-Income Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-18	Col. B Planned Jan-19	Col. C Planned Feb-19	Col. D Planned Mar-19	Col. E Planned Apr-19	Col. F Planned May-19	Col. G Planned Jun-19	Col. H Planned Jul-19	Col. I Planned Aug-19	Col. J Planned Sep-19	Col. K Planned Oct-19	Col. L Planned Nov-19	Col. M Planned Dec-19	Col. N Total
1	SBC Revenues		$ -	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (15.266)	$ (30.532)	$ (183.192)
2	EES Revenues		$ -	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (88.377)	$ (176.754)	$ (1,060.521)
3	FCM Revenues*		$ -	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (15.690)	$ (31.380)	$ (188.277)
4	RGGI Revenues*		$ -	$ -	$ (10.473)	$ -	$ -	$ (9.264)	$ -	$ -	$ (9.264)	$ -	$ -	$ (9.264)	$ (38.265)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (119.333)	$ (129.806)	$ (119.333)	$ (119.333)	$ (128.597)	$ (119.333)	$ (119.333)	$ (128.597)	$ (119.333)	$ (119.333)	$ (247.929)	$ (1,470.256)
7	Total Energy Efficiency Expenses**		$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 415.692	$ 4,988.309
8	Deferral (Over)/Under Recovery		$ 415.692	$ 296.360	$ 285.887	$ 296.360	$ 296.360	$ 287.096	$ 296.360	$ 296.360	$ 287.096	$ 296.360	$ 296.360	$ 167.763	
9	Interest on Deferral Balance		$ (1.924)	$ (1.718)	$ (1.549)	$ (1.380)	$ (1.208)	$ (1.038)	$ (0.869)	$ (0.696)	$ (0.527)	$ (0.357)	$ (0.184)	$ (0.049)	$ (11.499)
10	(Over)/Under Ending Balance	$ (3,506.554)	$ (3,092.786)	$ (2,798.144)	$ (2,513.806)	$ (2,218.826)	$ (1,923.674)	$ (1,637.617)	$ (1,342.126)	$ (1,046.462)	$ (759.893)	$ (463.890)	$ (167.714)	$ (0.000)	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

*Sector portion of revenues are allocated based on 2019 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2020 Low-Income Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-19	Col. B Planned Jan-20	Col. C Planned Feb-20	Col. D Planned Mar-20	Col. E Planned Apr-20	Col. F Planned May-20	Col. G Planned Jun-20	Col. H Planned Jul-20	Col. I Planned Aug-20	Col. J Planned Sep-20	Col. K Planned Oct-20	Col. L Planned Nov-20	Col. M Planned Dec-20	Col. N Total
1	SBC Revenues		$ -	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (15.282)	$ (30.564)	$ (183.384)
2	EES Revenues		$ -	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (726.133)	$ (1,452.266)	$ (8,713.595)
3	FCM Revenues*		$ -	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (10.057)	$ (20.113)	$ (120.681)
4	RGGI Revenues*		$ -	$ -	$ (9.296)	$ -	$ -	$ (9.425)	$ -	$ -	$ (9.425)	$ -	$ -	$ (9.425)	$ (37.569)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (751.472)	$ (760.767)	$ (751.472)	$ (751.472)	$ (760.896)	$ (751.472)	$ (751.472)	$ (760.896)	$ (751.472)	$ (751.472)	$ (1,512.368)	$ (9,055.228)
7	Total Energy Efficiency Expenses**		$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 753.047	$ 9,036.565
8	Deferral (Over)/Under Recovery		$ 753.047	$ 1.575	$ (7.720)	$ 1.575	$ 1.575	$ (7.849)	$ 1.575	$ 1.575	$ (7.849)	$ 1.575	$ 1.575	$ (759.321)	
9	Interest on Deferral Balance		$ 0.847	$ 1.698	$ 1.695	$ 1.692	$ 1.699	$ 1.696	$ 1.693	$ 1.700	$ 1.697	$ 1.694	$ 1.701	$ 0.852	$ 18.664
10	(Over)/Under Ending Balance	$ (0.000)	$ 753.894	$ 757.168	$ 751.143	$ 754.410	$ 757.685	$ 751.531	$ 754.800	$ 758.075	$ 751.923	$ 755.192	$ 758.468	$ 0.000	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

*Sector portion of revenues are allocated based on 2020 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2021 Low-Income Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-20	Col. B Planned Jan-21	Col. C Planned Feb-21	Col. D Planned Mar-21	Col. E Planned Apr-21	Col. F Planned May-21	Col. G Planned Jun-21	Col. H Planned Jul-21	Col. I Planned Aug-21	Col. J Planned Sep-21	Col. K Planned Oct-21	Col. L Planned Nov-21	Col. M Planned Dec-21	Col. N Total
1	SBC Revenues		$ -	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (15.244)	$ (30.489)	$ (182.932)
2	EES Revenues		$ -	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (999.290)	$ (1,998.580)	$ (11,991.480)
3	FCM Revenues*		$ -	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (9.196)	$ (18.392)	$ (110.350)
4	RGGI Revenues*		$ -	$ -	$ (9.443)	$ -	$ -	$ (9.798)	$ -	$ -	$ (9.798)	$ -	$ -	$ (9.798)	$ (38.838)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (1,023.730)	$ (1,033.174)	$ (1,023.730)	$ (1,023.730)	$ (1,033.528)	$ (1,023.730)	$ (1,023.730)	$ (1,033.528)	$ (1,023.730)	$ (1,023.730)	$ (2,057.258)	$ (12,323.599)
7	Total Energy Efficiency Expenses**		$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 1,024.850	$ 12,298.200
8	Deferral (Over)/Under Recovery		$ 1,024.850	$ 1.120	$ (8.324)	$ 1.120	$ 1.120	$ (8.678)	$ 1.120	$ 1.120	$ (8.678)	$ 1.120	$ 1.120	$ (1,032.408)	
9	Interest on Deferral Balance		$ 1.153	$ 2.310	$ 2.307	$ 2.304	$ 2.312	$ 2.308	$ 2.305	$ 2.313	$ 2.309	$ 2.306	$ 2.314	$ 1.159	$ 25.400
10	(Over)/Under Ending Balance	$ 0.000	$ 1,026.003	$ 1,029.433	$ 1,023.416	$ 1,026.840	$ 1,030.271	$ 1,023.901	$ 1,027.326	$ 1,030.759	$ 1,024.390	$ 1,027.816	$ 1,031.250	$ (0.000)	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

*Sector portion of revenues are allocated based on 2021 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2019-2021 Commercial & Industrial Energy Efficiency Reconciliation Factor
$ in Thousands

Year	EE Expenses	EE Charge Revenues	FCM, RGGI, & Other Revenues	Past Period Reconciliation with Interest	Interest on Deferral	Total EERF	Billed Distribution (GWH)	EE Reconciliation Factor (cents/kWh)	CI-LI Rev. Req. Allocation	Low Income Reconciliation Factor (cents/kWh)	EE Reconciliation Factor (cents/kWh)
Col. A	Col. B	Col. C	Col. D	Col. E	Col. F	Col. G	Col. H	Col. I	Col. J	Col. K	Col. L
	EEE	EEC	OR	PPRA	I		FkWh			$EERF_{LI}$	$EERF_{R}$
2019	$ 15,223.278	$ (2,128.792)	$ (2,632.544)	$ (6,394.656)	$ (17.512)	$ 4,049.775	851.517	0.476	587.211	0.069	0.545
2020	$ 16,213.827	$ (2,115.824)	$ (1,825.841)	$ 0.000	$ 33.568	$ 12,305.730	846.330	1.454	4,729.739	0.559	2.013
2021	$ 16,408.027	$ (2,101.568)	$ (1,713.907)	$ (0.000)	$ 33.998	$ 12,626.550	840.627	1.502	6,508.975	0.774	2.276

Col. A: Effective year (January 1, 2019 - December 31, 2019), (January 1, 2020 - December 31, 2020), (January 1, 2021 - December 31, 2021).
Col. B: Consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.
Col. C: 2018 C&I Monthly Deferral, Lines 1, Cols. N.
Col. D: 2018 C&I Monthly Deferral, Lines 3, Cols. N + Lines 4, Cols. N + Lines 5, Cols. N.
Col. E: 2018 C&I Monthly Deferral, Lines 10, Cols. A.
Col. F: 2018 C&I Monthly Deferral, Lines 9, Cols. N.
Col. G: Col. B + Col. C + Col. D + Col. E + Col. F.
Col. H: Eversource forecast of Cape Light Compact sales through December 31, 2018. C&I sales only.
Col. I: Col. G/Col. H divided by 10.
Col. J: Consistent with Eversource's rate making practices, 55.37% of 2019 Low-Income Energy Efficiency Reconciliation Factor, Col. G, and 54.28% of 2020 and 2021 Low-Income Energy Efficiency Reconciliation Factor, Col. G.
Col. K: Col. J/Col. H divided by 10.
Col. L: Col. I + Col. K.

Note that per D.P.U. 10-06, at 2-3 (June 24, 2010), lost base revenue is not applicable to the Cape Light Compact.

Cape Light Compact JPE
2018 Commercial & Industrial Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Actual Dec-17	Col. B Actual Jan-18	Col. C Actual Feb-18	Col. D Actual Mar-18	Col. E Actual Apr-18	Col. F Actual May-18	Col. G Actual Jun-18	Col. H Actual Jul-18	Col. I Actual Aug-18	Col. J Actual Sep-18	Col. K Planned Oct-18	Col. L Planned Nov-18	Col. M Planned Dec-18	Col. N Total
1	SBC Revenues		$ -	$ -	$ (339.712)	$ (169.856)	$ (169.856)	$ (169.856)	$ (169.856)	$ (169.856)	$ (169.856)	$ (169.856)	$ (169.856)	$ (339.712)	$ (2,038.272)
2	EES Revenues		$ -	$ -	$ (439.601)	$ (219.800)	$ (219.800)	$ (219.800)	$ (219.800)	$ (219.800)	$ (219.800)	$ (219.800)	$ (219.800)	$ (439.601)	$ (2,637.605)
3	FCM Revenues*		$ -	$ -	$ (259.811)	$ (126.280)	$ (127.336)	$ (128.851)	$ (280.137)	$ (283.700)	$ (279.747)	$ (304.354)	$ (304.354)	$ (304.354)	$ (2,398.924)
4	RGGI Revenues*		$ -	$ -	$ -	$ (45.951)	$ -	$ -	$ -	$ (62.404)	$ (70.774)	$ -	$ -	$ (88.812)	$ (267.941)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ -	$ (1,039.124)	$ (561.888)	$ (516.992)	$ (518.508)	$ (669.793)	$ (735.761)	$ (740.177)	$ (694.010)	$ (694.010)	$ (1,172.479)	$ (7,342.741)
7	Total Energy Efficiency Expenses**		$ 35.531	$ 3.336	$ 863.170	$ 661.691	$ 294.568	$ 1,043.755	$ 443.547	$ 462.536	$ 1,019.455	$ 2,742.357	$ 2,742.357	$ 2,742.357	$ 13,054.660
8	Deferral (Over)/Under Recovery		$ 35.531	$ 3.336	$ (175.954)	$ 99.803	$ (222.424)	$ 525.248	$ (226.246)	$ (273.225)	$ 279.278	$ 2,048.347	$ 2,048.347	$ 1,569.878	
9	Interest on Deferral Balance		$ 0.626	$ -	$ 0.474	$ 0.097	$ 0.125	$ 0.149	$ 0.150	$ 0.178	$ 0.174	$ (2.758)	$ (2.246)	$ (1.794)	$ (4.824)
10	(Over)/Under Ending Balance	$ (12,101.750)	$ (12,065.593)	$ (12,062.257)	$ (12,237.737)	$ (12,137.837)	$ (12,360.136)	$ (11,834.739)	$ (12,060.835)	$ (12,333.881)	$ (12,054.430)	$ (10,008.840)	$ (7,962.740)	$ (6,394.656)	
11	Surplus Revenue Annual Interest Rate		0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	
12	Borrowing Annual Interest Rate		1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	

*Sector portion of revenues are allocated based on 2018 planned kWh sales.
**2018 Expenditures are based on actual results through September, and are forecasted for October through December using the most up-to-date data available.

Cape Light Compact JPE
2019 Commercial & Industrial Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-18	Col. B Planned Jan-19	Col. C Planned Feb-19	Col. D Planned Mar-19	Col. E Planned Apr-19	Col. F Planned May-19	Col. G Planned Jun-19	Col. H Planned Jul-19	Col. I Planned Aug-19	Col. J Planned Sep-19	Col. K Planned Oct-19	Col. L Planned Nov-19	Col. M Planned Dec-19	Col. N Total
1	SBC Revenues		$ -	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (177.399)	$ (354.799)	$ (2,128.792)
2	EES Revenues		$ -	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (337.481)	$ (674.962)	$ (4,049.775)
3	FCM Revenues*		$ -	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (182.323)	$ (364.647)	$ (2,187.879)
4	RGGI Revenues*		$ -	$ -	$ (121.701)	$ -	$ -	$ (107.654)	$ -	$ -	$ (107.654)	$ -	$ -	$ (107.654)	$ (444.665)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (697.204)	$ (818.905)	$ (697.204)	$ (697.204)	$ (804.858)	$ (697.204)	$ (697.204)	$ (804.858)	$ (697.204)	$ (697.204)	$ (1,502.062)	$ (8,811.110)
7	Total Energy Efficiency Expenses**		$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 1,268.606	$ 15,223.278
8	Deferral (Over)/Under Recovery		$ 1,268.606	$ 571.403	$ 449.701	$ 571.403	$ 571.403	$ 463.748	$ 571.403	$ 571.403	$ 463.748	$ 571.403	$ 571.403	$ (233.455)	
9	Interest on Deferral Balance		$ (3.360)	$ (2.825)	$ (2.529)	$ (2.233)	$ (1.901)	$ (1.600)	$ (1.299)	$ (0.967)	$ (0.665)	$ (0.364)	$ (0.031)	$ 0.262	$ (17.512)
10	(Over)/Under Ending Balance	$ (6,394.656)	$ (5,129.409)	$ (4,560.832)	$ (4,113.660)	$ (3,544.491)	$ (2,974.989)	$ (2,512.841)	$ (1,942.737)	$ (1,372.301)	$ (909.218)	$ (338.179)	$ 233.193	$ 0.000	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

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**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2020 Commercial & Industrial Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-19	Col. B Planned Jan-20	Col. C Planned Feb-20	Col. D Planned Mar-20	Col. E Planned Apr-20	Col. F Planned May-20	Col. G Planned Jun-20	Col. H Planned Jul-20	Col. I Planned Aug-20	Col. J Planned Sep-20	Col. K Planned Oct-20	Col. L Planned Nov-20	Col. M Planned Dec-20	Col. N Total
1	SBC Revenues		$ -	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (176.319)	$ (352.637)	$ (2,115.824)
2	EES Revenues		$ -	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (1,025.477)	$ (2,050.955)	$ (12,305.730)
3	FCM Revenues*		$ -	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (116.031)	$ (232.063)	$ (1,392.377)
4	RGGI Revenues*		$ -	$ -	$ (107.249)	$ -	$ -	$ (108.738)	$ -	$ -	$ (108.738)	$ -	$ -	$ (108.738)	$ (433.464)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (1,317.828)	$ (1,425.077)	$ (1,317.828)	$ (1,317.828)	$ (1,426.566)	$ (1,317.828)	$ (1,317.828)	$ (1,426.566)	$ (1,317.828)	$ (1,317.828)	$ (2,744.393)	$ (16,247.395)
7	Total Energy Efficiency Expenses**		$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 1,351.152	$ 16,213.827
8	Deferral (Over)/Under Recovery		$ 1,351.152	$ 33.325	$ (73.925)	$ 33.325	$ 33.325	$ (75.414)	$ 33.325	$ 33.325	$ (75.414)	$ 33.325	$ 33.325	$ (1,393.241)	
9	Interest on Deferral Balance		$ 1.520	$ 3.081	$ 3.042	$ 3.003	$ 3.085	$ 3.045	$ 3.004	$ 3.086	$ 3.046	$ 3.005	$ 3.087	$ 1.564	$ 33.568
10	(Over)/Under Ending Balance	$ 0.000	$ 1,352.672	$ 1,389.078	$ 1,318.196	$ 1,354.524	$ 1,390.934	$ 1,318.565	$ 1,354.894	$ 1,391.304	$ 1,318.936	$ 1,355.266	$ 1,391.677	$ (0.000)	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

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**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2021 Commercial & Industrial Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Planned Dec-20	Col. B Planned Jan-21	Col. C Planned Feb-21	Col. D Planned Mar-21	Col. E Planned Apr-21	Col. F Planned May-21	Col. G Planned Jun-21	Col. H Planned Jul-21	Col. I Planned Aug-21	Col. J Planned Sep-21	Col. K Planned Oct-21	Col. L Planned Nov-21	Col. M Planned Dec-21	Col. N Total
1	SBC Revenues		$ -	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (175.131)	$ (350.261)	$ (2,101.568)
2	EES Revenues		$ -	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (1,052.212)	$ (2,104.425)	$ (12,626.550)
3	FCM Revenues*		$ -	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (105.644)	$ (211.287)	$ (1,267.724)
4	RGGI Revenues*		$ -	$ -	$ (108.489)	$ -	$ -	$ (112.565)	$ -	$ -	$ (112.565)	$ -	$ -	$ (112.565)	$ (446.183)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (1,332.987)	$ (1,441.476)	$ (1,332.987)	$ (1,332.987)	$ (1,445.551)	$ (1,332.987)	$ (1,332.987)	$ (1,445.551)	$ (1,332.987)	$ (1,332.987)	$ (2,778.538)	$ (16,442.024)
7	Total Energy Efficiency Expenses**		$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 1,367.336	$ 16,408.027
8	Deferral (Over)/Under Recovery		$ 1,367.336	$ 34.349	$ (74.140)	$ 34.349	$ 34.349	$ (78.216)	$ 34.349	$ 34.349	$ (78.216)	$ 34.349	$ 34.349	$ (1,411.203)	
9	Interest on Deferral Balance		$ 1.538	$ 3.119	$ 3.081	$ 3.043	$ 3.127	$ 3.085	$ 3.042	$ 3.127	$ 3.084	$ 3.042	$ 3.126	$ 1.584	$ 33.998
10	(Over)/Under Ending Balance	$ (0.000)	$ 1,368.874	$ 1,406.341	$ 1,335.282	$ 1,372.674	$ 1,410.149	$ 1,335.018	$ 1,372.410	$ 1,409.885	$ 1,334.753	$ 1,372.144	$ 1,409.619	$ 0.000	
11	Surplus Revenue Annual Interest Rate		0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	
12	Borrowing Annual Interest Rate		2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	

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**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

Cape Light Compact JPE
2018 Total Monthly EES Deferral
$ in Thousands

Line	Description	Col. A Actual Dec-17	Col. B Actual Jan-18	Col. C Actual Feb-18	Col. D Actual Mar-18	Col. E Actual Apr-18	Col. F Actual May-18	Col. G Actual Jun-18	Col. H Actual Jul-18	Col. I Actual Aug-18	Col. J Actual Sep-18	Col. K Planned Oct-18	Col. L Planned Nov-18	Col. M Planned Dec-18	Col. N Total
1	SBC Revenues		$ -	$ -	$ (814.192)	$ (407.096)	$ (407.096)	$ (407.096)	$ (407.096)	$ (407.096)	$ (407.096)	$ (407.096)	$ (407.096)	$ (814.192)	$ (4,885.152)
2	EES Revenues		$ -	$ -	$ (3,917.280)	$ (1,958.640)	$ (1,958.640)	$ (1,958.640)	$ (1,958.640)	$ (1,958.640)	$ (1,958.640)	$ (1,958.640)	$ (1,958.640)	$ (3,917.280)	$ (23,503.680)
3	FCM Revenues*		$ -	$ -	$ (592.273)	$ (287.872)	$ (290.279)	$ (293.733)	$ (638.608)	$ (646.731)	$ (637.720)	$ (693.814)	$ (693.814)	$ (693.814)	$ (5,468.658)
4	RGGI Revenues*		$ -	$ -	$ -	$ (104.751)	$ -	$ -	$ -	$ (142.259)	$ (161.338)	$ -	$ -	$ (202.459)	$ (610.807)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ -	$ (5,323.745)	$ (2,758.359)	$ (2,656.015)	$ (2,659.469)	$ (3,004.344)	$ (3,154.726)	$ (3,164.794)	$ (3,059.550)	$ (3,059.550)	$ (5,627.745)	$ (34,468.297)
7	Total Energy Efficiency Expenses**		$ 85.657	$ 8.788	$ 5,273.362	$ 2,064.286	$ 1,439.477	$ 3,294.847	$ 2,831.986	$ 1,309.005	$ 4,719.588	$ 8,115.031	$ 8,115.031	$ 8,115.031	$ 45,372.089
8	Deferral (Over)/Under Recovery		$ 85.657	$ 8.788	$ (50.383)	$ (694.074)	$ (1,216.538)	$ 635.377	$ (172.358)	$ (1,845.720)	$ 1,554.795	$ 5,055.481	$ 5,055.481	$ 2,487.286	
9	Interest on Deferral Balance		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (4.633)	$ (3.370)	$ (1.792)	$ (9.795)
10	(Over)/Under Ending Balance	$ (19,364.958)	$ (19,279.301)	$ (19,270.513)	$ (19,320.896)	$ (20,014.970)	$ (21,231.508)	$ (20,596.130)	$ (20,768.489)	$ (22,614.209)	$ (21,059.414)	$ (16,008.566)	$ (10,956.455)	$ (8,470.960)	

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Cape Light Compact JPE
2019 Total Monthly EES Deferral
$ in Thousands

		Col. A Planned Dec-18	Col. B Planned Jan-19	Col. C Planned Feb-19	Col. D Planned Mar-19	Col. E Planned Apr-19	Col. F Planned May-19	Col. G Planned Jun-19	Col. H Planned Jul-19	Col. I Planned Aug-19	Col. J Planned Sep-19	Col. K Planned Oct-19	Col. L Planned Nov-19	Col. M Planned Dec-19	Col. N Total
1	SBC Revenues		$ -	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (406.388)	$ (812.776)	$ (4,876.654)
2	EES Revenues		$ -	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (2,195.768)	$ (4,391.536)	$ (26,349.214)
3	FCM Revenues*		$ -	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (417.668)	$ (835.335)	$ (5,012.012)
4	RGGI Revenues*		$ -	$ -	$ (278.795)	$ -	$ -	$ (246.616)	$ -	$ -	$ (246.616)	$ -	$ -	$ (246.616)	$ (1,018.641)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (3,019.823)	$ (3,298.618)	$ (3,019.823)	$ (3,019.823)	$ (3,266.439)	$ (3,019.823)	$ (3,019.823)	$ (3,266.439)	$ (3,019.823)	$ (3,019.823)	$ (6,286.262)	$ (37,256.522)
7	Total Energy Efficiency Expenses**		$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 3,806.801	$ 45,681.618
8	Deferral (Over)/Under Recovery		$ 3,806.801	$ 786.978	$ 508.183	$ 786.978	$ 786.978	$ 540.363	$ 786.978	$ 786.978	$ 540.363	$ 786.978	$ 786.978	$ (2,479.461)	
9	Interest on Deferral Balance		$ 0.321	$ 3.372	$ 3.508	3.644	3.983	4.141	4.299	4.637	4.795	4.952	5.289	2.923	$ 45.864
10	(Over)/Under Ending Balance	$ (8,470.960)	$ (4,663.837)	$ (3,873.487)	$ (3,361.795)	$ (2,571.173)	$ (1,780.212)	$ (1,235.708)	$ (444.431)	$ 347.184	$ 892.341	$ 1,684.271	$ 2,476.538	$ 0.000	

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Cape Light Compact JPE
2020 Total Monthly EES Deferral
$ in Thousands

		Col. A Planned Dec-19	Col. B Planned Jan-20	Col. C Planned Feb-20	Col. D Planned Mar-20	Col. E Planned Apr-20	Col. F Planned May-20	Col. G Planned Jun-20	Col. H Planned Jul-20	Col. I Planned Aug-20	Col. J Planned Sep-20	Col. K Planned Oct-20	Col. L Planned Nov-20	Col. M Planned Dec-20	Col. N Total
1	SBC Revenues		$ -	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (405.438)	$ (810.877)	$ (4,865.260)
2	EES Revenues		$ -	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (3,904.260)	$ (7,808.520)	$ (46,851.118)
3	FCM Revenues		$ -	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (266.810)	$ (533.620)	$ (3,201.721)
4	RGGI Revenues		$ -	$ -	$ (246.616)	$ -	$ -	$ (250.040)	$ -	$ -	$ (250.040)	$ -	$ -	$ (250.040)	$ (996.734)
5	Other Revenues		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (4,576.508)	$ (4,823.124)	$ (4,576.508)	$ (4,576.508)	$ (4,826.548)	$ (4,576.508)	$ (4,576.508)	$ (4,826.548)	$ (4,576.508)	$ (4,576.508)	$ (9,403.056)	$ (55,914.834)
7	Total Energy Efficiency Expenses**		$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 4,649.952	$ 55,799.419
8	Deferral (Over)/Under Recovery		$ 4,649.952	$ 73.443	$ (173.172)	$ 73.443	$ 73.443	$ (176.596)	$ 73.443	$ 73.443	$ (176.596)	$ 73.443	$ 73.443	$ (4,753.105)	
9	Interest on Deferral Balance		$ 5.231	$ 10.557	$ 10.468	10.380	10.568	10.476	10.384	10.572	10.480	10.387	10.576	5.335	$ 115.415
10	(Over)/Under Ending Balance	$ (0.000)	$ 4,655.183	$ 4,739.183	$ 4,576.479	$ 4,660.302	$ 4,744.314	$ 4,578.193	$ 4,662.020	$ 4,746.036	$ 4,579.919	$ 4,663.750	$ 4,747.769	$ (0.000)	

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Cape Light Compact JPE
2021 Total Monthly EES Deferral
$ in Thousands

		Col. A Planned Dec-20	Col. B Planned Jan-21	Col. C Planned Feb-21	Col. D Planned Mar-21	Col. E Planned Apr-21	Col. F Planned May-21	Col. G Planned Jun-21	Col. H Planned Jul-21	Col. I Planned Aug-21	Col. J Planned Sep-21	Col. K Planned Oct-21	Col. L Planned Nov-21	Col. M Planned Dec-21	Col. N Total
1	SBC Revenues		$ -	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (403.632)	$ (807.263)	$ (4,843.580)
2	EES Revenues		$ -	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (4,398.619)	$ (8,797.239)	$ (52,783.432)
3	FCM Revenues*		$ -	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (243.482)	$ (486.964)	$ (2,921.782)
4	RGGI Revenues*		$ -	$ -	$ (250.040)	$ -	$ -	$ (259.433)	$ -	$ -	$ (259.433)	$ -	$ -	$ (259.433)	$ (1,028.338)
5	Other Revenues*		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Total Energy Efficiency Revenues		$ -	$ (5,045.733)	$ (5,295.772)	$ (5,045.733)	$ (5,045.733)	$ (5,305.166)	$ (5,045.733)	$ (5,045.733)	$ (5,305.166)	$ (5,045.733)	$ (5,045.733)	$ (10,350.899)	$ (61,577.132)
7	Total Energy Efficiency Expenses**		$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 5,120.832	$ 61,449.986
8	Deferral (Over)/Under Recovery		$ 5,120.832	$ 75.099	$ (174.940)	$ 75.099	$ 75.099	$ (184.334)	$ 75.099	$ 75.099	$ (184.334)	$ 75.099	$ 75.099	$ (5,230.066)	
9	Interest on Deferral Balance		$ 5.761	$ 11.619	$ 11.533	11.447	11.642	11.545	11.448	11.643	11.546	11.449	11.644	5.871	$ 127.146
10	(Over)/Under Ending Balance	$ 0.000	$ 5,126.593	$ 5,213.312	$ 5,049.905	$ 5,136.451	$ 5,223.192	$ 5,050.403	$ 5,136.950	$ 5,223.692	$ 5,050.904	$ 5,137.453	$ 5,224.196	$ (0.000)	

*Sector portion of revenues are allocated based on 2021 forecasted kWh sales.
**Expenses are consistent with the Cape Light Compact JPE's 2019-2021 Three-Year Plan, D.P.U. 18-116.

PARTICIPANT BILL IMPACTS

Class	Rate Class	Pre-Participation			Low Participation								
		2018			Savings (Reduced Usage)	Monthly Usage		2019			2021		
		Monthly Usage		Total Bill				Total Bill	Change from 2018 Bill		Total Bill	Change from 2018 Bill	
		kWh	*kW*	*$*	*%*	*kWh*	*kW*	*$*	*$*	*%*	*$*	*$*	*%*
Residential	Rate R-1 Residential	516	-	$ 120.01	2%	506	-	$ 119.10	$ (0.91)	-0.8%	$ 124.87	$ 4.86	4.0%
	Rate R-2 Residential Assistance	488	-	$ 67.54	25%	366	-	$ 51.53	$ (16.01)	-23.7%	$ 52.60	$ (14.94)	-22.1%
	Rate R-3 Residential Space Heating	740	-	$ 161.45	2%	725	-	$ 160.16	$ (1.29)	-0.8%	$ 168.42	$ 6.97	4.3%
	Rate R-4 Residential Assistance Space Heating	874	-	$ 111.66	25%	656	-	$ 84.48	$ (27.18)	-24.3%	$ 86.40	$ (25.26)	-22.6%
Small Comm.	Rate G-1 Small General Service	400	2	$ 84.90	1%	396	2	$ 84.17	$ (0.73)	-0.9%	$ 91.03	$ 6.13	7.2%
	Rate G-1 Small General Service	5,700	19	$ 1,073.17	1%	5,643	19	$ 1,064.46	$ (8.71)	-0.8%	$ 1,162.14	$ 88.97	8.3%
	Rate G-1 Small General Service	10,800	27	$ 1,966.73	1%	10,692	27	$ 1,950.23	$ (16.50)	-0.8%	$ 2,135.31	$ 168.58	8.6%
	Rate G-1 Seasonal Small General Service	450	9	$ 110.24	1%	446	9	$ 109.38	$ (0.86)	-0.8%	$ 117.10	$ 6.86	6.2%
	Rate G-1 Seasonal Small General Service	1,200	8	$ 283.97	1%	1,188	8	$ 281.37	$ (2.60)	-0.9%	$ 301.93	$ 17.96	6.3%
	Rate G-1 Seasonal Small General Service	2,700	9	$ 585.34	1%	2,673	9	$ 580.87	$ (4.47)	-0.8%	$ 627.14	$ 41.80	7.1%
	Rate G-2 Medium General Time-of-Use	61,500	205	$ 11,280.23	1%	60,885	203	$ 11,180.74	$ (99.49)	-0.9%	$ 12,234.66	$ 954.43	8.5%
	Rate G-2 Medium General Time-of-Use	85,600	214	$ 14,865.82	1%	84,744	212	$ 14,734.93	$ (130.89)	-0.9%	$ 16,201.85	$ 1,336.03	9.0%
	Rate G-2 Medium General Time-of-Use	126,500	253	$ 21,180.35	1%	125,235	250	$ 20,986.49	$ (193.86)	-0.9%	$ 23,154.31	$ 1,973.96	9.3%
	Rate G-3 Large General Time-Of-Use	373,100	1,066	$ 61,833.59	1%	369,369	1,055	$ 61,276.87	$ (556.72)	-0.9%	$ 67,670.64	$ 5,837.05	9.4%
	Rate G-3 Large General Time-Of-Use	354,600	788	$ 56,767.16	1%	351,054	780	$ 56,260.36	$ (506.80)	-0.9%	$ 62,337.10	$ 5,569.94	9.8%
	Rate G-3 Large General Time-Of-Use	614,900	1,118	$ 95,496.99	1%	608,751	1,107	$ 94,644.27	$ (852.72)	-0.9%	$ 105,181.75	$ 9,684.76	10.1%
	Rate G-4 General Power	7,800	52	$ 1,424.46	1%	7,722	51	$ 1,409.30	$ (15.16)	-1.1%	$ 1,542.97	$ 118.51	8.3%
	Rate G-4 General Power	6,750	27	$ 1,153.77	1%	6,683	27	$ 1,144.57	$ (9.20)	-0.8%	$ 1,260.25	$ 106.48	9.2%
	Rate G-4 General Power	9,450	27	$ 1,565.03	1%	9,356	27	$ 1,552.12	$ (12.91)	-0.8%	$ 1,714.07	$ 149.04	9.5%
	Rate G-5 Commercial Space Heating	1,472	-	$ 299.06	1%	1,457	-	$ 296.29	$ (2.77)	-0.9%	$ 321.51	$ 22.45	7.5%
	Rate G-6 All Electric Schools	60,748	-	$ 10,261.79	1%	60,141	-	$ 10,168.57	$ (93.22)	-0.9%	$ 11,209.61	$ 947.82	9.2%
	Rate G-7 Optional General Time-of-Use	7,000	20	$ 1,324.54	1%	6,930	20	$ 1,315.23	$ (9.31)	-0.7%	$ 1,435.19	$ 110.65	8.4%
	Rate G-7 Optional General Time-of-Use	15,500	31	$ 2,735.31	1%	15,345	31	$ 2,714.69	$ (20.62)	-0.8%	$ 2,980.31	$ 245.00	9.0%
	Rate G-7 Optional General Time-of-Use	11,700	18	$ 1,991.78	1%	11,583	18	$ 1,976.22	$ (15.56)	-0.8%	$ 2,176.72	$ 184.94	9.3%
	Rate G-7 Optional Seasonal General Time-of-Use	450	9	$ 161.06	1%	446	9	$ 160.45	$ (0.61)	-0.4%	$ 168.17	$ 7.11	4.4%
	Rate G-7 Optional Seasonal General Time-of-Use	1,500	10	$ 347.15	1%	1,485	10	$ 344.83	$ (2.32)	-0.7%	$ 370.54	$ 23.39	6.7%
	Rate G-7 Optional Seasonal General Time-of-Use	3,900	13	$ 778.42	1%	3,861	13	$ 772.40	$ (6.02)	-0.8%	$ 839.23	$ 60.81	7.8%

Notes:
The Program Administrators determined that there is no low, medium, or high savings scenario for low-income and street lighting participants.

Customer participation in the Energy Efficiency programs is assumed to occur in 2019.

PARTICIPANT BILL IMPACTS

Class	Rate Class	Pre-Participation			Medium Participation								
		2018			Savings (Reduced Usage)	Monthly Usage		2019			2021		
		Monthly Usage		Total Bill				Total Bill	Change from 2018 Bill		Total Bill	Change from 2018 Bill	
		kWh	kW	$	%	kWh	kW	$	$	%	$	$	%
Residential	Rate R-1 Residential	516	-	$ 120.01	10%	464	-	$ 109.80	$ (10.21)	-8.5%	$ 115.08	$ (4.93)	-4.1%
	Rate R-2 Residential Assistance	488	-	$ 67.54	25%	366	-	$ 51.53	$ (16.01)	-23.7%	$ 52.60	$ (14.94)	-22.1%
	Rate R-3 Residential Space Heating	740	-	$ 161.45	10%	666	-	$ 147.70	$ (13.75)	-8.5%	$ 155.28	$ (6.17)	-3.8%
	Rate R-4 Residential Assistance Space Heating	874	-	$ 111.66	25%	656	-	$ 84.48	$ (27.18)	-24.3%	$ 86.40	$ (25.26)	-22.6%
Small Comm.	Rate G-1 Small General Service	400	2	$ 84.90	10%	360	2	$ 77.06	$ (7.84)	-9.2%	$ 83.30	$ (1.60)	-1.9%
	Rate G-1 Small General Service	5,700	19	$ 1,073.17	10%	5,130	17	$ 968.70	$ (104.47)	-9.7%	$ 1,057.50	$ (15.67)	-1.5%
	Rate G-1 Small General Service	10,800	27	$ 1,966.73	10%	9,720	24	$ 1,772.63	$ (194.10)	-9.9%	$ 1,940.88	$ (25.85)	-1.3%
	Rate G-1 Seasonal Small General Service	450	9	$ 110.24	10%	405	8	$ 99.87	$ (10.37)	-9.4%	$ 106.89	$ (3.35)	-3.0%
	Rate G-1 Seasonal Small General Service	1,200	8	$ 283.97	10%	1,080	7	$ 256.33	$ (27.64)	-9.7%	$ 275.03	$ (8.94)	-3.1%
	Rate G-1 Seasonal Small General Service	2,700	9	$ 585.34	10%	2,430	8	$ 536.99	$ (48.35)	-8.3%	$ 579.05	$ (6.29)	-1.1%
	Rate G-2 Medium General Time-of-Use	61,500	205	$ 11,280.23	10%	55,350	185	$ 10,202.34	$ (1,077.89)	-9.6%	$ 11,160.45	$ (119.78)	-1.1%
	Rate G-2 Medium General Time-of-Use	85,600	214	$ 14,865.82	10%	77,040	193	$ 13,431.66	$ (1,434.16)	-9.6%	$ 14,765.23	$ (100.59)	-0.7%
	Rate G-2 Medium General Time-of-Use	126,500	253	$ 21,180.35	10%	113,850	228	$ 19,119.29	$ (2,061.06)	-9.7%	$ 21,090.04	$ (90.31)	-0.4%
	Rate G-3 Large General Time-Of-Use	373,100	1,066	$ 61,833.59	10%	335,790	959	$ 55,789.96	$ (6,043.63)	-9.8%	$ 61,602.48	$ (231.11)	-0.4%
	Rate G-3 Large General Time-Of-Use	354,600	788	$ 56,767.16	10%	319,140	709	$ 51,229.50	$ (5,537.66)	-9.8%	$ 56,753.81	$ (13.35)	0.0%
	Rate G-3 Large General Time-Of-Use	614,900	1,118	$ 95,496.99	10%	553,410	1,006	$ 86,121.49	$ (9,375.50)	-9.8%	$ 95,701.01	$ 204.02	0.2%
	Rate G-4 General Power	7,800	52	$ 1,424.46	10%	7,020	47	$ 1,284.55	$ (139.91)	-9.8%	$ 1,406.07	$ (18.39)	-1.3%
	Rate G-4 General Power	6,750	27	$ 1,153.77	10%	6,075	24	$ 1,038.58	$ (115.19)	-10.0%	$ 1,143.73	$ (10.04)	-0.9%
	Rate G-4 General Power	9,450	27	$ 1,565.03	10%	8,505	24	$ 1,409.08	$ (155.95)	-10.0%	$ 1,556.30	$ (8.73)	-0.6%
	Rate G-5 Commercial Space Heating	1,472	-	$ 299.06	10%	1,325	-	$ 269.99	$ (29.07)	-9.7%	$ 292.93	$ (6.13)	-2.0%
	Rate G-6 All Electric Schools	60,748	-	$ 10,261.79	10%	54,673	-	$ 9,246.77	$ (1,015.02)	-9.9%	$ 10,193.16	$ (68.63)	-0.7%
	Rate G-7 Optional General Time-of-Use	7,000	20	$ 1,324.54	10%	6,300	18	$ 1,194.04	$ (130.50)	-9.9%	$ 1,303.09	$ (21.45)	-1.6%
	Rate G-7 Optional General Time-of-Use	15,500	31	$ 2,735.31	10%	13,950	28	$ 2,466.27	$ (269.04)	-9.8%	$ 2,707.74	$ (27.57)	-1.0%
	Rate G-7 Optional General Time-of-Use	11,700	18	$ 1,991.78	10%	10,530	16	$ 1,792.39	$ (199.39)	-10.0%	$ 1,974.67	$ (17.11)	-0.9%
	Rate G-7 Optional Seasonal General Time-of-Use	450	9	$ 161.06	10%	405	8	$ 145.19	$ (15.87)	-9.9%	$ 152.20	$ (8.86)	-5.5%
	Rate G-7 Optional Seasonal General Time-of-Use	1,500	10	$ 347.15	10%	1,350	9	$ 313.64	$ (33.51)	-9.7%	$ 337.00	$ (10.15)	-2.9%
	Rate G-7 Optional Seasonal General Time-of-Use	3,900	13	$ 778.42	10%	3,510	12	$ 704.60	$ (73.82)	-9.5%	$ 765.36	$ (13.06)	-1.7%

Notes:
The Program Administrators determined that there is no low, medium, or high savings scenario for low-income and street lighting participants.

Customer participation in the Energy Efficiency programs is assumed to occur in 2019.

PARTICIPANT BILL IMPACTS

Class	Rate Class	Pre-Participation			High Participation								
		2018			Savings (Reduced Usage)	Monthly Usage		2019			2021		
		Monthly Usage		Total Bill				Total Bill	Change from 2018 Bill		Total Bill	Change from 2018 Bill	
		kWh	*kW*	*$*	*%*	*kWh*	*kW*	*$*	*$*	*%*	*$*	*$*	*%*
Residential	Rate R-1 Residential	516	-	$ 120.01	30%	361	-	$ 86.98	$ (33.03)	-27.5%	$ 91.09	$ (28.92)	-24.1%
	Rate R-2 Residential Assistance	488	-	$ 67.54	25%	366	-	$ 51.53	$ (16.01)	-23.7%	$ 52.60	$ (14.94)	-22.1%
	Rate R-3 Residential Space Heating	740	-	$ 161.45	30%	518	-	$ 116.43	$ (45.02)	-27.9%	$ 122.33	$ (39.12)	-24.2%
	Rate R-4 Residential Assistance Space Heating	874	-	$ 111.66	25%	656	-	$ 84.48	$ (27.18)	-24.3%	$ 86.40	$ (25.26)	-22.6%
Small Comm.	Rate G-1 Small General Service	400	2	$ 84.90	20%	320	2	$ 69.17	$ (15.73)	-18.5%	$ 74.71	$ (10.19)	-12.0%
	Rate G-1 Small General Service	5,700	19	$ 1,073.17	20%	4,560	15	$ 863.39	$ (209.78)	-19.5%	$ 942.32	$ (130.85)	-12.2%
	Rate G-1 Small General Service	10,800	27	$ 1,966.73	20%	8,640	22	$ 1,581.76	$ (384.97)	-19.6%	$ 1,731.31	$ (235.42)	-12.0%
	Rate G-1 Seasonal Small General Service	450	9	$ 110.24	20%	360	7	$ 89.44	$ (20.80)	-18.9%	$ 95.68	$ (14.56)	-13.2%
	Rate G-1 Seasonal Small General Service	1,200	8	$ 283.97	20%	960	6	$ 228.52	$ (55.45)	-19.5%	$ 245.14	$ (38.83)	-13.7%
	Rate G-1 Seasonal Small General Service	2,700	9	$ 585.34	20%	2,160	7	$ 488.23	$ (97.11)	-16.6%	$ 525.62	$ (59.72)	-10.2%
	Rate G-2 Medium General Time-of-Use	61,500	205	$ 11,280.23	20%	49,200	164	$ 9,105.56	$ (2,174.67)	-19.3%	$ 9,957.21	$ (1,323.02)	-11.7%
	Rate G-2 Medium General Time-of-Use	85,600	214	$ 14,865.82	20%	68,480	171	$ 11,974.99	$ (2,890.83)	-19.4%	$ 13,160.38	$ (1,705.44)	-11.5%
	Rate G-2 Medium General Time-of-Use	126,500	253	$ 21,180.35	20%	101,200	202	$ 17,029.59	$ (4,150.76)	-19.6%	$ 18,781.36	$ (2,398.99)	-11.3%
	Rate G-3 Large General Time-Of-Use	373,100	1,066	$ 61,833.59	20%	298,480	853	$ 49,699.46	$ (12,134.13)	-19.6%	$ 54,866.15	$ (6,967.44)	-11.3%
	Rate G-3 Large General Time-Of-Use	354,600	788	$ 56,767.16	20%	283,680	630	$ 45,638.64	$ (11,128.52)	-19.6%	$ 50,549.14	$ (6,218.02)	-11.0%
	Rate G-3 Large General Time-Of-Use	614,900	1,118	$ 95,496.99	20%	491,920	894	$ 76,653.75	$ (18,843.24)	-19.7%	$ 85,168.88	$ (10,328.11)	-10.8%
	Rate G-4 General Power	7,800	52	$ 1,424.46	20%	6,240	42	$ 1,143.47	$ (280.99)	-19.7%	$ 1,251.49	$ (172.97)	-12.1%
	Rate G-4 General Power	6,750	27	$ 1,153.77	20%	5,400	22	$ 926.80	$ (226.97)	-19.7%	$ 1,020.27	$ (133.50)	-11.6%
	Rate G-4 General Power	9,450	27	$ 1,565.03	20%	7,560	22	$ 1,256.13	$ (308.90)	-19.7%	$ 1,387.00	$ (178.03)	-11.4%
	Rate G-5 Commercial Space Heating	1,472	-	$ 299.06	20%	1,178	-	$ 240.70	$ (58.36)	-19.5%	$ 261.10	$ (37.96)	-12.7%
	Rate G-6 All Electric Schools	60,748	-	$ 10,261.79	20%	48,598	-	$ 8,222.65	$ (2,039.14)	-19.9%	$ 9,063.88	$ (1,197.91)	-11.7%
	Rate G-7 Optional General Time-of-Use	7,000	20	$ 1,324.54	20%	5,600	16	$ 1,062.48	$ (262.06)	-19.8%	$ 1,159.41	$ (165.13)	-12.5%
	Rate G-7 Optional General Time-of-Use	15,500	31	$ 2,735.31	20%	12,400	25	$ 2,194.90	$ (540.41)	-19.8%	$ 2,409.54	$ (325.77)	-11.9%
	Rate G-7 Optional General Time-of-Use	11,700	18	$ 1,991.78	20%	9,360	14	$ 1,591.25	$ (400.53)	-20.1%	$ 1,753.27	$ (238.51)	-12.0%
	Rate G-7 Optional Seasonal General Time-of-Use	450	9	$ 161.06	20%	360	7	$ 129.24	$ (31.82)	-19.8%	$ 135.47	$ (25.59)	-15.9%
	Rate G-7 Optional Seasonal General Time-of-Use	1,500	10	$ 347.15	20%	1,200	8	$ 279.90	$ (67.25)	-19.4%	$ 300.67	$ (46.48)	-13.4%
	Rate G-7 Optional Seasonal General Time-of-Use	3,900	13	$ 778.42	20%	3,120	10	$ 621.88	$ (156.54)	-20.1%	$ 675.89	$ (102.53)	-13.2%

Notes:
The Program Administrators determined that there is no low, medium, or high savings scenario for low-income and street lighting participants.

Customer participation in the Energy Efficiency programs is assumed to occur in 2019.

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

AFFIDAVIT OF MARGARET T. DOWNEY ON BEHALF OF THE CAPE LIGHT COMPACT JPE

I, Margaret T. Downey, do depose and say:

1. My name is Margaret T. Downey and my business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit 4, South Yarmouth, MA 02664.

2. I am the Administrator for the Cape Light Compact JPE (the "Compact").

3. As the Compact's Administrator, I oversee the administration of the Compact and its development and implementation of its energy efficiency plans since 2001, as well as its provision of competitive energy supply through its municipal aggregation program. With respect to the Compact's activities as an electric energy efficiency program administer, I oversee the Compact's annual energy efficiency program budget that is part of the three-year plan, approved by the Department of Public Utilities. I am responsible for local and state regulatory reporting and approvals, as well as the oversight of the participation and compliance in the ISO New England forward capacity market. I regularly make presentations and provide reports to customers, Compact staff, board members, regulatory agencies and community advocates. In addition, I serve as the Compact's representative on the Massachusetts Energy Efficiency Advisory Council.

4. I certify that the information contained in the Compact's Petition filed with the Department on October 31, 2018, was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury as of this 31st day of October, 2018.

Margaret T. Downey

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

AFFIDAVIT OF MARGARET SONG ON BEHALF OF THE CAPE LIGHT COMPACT JPE

I, Margaret Song, do depose and say:

1. My name is Margaret Song and my business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit 4, South Yarmouth, MA 02664.

2. I am the Commercial & Industrial ("C&I") Program Manager for the Cape Light Compact JPE (the "Compact").

3. As the Compact's C&I Program Manager, I oversee the implementation of Compact's C&I energy efficiency programs for Cape Cod and Martha's Vineyard. In addition, I assisted in the design of the Compact-specific C&I programs, as well as the development of the corresponding Compact budgets and savings goals.

4. On behalf of the Compact, I participate on the C&I Management Committee and assisted in the development of the C&I program offerings that are included in the 2019-2021 Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan.

5. I certify that the information concerning the Compact's C&I energy efficiency programs contained in the Compact's 2019-2021 Three-Year Energy Efficiency Plan filed with the Department on October 31, 2018, was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury as of this 31st day of October, 2018.

Margaret Song

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

AFFIDAVIT OF AUSTIN BRANDT ON BEHALF OF THE CAPE LIGHT COMPACT JPE

I, Austin Brandt, do depose and say:

1. My name is Austin Brandt and my business address is c/o Cape Light Compact JPE, 261 Whites Path, Unit 4, South Yarmouth, MA 02664.

2. I am the Senior Power Supply Planner for the Cape Light Compact JPE (the "Compact").

3. As the Compact's Senior Power Supply Planner, I oversee the Compact's provision of competitive power supply to its customers. As part of my responsibilities, I have been involved in the development and administration of the Compact's energy efficiency demand response programs, as well as the development of the corresponding Compact budgets and savings goals.

4. On behalf of the Compact, I participate on the Demand Response Working Group and have assisted in the development of the demand response program offerings that are included in the 2019-2021 Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan.

5. I certify that the information concerning the Compact's demand response program offerings contained in the Compact's 2019-2021 Three-Year Energy Efficiency Plan filed with

the Department on October 31, 2018, was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury as of this 31st day of October, 2018.

Austin Brandt

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

AFFIDAVIT OF DOUG HURLEY

I, Doug Hurley, do depose and say:

1. My name is Doug Hurley and my business address is c/o Synapse Energy Economics, Inc., 485 Massachusetts Avenue, Suite 2, Cambridge, MA 02139.

2. I am a Principal Associate for Synapse Energy Economics, Inc.

3. As consultant to the Compact, I assisted in the development in certain quantitative components of the Compact's 2019-2021 Three-Year Energy Efficiency Plan. Specifically, I have contributed in the areas of Forward Capacity Market ("FCM") calculations.

4. I certify that the information concerning FCM calculations contained in the Compact's Petition and accompanying exhibits filed with the Department on October 31, 2018, was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury as of this 31st day of October, 2018.

Douglas J. Hurley

Doug Hurley

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CAPE LIGHT COMPACT JPE	)	D.P.U. 18-116

AFFIDAVIT OF ERIN MALONE

I, Erin Malone, do depose and say:

1. My name is Erin Malone and my business address is c/o Synapse Energy Economics, Inc., 485 Massachusetts Avenue, Suite 2, Cambridge, MA 02139.

2. I am a Senior Associate for Synapse Energy Economics, Inc.

3. As consultant to the Compact, I assisted in the development of certain quantitative components in the Compact's 2019-2021 Three-Year Energy Efficiency Plan. Specifically, I was responsible for the Compact's quantitative analysis included in the Energy Efficiency Data Tables ("Data Tables"). To complete the Data Tables, I worked with the Compact to analyze costs, savings and benefits through internal budget modeling and the Benefit-Cost screening model, and coordinated with the Program Administrators on consistent program assumptions for all applicable calculations. I also assisted the Compact in the development of its Bill Impact Analysis.

4. I certify that the information concerning the quantitative analysis included in the Compact's Data Tables contained in Exhibit Compact-4 and the Bill Impact Analysis contained in Exhibit Compact-6 filed with the Department on October 31, 2018, was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury as of this 31st day of October, 2018.

Erin Malone

Opinion Dynamics

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Memorandum

Cape Light Compact Stakeholder Engagement Meetings

To: Maggie Downey and Briana Kane (Cape Light Compact)
From: Paul Wasmund, Antje Flanders, and Brendon Donoghue
Date: May 11, 2018
Re: Cape Light Compact Stakeholder Engagement Meetings in Support of the 2019-2021 Planning Process

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1. Introduction

Cape Light Compact (the Compact) sought to involve their customers in planning for the 2019-2021 Energy Efficiency Plan by hosting a series of meetings early in the planning process. The Compact contracted with Opinion Dynamics to facilitate these meetings in late 2017/early 2018, to be completed prior to submitting the first draft of the plan in April 2018. Specifically, the Compact sought input on the following:

- Compact energy efficiency programs and initiatives that work well;
- Changes that the Compact can implement cost-effectively; and
- Additions to the Compact's delivery of energy efficiency programs.

In addition, the Compact sought input from stakeholders about key barriers to energy efficiency and program participation and strategies to overcome these barriers.

The following are the most practical findings gleaned from the various stakeholder meetings for the Compact to consider when developing its 2019-2021 Energy Efficiency Plan. It should be noted that many ideas put forth by meeting attendees have already been tried by the Compact or are not within the Compact's purview. Where relevant, we note this throughout this memorandum.

- **There is broad support amongst meeting attendees to engage in partnership with the Compact.** Stakeholders in attendance at each of the different meetings expressed broad support for the Compact's energy efficiency goals. As such, attendees representing local governments, educators, community groups, commercial and industrial (C&I) customers, and the vendor community were all willing to develop new or expand existing partnerships to help the Compact increase their reach to educate the Cape and Vineyard community about the value of energy efficiency and the ways that the Compact can help facilitate energy efficiency improvements in their homes and businesses.
- **Energy efficiency is not always associated with environmentalism and solving climate change.** While nearly all stakeholder groups cited protecting the environment and solving climate change as

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motivators to improve their own energy efficiency, several groups also maintained that many of their peers do not readily make the same connection. Attendees encouraged the Compact to make the case for energy efficiency by linking energy-saving actions to protecting the fragile environment of the Cape and the Vineyard and helping to address the broader problem of climate change.

- **Customers and vendors are interested in basic communications (e.g., email lists) to keep up-to-date on the latest rebates and incentives available through the Compact.** Vendors and C&I customers specifically expressed an interest in having more regular contact with the Compact so they are able to stay informed about the latest Compact offerings and program changes. To help facilitate these types of communications, the Compact would need to receive additional contact information, such as email addresses, through the monthly data exchange with Eversource.
- **Word of mouth is still the most effective means by which Compact customers learn about energy efficiency and Compact programs.** In many different meetings attendees stressed that word of mouth communication is very effective on the Cape and the Vineyard. Further, as some attendees believed their peers to be skeptical of "free offers," hearing about the value of Compact programs from a familiar source may circumvent the trust-related barriers that several attendees raised. As such, attendees representing several different stakeholder groups suggested leveraging existing networks (see Section 3.2.1) to reach those Compact customers that have yet to enroll in an energy efficiency program.
- **Stakeholders believe that customers are more interested in existing offerings than new technology.** Meeting attendees stressed that residential customers in particular would be less interested in emerging technologies (e.g., smart appliances and on-line energy assessments), and more interested in standard offerings (e.g., insulation, air sealing, HVAC).
- **Attendees representing several different stakeholder groups suggested the following additions to existing residential programs.**
  - Offer more scheduling flexibility, such as energy assessments on weekends or evenings, to accommodate those that cannot dedicate several hours to the assessment during a normal weekday.
  - Raise the $4,000 insulation cap. While the current cap is likely adequate for most homes, raising the cap may encourage owners of older homes to enroll in the Home Energy Assessment program, as they tend to be far more costly to insulate.
  - Provide more hands on guidance to those that enroll into the Home Energy Assessment program, such as assigning case managers to help lead participants through the application and assessment process, and ensure that participants eventually implement energy efficiency measures.
- **Attendees representing several different stakeholder groups suggested the following additions to existing commercial programs.**

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- Provide easily digestible information on the financial benefits of improving the efficiency of specific building systems, particularly geared towards small and medium businesses as they are less likely to have dedicated facility or sustainability staff.
- Offer more prescriptive, or standard rebates for common measures, such as variable frequency drives, to help expedite the rebate process and improve participants' ability to plan for specific rebate amounts.
- Provide some assistance with post-installation measurement and verification and sub-metering, where required for large C&I projects, either by including metering services as part of the program (through a contractor), providing an additional rebate for metering equipment, or loaning metering equipment to program participants and providing some basic technical support.

- **Both residential and commercial stakeholders expressed an interest in low-interest project financing.** Attendees suggested that low-interest financing options (e.g., on-bill financing) would be of particular interest to residential small and medium C&I customers. Further, several stakeholders that work with hard-to-reach population suggested financing options for low- and middle-income residential customers; however, they also noted that any financing for low-income customers should be paired with credit workshops (see Section 3.2.2).

The remainder of this memorandum presents our approach for structuring and facilitating these meetings and a more detailed discussion of common themes that emerged in the meetings. Additionally, we present summaries of each individual meeting as Appendix A, noting specific feedback from those in attendance.

2. Approach

The scope of work for this study defined 10 different stakeholder groups from which to seek feedback. At the request of the Compact, Opinion Dynamics conducted two meetings with residential customers and added a meeting with Compact staff, bringing the total number of meetings to 12 (see Table 2 below). The remainder of this section outlines Opinion Dynamics' research approach, including meeting architecture, facilitation style, and recruitment.

2.1 Research Questions

In collaboration with the Compact, Opinion Dynamics developed 12 research questions to address during the stakeholder meetings. Some research questions were relevant to all of the stakeholder groups while others only applied to specific groups. Table 1 below shows the 12 questions and which stakeholder meeting(s) addressed each.

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Table 1. Research Questions

Research Topic	Environmental Organizations	Community Organizations	Local Government/Public Entities	Vineyard Organizations	Educational Organizations	Contractor & Vendor Community	Residential Customers	Small/Medium C&I	Large C&I	Compact Board of Directors
What opportunities, from energy efficiency to solar, are of interest to stakeholders?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
What else should the Compact be offering that is not currently offered?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
How can the Compact increase participation in its programs?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
How can the Compact better serve customers in a comprehensive manner and achieve deeper savings?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
How can the Compact better provide information to stakeholders' towns and residents/businesses?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
How can the Compact better involve and leverage different stakeholder groups for outreach?	✓	✓	✓	✓	✓	✓				✓
How can the Compact better reach hard-to-reach customers?						✓	✓			
What is customer interest in in-person versus on-line assessments?						✓	✓			
To what extent do free energy efficient light bulbs motivate customers to participate in Compact programs?						✓	✓			
How can the Compact modify its low income program guidelines (e.g., $4,000 cap) to reduce barriers to participation?						✓	✓			
What will energy education look like when lighting is no longer offered?					✓					
How can energy efficiency support efforts to address climate change?	✓									

2.2 Recruitment and Attendance

The Compact provided Opinion Dynamics with a list of potential attendees for each of the stakeholder meetings. Our team then recruited a diverse set of meeting attendees, representing the various different stakeholder groups outlined in Table 1. We offered all attendees a $100 incentive, delivered at the conclusion of each meeting, with the exception of government employees, Compact staff, and members of the Compact Board of Directors.

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Our goal was to have a minimum of eight individuals attend each meeting. As such, Opinion Dynamics recruited up to 15 attendees for each meeting, knowing that some cancellations are unavoidable. Table 2 shows the date and number of attendees for each meeting. Due to relatively small numbers of C&I customers and environmental organizations on the Cape, we expected lower attendance for those meetings. On average, there were just under 10 attendees per meeting.

Table 2. Stakeholder Meeting Groups

Meeting Number	Stakeholder Group	Date	Number of Attendees
1	Cape Cod Environmental Organizations	11/30/2017	5
2	Cape Cod Municipal/Public Entities	12/01/2017	13
3	Educational Organizations	12/12/2017	10
4	Compact Board of Directors	12/13/2017	9
5	Compact Large C&I Customers	01/10/2018	6
6	Compact Vendor Community	01/11/2018	9
7	Compact Residential Customers #1	01/11/2018	13
8	Compact Small/Medium C&I Customers	01/16/2018	5
9	Vineyard Organizations	01/22/2018	13
10	Cape Cod Community Organizations	01/23/2018	11
11	Compact Staff	01/23/2018	11
12	Compact Residential Customers #2	02/01/2018	9
Total Number of Meeting Attendees			**114**

2.3 Meeting Architecture and Facilitation Approach

Opinion Dynamics prepared custom meeting designs, including agendas and discussion guides, for each group to enable us to address the relevant research topics with each group. Additionally, our team adapted the style and structure of subsequent meetings based on attendee feedback and which strategies we found most effective in the early meetings.

Though we designed custom agendas for each meeting, our team based the overall structure on Naomi Henderson's *Secrets of a Master Moderator*[1]. At a high-level, the structure of all meetings followed the four stages and discussed the different topical areas outlined in Table 3 below.

[1] Henderson, N. R. (2011). *Secrets of a Master Moderator, 3rd Edition.* Rockville, MD: VISAR Corporation

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Table 3. Four Meeting Stages

Meeting Stage	Topics	Description	Time (minutes)
Introduction	▪ Meeting objectives ▪ Ground rules	Introduced the meeting objectives, the various attendees, and established basic ground rules for the discussion.	10
Rapport and Reconnaissance	▪ Introductions ▪ Why energy efficiency is important	Facilitators asked the group high-level questions to gain an understanding of the baseline level of knowledge amongst attendees, introduced general topics for more in-depth discussion, and developed a sense of group dynamics.	15
In-Depth Investigation	▪ Discuss motivators and barriers ▪ Outreach education, and potential partnerships ▪ Brainstorm programs and offerings of interest to Compact customers	The main portion of the meeting where facilitators explored research topics. These sections included different activities in large and small groups, allowing facilitators to draw out detailed feedback on key issues.	85
Closure	▪ Wrap-up ▪ Meeting evaluations ▪ Incentives	Re-stated high-level meeting outcomes, administered evaluation forms, distributed incentives (where applicable), and concluded.	10

During the *introduction* stage Opinion Dynamics facilitators described the impetus for the meetings and the meeting objectives. Additionally, facilitators established a set of ground rules that primed attendees to stay on-topic, while also creating an environment that allowed attendees to share their feedback openly. Moving into the *rapport and reconnaissance* stage, facilitators asked attendees to introduce themselves and share their thoughts on why energy efficiency was important to the Cape and the Vineyard. At this point in the meetings, facilitators encouraged attendees to relate energy efficiency to their own personal and professional experiences to help foster contributions from all in attendance.

The *in-depth investigation stage* represented the bulk of the substantive discussion for each meeting. During this stage, attendees detailed motivators and barriers they saw to increasing energy efficiency on the Cape and the Vineyard and participation in Compact programs. Facilitators also covered outreach and engagement topics and asked attendees to brainstorm different programs and offerings that would be of interest to their peers, constituents, or customers. Attendees both shared their thoughts on existing programs that were of interest to Compact customers, how they thought the Compact might be able to enhance those existing programs, and which new programs may be of interest to Compact customers in the future. Facilitators used different strategies to encourage attendees to delve deeper into these topical areas, including brainstorming;

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small group work; sorting; and basic association exercises where facilitators reflected back on previously identified barriers or motivators to prompt additional discussion of existing or new offerings.

Finally, during the *closure* stage, facilitators wrapped up discussion topics and reflected on the range of topics that each group covered. We also collected basic feedback on the meeting structure and content (via an evaluation form), provided attendees with their attendance incentive (where applicable), and adjourned.

3. Common Themes

This section discusses the most common themes that carried through the different stakeholder meetings. The section is organized into the different topical areas that our facilitators focused on during the *in-depth investigation* stage of each meeting. Throughout the remainder of this section we present anecdotal evidence, including direct quotes and suggestions from meeting attendees on the various research topics (see Table 1). These observations are not representative of the Compact's entire customer base, but rather the opinions of those in attendance.

3.1 Motivations and Barriers

At the outset of each meeting, facilitators encouraged attendees to explore the different motivators and barriers they saw to increasing energy efficiency on the Cape and the Vineyard, and increasing participation in Compact programs. One major theme that carried through both of these conversations was the idea of "trust." While the close-knit nature of the Cape could be an asset to the Compact in terms of leveraging existing networks and encouraging referrals, several attendees also saw the lack of trust in "free offers" as a large barrier that the Compact needed to overcome. Attendees, therefore, encouraged the Compact to tap into existing trusted networks to facilitate more participation in their programs.

3.1.1 Motivators

Meeting attendees consistently mentioned several different factors that they feel motivate people living and working on the Cape to improve the energy efficiency of their home or business. Table 4 provides a list of the most commonly mentioned motivators for both residential and commercial customers cited throughout the various stakeholder meetings.

Table 4. Motivators for Energy Efficiency

Motivator
Saving money/Return on investment
Being responsible community members
Protecting the environment/Addressing climate change
Avoiding the need for disruptive energy infrastructure upgrades
Protecting future generations
Referrals from trusted sources (e.g., neighbors or colleagues)
Occupant health
Comfort

The most commonly mentioned motivating factor in all meetings was saving money on energy costs and, specifically for C&I customers, achieving a return on their investment (ROI) in short order. Attendees representing the C&I community specifically noted that decision makers will typically look to get a return on energy efficiency investments within 3 years, though an ROI of 5 years would be acceptable for lower cost projects.

According to attendees, the community mindset and close-knit nature of the Cape and the Vineyard are also major drivers for improving energy efficiency. As such, during most meetings, stakeholders mentioned referrals (i.e., hearing about energy efficiency via word-of-mouth) and being responsible stewards of the community as main motivators for improving their energy efficiency. Attendees representing the Compact's C&I customers also described peer referrals as an important way to drive participation in Compact programs, as one of the primary motivations for reducing energy consumption was to be positive members of their local community.

Similarly, in all meetings attendees described the desire to preserve and protect the environment as a major motivator for improving energy efficiency on the Cape and the Vineyard. However, though some attendees described a general desire to reduce their carbon footprint, most discussed this motivator in the context of protecting fragile local ecosystems by avoiding the need for disruptive energy infrastructure projects. Attendees noted, however, that many of their peers likely do not directly associate energy efficiency with protecting the environment. As such, they felt that it was important for the Compact to make a clearer connection between the two in their program outreach.

3.1.2 Barriers

In all stakeholder meetings, facilitators asked meeting attendees to discuss the most significant barriers to improving energy efficiency on the Cape and the Vineyard and to participating in the Compact's programs. Table 5 summarizes the key barriers mentioned.

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Table 5. Barriers to Energy Efficiency and Participating in Compact Programs

Barriers	Energy Efficiency	Compact Programs
High equipment cost	✓	
Measurement & verification costs		✓
Split incentive	✓	✓
Lack of awareness/understanding	✓	✓
Scheduling challenges		✓
Seasonality	✓	✓
Competing priorities	✓	✓
Compact staff time		✓
Compact budgetary constraints		✓
Trust		✓
Older building stock	✓	
Lack of training for facility staff	✓	
Limited pool of local trades people	✓	

Another theme that carried through many of the meetings was the lack of awareness, among both residential and C&I customers, of what the Compact already offers. From past program participants to the vendor community and Compact staff, attendees agreed that the majority of Compact customers still do not know that, for example, they are entitled to a free home energy audit each year. While attendees agreed that the Compact does a good job of advertising through a variety of different media, several suggested that the Compact continue to tap into existing networks by partnering with local governments and community organizations.

Additionally, many attendees felt that residents and businesses owners on the Cape were not well versed in the concept of energy efficiency and demand-side programs in general. First, attendees felt that Compact customers did not have a good understanding of the amount of energy they use on a daily basis, the amount that could be saved by making energy efficiency improvements, and how those energy savings would translate into financial savings. Further, attendees believed that most of their peers were unaware of the systems benefit charge (SBC)—i.e., they are, in part, funding energy efficiency programs—and how much they contributed annually. Those speaking on behalf of medium and large C&I customers, in particular, noted that if their peers understood the amount they contributed towards energy efficiency annually, combined with their potential savings, they would be far more likely to take advantage of the Compact's offerings.

Compact Staff

Compact staff noted that resource constraints may pose a barrier to the Compact's ability to implement some of the suggestions provided by meeting attendees. For example, as suggested by several different stakeholder groups, the Compact had previously used volunteers to assist older Cape residents with the energy assessment process, including assistance signing up for the program and helping to interpret the results of the assessment. Compact staff found that the effort required to initiate a volunteer program, train volunteers,

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and continue to administer the process took a considerable amount of time and energy and was not feasible given other competing priorities.

In addition to limits on staff time, cost-effectiveness presents another barrier to the implementation of certain offerings, as the Compact's budgets must pass strict cost-effectiveness requirements. The high-cost comprehensive programs that some Compact customers desire, assuming they are cost-effective, might lead to higher bill impacts. In addition, while lack of awareness is a major obstacle to realizing greater program participation, Compact staff have to balance increasing budgets for marketing with customer bill impacts.

3.2 Outreach and Education

According to meeting attendees, one of the major barriers to realizing more participation in Compact programs and achieving more energy savings on the Cape is lack of awareness and understanding. In most meetings, attendees agreed increasing awareness of Compact offerings, thereby increasing program participation, will require persistent outreach efforts and consistency of messaging. Further, attendees in several different meetings agreed that, as energy efficiency can be a highly detailed and technical subject, the simplicity of messaging is key to reach those that are still unaware of the benefits of energy efficiency and the types of opportunities that the Compact offers.

> *I think the consistency of communication to people who would benefit from [Compact programs] is not there. And the reason I say this is my job…part of it, self-defined, has been to do that communication. And so I'll invite people over and over again and I'll run into them in the halls and it's a constant source of conversation and it's amazing to me how long it takes people before they do it.*
>
> ~ Small/Med C&I Customer ~

Several different stakeholder groups also touted the value of using testimonials for engagement purposes. Given the value of trusted referrals as a motivator, attendees believed that hearing from their peers about the benefits of working with the Compact to improve the energy efficiency of their home or business may be a powerful motivator for participation in Compact programs. Compact staff acknowledged that they had promoted testimonials through videos on their website with mixed success. However, attendees suggested shorter videos pushed out through the Compact's social media accounts. Further, some attendees suggested using past program participants as "ambassadors" for the Compacts programs and reaching out to their personal or professional networks to share positive experiences with the Compact programs.

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3.2.1 Tapping into Existing Networks

During several meetings attendees brought up the idea of the Compact helping to establish workshops, with the goal of educating different groups of people about energy efficiency. Several attendees noted that there are a range of different groups that already exist that the Compact may be able to leverage. For example, one group suggested modeling an "energy efficiency institute" after the Housing Institute, launched by the Cape Cod Community Development Partnership (CDP) and the Housing Assistance Corporation (HAC).

> *The energy efficiency institute idea would be really helpful as a regional planning agency. To participate in something like that would be helpful for us and I think it would be helpful for towns too because it would better inform us as to how to do the planning…and policies within the town that would facilitate energy efficiency.*
>
> ~ Cape Community Groups ~

Meetings attendees also suggested that the Compact tap into existing networks via partnerships with other organizations. Attendees felt that, both leveraging existing partnerships and building new ones would be an effective strategy for educating Compact customers on the value of energy efficiency and the different offerings that the Compact provides.

- **Community organizations**—several different community groups expressed interest in leveraging their own networks to share information about energy efficiency and Compact programs. Further, C&I customers suggested facilitating community industry groups or workshops to help share information about the benefits of energy efficiency and best practices with their peers.
- **Educational institutions**—stakeholders noted that the Compact has a long history of working within the school systems on the Cape and the Vineyard to share information about energy efficiency. Attendees suggested building upon those partnerships by working with school administrators and providing materials to help incorporate energy efficiency into existing curricula. Among other activities (see Appendix A), attendees suggested lessons involving students completing basic energy assessments of their own homes or their schools, or providing low-cost retrofit kits. Further, attendees suggested working with local technical and vocational schools to help build the network of local technical professionals on the Cape and the Vineyard.
- **Local governments**—several stakeholders noted that energy efficiency efforts were fragmented and suggested helping local governments and energy committees collaborate in reaching their residents. Attendees provided the example of *Outer Cape Energize* as a successful partnership between different local governments that the Compact could use as a model to shape partnerships between towns on the Cape and the Vineyard.
- **Real estate industry**—a number of stakeholders suggested developing partnerships or workshops with members of the real estate industry. For example, the Compact could work with home inspectors and real estate agents to share Compact offerings with home buyers and sellers. Specifically, attendees thought that home inspections were an ideal time to approach residential customers about the value of energy efficiency, the opportunities that may exist in their home, and the different ways that the Compact can help to facilitate energy efficiency improvements.

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- **Seasonal population**—attendees also suggested attempting to reach seasonal residents on the Cape and the Vineyard through partnerships with non-resident taxpayers associations and rental property managers. Stakeholders acknowledged the challenges related to reaching this population, as there is little incentive for those that come to the Cape for a limited vacation to invest in energy efficiency. However, there may be value in working with vacation property owners to make the case for reducing energy costs, both during the summer months and in the off-season.
- **Vendor community**—representatives from the Cape's vendor community noted that many of their peers were still not well versed in the different energy efficiency offerings available through the Compact. While vendors were not interested in having a "qualified vendor network" that would require additional certifications or administrative work, they were interested in developing a network to share the latest information on rebates and incentives. Vendors believed that, as they are typically more closely associated with home improvement than the Compact, building a broader network of local vendors and contractors is an important part of increasing participation in Compact programs.

3.2.2 Hard-to-Reach Customers

One recurring topic in several of the residentially-focused meetings, was how to increase participation in Compact programs amongst hard-to-reach populations on the Cape and the Vineyard. Attendees believed that the main solutions to increasing participation for hard-to-reach customers rested on improving outreach and education efforts aimed at these communities. Stakeholders offered the following suggestions.

- **Financing**—while different stakeholder groups suggested giving low- and middle-income customers access to financing options (e.g., on-bill financing), several attendees noted that taking out more debt may do more harm than good for members of these populations. As such, stakeholders recommended that, in addition to offering financing, the Compact work through their existing partnerships with the HAC to facilitate participation in credit workshops for those that wished to finance energy efficiency improvements.
- **Language barriers**—a number of different stakeholders suggested that the Compact should print non-English materials and reach out to community groups that serve non-English speaking populations. Several attendees also noted that, to successfully serve non-English speaking groups, the Compact would need to offer support in other languages, both in terms of administrative support to help enroll non-English speaking participants and home energy assessments and recommendations.
- **Stigma**—several attendees noted that there is often some social stigma associated with participating in an income qualified offering. As such, attendees stressed incorporating as much discretion as possible during the application process. For example, the Compact should find ways to digitally verify income, or other sensitive information, prior to a home energy assessment.
- **Customer awareness**—attendees agreed that the Compact offers an exceptional renters program and that the program design (e.g., the $4,000 cap) is not the main obstacle to enrolling a larger share of the Cape and Vineyard's hard-to-reach renters. However, attendees noted that some renters on the Cape are still unaware of the program and that some may be reticent to approach their property owner to get permission to move forward with deeper savings upgrades. Therefore, attendees suggested the Compact continue to find ways to market the program to property owners and encourage them to suggest the program to their tenants.

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3.3 Programs and Offerings

Another key component of each meeting was to discuss the different programs and offerings that were of interest to Compact residential and commercial customers. In each of the sessions, we explored the facets of existing programs that were popular amongst different groups and which types of new or emerging programs the Compact should explore in the future.

3.3.1 Existing programs

Meeting attendees mentioned several existing Compact programs that they thought are still of interest to customers. While meeting attendees were heavily skewed in favor of past program participants, the majority had very favorable opinions of energy efficiency, specifically the financial benefits of making energy-related improvements to homes and businesses.

Residential

According to meeting attendees, residential customers are still very interested, and find value in the free home energy assessments (HEA). In several different meetings, attendees perceived that their peers would be particularly interested in the free insulation and air sealing that is currently part of the HEA offering.

Meeting attendees also offered several suggestions for how the Compact could circumvent barriers and increase enrollment in the HEA program:

- **Offer more scheduling flexibility**—as several different groups identified "competing priorities" and "scheduling challenges" as major barriers to increasing participation in Compact programs, attendees suggested that the Compact work with energy auditors to find ways to offer energy assessments on weekends or evenings to accommodate those that cannot dedicate several hours to the assessment during a normal weekday.
- **Raising the $4,000 insulation cap**—though attendees generally agreed that the insulation offering is of great value to residential customers and that the current cap covers the majority of cases, some attendees felt that, particularly for older housing stock, insulation work may exceed the current $4,000 cap. Attendees felt that owners of older homes may be less likely to participate in the HEA program as they likely already know that their home's energy efficiency could be improved, but feel that the cost of making the necessary upgrades would be prohibitive.
- **More "hands on" guidance for participants**—attendees suggested that the Compact do more to shepherd participants through the HEA program—that is, assign case managers to participants to assist with the application process, help decipher energy-saving recommendations, and ensure that participants implement energy efficiency measures. Attendees also raised the idea of providing added incentives for contractors to spend more time with participants during the assessment to offer expanded education and explain the different energy efficiency measures that they recommend.

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Attendees in several meetings also suggested that air source heat pumps were gaining popularity amongst their peers. Attendees noted that air source heat pumps have broad appeal, both to customers interested in protecting the environment and those driven more by saving money. As such, attendees proposed augmenting the current air source heat pump offerings to include replacement of other types of heating systems. While attendees representing several different stakeholder groups spoke to the savings residential customers would likely realize from replacing electric resistance heating systems with air source heat pumps, attendees also advocated for programs incenting a switch from gas powered heating systems.

Commercial and Industrial

Many of the attendees representing the Compact's C&I customer base spoke favorably about the Compact's programs, and most agreed that lack of time and awareness were major impediments to realizing more participation in the Compact's C&I programs. Specifically, C&I customers typically cannot afford the down-time necessary to complete an energy assessment or a non-critical equipment upgrade. Further, small and medium, and sometimes large, C&I customers do not always have a staff member dedicated to sustainability or energy management, and thus may not be aware of the financial benefits of energy efficiency.

> *Our payback for all of our projects has been less than three years. The one proposed that was a five-year payback, was with controls. Like fancy controls, we had to cut those out to get it down to a three-year payback, but the incentive was huge. A third of the cost of the whole project. Cape Light Compact, they do a lot of things well.*
>
> ~Large C&I~

As such, attendees focused recommendations for improving existing C&I offerings on those that would add flexibility and clarity, while also reducing the time necessary to participate in programs.

- **Assistance with financial decision-making**—while some C&I attendees were interested in improving their energy efficiency, they did not have the time or resources to calculate what they could be saving, in terms of operating costs, by replacing inefficient equipment. Attendees suggested offering guidelines and easily digestible pay-back information.
- **More prescriptive rebates**—attendees raised the idea of standard, or prescriptive, rebates for some of the most common measures (e.g., variable frequency drives and HVAC roof-top-units) with expedited approval and limited measurement and verification (M&V) processes.

> *Just give us a standard rebate. It is so expensive and timely for us to try to verify everything.*
>
> ~Small/Medium C&I~

- **Measurement and verification assistance**—large C&I attendees in particular noted the added time and costs associated with sub-metering and post-installation M&V for certain projects. Therefore, attendees suggested that the Compact provide some assistance as part of the large C&I program, either by including metering services as part of the program (through a contractor) or providing an additional rebate for metering equipment. Further, attendees suggested loaning metering equipment and providing technical assistance to program participants.

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3.3.2 New Programs

Facilitators also asked meeting attendees to think about new programs or offerings that they were aware of that may be of interest to Compact customers in the future. While customers were interested in some emerging technologies and program areas, most noted that their peers would likely be more interested in the existing offerings discussed previously. In Table 6 below, we outline several new program areas that stakeholder mentioned most frequently throughout various meetings.

Table 6. New Offerings of Interest to Compact Customers

New Offering	Residential	Commercial
Renewable Energy (Solar PV)	✓	✓
Energy Storage	✓	✓
Low Interest Loans (e.g., on-bill financing)	✓	✓
Retrocommissioning		✓
Energy Management Systems/Smart Home		✓
Behavioral (Information Display)	✓	
Duct Sealing	✓	
Electric Vehicles (Charging Stations)		✓
Alternative Certification Programs	✓	✓

Residential attendees suggested that their peers may be interested in renewables (specifically solar PV), potentially paired with energy storage or other offerings. Attendees suggested that more tangible types of measures (such as solar PV and electric vehicles) may appeal to residential customers, particularly those motivated by protecting the environment and addressing climate change. Residential customers also noted that some of their peers may be interested in an offering through the Compact that combines solar PV with energy efficiency—such as, air source heat pumps. Attendees felt that adding solar PV to existing offerings may help to encourage more participation in energy efficiency programs given the visibility and increasing popularity of residential solar PV on the Cape.

Most stakeholder groups also suggested that their peers would be interested in the Compact helping to secure low-interest project financing, specifically for low- and middle-income residential customers (see Section 3.2) and small businesses. Stakeholders also suggested finding ways to recognize energy efficiency efforts at the town level as a means of enticing local governments to enroll more of their constituents in Compact programs.

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Residential stakeholders expressed an interest in behavioral programs, especially programs that provide information displays that show near real-time energy use, as opposed to report programs comparing their energy habits to their neighbors. Vendors also mentioned that many of their residential customers may be interested in a duct sealing option that was not tied to the installation of a new HVAC system.

Commercial stakeholders expressed strong support for retrocommissioning offerings, as those projects can have large savings potential and may also be more cost-effective for commercial customers than replacing major equipment. Similarly, commercial stakeholders were interested in building automation or energy management systems, and expressed some interested in an incentive to install electric vehicle charging stations. Finally, some commercial customers expressed an interest in more renewable (solar PV) and energy storage options, but also acknowledged that both may be less appealing to some commercial customers due to the perception of added maintenance costs.

> *Well, the truth is that if you get PV, the natural thing to do is to put in a battery because then, for instance…. [after the hurricane] in Puerto Rico, there were four resorts that were back in business in four days afterwards because they all had solar and they all had batteries. They just flipped everything up, and all the lights came back on. They swept their beaches clean, and they were back in business.*
>
> ~Residential~

While facilitators did raise the idea of on-line or remote energy assessments (see Table 1), stakeholders maintained that their peers would not be willing to take the time, or would be unable, to provide information necessary to participate in a sufficiently rigorous on-line assessment. Further, vendors suggested that even if the Compact deployed remote energy assessment software, in their experiences, most modeling software would not be able to capture all of the nuances associated with each building. As such, installation visits may end up taking the same amount of time, or even become more challenging, as technicians would be unaware of individual building conditions and characteristics. Further, attendees were concerned that on-line energy assessments may erroneously identify some savings opportunities, thereby exacerbating existing scheduling challenges.

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Appendix A. Stakeholder Meeting Summaries

This appendix provides summaries for each of the 12 meetings, noting meetings dates, attendance, and the organizations or towns represented by attendees (where applicable) as well as key topics of discussion.

Meeting #1: Cape Environmental Organization

Cape Cod Environmental Organizations	
Date	November 30th, 2017
Number of Attendees	5
Organizations Present	Association to Preserve Cape Cod, Inc., Cape Cod Climate Change Collaborative, National Audubon Society, and Sierra Club

- Energy efficiency can set the foundation for people to feel good about actions they have taken to reduce negative environmental impacts, and also presents opportunities to engage people that may not otherwise get involved in environmental issues.
- Energy efficiency is not typically associated with climate change mitigation or taking action to protect the environment. Communicating how **energy efficiency is connected to protecting the environment and emphasizing energy conservation as a fuel source** that is similar to other renewable energy sources may help engage some stakeholders that care about these issues.
- Energy efficiency is perceived as "boring" since many of the most practical measures are not as visible as solar panels or electric vehicles (EVs). Connecting it to more "exciting" solutions, like renewables, can help **get people engaged**.
- Lack of awareness of the Compact and its programs is seen as **a key barrier to program participation**: Many Cape residents and businesses are still unaware of the different energy efficiency programs that the Compact offers and that part of their electricity bills go towards funding those programs. Understanding these points, along with the rebates available and the potential cost savings that may come from implementing the recommendations from an energy audit, may increase participation and eventual adoption of deeper savings measures.
- **Energy audits** are seen as an attractive offering (multiple attendees had received multiple audits and associated incentives on their own homes) and a good way to get people into energy efficiency. However, knowledge of audits among the general population is seen as limited. Recommendations are to (1) target people who have not yet had an audit (mine databases to identify them); (2) use language that is understandable to people, such as "free" and "easy;" and (3) offer audits on Saturdays to reduce logistical barriers. Online audits might not be the solution since the audit process is not the issue (except for Saturday audits). Online audits might end up being costly if contractors are deployed to homes with little opportunities for upgrades.
- Environmental organizations would likely be open to including Compact messaging in **communications** with their members, although they feel that their reach might be limited due to their small membership.

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Such cooperation would be more interesting to environmental groups if there was an incentive for doing so.

- The Compact is seen as a regional organization, whereas Cape residents are more likely to turn to their towns for information. Towns have a much larger reach than environmental groups and are thus seen as key potential players in **helping raise awareness and increase participation** in the Compact's energy efficiency programs. However, towns currently do not promote energy efficiency to their constituents (although they often implement it in their own buildings). The Compact can help foster this leadership by continuing to show the value of energy efficiency from the perspective of Town governments (e.g., elected officials, energy committees, chambers of commerce, etc.).
  - The Compact may consider joint press releases or posting information on towns' websites. Additionally, creating a "sense of urgency"—e.g., via time-limited offers—to enroll more residents or businesses in programs may serve to increase participation.
  - One example of towns leading on energy issues is Outer Cape Energize, a coalition between Provincetown, Truro, Wellfleet, and Eastham that promotes renewable energy and energy efficiency. This model may be replicable elsewhere on the Cape as a strategy for driving awareness of energy efficiency, participation in the Compact's programs, and deeper energy savings.
- The Compact does a great job of addressing the split-incentive barrier for residential spaces, and could mirror aspects of their renters program for businesses that rent commercial space. Any program for commercial renters should try to address the seasonal nature of most Cape businesses—that is, try to **increase program participation** before or after the peak season when businesses have time and extra capital to put towards improving energy efficiency.
- Newer, technology-related **program designs** (e.g., Smart Homes, DR, behavioral programs) are not seen as attractive to Cape Cod residential customers (in part due to the older population on the Cape). In particular, behavioral programs are thought to be of little value due to (1) frequent hardware issues, (2) modest savings, (3) the lack of time-of-use rates, and (4) the need for participants to be responsive/engaged. Instead, meeting attendees suggested that the Compact should focus more on upgrading their existing equipment (e.g., boiler replacements, air source heat pumps, and building envelope measures). DR and behavioral programs are seen as more viable for commercial customers.
- EVs may be one good **new technology** program that the Compact can offer, particularly if there are suitable replacements for commercial fleets. Driving is the primary means of transportation on the Cape. EVs are an established technology and are highly visible, i.e., drivers of EVs are seen as doing something to reduce their carbon footprint.

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Meeting #2: Public Entities

Cape Cod Public Entities	
Date	December 1st, 2017
Number of Attendees	13
Towns Represented	Energy Committee Chairs: Barnstable, Bourne, Chatham, Dennis, Falmouth, Orleans, and Yarmouth; Town Managers: Harwich, Provincetown, Truro, and Yarmouth; Cape Cod Commission; and the Town of Brewster Department of Public Works

- Towns feel that there is strong motivation to reduce annual energy costs so that governments can spend money elsewhere to benefit their citizens. Meeting attendees also acknowledged that towns can be more effective at **promoting the positive impacts of energy efficiency** work they have already completed to help promote the idea to their constituents (e.g., Falmouth ice arena chiller and municipal street light LED replacements). Specifically, attendees wanted to show the cost savings that resulted from making municipal facilities more energy efficient and how those savings directly benefit their constituents.
- Towns throughout the Cape have different **communications structures** and, as such, the Compact and specific towns should work together to tailor outreach approaches that leverage those existing structures. Additionally, attendees acknowledged that the fragmented organization of local governments on the Cape creates some difficulty building Cape-wide momentum on energy issues. As such, towns should consider establishing a forum to share their challenges and successes to help create a more cohesive government-based energy efficiency outreach strategy.
- Residents may also be receptive to **marketing efforts** that discuss energy efficiency as an individual benefit, such as providing information about improved in-door air quality, increased comfort, and reduced operations and maintenance costs that generally result from implementing energy efficiency measures. Rate increases, similar to the minor increase approved by the DPU at the end of November 2017, may be good opportunities to communicate with customers about some of these benefits, specifically the potential for cost-savings.
- The Cape's elderly constituents are often skeptical of "free" offers, due to the prevalence of scams targeting older generations, and therefore may be more reticent to sign up for the free home energy audit. The Compact might consider working with the Councils on Aging to develop a **strategy to build trust** with older Cape residents and educate them about energy efficiency programs, how they are funded, and the benefits associated with making their homes more energy efficient.
- Attendees suggested the following different **community outreach strategies**: (1) The Compact having a presence at school events, such as science fairs, to discuss the value of energy efficiency at home; (2) Encouraging energy committees to hold community "office hours" to answer resident questions about energy efficiency and solar opportunities; (3) Advertising Compact offerings on local community access channels, which may be particularly useful for reaching senior residents; and (4) Facilitating competitions between different towns to drive participation in Compact programs.

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- Word-of-mouth is the most effective **marketing** tool for energy efficiency programs in the small communities on the Cape. For any town-centered community outreach strategies, attendees encouraged the Compact to highlight residents or businesses within that town that have participated in the Compact's programs and had positive experiences. For example, attendees proposed a community access program that highlighted the success stories and the specific positive outcomes for residential or commercial program participants in their town. Meeting attendees also suggested that energy committee chairs share information from the Compact with their volunteer networks, and other committee chairs, with the goal of spreading awareness about the Compact's energy efficiency offerings and their benefits.
- Representatives of town managers associations touted the value of becoming a Green Community in Massachusetts and encouraged other towns to go through the process. Green Communities have access to more funding opportunities that can have major energy and cost saving implications for towns throughout the Cape. Several attendees specifically mentioned that one of the goals of attending this meeting was to learn more about energy efficiency and connect with representatives from other towns, with the goal of eventually becoming a Green Community. Towns that have become Green Communities acknowledged that there is some difficulty adopting the stretch code, but also noted that, with very little new construction in some Cape towns, there would be minimal impact from doing so. They stressed the need to work with town representatives to have stretch code measures approved sooner rather than later as this can be a small issue that often becomes a much larger hurdle later in the process.
- While attendees thought that emerging program areas are important (i.e., building automation, behavior, DR, and electric vehicle programs), they expressed the view that their constituencies may be more interested in traditional **energy efficiency measures**, such as LEDs, building envelope, dehumidifiers, heat pumps, and fuel-blind water heater measures. They noted that the moratorium on natural gas has been very effective at increasing the prevalence of heat pumps on the Cape, and that Compact rebates for ductless mini splits have also been very effective.
- Attendees expressed a desire for new construction and retrofit offerings geared towards affordable housing and recognized the value of the Compact getting involved early in the planning process for new affordable housing developments. Several other **program offerings** that were of interest to attendees were (1) energy storage, (2) programs geared specifically towards older home restoration, (3) programs focused on middle income residents, (4) commercial offerings aimed at businesses that lease space, and (5) existing building deep energy retrofit programs. Attendees also expressed some concern that residents and businesses did not understand the value of deeper saving measures and therefore are more likely to take advantage of the simpler, more immediately visible measures (e.g., LEDs) and miss opportunities to address other savings opportunities. They felt additional education on deep energy savings may help to address this issue.

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Meeting #3: Cape Educational Organizations

Cape Cod Educational Organizations	
Date	December 12th, 2017
Number of Attendees	10
Organizations Present	Waquoit Bay National Estuaries Research Preserve, Audubon Wellfleet Bay Wildlife Sanctuary, Sandwich STEM Academy, Monomoy Middle School, Mattacheese Middle School, and the Sandwich Energy Committee

- Meeting attendees representing educational organizations felt that lack of awareness of Compact programs, such as free energy audits, is still a major issue on the Cape. They also noted that schools may be a great avenue for **engaging with the public** about energy efficiency. Several educators cited free LEDs and other handouts they had provided to students in the past as a great way to increase the awareness of energy efficiency and the programs that the Compact offers. There are also many opportunities to incorporate energy efficiency in their curricula—e.g., math, science, computer programming, or literacy. However, attendees noted the need for support from the Compact to make any partnerships with educational organizations successful (described below).
- Meeting attendees noted the benefit of partnering with schools to help teach the public about energy efficiency given their role in the community. Educators also mentioned that, for any partnerships to be successful, the Compact would need to get buy-in from school administrations first. Also, attendees stressed the need for the Compact to offer support to teachers by providing training (e.g., assistance with lesson planning) and resources (e.g., classroom materials specific to energy efficiency activities). Aside from traditional schools, attendees suggested other partnerships to help expand the reach of the Compact and **educate the public** about energy efficiency and its benefits: the Council on Aging, municipal governments, chambers of commerce, and technical high schools—specifically to highlight career opportunities in energy efficiency.
- Meeting attendees also noted several other benefits that they feel most of the public does not associate with energy efficiency (e.g., health, comfort, and reduced operating costs). Attendees felt that making these links more visible and explicit in outreach materials may help to **encourage greater participation** in the Compact's programs. Additionally, the Compact can also help show the link between increased investment in energy efficiency and mitigating negative environmental impacts on the Cape. While schools can help to engage with residents that live on the Cape all year, citing the air quality during some summer months, attendees feel that the Compact should work more to make the environmental case for energy efficiency to seasonal visitors.
- The following bullets summarize several lessons or school activities suggested by meeting attendees to **increase the community's knowledge of energy efficiency**. For each, attendees suggested the Compact may help facilitate curriculum development, teacher training, and material development, and provide additional financial support, particularly when measure installation is involved.
    - Teachers provide students with some instruction and a questionnaire designed to help them conduct a basic energy audit of their home. Students then conduct the audit, calculate estimated

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energy savings, and complete an analysis of the cost savings and payback period for their suggested upgrades. Students can then encourage their parents to sign up for an energy audit through the Compact, having calculated potential benefits for their household.

- Schools put on an "energy carnival" where students go to different stations and learn about different energy efficiency measures, their applications, and their potential benefits in different settings. Students could complete different activities, such as calculating the savings associated with different measures, at each station. The event could be open to parents, where they would be able to sign-up for energy audits and learn about other Compact programs.

- A school completes an energy audit and the associated upgrades, and students are engaged throughout the entire process. This may include working with the school's facilities staff to show how a newly installed energy management system (EMS) helps staff see energy usage in different parts of the school; creating energy efficiency competitions between different wings of school buildings to encourage energy-saving behaviors; and giving students access to real-time usage information from the school's EMS to monitor their progress.

- Teachers use energy efficiency as a civic engagement lesson, by encouraging students to advocate on behalf of their school and town. Students could write letters to their local government officials to encourage their town to apply for Green Communities status. Further, students might engage with their administration, and other stakeholders, to urge the school system to invest in energy efficiency and renewable energy upgrades, with the goal of becoming a "Green Ribbon School."

- Meeting attendees mentioned several different **program offerings** that may be of interest to Compact customers: building automation systems (BAS), smart appliances, electric vehicles (EVs), behavior programs, weatherization measures, solar PV panels, fuel switching measures (e.g., electric heat pumps for those with oil heat), deep energy retrofit programs, and zero-net-energy programs. Additionally, educators noted that several of these measures, specifically, BAS, EVs, and solar PV panels, may be suitable replacements for LEDs in terms of illustrating the benefits of energy efficiency and renewable energy. Meeting attendees noted the ease of being able to provide a physical LED as a way to educate students and their parents about energy efficiency. However, designing activities around these very visible types of measures may be just as effective. In particular, educators touted the effectiveness of teaching students about the specific cost saving benefits associated with making certain energy efficiency upgrades, as a means of reaching their parents. Attendees echoed the need for support from the Compact to engage administrators and provide teacher training to help develop these types of classroom activities.

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Meeting #4: Cape Light Compact Board of Directors

Cape Light Compact Board of Directors	
Date	December 13th, 2017
Number of Attendees	9
Towns Represented	Brewster, Eastham, Wellfleet, Barnstable, Harwich, Bourne, Orleans, Provincetown, and Yarmouth

- Compact board members feel there is a general lack of understanding about energy efficiency among customers on the Cape, particularly older residents. Many people are still unaware of the programs that Compact offers and how they are funded. Further, the board feels that many residents also lack an understanding of what energy efficiency opportunities exist in their homes and what the benefits of making their home more efficient may be. Finally, older residents may be less trusting of a "free" energy audit, as they are wary of scams or simply do not want to give someone access to their home. Given these barriers, the Compact should seek different **strategies for educating and engaging** their customers about energy efficiency and its benefits (their suggestions are outlined below).
- Several board members spoke to the logistical challenges associated with scheduling the **home energy audit**. The long lead times that the home energy specialist (HES) company requires, sometimes needing to schedule the audit 6 weeks in advance, is often prohibitive for some customers. Additionally, the time commitment for the audit and follow-up installation appointments can be a substantial burden for customers, particularly when installing deeper savings measures. While some of these difficulties are unavoidable, the board members suggested working with HES companies to develop processes similar to cable and internet providers where the HES provides a window of several hours when the audit will take place.
- In discussing the need to **reach program non-participants and hard-to-reach populations**, board members also acknowledged the difficulty in reaching customers that are not already engaged in their community. They noted that, on the Cape specifically, the same people tend to "show up" for all of the different community events. As such, when the Compact has a presence at an event, they are typically reaching the people that are already aware of their energy efficiency offerings, or have already participated. Aside from fostering partnerships with different organizations mentioned below, the board also suggested lawn signs, similar to those a general contractor or painter would provide, noting that a specific home had recently received discounted energy efficiency measures from the Compact, or providing a referral incentive to past participants.
- The board highlighted the need for the Compact to develop partnerships to broaden its reach by tapping into the networks of other trusted organizations. Members mentioned the following specifically: Nauset Newcomers, the Rotary Club, chambers of commerce, schools, Lower Cape Outreach Council, churches, and town building departments. The board also cited several different organizations that may be specifically useful for helping the Compact **engage with older residents**: the Council on Aging, retired men's clubs, and the Cape Cod Hoarding Taskforce.
- Given the lack of trust and general lack of **awareness about energy efficiency** of older Cape residents, Compact board members discussed the possibility of leveraging volunteers or staff from other

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organizations to be present during audits of elderly homeowners (e.g., the Cape Cod Hoarding Task Force or the Council on Aging). The Compact could establish an "audit buddies" program that would provide someone to help elderly residents prepare for a home energy audit (e.g., clearing out an attic in advance) and also to be present to facilitate the audit process and help the HES translate the recommendations.

- Several Compact board members noted that seasonal renters are a group of Compact customers that are not typically engaged in energy efficiency offerings. Particularly for those that own seasonal homes, board members feel that there may be some value to the Compact exploring partnerships (e.g., non-resident tax payers associations or winter caretaking companies) to help **engage this customer base**. For example, seasonal homeowners that pay heating bills all winter may be interested in weatherization programs.
- The Compact board mentioned several different **program offerings** that they thought would be of most interest to Compact customers: heat pump programs, measures for walk-in refrigerators (restaurants), weatherization measures, appliance recycling (washers, dryers, and refrigerators), and behavior programs (in-home displays and report programs). Board members also discussed the need for targeted outreach for certain measures—e.g., directing weatherization and heat pump information to homes with electric baseboard heat.
- Compact board members see the future of the **Compact's programs** including more renewable energy measures, and those that give households more visibility into their energy usage (e.g., in-home displays). Board members also mentioned the need for Compact programs to develop measures aimed at adding resiliency to the grid (e.g., energy storage) and demand response measures that will help mitigate usage over peak periods.
- Finally, Compact board members repeatedly stressed the importance of weatherization measures for Cape residents in the future, especially as year-round occupancy increases.

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Meeting #5: Large C&I Customers

Large Commercial and Industrial Customers	
Date	January 10, 2018
Number of Attendees	6
Businesses Present	Cape Cod Mall, Woods Hole Oceanographic Institute, Cape Cod Community College, Catania Hospitality Group, Associates of Cape Cod, and Holly Management

- Meeting attendees listed the following as common **motivating factors** that lead to commercial and industrial (C&I) customers improving the energy efficiency of their facilities: (1) the availability of funding; (2) achieving a return on their investment in 3 years or less; (3) the desire to be responsible members of their community; (4) reducing their carbon footprint; and (5) the desire to obtain LEED, or other similar, building certifications.
- Attendees noted several **key barriers** that prevent more investment in energy efficiency: (1) the capital cost of energy efficiency upgrades; (2) building or equipment down-time during renovations; (3) maintenance costs/challenges, particularly for larger more complicated and less common measures; (4) the need to conduct measurement and verification (M&V) activities for some custom measures; and (5) lack of knowledge about what types of programs are available.
- Meeting attendees suggested different **outreach strategies to help increase C&I customers' awareness** of program opportunities. Attendees were interested in starting a large C&I networking group that the Compact could use for periodic outreach to keep members up to date on program changes and the latest Compact offerings. Additionally, attendees mentioned that it may benefit the Compact to promote their programs and successes through social media. Finally, meeting attendees emphasized the need for the Compact to leverage their vendor communities to share information about their programs and offerings.
- Attendees were also enthusiastic about convening a large C&I networking group annually to maintain **communication** between facility managers and the Compact, and also to encourage those that have participated in the Compact's programs in the past to share their success stories. Given the small number of large customers on the Cape, this would allow businesses to share their knowledge about Compact programs, their personal experiences working with the Compact, and the benefits that improving energy efficiency can have on their businesses.
- Several meeting attendees also noted that large C&I customers, and other Compact customers on the Cape, do not have a good understanding that they already pay for the Compact's energy efficiency programs through their utility bills. For large C&I customers specifically, attendees thought that making this point clear might help to **encourage more program participation**.
- Attendees generally agreed that a timely payback period was a **key factor driving their decisions** to act on energy efficiency upgrades in large C&I facilities. Most attendees voiced that a 3-year payback period is ideal, while they would consider projects with payback periods up to 5 years. They also acknowledged that determining the payback period before moving forward with a project is difficult, in part, due to the fact that rebate amounts may change—that is, projected rebate amounts at the pre-approval stage of a project may differ from the rebates paid upon that project's completion. Attendees

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therefore expressed a desire for more prescriptive rebates for large C&I, where possible, especially for more common measures. This would help with their capital planning and would help make a more clear and straightforward case for energy efficiency to the ultimate decision makers.

- As noted above, meeting attendees expressed that M&V activities can present a **barrier to participating** in Compact custom programs because they take a considerable amount of time and training and because metering equipment can be costly. Attendees therefore suggested that the Compact provide some assistance with M&V, such as loaning metering equipment, providing additional incentives for the purchase of M&V equipment, and/or providing some training or staff support to conduct M&V activities.
- Meeting attendees presented a number of different **programs or offerings** that large C&I customers would be most interested in: (1) Energy management systems (EMS), (2) retro-commissioning (RCx), (3) HVAC roof top units, (4) renewable energy systems, and (5) commercial refrigeration equipment.
  - Building EMS generated a lot of interest from attendees due to the ability to have greater control and visibility over all of the building's systems. Several attendees also noted that they would be interested in the Compact providing training and support to facility managers after the installation of an EMS as well.
  - RCx also generated a great deal of interest because it did not require any new equipment to be installed, circumventing some of the barriers related to down-time and maintenance noted previously. One meeting attendee who had implemented RCx at their facility, touted the savings that businesses could realize simply from ensuring that their current equipment is operating as intended.
  - The following programs and offerings were also mentioned by meeting attendees, but did not generate as much interest: battery storage, occupancy sensors, prescriptive rebates for variable speed drives, boilers, and more technical assistance for building owners/facility managers.
  - Meeting attendees also acknowledged that most large C&I facilitates are unique and have very specific needs for their equipment (e.g., lab equipment). As such, there was some discussion of the need to add more flexibility and resources to the custom component of the large C&I program.

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Meeting #6: Vendors

Vendor Organizations	
Date	January 11, 2018
Number of Attendees	9
Businesses Present	RISE Engineering; Cape Cod Energy Solutions; Cape Cod Insulation; Cape Save, Inc.; Riedell; JM of New Bedford Weatherization Co.; Hyannis Tavano Mechanical; and South Shore Heating & Cooling.

- All of the vendors attending the meeting focus almost entirely on residential customers, with some doing limited work in small commercial facilities. Additionally, all had worked with their customers to participate in Compact programs in the past.
- Attendees mentioned several different factors that **motivate** their customers to improve their energy efficiency, most notably the desire to save money on their utility bills. The Compact's incentives also drive people to consider energy efficiency improvements to their homes. Other motivating factors include the desire to protect their asset (i.e., their home), occupant health, and comfort.
- Word of mouth is still the method that most of the vendors rely on to bring in new business opportunities. One of the vendors specifically mentioned that their company has a referral incentive for their customers. Several attendees agreed that such an incentive might help **increase participation** in the Compact's programs—e.g., a higher or added incentive for customers that refer other program participants.
- Vendors also noted a number of **barriers** that prevent their customers from improving their homes' energy efficiency. The cost of equipment upgrades, specifically the incremental cost of more efficient major appliances, still remains the largest barrier to more adoption of energy efficient technology. Vendors also noted that a general lack of knowledge prevents greater investment in energy efficiency.
  - According to attendees, the cost barrier manifests itself in different ways for different customers. While year-round residents often see the added cost of energy efficient equipment as simply too high, seasonal customers do not believe the investment in a more efficient heating system, for example, is worthwhile as they are only on the Cape for the summer months. For wealthier customers, vendors reported that the cost of utility bills is not enough of a motivation for them to act.
  - In general, vendors cited a lack of knowledge as another important barrier to getting more of their residential customers to make energy efficiency improvements. First, their customers do not have a good understanding of what the Compact actually does, what programs/rebates they offer, and how to participate in those programs. Additionally, vendors noted that their colleagues (i.e., other vendors not in attendance) did not have a good understanding of the current offerings, when they will change, and what future offerings may be. Second, vendors stated that their customers typically do not understand how their homes work and are mostly driven to replace equipment as needed, or upon failure.
- To **engage hard-to-reach customers**, vendors in attendance suggested the following:

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- Vendors present acknowledged that the Compact's income-eligible and renters program provides great benefits to residents. However, most of their customers that would qualify are still unaware of these offerings. Attendees also mentioned that the Housing Assistance Corporation (HAC), while extremely helpful to low-income customers, sometimes has capacity constraints that delay energy assessments. Attendees suggested leveraging RISE, or other home performance contractors, to alleviate bottlenecks and bring down scheduling delays.
- Vendors also suggested expanding income-based incentives to include middle-income customers. There are a number of customers that do not qualify for the Compact's Enhanced Residential Program, but still struggle to afford the services that vendors provide (e.g., a necessary heating system replacement). Vendors also mentioned that the $4,000 cap does not always cover the cost of the weatherization work, and could be lifted to encourage more up-take, particularly for residents in older homes.

- Attendees noted that contractors are often well positioned to facilitate their **customers' participation** in the Compact's programs. They also mentioned, as noted above, that many of their colleagues are still unfamiliar with the programs that the Compact offers. As such, meeting attendees were very interested in developing a network of qualified vendors. This would not necessarily entail an additional "qualification," but a contact list maintained by RISE (or other program implementers) that could be used to share the latest information about program availability and changes. Vendors also liked the idea of holding in-person meetings at regular intervals to provide additional updates or train network members on new program requirements.
- Meeting attendees also shared several different **new program areas, or measures**, that they thought their customers would be most interested in. All attendees thought that insulation and air sealing measures would be of most interest to their customers and have the potential to generate the highest amount of savings, particularly for older homes or those not originally designed for year-round occupancy. Attendees also mentioned that many of their customers are in need of duct work or duct replacements, even if they do not require a new HVAC system, and suggested that the Compact offer an incentive to support duct work that is not tied to an HVAC upgrade. Vendors did not think that their customers would be particularly interested in on-line audits.
  - Though this did not generate as much discussion, attendees also noted that there is still a lot of opportunity for the early replacement HVAC program. Attendees felt that tiered incentive levels based on income, or increasing incentives altogether, would help to increase participation.
  - Vendors present also noted that many residential customers are interested in upgrading to more energy efficient windows and doors. Though attendees acknowledged that these types of measures would likely have a limited impact on energy savings, if a small incentive for window upgrades were tied to participating in other Compact programs, this may serve to drive participation.

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Meeting #7: First Residential Group

Cape Cod Residential Customers	
Date	January 11, 2018
Number of Attendees	13
Towns Represented	Brewster, West Brewster, Barnstable, Pocasset, Wellfleet, Sandwich, Dennis Port, and Provincetown

- According to meeting attendees, the major factors that **motivate** Cape residents to improve the energy efficiency of their homes are *saving money, reducing their emissions, protecting the planet for future generations, and improving their health*.
- Conversely, meeting attendees cited the following **barriers to making their homes more energy efficient**: *the cost of upgrades; the lack of understanding about home improvement; competing priorities, both in terms of time and money; and lack of personal responsibility*.
  - Attendees also noted that there are several **barriers to realizing greater participation in Compact programs**. First, attendees agreed that their peers are still relatively unaware of Compact programs, the benefits they provide, and how to reconcile the upfront cost with the long-term cost savings. Additionally, attendees reported that some homeowners don't really know where to begin with home improvements in general and don't always associate the Compact with making changes to their homes. Attendees agreed that ongoing technical assistance, or training, provided by the Compact on how to incorporate energy efficiency into their home improvement plans, particularly for those in older homes, might help increase participation in Compact programs. Attendees also thought that basic financial planning to help residents calculate payback periods for energy efficiency measures would be a useful resource for homeowners.
- Meeting attendees had several suggestions for the **residential assessment program**:
  - Attendees stressed the need to follow-up several times after completing their energy assessment as taking action post-assessment can get lost when competing with other priorities.
  - Attendees encouraged the Compact to foster a "sense of urgency" with their messaging, and their incentive levels (e.g., limited time or tiered incentives based on specific timelines).
  - Attendees suggested building a network of volunteers to assist residential customers through the participation process, particularly for older residents. These could be trusted members of the community that help fill out application materials, assist older residents clearing out their attics pre-assessment, or assist with interpreting the results of the assessment and taking action.
  - Attendees suggested that the Compact work towards a quicker turn-around time between when someone signs up for an energy assessment and when they can have it done. Attendees, and their peers, have experienced long wait times and noted that, as making time available for the assessment can be a barrier, quicker turn-around times are key to encouraging greater

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participation. Attendees felt that these bottlenecks are particularly true for the income-qualified programs.

- Attendees also suggested that the Compact find ways to leverage more local contractors as an entry point into their programs. Attendees noted that contractors are typically the first contact that a residential customer makes when they are planning home improvements or are faced with emergency equipment replacements, and may not necessarily associate the Compact or energy efficiency with these types of home improvement or maintenance projects.
- Meeting attendees expressed the most interest in the following **new and expanded programs or offerings**.
  - Attendees thought many residents on the Cape would be interested in improving the energy efficiency of the "big ticket items" in their homes—i.e., HVAC systems and major appliances. While several attendees noted that the Compact already offers some rebates for many of these items, they feel that many of their peers are still unaware of them. Additionally, several attendees suggested that rebates for major appliances were not sufficient and eligibility requirements were too stringent to encourage residents to choose energy efficiency appliances over standard models. Similarly, attendees noted that, in some cases, rebates for HVAC measures were insufficient to convince people to upgrade to more efficient equipment when factoring in high installation costs.
  - Meeting attendees that had received home energy assessments spoke very highly of the program, specifically noting the benefits that they have realized from the weatherization measures. However, attendees still believe that there is a lot of opportunity on the Cape for more insulation and air sealing in homes of their peers that have yet to receive an energy assessment. There was some discussion of removing the $4,000 cap for weatherization measures to encourage those in older homes to participate in the program. Additionally, attendees voiced some desire for added quality control measures to ensure that auditors provide a consistent level of service.
  - Attendees also expressed an interest in a whole house offering, such as an added incentive for residential customers to address multiple systems simultaneously. Though attendees thought that added incentives for comprehensive projects might encourage more residents to implement deeper retrofit projects, they also acknowledged that might require some coordination between contractors offering different services.
  - Attendees also mentioned the following offerings, although they thought that interest would be lower than in the offerings listed above: (1) Energy monitoring (e.g., in-home displays or cell phone apps) to encourage households to understand their energy usage in real-time; (2) programs that encouraged electrification (e.g., incentives to move from hydrocarbon fueled heating systems to cold-climate heat pumps); and (3) incentives to install residential solar PV and other renewable energy technologies, coupled with energy storage.

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Meeting #8: Small-Medium Commercial & Industrial

Small-Medium Commercial and Industrial Organizations	
Date	January 16, 2018
Number of Attendees	5
Businesses Present	Cape Cod Chamber of Commerce; Captain Parker's; Gosnold Treatment Centers; Cape Air; and Cape Cod Climate Change Collaborative

- Meeting attendees representing small and medium sized commercial and industrial (C&I) customers on the Cape mentioned several different **motivators** for energy efficiency.
  - The most prevalent factor is saving money. As such, attendees suggested that the Compact frame benefits in terms of how much businesses could save annually for specific measures. Attendees recognized this as a challenge for the Compact as savings may vary widely based on individual circumstances. However, they suggested this would still be a powerful message to most decision makers, particularly if framed in terms of other business expenses that these savings might be funneled towards.
  - Several attendees also noted that their organizations had devoted resources towards becoming more energy efficient as it was a tangible step that they could take to be more responsible members of the Cape community and mitigate the negative environmental impacts of their daily operations.
- Attendees also described four major **barriers to participation in Compact programs** for small and medium C&I customers, all of which were mentioned by other stakeholder groups (cost, competing priorities, seasonality, and lack of knowledge).
  - Though *competing priorities* and seasonality are frequently cited barriers for other stakeholder groups, attendees agreed that both were particularly challenging for small and medium businesses. As such, attendees made two recommendations to help make it easier for those who complete energy assessments to follow through with the recommended energy efficiency upgrades: (1) The Compact should keep digital archives of energy assessment recommendations and grant customers access to those recommendations as several attendees mentioned they intended to follow through with energy efficiency improvements but had lost track of their hard copies; and (2) the Compact, or their program implementers, should consistently and frequently follow up with customers that received energy assessments, using their recommendations to prompt customers to take specific courses of action.
- Attendees suggested different **outreach and engagement strategies** that may help to encourage more participation in Compact programs:
  - According to attendees, peer recommendations are still the most common way that C&I customers on the Cape hear about the Compact's offerings and, as such, attendees recommended that the Compact organize C&I workshops dedicated to energy efficiency. Attendees envisioned colleagues sharing testimonials and success stories related to improving building efficiency and past participation in Compact programs. All agreed that hearing about the benefits of energy efficiency

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from other members of the C&I community is more effective than only hearing this message from the Compact. Attendees representing the Cape Cod Chamber of Commerce and the Cape Cod Climate Change Collaborative offered to partner with the Compact to help facilitate these types of events.

- Attendees also maintained that decision makers at most Cape businesses and non-profits do not have a good understanding of their energy bills and the extent to which they help fund the Compact's energy efficiency offerings. Those present felt that the Compact could present this information, specific to individual C&I customers, to drive more interest in their programs—i.e., share the amounts they pay into energy efficiency programs annually along with the energy savings that they could expect from typical energy efficiency measures. Attendees acknowledged that this type of personalized messaging may be difficult for the Compact as it would require a considerable amount of staff time; however, also noted that tailored outreach and one-on-one communication would be effective at driving more participation Compact programs.

- Similar to feedback from other groups, attendees recommended referral incentives, the use of social media to share short video testimonials, mass mailings, and email lists.

- Attendees had many suggestions for **new or expanded programs and offerings** that they thought would be of interest to their peers (number of votes in parentheses).
  - *Energy efficiency offerings:* Comprehensive business energy assessment program—specifically insulation and air sealing measures (5), expanded early retirement HVAC program (4), low interest finance program (3), major appliance early retirement program (2),upstream lighting and appliance program (2)
  - *Renewables and energy storage programs:* Battery storage (2), solar PV (2), electric vehicles (1), RECs program (1)
  - Attendees also reiterated the fact that decision makers for small to medium businesses and non-profits typically fill many different roles in their organizations and, as noted previously, energy efficiency usually gets lost amongst many other priorities. Therefore, for all Compact offerings geared towards this group, attendees voiced the need for the Compact, or program implementers, to provide more hands-on guidance (e.g., consistent follow-up, application support, technical assistance) to ensure greater participation in Compact programs and more follow-through with energy efficiency measure installation.

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Meeting #9: Martha's Vineyard

Martha's Vineyard Organizations	
Date	January 22, 2018
Number of Attendees	13
Organizations Present	MV Commission, Vineyard Power Cooperative, Vineyard Conservation Society, MV Preservation Trust, MV High School, Island Housing Trust, MV Chamber of Commerce, CLC Board delegates, Edgartown Energy Commission, and representatives from the towns of West Tisbury, Tisbury, and Aquinnah

- Attendees noted a number of **motivators** for energy efficiency. In addition to general motivators (e.g., cost savings, comfort, and health), attendees mentioned several that are specific to the Vineyard and its community: the island's greater vulnerability to energy disruptions; a housing stock that is old and often not meant for four seasons; severe weather and resulting threats to structures (e.g., ice dams); setting a good example as a tourist destination; and reducing business cost for a predominantly small business community (according to one attendee, 96% of businesses have less than 20 employees).
- Similarly, attendees mentioned a number of **barriers to energy efficiency**, some general (upfront cost, education/knowledge, other priorities, inertia) and some Vineyard specific (a huge skills gap due to a limited pool of trades people who are not always up-to-date on new trends and technologies; a high incidence of rental housing; a large population of low income households; stocking practices, e.g., contractors do not stock heat pumps; and a public bidding process that tends to gives a job to the lowest bidder).
- Attendees also noted several **barriers to participation in Compact programs**, most notably awareness (of the Compact in general, but also of specific offerings, such as incentives for recycling old dehumidifiers and for non-electric HVAC measures); trust (the program offerings are too good to be true); and reliance on a single, off-island contractor (RISE) to do all program work.
- Attendees offered a number of **strategies for increasing energy efficiency on the Vineyard**, including some that the Compact could help with:
  - *Training and education:* provide energy efficiency training at the high school level (to do work that RISE is doing); educate trades people on energy efficiency (which also helps with word-of-mouth); offer a program for building maintenance people; educate building inspectors to provide energy efficiency education during the inspection process; make energy efficiency information more accessible ("dumb down" materials presented in workshops to make the information understandable; make information about Compact offerings easier to find, e.g., on website).
  - *Procurement process/regulatory requirements:* provide technical assistance with respect to energy efficiency requirements during the procurement process; require bidders to submit energy data and examples of past projects; encourage regulators to do a better job addressing energy efficiency; establish regulations for the maintenance of seasonal buildings.

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- *Buying cooperative for non-regulated fuels:* One attendee suggested forming a buying cooperative for non-regulated fuels, most notably propane, which would result in cost savings for members but would also provide access to energy bills that could be used for more targeted outreach.

- Attendees offered a number of suggestion for **outreach strategies** to increase participation in Compact programs:
  - Put out messaging through multiple media (e.g., radio, newspaper, town columns, social media) and embrace new strategies (e.g., twitter)
  - Hold more meetings like this one
  - Establish an island-wide energy office to reduce reliance on town-specific efforts
  - Increase partnerships/cooperation with community groups and non-profits, e.g., add content to their newsletters to reach their members
  - Target seasonal residents/homes through tax bill inserts, outreach during June/July, and messaging targeted towards realtors and care takers
  - Conduct energy benchmarking and make data public
  - Have a periodic energy efficiency column in the paper, addressing a specific topic that can be shared via Facebook. Several attendees thought that this would be very beneficial to stakeholders on the Vineyard.
  - Better aggregate information on available programs (one attendee noted that frequent changes in programs and incentives are hard to follow and introduce uncertainty about available support)
- Attendees had many suggestions for new/expanded programs and offerings that they thought would be of interest to Island constituents; attendees then voted on their top choices (number of votes in parentheses):
  - Incentives for Heat pumps, including a mechanism to provide certainty around installation cost, which is often much higher on the Vineyard (8)
  - Training for local resources (7)
  - Electric vehicles / charging stations (4)
  - Windows/doors (as part of a comprehensive envelope strategy) (4)
  - Solar PV (1)
  - Building automation/Smart Home (0)
  - Behavioral program (0)
  - Heat recover ventilation (HRV) (0)
  - Incentive for contractors (0)
  - Comprehensive retrofit (0)

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Meeting #10: Community Groups

Cape Cod Community Organizations	
Date	January 23, 2018
Number of Attendees	11
Organizations Present	HECH, Habitat for Humanity, Community Development Partnership, Cape Technology Council, YMCA, Muniz Home Improvement, Barnstable Housing Authority, Cape Cod Young Professionals, and Cape Cod Commission

- Attendees noted a number of **motivators** for energy efficiency that were similar to previous groups (cost savings, comfort, health, and environmental benefits). Additionally, attendees mentioned several other benefits that may motivate public-sector decision makers to continue to invest in energy efficiency: improving energy efficiency enables smart growth on the Cape, limits the need for some disruptive energy-related infrastructure (e.g., new power plants), and benefits the Cape workforce (e.g., HVAC contractors and HES companies). One attendee mentioned the value to younger generations as a motivator and another offered the motto:

  "If everybody saves a little, then everybody saves a lot."

- Similarly, attendees listed a number of **barriers to energy efficiency**, some of which were consistently noted by other groups (upfront cost, education/knowledge, other priorities, older housing stock, and seasonality). Attendees also mentioned that there are limited local resources on the Cape in terms of home performance contractors and design engineers.
  - Attendees also discussed fear and trust as a barrier to improving residential energy efficiency. Similar to other groups, attendees noted that Cape residents, particularly those with lower incomes, may be fearful of "special" or "free" offers. However, attendees also added that some of this fear or trust may be linked to a lack of technical understanding of their homes' systems and the financial benefits that may come from improving their efficiency.
- Attendees offered a number of **strategies for increasing energy efficiency on the Cape**, including some that the Compact could help with:
  - *Energy Efficiency Institute:* Attendees suggested creating a regional planning body, modeled after the Cape Housing Institute. This body would provide training and technical assistance with respect to energy efficiency benefits and best practices. Attendees suggested that training modules might be geared towards community organizations as well as public and private entities involved with planning and development on the Cape (e.g., government staff, housing authorities, chambers of commerce, trade organizations, non-resident taxpayers associations, landlords, and vacation property managers).
  - *Partnerships with real estate industry*: ensure that those that interact regularly with new home owners and those looking to build or purchase a new home (e.g., community groups, realtors, home inspectors, and home builders) understand the value of energy efficiency, what programs the Compact offers, and how to direct residents towards those resources.

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- *Certification schemes*: develop a set of certification schemes for towns and individual homes—i.e., Compact certified "Green Homes" or "Green Towns." Attendees suggested that home-level certifications may be based on comprehensive efficiency measures taken, while town-level certifications may describe the share of homes that have taken advantage of Compact programs. Several attendees suggested that this may be achieved by expanding the *Cape and Islands Green Initiative*.

- Attendees offered a number of suggestion for **outreach strategies** to increase participation in Compact programs:
  - Develop a series of "talking points" and resources for town leadership so they are able to provide basic information to residents and help direct those interested to the Compact.
  - Make apparent to Cape residents and businesses how much they contribute to the Compact's energy efficiency programs. Attendees suggested that this might be achieved by working with utilities to show this line item more clearly on energy bills.
  - Use an "all of the above" media strategy to reach Compact customers, including radio, newspaper, community TV, social media, and posting information at transportation hubs throughout the Cape. Attendees thought that messaging needed to be repeated and targeted. Attendees also noted that short educational video clips and interactive infographics (e.g., Story Maps and Prezi) had been successful at reaching their core constituencies.
  - Form partnerships with organizations that have active memberships (community groups, environmental organizations, schools, PTAs, and senior centers) and leveraging those networks to increase participation in Compact programs. They also suggested that each town on the Cape should have a link to the Compact website on their websites.
  - Provide more and clearer information on the Compact website (e.g., what programs are available; what AC models qualify for a rebate).
  - Offer referral incentives to individuals, or community organizations (e.g., libraries or schools), to help raise awareness about Compact programs and the value of energy efficiency. Attendees suggested that this may include develop materials that individuals and organizations can share with others that show how to sign up to participate in Compact programs.

- Attendees had many suggestions for **new/expanded programs and offerings** that they thought would be of interest to Cape constituents; attendees then voted on their top choices (number of votes in parentheses):
  - *Energy monitoring behavior program (10), technical assistance workshops for older homes (6), expanded educational component during home energy assessments (6), low-interest/forgivable loan program (5), air-source heat pumps (4), educational program to develop more local contractor resources (4), renewable energy credits (4), partnership with restoration companies/historical building program (2), home buyer technical assistance program (1), volunteer program to assist residents with application and implementation process (1), renewables (1), smart thermostat (0), major appliance (0), solar hot water (0), assistance for individuals seeking LEED certifications (0), and energy efficiency grants (0).*

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Meeting #11: CLC Staff

Cape Light Compact Staff	
Date	January 23, 2018
Number of Attendees	11
Staff Present	Margaret, Briana, Gail, Melissa, Lindsay, Matt, Kathy, Dave, Phil, Meredith, and Maggie

- Staff members mentioned a lot of the same **motivators and barriers** as stakeholders in the other meetings.
  - *Key motivators:* saving money, comfort, reliability, replacing old equipment, environment/savings energy/doing good, community responsibility, health, value/investment
  - *Key barriers:* upfront cost, time (e.g., competing priorities, scheduling assessment, cleaning out the attic), complexity (process, paperwork, different offers for different situations), confusion between Compact offerings and MassSave, awareness, building stock (historic, pre-weatherization needs), second/seasonal homes, split incentives, language, education (knowledge of payback periods)
    - Trust (offer might be a scam because it is too good to be true), especially among older residents, was mentioned as barrier by several of the other stakeholder groups, but Compact staff did not feel it is a barrier.
- The Compact is, and has been, engaged in a variety of **outreach and engagement** efforts. Many of these efforts have been suggested as "new" ideas in the stakeholder meetings. Consensus was that there is no "silver bullet" in overcoming lack of awareness of the Compact's program. Rather, continuous presence in multiple media is needed. Compact staff identified word-of-mouth as a very effective, but difficult way of encouraging program participation.
  - *Key current/past outreach efforts:* community events, testimonials, energy champions (CLC board members), social media (mostly Facebook), newspaper, radio, presence at various organizations (e.g., senior centers, chamber of commerce meetings, etc.), workshops (renters, first-time homebuyers).
  - Opinion Dynamics facilitators mentioned two types of outreach that were suggested during several stakeholder meetings:
    - *Networks* could help to disseminate information and reduce knowledge barriers. Examples include a vendor network where RISE Engineering could share information about the latest offerings with participating contractors. C&I stakeholders also suggested the idea of the Compact facilitating workshops focused on energy efficiency where past participants could share testimonials and success stories. Such networks are different from Compact presence at organization meetings, which are single events and which often attract the same people (i.e., those that are already knowledgeable and have participated).

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    - *Partnerships* with various organizations could help reach new constituents. This might include adding Compact-related content to monthly newsletters.
  - The Compact has made a number of efforts to better engage hard-to-reach populations, e.g., a "buddy system" and other efforts at senior centers, reaching out to the Portuguese population, and workshops for renters and first-time homebuyers. Challenges are reaching people at the right time (e.g., seasonal customers and customers making renovations), sustained interest amongst volunteers, and, for the population of renters, establishing a relationship with the landlord.
- Compact staff noted that the **Home Energy Assessment Program** continues to be very popular, which is surprising since it has been offered for a long time. Staff wondered how common repeat participation was (to be explored further). Long wait times for audits were noted – this is an issue that is (1) not uncommon and a similar issue for other MA PAs and (2) difficult to tackle by the Compact given that it is dependent on vendor staffing.
  - Opinion Dynamics facilitators mentioned a few ideas for program expansion suggested in the stakeholder meetings, including more education during the audit and energy monitoring before or after the audit. These additions could help increase customer knowledge and might motivate them to take more energy efficiency actions following the audit.
- Compact staff noted challenges associated with its **low income program**, including long wait times for the energy audit, a reluctance by vendors to install programmable/WiFi thermostats, some customers not wanting to admit they qualify for the LI program, and having to apply for a LI rate every year.
- Compact staff brainstormed a number of **new or expanded programs/offerings** that they feel would be of interest to their constituents. Following the brainstorming session, staff voted for their top residential and C&I choices (number of votes in parentheses):
  - *Residential programs:* Smart/Connected homes (7); fuel conversion "trifecta" consisting of heat pumps, PV, and storage (6); windows/doors (3); DR/EV charging (3); renovations/additions (3); behavioral (2); expanded home energy assessments (1); appliances/white goods (1); solar PV (1), storage (1); expanded HEAT loan program (0); expanded LI offering (0); expanded moderate income offering (0)
  - *C&I programs:* on-bill financing (9); fuel conversion "trifecta" consisting of heat pumps, PV, and storage (8); building automation/strategic energy management (5); business energy assessment (5); demand response (1); solar PV (0); storage (0)

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Meeting #12: Second Residential Meeting

Cape Cod Residential Customers	
Date	February 1, 2018
Number of Attendees	9
Towns represented	Orleans, Pocasset, Barnstable, Brewster, and Eastham

- Attendees noted a number of **motivators** for energy efficiency that were similar to previous groups (cost savings, comfort, health, and environmental benefits). Additionally, attendees mentioned that residential customers may be motivated by protecting future generations, preserving their quality of life, energy independence, and cultural pressure from their peers.
- According to attendees, key **barriers to energy efficiency** include upfront cost, education/knowledge, uncertainty about savings and technology costs, and the historical building stock. Attendees also mentioned that Cape residents may be resistant to change, energy efficiency may be perceived as boring, and the disjointed regulatory landscape on the Cape presents barriers to incorporating energy efficiency into Cape-wide planning.
  - Attendees also suggested that contractor quality may also be a barrier to completing more energy efficiency work, and, as such, suggested that the Compact develop a "badge" or certification noting which contractors followed Compact-approved quality installation guidelines. Alternatively, attendees suggested that the Compact might assist with, or subsidize existing contractor certifications.
- Attendees also mentioned several **barriers to increased participation in Compact programs**: people do not have a good understanding of the Compact and the services they provide; people are unaware that they help to fund energy efficiency programs; some are wary of "free offers" as there are many and it is sometimes difficult to know which are legitimate; and Compact messaging does not always come through clearly as energy efficiency can be complicated.
- Attendees offered a number of **strategies for increasing energy efficiency on the Cape**, including some that the Compact could help with:
  - *Education and training programs:* partner with high schools to develop educational programs (e.g., assemblies, after-school activities, and energy efficiency behavioral programs). Attendees also suggested that the Compact partner with technical and vocational schools on the Cape to provide financial assistance and develop job training programs geared towards careers in energy efficiency and renewable energy.
  - *Partnerships with real estate industry*: ensure that those that interact regularly with new home owners and those looking to build or purchase a new home (community groups, realtors, home inspectors, home builders, mortgage lenders, and local insurers) understand the value of energy efficiency, what programs the Compact offers, and how to direct residents towards those resources—e.g., provide home-buyer education as it relates to energy efficiency, facilitate post-purchase energy efficiency workshops, and develop a Compact presence at home shows.

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- Attendees offered a number of other suggestion for **outreach strategies** to increase participation in Compact programs, two of which are described below:
  - One general theme that carried through many of the attendees' suggestions was the idea of compensating people for their time and effort to encourage more understanding of, and participation in, Compact programs. For example, attendees suggested several different workshops for educators or technical professionals (e.g., home inspectors), but also noted that the Compact may need to provide compensation for that time to drive attendance.
  - Attendees also mentioned the need to circumvent language barriers with certain hard-to-reach populations by offering materials in Portuguese and Spanish. Drawing upon their own experiences in community service, attendees also suggested that outreach to diverse populations might be more effective if done by a more diverse staff (i.e., by staff that looks more like the targeted, hard-to-reach population).
- Meeting attendees also discussed one strategy for ensuring that more Compact customers **follow through with energy efficiency improvements** recommended during their energy assessments. Several attendees mentioned that a major barrier to completing work in *their* homes were very costly upgrades (e.g., electrical work) that needed to be dealt with prior to implementing other energy efficiency improvements. Attendees therefore recommended either an added incentive or allowing related improvements to be included in a low-interest loan program (discussed below).
- Attendees had many suggestions for **new/expanded programs and offerings** that they thought would be of interest to Cape constituents; attendees then voted on their top choices (number of votes in parentheses):
  - *Enhanced home energy assessment program (7), solar PV, including emergent technologies and community solar (5), low-interest loan program (4), expanded renter program (2), middle income appliance program (2), energy efficiency education program (2), fuel-switching/air-source heat pumps (2), expanded appliance program for all residents (0), ground-source heat pumps (0), on-line audit (0), specialty LEDs (0), and smart thermostat (0).*
    - An enhanced home energy assessment program allowed more flexible assessment schedules and shorter lead times before conducting the assessment. Attendees suggested having a "case manager" to help participants through the process and providing an incentive for contractors to spend more time on education and training.
    - Though interested in a loan program, several attendees also noted that, particularly for lower income residents, this should be paired with a requirement to take part in credit-repair workshops (already provided by organizations like the Housing Assistance Corporation). Attendees also noted that any such loan program should include options for those with seasonal employment.
    - The educational program involved the Compact providing retrofit kits to schools and public libraries for students to take home and conduct a basic energy assessment. Attendees also suggested, as part of this program, providing workshops for teachers and librarians to assist with lesson planning and financial assistance for school districts to pay for substitutes during the workshops. Attendees noted that the Compact has provided similar programming in the past, but proposed expanding this model to more school districts on the Cape.

Cape Light Compact JPE
Governing Board and Executive Committee
Open Session Meeting Minutes
Wednesday, April 11, 2018

The Cape Light Compact JPE Board of Directors and Executive Committee met on Wednesday, April 11, 2018 in the Martha's Vineyard Conference Room at the Cape Light Compact JPE Offices at 261 Whites Path, Yarmouth MA 02664 at 2:00PM.

Present Were:

1. David Anthony, Secretary, Executive Committee, Barnstable
2. Robert Schofield, Executive Committee, Bourne
3. Colin Odell, Brewster
4. Peter Cocolis, Executive Committee, Chatham – By phone
5. Fred Fenlon, Eastham
6. Paul Pimentel, Edgartown – By phone
7. Ronald Zweig, Vice-Chair, Executive Committee, Falmouth
8. Valerie Bell, Harwich
9. Wayne Taylor, Mashpee
10. Richard Toole, Executive Committee, Oak Bluffs – By phone
11. Martin Culik, Orleans
12. Thomas Donegan, Executive Committee, Provincetown
13. Leanne Drake, Sandwich
14. Jay Grande, Tisbury – By phone
15. Richard Elkin, Wellfleet
16. ChristiAne Mason, Wellfleet Alternate
17. Sue Hruby, West Tisbury – By phone
18. Joyce Flynn, Chair, Executive Committee, Yarmouth

Absent Were:

1. Michael Hebert, Aquinnah
2. Timothy Carroll, Chilmark
3. Brad Crowell, Dennis
4. Robert Hannemann, Duke's County
5. Jarrod Cabral, Truro

Members/Alternates
Physically present: 13
Present by phone: 5

Legal Counsel:
Jeffrey Bernstein, Esq., BCK Law, P.C.

Staff Present:
Austin Brandt, Senior Power Supply Planner
Briana Kane, Planning and Evaluation Manager
Joanne Nelson, Comptroller
Lindsay Henderson, Senior Energy Efficiency Program and Marketing Analyst

Maggie Downey, Administrator
Margaret Song, C&I Program Manager
Matt Dudley, Senior Energy Efficiency Program Analyst
Melissa Allard, Senior Administrative Coordinator
Tony Gionfriddo, Senior Energy Efficiency Program Analyst

Public Present:
None present.

Joyce Flynn called the meeting to order at 2:08 PM. Joyce Flynn recognized Peter Cocolis of Chatham, Paul Pimentel of Edgartown and Richard Toole of Oak Bluffs who were participating remotely because physical attendance at the meeting would be unreasonably difficult.

Open Session Vote on entry into Executive Session pursuant to M.G.L. c. 30A §§21(a)(3) to discuss matters below, to return to open session:

1. Trade secrets and confidential, competitively-sensitive or other proprietary power supply information and to determine whether it is appropriate to release any portion of confidential contract provisions, Potential Vote

Joyce Flynn at 2:10 PM moved to enter into Executive Session pursuant to MGL Chapter 30A §21(a) 10 to discuss trade secrets, confidential and competitively sensitive information contained in and relative to pricing exhibits of Compact power supply contracts.

Joyce Flynn declared that an open session may adversely affect the Cape Light Compact's ability to conduct business in relation to other entities making, selling or distributing electric power and energy. The governing Board will return to Open Session at the conclusion of Executive Session. Seconded by Robert Schofield.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Peter	Cocolis	Chatham	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Valerie	Bell	Harwich	Yes
Wayne	Taylor	Mashpee	Yes
Richard	Toole	Oak Bluffs	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Jay	Grande	Tisbury	Absent
Richard	Elkin	Wellfleet	Yes
Sue	Hruby	West Tisbury	Absent
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (15 – 0 – 0)

Jay Grande joined by phone at 2:14 PM.

Sue Hruby joined by phone at 2:25 PM.

Jay Grande ended participation by phone at 3:24.

Joyce moved to return to Open Session *Seconded by Robert Schofield.*

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Peter	Cocolis	Chatham	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Valerie	Bell	Harwich	Yes
Wayne	Taylor	Mashpee	Yes
Richard	Toole	Oak Bluffs	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Jay	Grande	Tisbury	Absent
Richard	Elkin	Wellfleet	Yes
Sue	Hruby	West Tisbury	Absent
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (15 – 0 – 0)

Returned to Open Session at 3:26 PM.

PUBLIC COMMENT:

There were no members of the public present.

APPROVAL OF MINUTES:

The Board considered the March 28, 2018 Meeting Minutes. Paul Pimentel requested that in the third paragraph, under 2019-2021 Energy Efficiency Plan, that "CHP" be changed to "heat pumps." David Anthony noted an issue with the first sentence under discussion of questions and communications from the Attorney General's Office on DPU 17-95. Maggie Downey read it over and stated that the first and second sentence should be combined with a comma.

Martin Culik moved the Board to accept the minutes as amended, seconded by Colin Odell.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Peter	Cocolis	Chatham	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Abstained
Valerie	Bell	Harwich	Yes
Wayne	Taylor	Mashpee	Yes
Richard	Toole	Oak Bluffs	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Jay	Grande	Tisbury	Absent
Richard	Elkin	Wellfleet	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (15 – 0 – 1)

CHAIRMAN'S REPORT:

Joyce Flynn asked the Compact's new employee, Tony Gionfriddo, to introduce himself.

Joyce Flynn stated that she and Liz Argo from CVEC are trying to kickstart a Cape Wind Energy Meeting that would meet twice a year. If any members of the Board would like to be involved, they are to send her an email.

Joyce Flynn asked members if their respective towns were considering becoming Green Communities. She then handed out an FAQ sheet to the Board that could be used to answer questions people may have. Valerie Bell also indicated that the Massachusetts Green Communities Division has good resources to answer questions too.

FISCAL REPORT, PETER COCOLIS:

Peter Cocolis requested Maggie Downey to go over the fiscal report since he was not physically present. Maggie Downey noted that the 2018 operating budget expenditures go to the end of March and that the Compact is waiting on credits to be processed for supplies.

Joanne Nelson stated that all, but a small portion of the money owed to the Compact from the Barnstable County has now been received by the Compact. A final reconciliation will be done through the Compact's 2017 audit.

DISCUSSION AND VOTE TO ADOPT COMPACT MEETING PROTOCOLS:

Tom Donegan asked for discussion on the meeting protocols (Code of Conduct) that had been shared with the Board. David Anthony asked what happens if the protocols are not followed. Valerie Bell stated that penalties assessed would most likely involve the town the Board Member represents as well. Thomas Donegan stated that the penalties could include having the Board Member's appointment taken away.

Colin Odell noted that the protocols' overall purpose is to give the chair authority to uphold Board Meeting etiquette.

Richard Elkin brought up Robert's Rules of Order. Thomas Donegan stated that Robert's Rules of Order is overly complicated. A modified version of Robert's Rules of Order could be prepared and adopted if that is something the Board would like to do, but Thomas Donegan feels that the protocols we follow now are working well. All the Board Members are heard and are aware of the expectations for how the Board Meetings should be run.

Jeff Bernstein stated that the first paragraph of the meeting protocols should be all bullets and that the format should be neater before posting to the website.

Thomas Donegan moved the CLCJPE Board of Directors vote to adopt the attached Code of Conduct Policy for Board Members.

The Compact Administrator is authorized and directed to take all actions necessary or appropriate to implement this vote, and to execute and deliver all documents as may be necessary or appropriate to implement this vote. Seconded by Colin Odell.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Peter	Cocolis	Chatham	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Valerie	Bell	Harwich	Yes
Wayne	Taylor	Mashpee	Yes
Richard	Toole	Oak Bluffs	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Jay	Grande	Tisbury	Absent
Richard	Elkin	Wellfleet	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (16 – 0 – 0)

ENERGY EFFICIENCY PROGRAM:

1. **Small Business Main Streets Update, Matt Dudley**

Matt Dudley gave an update on the Main Street program. He stated that 107 eligible customers have signed up thus far. When comparing the number of businesses that have signed up from January 1st through April 6th of this year to the same period last year, the number is 85% higher. Businesses can sign up until Memorial Day,

but the Compact may extend the program through the summer. RISE's Energy Specialist and Technician have been stopping by neighboring eligible businesses to see if they are interested in signing up and are able to conduct the Main Streets energy assessment while they are there. Many of the Chambers have gotten involved in the process as well to promote this offer to their members.

David Anthony questioned the percentages on the Main Streets 2018 Update slide because they don't add up to 100%. Matt Dudley replied that those percentages are the top three types of business that signed up. There are many more types of businesses included in the other 42%.

Joyce Flynn asked how long it takes for businesses to get a call back after signing up for an assessment and then when are the assessments being scheduled for. Matt Dudley stated that people have been getting a call within a couple of days and the assessment is usually scheduled around a week later.

2. Discussion and Vote on Preliminary Program Enhancements and Budget for the 2019-2021 Energy Efficiency Plan

Maggie Downey reviewed the 2019-2021 Energy Efficiency Plan, making note of the changes she made on certain slides since March's Board Meeting. Martin Culik asked if an actual number to replace the "xxx" on the Residential Enhancements slide had been determined yet. Maggie Downey stated that it had not yet been decided on and wouldn't be until much closer to the final filing.

Robert Schofield moved the CLCJPE Board of Directors vote to support the Compact's Preliminary Enhancements to the 2019-2021 Energy Efficiency Plan (EEP) as presented on the attached slides.

The Compact Administrator is authorized and directed to take all actions necessary or appropriate to implement this vote, and to execute and deliver all documents as may be necessary or appropriate to implement this vote. Seconded by David Anthony.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Peter	Cocolis	Chatham	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Valerie	Bell	Harwich	Yes
Wayne	Taylor	Mashpee	Yes
Richard	Toole	Oak Bluffs	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Jay	Grande	Tisbury	Absent
Richard	Elkin	Wellfleet	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (16 – 0 – 0)

ADMINISTRATOR'S REPORT:

1. **Update on Compact's Second Limited Revised Aggregation Plan**

Maggie Downey stated that the second limited revised aggregation plan was filed on April 4th. So far there has been no response, and she will let the Board know if there is any communication.

2. **2018 Events**

Maggie Downey stated that the Compact would be volunteering at the Annual Community Cleanup Day in Yarmouth this coming weekend. Maggie Downey also gave an update on recent events the Compact participated in and that this past weekend, the Compact staffed a booth at the Lower Cape Home & Garden Show which was well attended and very successful in getting the word out about the Compact's programs.

Joyce Flynn stated that Board Members could help promote the programs by having Energy Assessment Sign-up cards on tables outside of town meetings.

Peter Cocolis, Paul Pimentel, Richard Toole, and Sue Hruby stopped participation by phone at 4:20 PM.

ADJOURNMENT:

Motion to adjourn made at 4:20 PM moved by Robert Schofield, seconded by Valerie Bell.

Respectfully submitted,

Melissa Allard

LIST OF DOCUMENTS AND EXHIBITS:

- Meeting Notice / Agenda
- March 28, 2018 Draft Meeting Minutes
- Main Streets 2018 Update Slide
- 2019-2021 Energy Efficiency Plan PowerPoint
- 2018 Operating Budget
- 2018 Energy Efficiency Budget Report
- CLC Code of Conduct Policy for Board Members

Cape Light Compact JPE
Governing Board
Open Session Meeting Minutes
Wednesday, October 10, 2018

The Cape Light Compact JPE Board of Directors met on Wednesday, October 10, 2018, in the Martha's Vineyard Conference Room at the Cape Light Compact JPE Offices at 261 Whites Path, Yarmouth, MA 02664 at 2:00PM.

Present Were:

1. David Anthony, Secretary, Barnstable
2. Peter Doyle, Barnstable Alternate
3. Robert Schofield, Executive Committee, Bourne
4. Colin Odell, Brewster
5. Fred Fenlon, Eastham
6. Paul Pimentel, Edgartown
7. Ronald Zweig, Vice-Chair, Falmouth
8. Wayne Taylor, Mashpee **– By Phone**
9. Martin Culik, Orleans
10. Thomas Donegan, Executive Committee, Provincetown
11. Leanne Drake, Sandwich
12. Kirk Metell, Tisbury Alternate **– By Phone**
13. Sue Hruby, West Tisbury
14. Joyce Flynn, Chair, Yarmouth

Absent Were:

1. Michael Hebert, Aquinnah
2. Peter Cocolis, Executive Committee, Chatham
3. Timothy Carroll, Chilmark
4. Brad Crowell, Dennis
5. Robert Hannemann, Dukes County
6. Valerie Bell, Harwich
7. Richard Toole, Executive Committee, Oak Bluffs
8. Jarrod Cabral, Truro
9. Richard Elkin, Wellfleet

Members/Alternates
Physically present: 12
Present by phone: 2

Legal Counsel:
JoAnn Bodemer, Esq., BCK Law, P.C.

Staff Present:
Austin Brandt, Senior Power Supply Planner
Briana Kane, Planning and Evaluation Manager
Joanne Nelson, Comptroller

Maggie Downey, Administrator
Margaret Song, C&I Program Manager
Melissa Allard, Senior Administrative Coordinator
Phil Moffit, Residential Program Manager

Public Present:
None Present.

Joyce Flynn called the meeting to order at 2:06 PM. Joyce Flynn recognized Wayne Taylor of Mashpee and Kirk Metell of Tisbury who were remotely participating because physical attendance at the meeting would be unreasonably difficult.

PUBLIC COMMENT:

There were no members of the public present.

APPROVAL OF MINUTES:

The Board considered the September 19, 2018 Meeting Minutes.

Colin Odell moved the Board to accept the minutes as amended, seconded by Martin Culik.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Wayne	Taylor	Mashpee	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Kirk	Metell	Tisbury	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (13– 0 – 0)

CHAIRMAN'S REPORT:

Joyce Flynn announced that the Cape & Island Energy Committees Meeting will be on November 1, 2018 at the Compact's Offices and thanked Maggie Downey and Liz Argo for putting it together.

Joyce Flynn reviewed the calendar she and Maggie Downey put together of important events that will be taking place over the next few months, and asked Board Members to attend if possible. Maggie Downey stated that the Compact staff will be in hearings at the DPU during the regularly scheduled December Board Meeting and

suggested that December 5th would work best for the December Cape Light Compact Board Meeting. The sense of the board is that December 5th will work.

ADMINISTRATORS REPORT:

1. **Fiscal Report: Overview of Energy Efficiency and Operating Budgets**

Maggie Downey stated that the Compact is on track to spend almost all of the Operating Budget. The RFP for municipal electric accounts is being worked on.

Maggie Downey stated that the Energy Efficiency Budget was also on track to be spent and it shows a hockey stick growth. Phil Moffit is on track to use all the Residential Budget and receive the planned savings. Ron Zweig stated that he understands the hockey stick principle when it comes to new projects, but since these are ongoing programs, why is this happening? Margaret Song stated there are few reasons why this has happened. With some projects they are going through the grant process in the summer, installation in the fall and the Compact doesn't get billed until December. Also, the Massachusetts Clean Energy Center grants decreased therefore the Compact has taken on more.

2. **Reminder of 2019-2021 Energy Efficiency Plan Informational Sessions**

Maggie Downey asked Board Members to attend the Public Sessions and invite others to attend as well. She also asked the Board Member to try and get people to participate in taking the online survey on our website at https://www.capelightcompact.org/eeplan/.

3. **November and December Board Meeting Dates and Agenda Topics**

Maggie Downey stated that the next two Board Meetings will be on November 14th and December 5th. The Operating Budget for 2019 will be voted on at the December Board Meeting, along with nominations for Energy Committees.

Maggie Downey stated that the Cape Cod Commission has released a Draft Regional Policy Plan (RPP) that references Cape Light Compact. The Compact has found some minor errors. Maggie Downey asked the Board to let the Compact respond to the errors and asked if the Board wanted to provide comment. Tom Donegan asked if someone for the Cape Cod Commission could come to the next Board Meeting to talk about it with us and stated in the meantime the Compact should send a letter on the corrections. Martin Culik stated that a committee should be put together that would work on Board comments on the RPP. Sue Hruby asked if it would be possible for the Board to submit comments by email. Maggie Downey stated that the Board should read the RPP and submit their comments to her by email. At the November Meeting the Board will vote on the letter Maggie Downey has put together with the comments.

2019-2021 ENERGY EFFICIENCY PLAN, DPU 18-116:

1. **Discussion and Potential Votes on Cape Light Compact Proposed Enhancements to the 2019-2021 Energy Efficiency Plan**

Maggie Downey reviewed background of the Three-Year Energy Efficiency Plan. The Compact works closely with other PA's to provide cost-effective energy efficiency programs, but each submits their own tables.

Maggie Downey reviewed the CLC Enhancements slide. Sue Hruby stated that she thought we decided to not continue with OPower at the last Board Meeting. Maggie Downey stated that the Board had decided to not continue with OPower unless the Compact received feedback expressing interest from stakeholders and then it would need to bring it back. There are savings opportunities with OPower being added to the CLC Enhancements. Fred Fenlon asked if there was a reason the Compact was not recommending that the 700 participants convert to gas in its Cape and Vineyard Electrification offering. Maggie Downey stated that converting to natural gas would not be strategic electrification. David Anthony asked if the Compact looked at cost effectiveness for smaller number of participants. Maggie Downey answered yes the Board discussed this at their September meeting, but the Compact came back to the 700 participants.

Colin Odell moved the CLCJPE Board of Directors vote to include the attached Compact energy efficiency program enhancements in the 2019-2021 Energy Efficiency Plan to be submitted to the Massachusetts Department of Public Utilities on October 31, 2018.

The Compact Administrator is authorized and directed to take all actions necessary or appropriate to implement this vote, and to execute and deliver all documents as may be necessary or appropriate to implement this vote. Seconded by Bob Schofield.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Wayne	Taylor	Mashpee	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Kirk	Metell	Tisbury	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (13– 0 – 0)

2. Discussion and Potential Votes on Utilizing State Median Income versus Area Median Income for Customers in 61-80% and 81-120% Income Range

Maggie Downey reviewed the Residential Income Verification Offerings slide and stated that the Compact believes it's best not to change the 60% offering from State Median Income (SMI) to Area Median Income (AMI) because it would affect other programs those people participate in like SNAP, WIC, EBT, etc. However, the 61-80% and 81-120% could be changed to Area Median Income (AMI). Tom Donegan stated that it would allow more customers to qualify for more help. JoAnn Bodemer asked what about the gap between the 60% SMI and the 61-80% AMI. Maggie Downey stated that the Compact could lower the starting numbers from the 61-80% AMI to meet the 60% SMI. Joyce Flynn asked if changing the numbers would it make it more difficult for staff with their programs. Maggie Downey stated that staff already checks the customers income. Martin Culik asked if these numbers change annually. Maggie Downey answered yes. Briana Kane stated that the Compact would check to see if the 2019 numbers are up yet. Tom Donegan stated that when thinking about

each town separately, what is the average people per household? Margaret Song stated that there is an average 2.2 people per household on Cape Cod and 2.1 people per household in Martha's Vineyard.

Tom Donegan moved the CLCJPE Board of Directors vote to approve the use of Area Median Incomes for determining whether a customer is eligible for Cape Light Compact moderate (61-80% AMI) or extended moderate (81-120% AMI) income offerings, and to continue to use the State Median Income for the Low-Income Customers (60% SMI) .

The Compact Administrator is authorized and directed to take all actions necessary or appropriate to implement this vote, and to execute and deliver all documents as may be necessary or appropriate to implement this vote. Seconded by Martin Culik.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Wayne	Taylor	Mashpee	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Kirk	Metell	Tisbury	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (13– 0 – 0)

3. Discussion and Potential Vote on Proposed 2019-2021 Energy Efficiency Plan Budget and Savings Goals

Briana Kane reviewed the budget, savings and bill impacts slides. Colin Odell asked why the residential bills are increasing an average of $4.84. Maggie Downey stated it is primarily because of the Cape and Vineyard electrification offering. Colin Odell stated that the Compact will need to prepare speaking points that people will understand on why customers will be seeing an increase on their bill. Maggie Downey stated that this is a $23-million-dollar offering that the Compact is proposing. Briana Kane stated that the other Compact Energy Efficiency Plan enhancements are also contributing to the budget increase. Maggie Downey noted that there will be higher percentage of propane and oil customers in our territory than in other Program Administrator territories. Martin Culik asked how the average increase of $4.84 compares to other PA's across the state. Briana Kane stated that the Compact is about double the cost per kWh as of the past month. Martin Culik asked if this proposal to the state isn't set in stone because they could deny or ask for changes. Maggie Downey answered yes. Fred Fenlon asked how the Compact feels about the projections going forward on the billing impacts. Maggie Downey stated that she thinks the Compact will be on the higher end. Sue Hruby stated that the communications need to be targeted to the low- and moderate-income customers and should be sent out around the time they get their bill. The bill impacts may not seem like much, but for some it is.

Joyce Flynn asked what would happen to the $23 million dollars for the electrification program if the state says no. Will it go away, or would there be a substitute? Maggie Downey stated that it will be removed from the 2019-2021 Energy Efficiency Plan. JoAnn Bodemer stated that the Compact could change the program a bit, for instance make it 300 participants and see if the state accepts it then if directed by the Department of Public Utilities. Maggie Downey stated nothing new could be added to the proposal, but yes, programs already in the proposal could be reworked. Martin Culik asked if there has been a conversation with the state on the Compact electrification program. Maggie Downey stated that it has been well discussed and won't be a surprise. Maggie Downey stated that Dan Schell will take time to talk to the Board and figure out what the Compact needs to focus on and what the concerns are when it comes to explain to our customers about the bill impacts. Paul Pimentel stated the Compact should link electrification to renewable energy and climate change.

Martin Culik moved the CLCJPE Board of Directors vote to approve the proposed goals and budgets presented by staff for the 2019-2021 Energy Efficiency Plan and authorized submission of the proposed Plan to the Massachusetts Department of Public Utilities.

The Compact Administrator is authorized and directed to take all actions necessary or appropriate to implement this vote, and to execute and deliver all documents as any necessary or appropriate to implement this vote. Seconded by Colin Odell.

David	Anthony	Barnstable	Yes
Robert	Schofield	Bourne	Yes
Colin	Odell	Brewster	Yes
Fred	Fenlon	Eastham	Yes
Paul	Pimentel	Edgartown	Yes
Ronald	Zweig	Falmouth	Yes
Wayne	Taylor	Mashpee	Yes
Martin	Culik	Orleans	Yes
Thomas	Donegan	Provincetown	Yes
Leanne	Drake	Sandwich	Yes
Kirk	Metell	Tisbury	Yes
Sue	Hruby	West Tisbury	Yes
Joyce	Flynn	Yarmouth	Yes

Motion carried in the affirmative (13– 0 – 0)

4. Review Department of Public Utilities (DPU) Schedule

Maggie Downey stated that it would be great if any Board Members could attend the DPU Meeting in Boston. This would be to create a presence but that no Board Members would be allowed to comment.

Wayne Taylor and Kirk Metell stopped participation by phone at 3:34pm.

ADJOURNMENT:

Motion to adjourn made at 3:46 PM moved by Robert Schofield, seconded by Ron Zweig.

Respectfully submitted,

Melissa Allard

LIST OF DOCUMENTS AND EXHIBITS:

- Meeting Notice / Agenda
- September 19, 2018 Meeting Minutes
- October -December 2018 Calendars of Events
- 2018 Operating Budget
- 2018 Energy Efficiency Budget
- October update on the Compact's 2019-2021 Three-Year Energy Efficiency Plan PowerPoint
- Agenda Action Request: 2019 – 2021 Energy Efficiency Plan Budget and Savings Goals
- Agenda Action Request: 2019 – 2021 Energy Efficiency Plan Compact Specific Enhancements
- Agenda Action Request: 2019 – 2021 Energy Efficiency Plan: Income Eligible Programs
- DPU 18-110 – 18-119 Three-Year Energy Efficiency Plans Prefiling Memo

CAPE LIGHT COMPACT STAKEHOLDER ENGAGEMENT & 2019-2021 POTENTIAL STUDY

Board Meeting

3/28/2018

Opinion Dynamics

dunsky ENERGY CONSULTING

Agenda

Opinion Dynamics

dunsky ENERGY CONSULTING

Study Background

Study Components

- **Stakeholder Engagement Meetings:** New effort to engage a variety of customers and stakeholders early in the planning process

- **Potential Study for 2019-2021:** Update to the 2016-2018 potential study completed in 2014/2015

Study Objectives

- Give stakeholders a voice early in the Compact's planning process
- Collect feedback on programs and outreach strategies (present and future)

- Determine the remaining achievable potential for the 3-year period 2019-2021
  - Electric EE and DR potential, by sector/segment and year
- Comply with requirements of the Massachusetts Department of Public Utilities ("DPU") that each Program Administrator "conduct a service territory-specific energy efficiency potential study every three years"

Stakeholder Engagement Meetings

Scope

Meeting #	Stakeholder Group	Date	# Attendees
1	Cape Cod Environmental Organizations	11/30/2017	5
2	Cape Cod Municipal/Public Entities	12/1/2017	13
3	Educational Organizations	12/12/2017	10
4	Compact Board of Directors	12/13/2017	9
5	Compact Large C&I Customers	1/10/2018	6
6	Compact Vendor Community	1/11/2018	9
7	Compact Residential Customers #1	1/11/2018	13
8	Compact Small/Medium C&I Customers	1/16/2018	5
9	Vineyard Organizations	1/22/2018	13
10	Cape Cod Community Organizations	1/23/2018	11
11	Compact Staff	1/23/2018	11
12	Compact Residential Customers #2	2/01/2018	9

Key Research Questions

- What opportunities are of interest to stakeholders?
- What else should the Compact be offering that is not currently offered?
- How can the Compact modify its low income program guidelines to reduce barriers to participation?
- What will energy education look like when lighting is no longer offered?

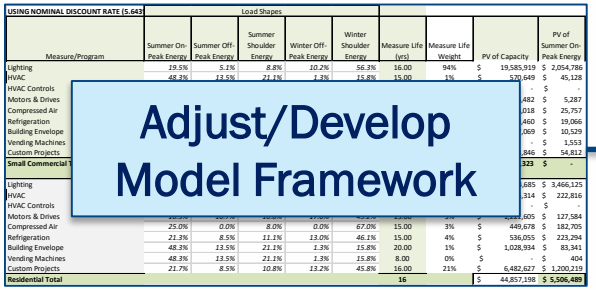
- How can the Compact increase participation in its programs?
- How can the Compact better…
  - serve customers in a comprehensive manner/achieve deeper savings?
  - provide information to stakeholders' towns and residents/businesses?
  - involve and leverage different stakeholder groups for outreach?
  - reach hard-to-reach customers?

Key Stakeholder Feedback

- Program Opportunities
  - There is higher interest in existing offerings than new technologies; solar PV, heat pumps, and energy storage are the exception (individually or in combination)
  - Meeting attendees offered a range of ideas for enhancing current programs
  - Attendees suggested efforts to improve the limited local contractor base
  - Both residential and commercial stakeholders expressed an interest in low-interest project financing
- Outreach
  - Low awareness remains the biggest barrier to program participation
    - Word-of-mouth is still the most effective means by which Compact customers learn about energy efficiency and Compact programs
  - Many ideas for Compact outreach are already used by the Compact
  - There is broad support for engaging in partnerships with the Compact
  - There is a need for simpler, more consistent messaging and more accessible information on Compact offerings

Potential Study

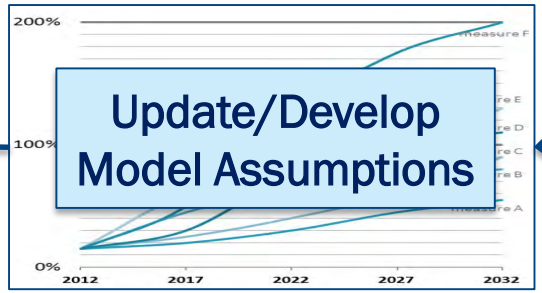
Potential Study Overview



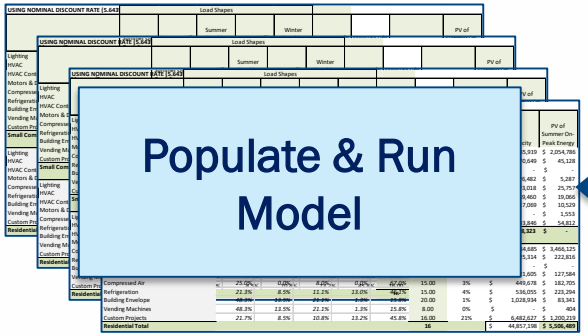
Adjust/Develop Model Framework

Review CLC Data and Materials

Process and Analyze Secondary Data



Update/Develop Model Assumptions



Populate & Run Model

Key Model Outputs

- Technical, economic, and achievable potential
- By energy source

- Budget
- Total Resource Benefits/Costs
- Cost-effectiveness

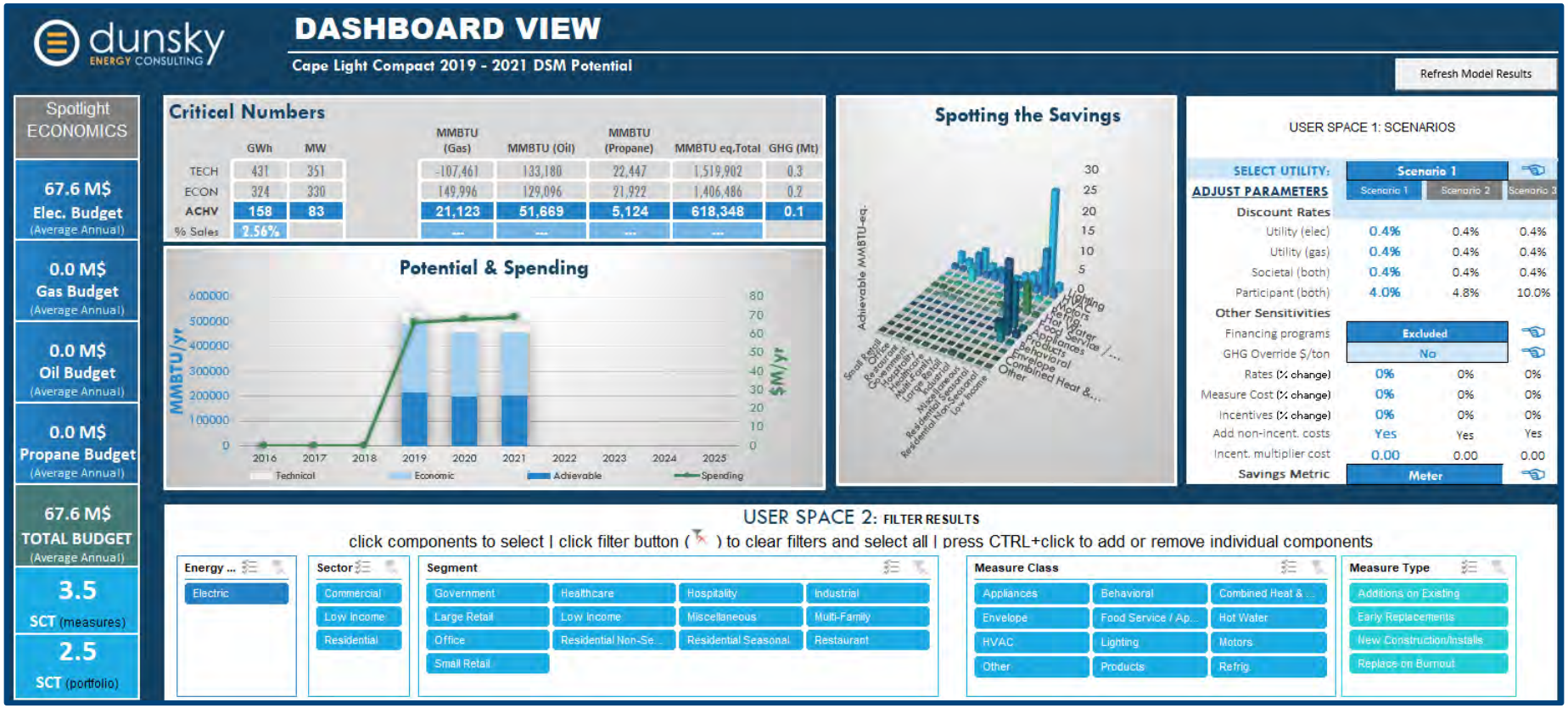
- Results by segment/sector
- Results by measure class (end-use)

Technical Potential:
Technologies with the most savings are installed in all applicable buildings.

Economic Potential:
Subset of technical potential that is cost-effective.

Achievable Potential:
Subset of economic potential that can be achieved with ambitious and comprehensive program design.

Potential Model Dashboard



Opinion Dynamics

dunsky ENERGY CONSULTING

Key Updates to 2014 Study

- Addition of several new energy efficiency measures, removal of a few others
- Addition of demand response measures

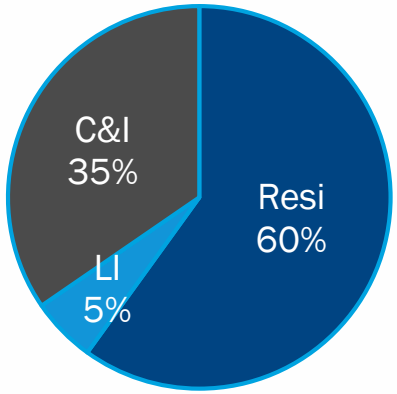
- General update based on Massachusetts' Technical Reference Manual, evaluation reports, and other sources
- Adjustment of baseline assumptions following code and standard changes
  - Adjustment of lighting assumptions (e.g., savings, cost, measure life) to reflect latest market data and assumptions related to EISA standards
- Development of new penetration and saturation inputs

- Update of detailed program-level costs, with fixed and variable components
- Update of avoided cost – *not yet available*

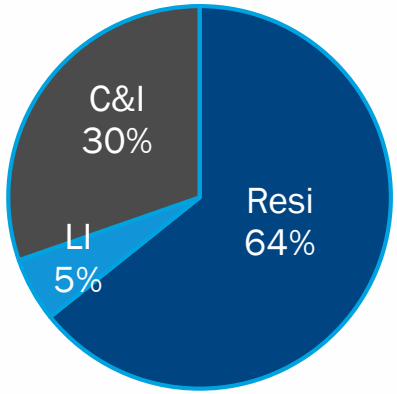
Key Results

	All Sectors		Residential		Low Income		C&I	
Annual Potential	MWh	MW	MWh	MW	MWh	MW	MWh	MW
Technical	143,774	116.9	88,879	65.5	5,932	3.9	48,963	47.5
Economic	107,994	109.9	59,188	59.1	4,311	3.5	44,496	47.3
Achievable	52,795	27.7	31,652	17.8	2,886	1.5	18,257	8.4
Achievable as % of Sales	2.81%		2.98%		4.58%		2.43%	
Cost-Effectiveness (Total Resource Cost Test)								
Sector-level	2.5		2.1		3.6		3.9	
Measure-level	3.5		2.9		4.3		6.5	

Achievable MWh



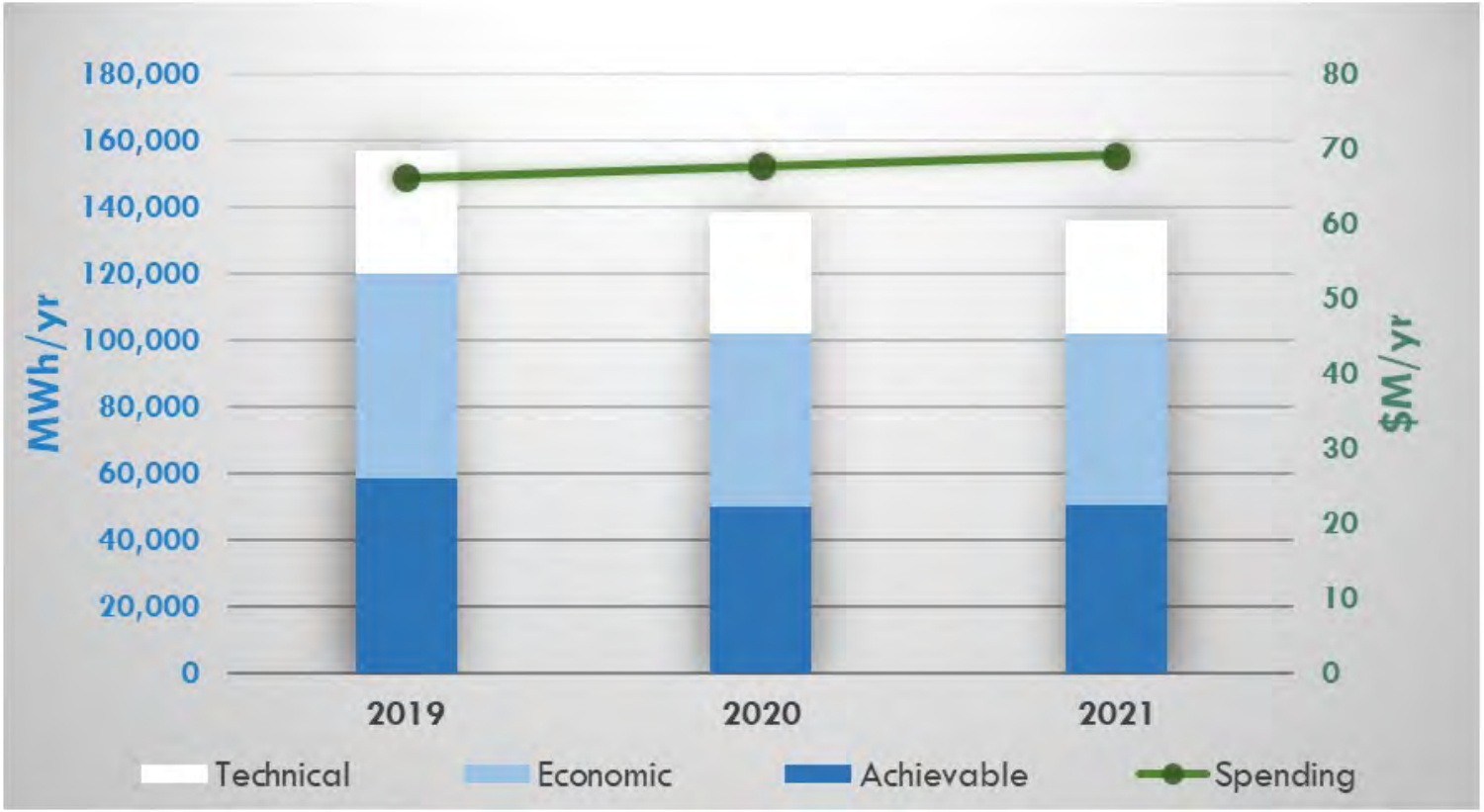
Achievable MW



Opinion Dynamics

dunsky ENERGY CONSULTING

Annual Savings and Spending, by Year



Opinion Dynamics

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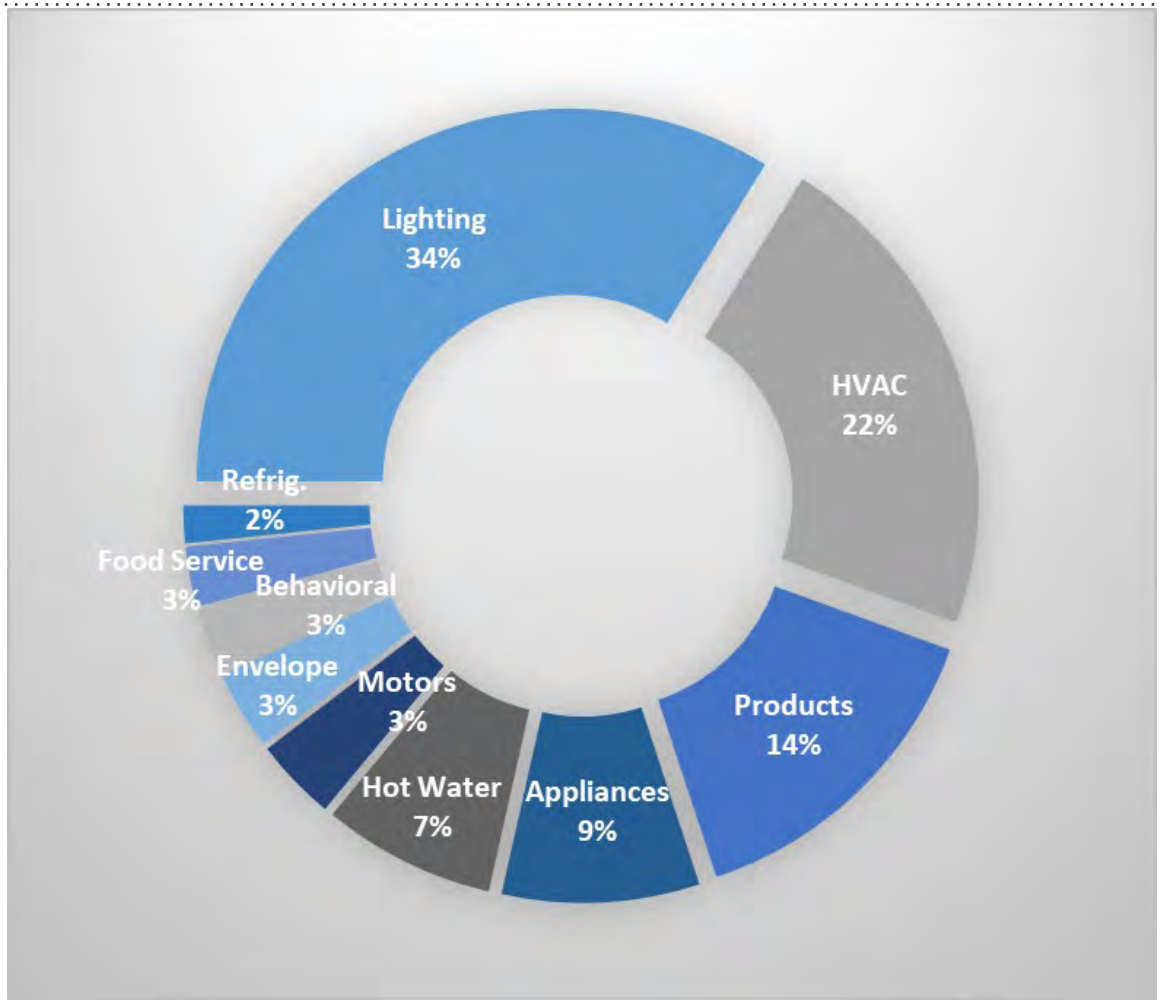
Achievable Potential, by End-Use



Opinion Dynamics

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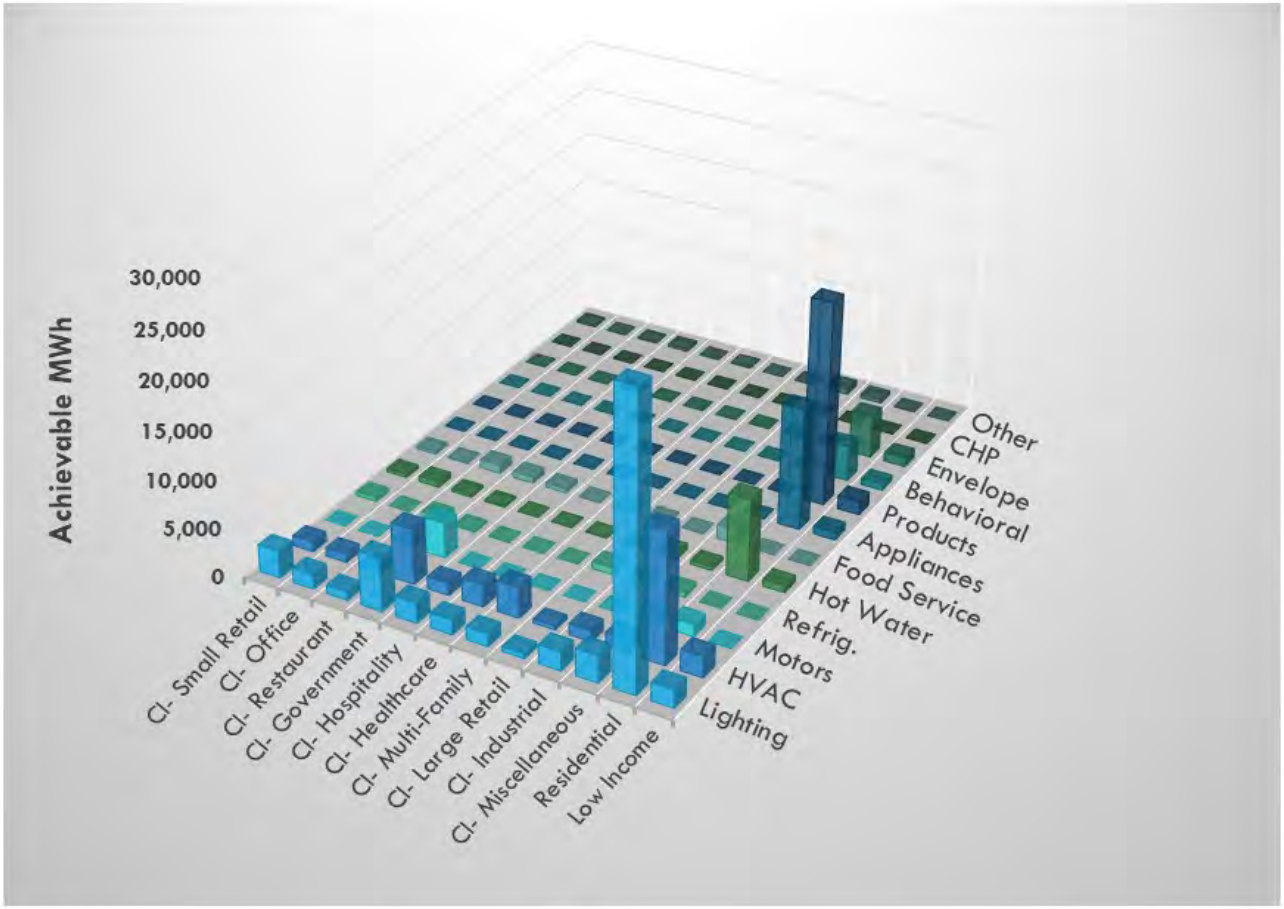
3-Year Achievable Potential, by Segment and End-Use



Status and Next Steps

Status and Next Steps

- Completed meetings
- Submitted meeting summaries following each meeting
- Submitted draft methodology and results memo last week

- Draft report went through Compact and EEAC review
- Responded to EEAC questions and comments
- Awaiting final avoided cost
  - Will rerun the model
  - Expect slight changes in results

Questions & Answers

Cape Light Compact JPE
2019-2021 Energy Efficiency Plan
Proposed Enhancements

March 28, 2018

Working Together Toward A Smarter Energy Future

2019-2021 EEP Schedule

- March 28 Discuss Compact Enhancements
- April 11 Compact Board votes on First Draft of Proposed Enhancements to the 2019-2021 Energy Efficiency Plan (EEP)
- April 30th Compact presents draft EEP to the state Energy Efficiency Advisory Council
- May – September Compact staff continue to refine EEP
- September - Compact Board finalizes proposed 2019-2021 EEP Enhancements and Program Budgets
- October 30, 2018 – Compact files EEP with the Department of Public Utilities

Residential Enhancements

- Continue with cost effective no cap insulation offer for residential customers
- Continue offering 100% insulation incentives to our renter and moderate income customers
- Continue to explore ways to serve our hard-to-reach customers
- Proposed new offer: $5,000 grant to be used for energy efficiency upgrades for any school that recruits xxx Home Energy Assessments in any one year

C&I Enhancements

- Continue enhanced incentives for:
  - Municipal
  - Non-profits
  - Year-round tenants
  - Oil, propane and unregulated fuels
  - “Main Streets”

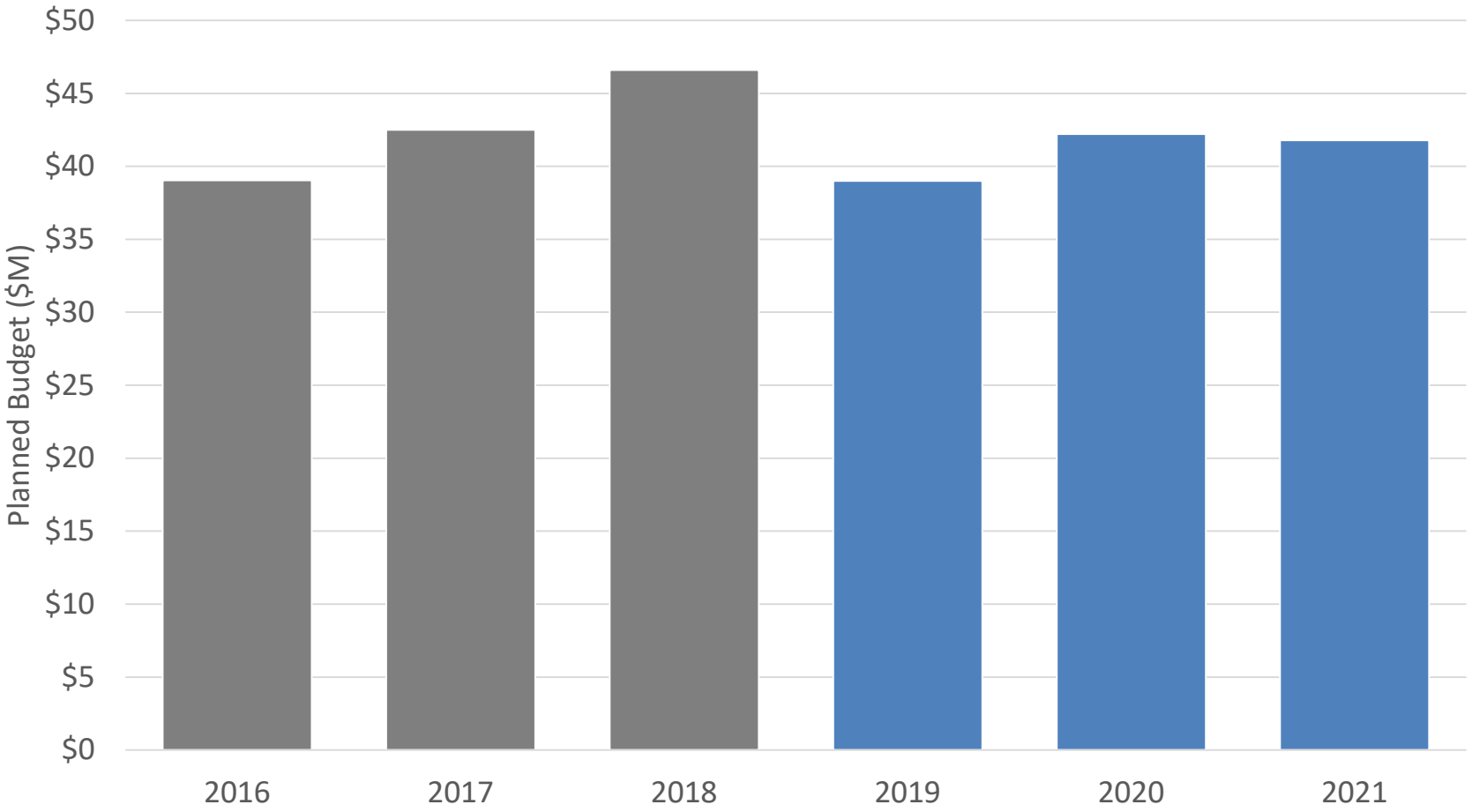
Demand Management - Storage

- Small Scale Battery Storage for Residential and Small Commercial Customers
  - Proposed to focus mostly on residential and small commercial customers who have installed distributed generation (DG) such as solar and wind
  - Modeled after existing utility programs (e.g., Unitil and Green Mountain Power)
  - Objective is to reduce system and local peak demand

Demand Management

- Residential Demand Management
  - Connected devices
    - R&D funds to explore potential for load management through connected devices (e.g., plug load controllers, pool pumps, smart lighting, etc.)
  - Behavioral
    - Discussion: Does the Board support exploring a home energy report model (e.g., OPower)?
- C&I Demand Management
  - Thermal Storage
    - Shifts air conditioning load to off-peak hours

Proposed 2019-2021 Energy Efficiency Budget



Cape Light Compact JPE
2019-2021 Energy Efficiency Plan
Proposed Enhancements

April 11, 2018

Working Together Toward A Smarter Energy Future

Residential Enhancements

- Continue with cost effective no cap insulation offer for residential customers
- Continue offering 100% insulation incentives to our renter and moderate income customers
- Continue to explore ways to serve our hard-to-reach customers
- Proposed new offer: $5,000 grant to be used for energy efficiency upgrades for organizations (public and non-profit) that recruits xxx Home Energy Assessments in any one year

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- Continue enhanced incentives for:
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  - Year-round tenants
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Demand Management

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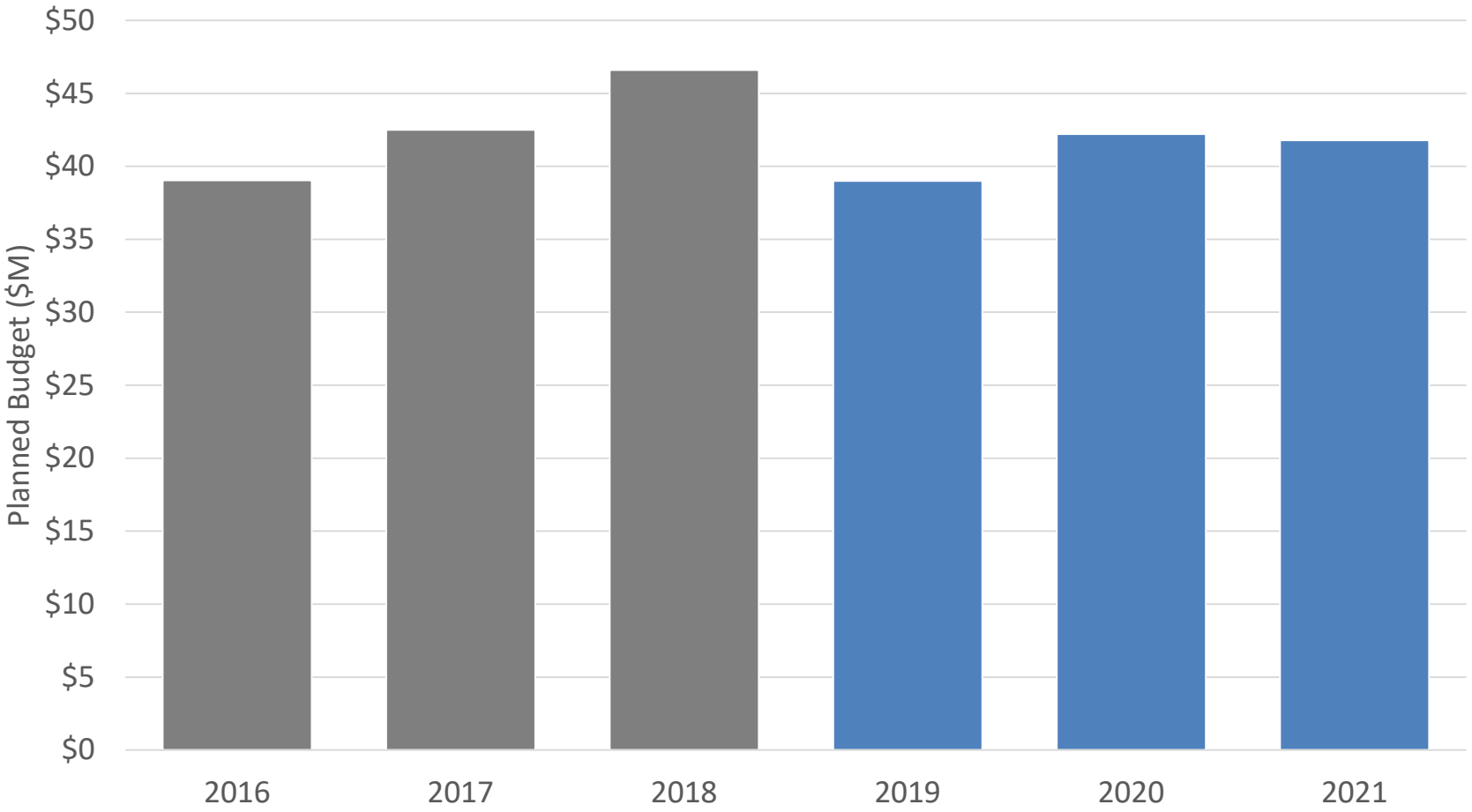
    - R&D funds to explore potential for load management through connected devices (e.g., plug load controllers, pool pumps, smart lighting, etc.)
  - Behavioral
    - Continue to explore a home energy report model (e.g. OPower)
- C&I Demand Management
  - Thermal Storage
    - Shifts air conditioning load to off-peak hours

Proposed 2019-2021 Energy Efficiency Budget: $122,975,328



Cape Light Compact JPE
2019-2021 Energy Efficiency Plan Updates

July 11, 2018

Working Together Toward A Smarter Energy Future

New Residential Enhancements

- Proposed new offer: $5,000 grant to be used for energy efficiency measures/upgrades for organizations (public and non-profit) that recruit **100** residents that complete Home Energy Assessments (HEA) in any one year ($50 head fee)
  - Should CLC provide incentive for HEA only or require implementation of a measure(s)?
- Opower
  - Is willing to work with CLC over the 19-21 plan years
  - Is putting together a cost proposal
  - Does the Board wish to move forward?

Residential and C&I Enhancements

- Residential
  - Continue with cost effective no cap insulation offer for residential customers
  - Continue offering 100% insulation incentives to our renter and moderate income customers
  - Continue to explore ways to serve our hard-to-reach customers
- C&I
  - Continue enhanced incentives for:
    - Municipal
    - Non-profits
    - Year-round tenants
    - Oil, propane and unregulated fuels
    - “Main Streets”

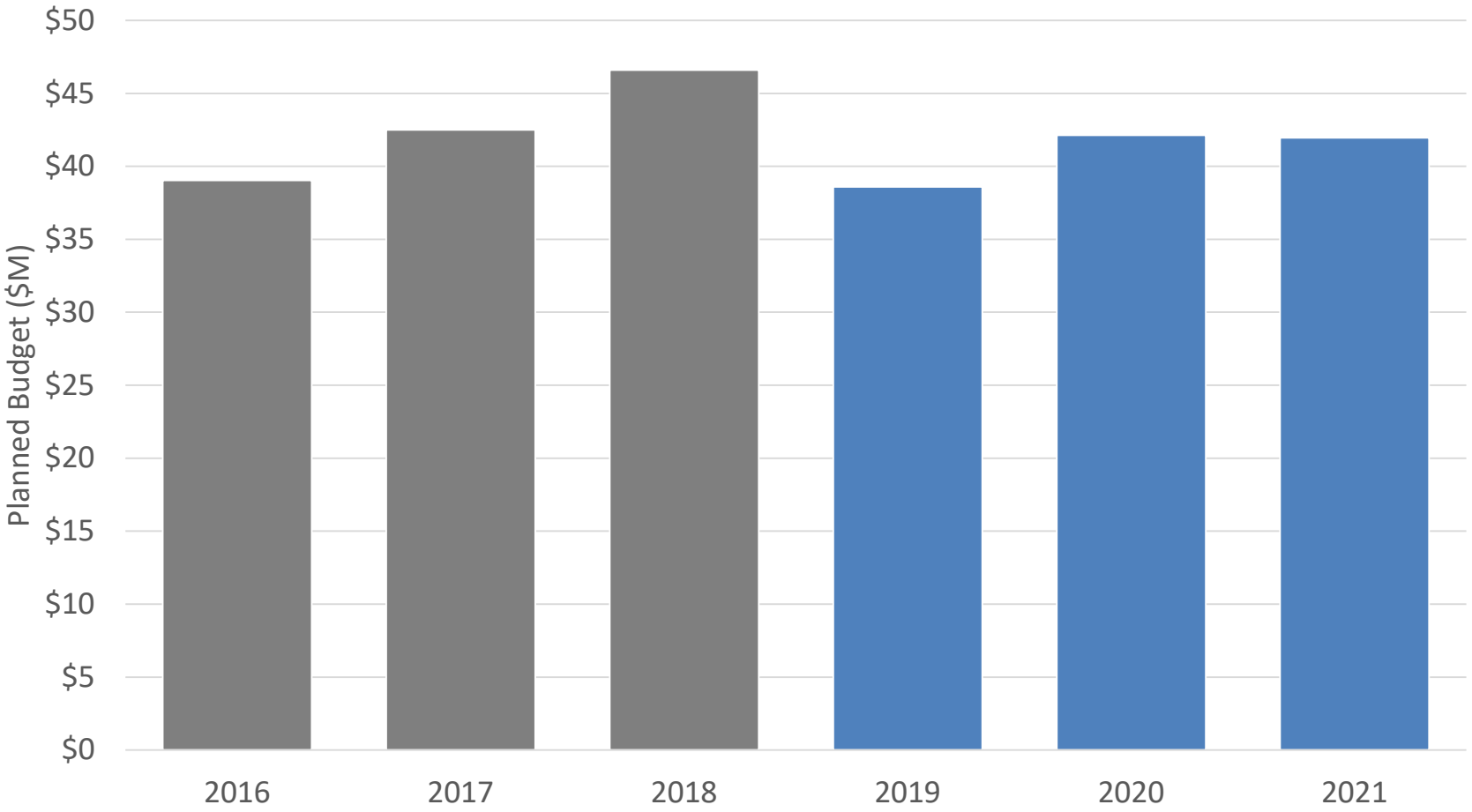
Demand Management - Storage

- Small Scale Battery Storage for Residential and Small Commercial Customers
  - Proposed to focus mostly on residential and small commercial customers who have installed distributed generation (DG) such as solar and wind
  - Modeled after existing utility programs (e.g., Unitil and Green Mountain Power)
  - Objective is to reduce system and local peak demand

Demand Management

- Residential Demand Management
  - Connected devices
    - R&D funds to explore potential for load management through connected devices (e.g., plug load controllers, pool pumps, smart lighting, etc.)
  - Behavioral
    - Continue to explore a home energy report model (e.g. OPower)
- C&I Demand Management
  - Thermal Storage
    - Shifts air conditioning load to off-peak hours
  - Pay-for-performance load curtailment

Proposed 2019-2021 Energy Efficiency Budget: $122,671,330



2016-2018 are Planned values only, no actuals.
Budgets shown include Demand Response (Behavior and Active Demand).

Next Steps as CLC heads towards the October 31 Filing

- July 31st, Program Administrators (PAs) will receive approval or comments on the April plan from the Energy Efficiency Advisory Council (EEAC)
- 2nd draft of Plan will be submitted sometime between August 31st and September 17th (date is still being negotiated)
  - MA DOER and PAs negotiate PA specific budgets and savings goals (Term Sheet)
- Late September – Early October CLC Board approves Final Budget and Savings Goals
  - Early October EEAC Resolution should be issued
- October 31st, plan filed with the DPU
- November – December:
  - discovery, hearings
- January:
  - Briefs
  - January 29th, DPU will issue its order on the 2019-2021 Three Year Plan

Building on success:
Update on Cape Light Compact's 2019-2021 Three-Year Energy Efficiency Plan

Background on Three-Year Energy Efficiency Plan

- 2008 Massachusetts Green Communities Act (GCA) mandates *"electric and natural gas resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply."*

- 2018 Amendments to the GCA:
  - Explicitly allows for cost effective energy storage and other active demand management technologies
  - Adds cost-effective strategic electrification
  - Explicitly authorizes renewable funding through EE funds
  - Changes cost-effectiveness requirement from program level to sector level (increases flexibility)

- Statewide Term Sheet: Department of Energy Resources and the Attorney General indicate Program Administrators' 2019-2021 Energy Efficiency Plans should comply with amendments (Active Demand Response, Storage, Electrification Goals Required)

- Compact works collaboratively with seven other statewide PAs to provide cost-effective energy efficiency programs. These programs are most commonly known as Mass Save®.

Calendar of Events

Date	Action
November 2017 – February 2018	Stakeholder Engagement Meetings to help inform the 2019-2021 EE Plan
April 30, 2018	Compact & all PAs submitted draft 2019-2021 Statewide EE Plans
September 14, and October 10, 2018	Second draft of Plan submitted Third draft of Plan due
October 31, 2018	Compact & all PAs file final 2019-2021 Statewide EE Plan with Department of Public Utilities

www.capelightcompact.org/eeplan

mdowney@capelightcompact.org

Overview of Energy Efficiency Programs

Sector	Program	Initiative
Residential	Residential New Buildings	Residential New Homes & Renovations
	Residential Existing Buildings	Residential Coordinated Delivery
		Residential Conservation Services
		Residential Retail
		Residential Behavior & Active Demand Reduction
Income-Eligible	Income-Eligible Existing Buildings	Income-Eligible Coordinated Delivery
Commercial & Industrial	C&I New Buildings	C&I New Buildings and Major Renovations
	C&I Existing Buildings	C&I Existing Building Retrofit
		C&I New & Replacement Equipment
		C&I Active Demand Reduction

CLC Specific Program Enhancements

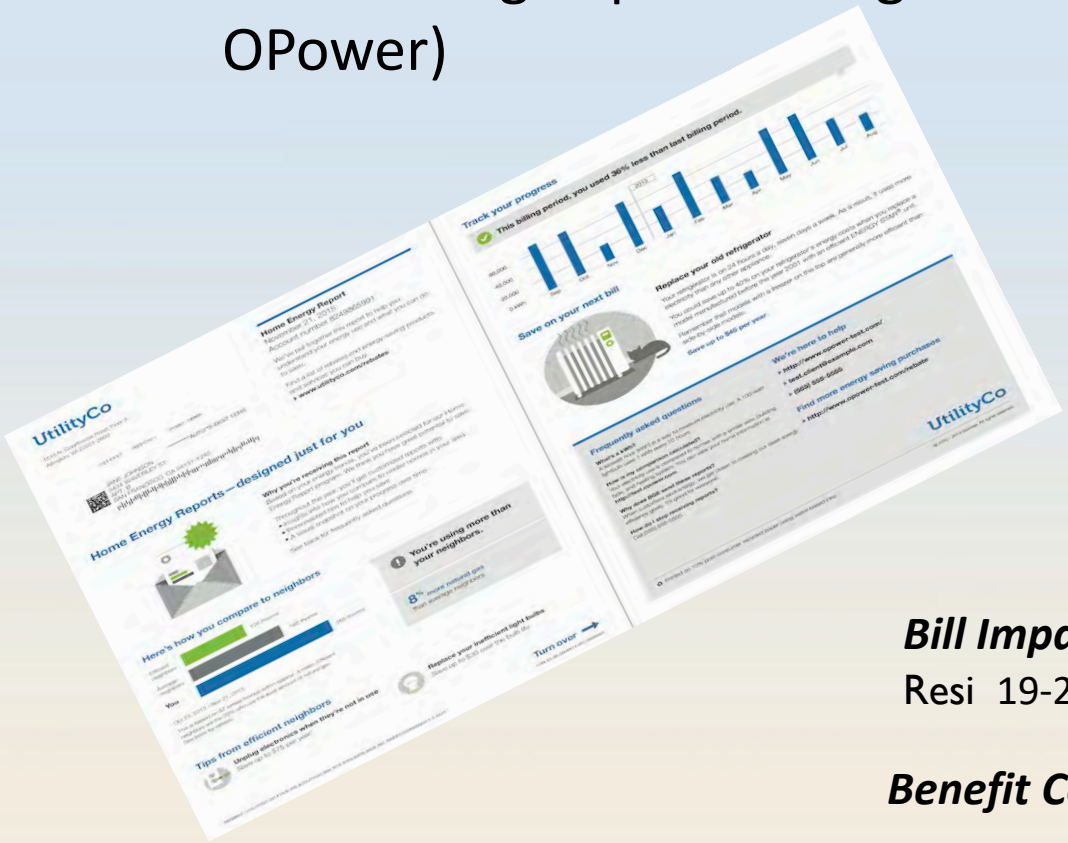
Recap of Board direction to date:

- Residential
  - Continue with cost effective no cap insulation offer for residential customers
  - Continue offering 100% insulation incentives to our renter and moderate income customers
  - Continue to explore ways to serve our hard-to-reach customers
  - Battery Storage and Active Demand Response
- C&I
  - Municipal up to 100% cost effective incentives
  - Eligible Non-profits 100% cost effective incentives
  - Year-round tenants 100% cost effective incentives
  - Serve Oil, propane, other fuel customers
  - Continue to Offer “Main Streets”

LI	19-21 Total Cost / mo	$2.03
C&I	19-21 Total Cost / mo	$7.20 – $194.48

Residential Behavior & Demand Management Offerings

– Considering implementing a home energy report (e.g., OPower)



Cost: $2M over 3 years

Cost effective over the 3 years

Contracting should not be an issue

Does the Board wish to pursue this as a measure?

Bill Impact

Resi 19-21 Total Cost / mo $0.36

Benefit Cost Ratio 2019 – 2021 2.02

Cape & Vineyard Electrification

- Objectives
  - 700 total non-gas heated participants, tiered services by income
    - Additional incentives for low-income (up to 60%), moderate income (61-80%) and extended moderate income (81-120%) customers
  - Convert oil, propane, electric resistance heat to cold climate heat pumps
  - Install PV systems to support electrification of heating system, reduce GHG emissions, offset increased electricity usage
  - Install battery storage for demand response and resiliency

LI	19-21 Total Cost / mo	$0.75
C&I	19-21 Total Cost / mo	$1.27 – $34.20

		Benefit-Cost Ratio
Solar + EO	2019-2021	2.12

Bill Impacts

09.14 filing includes everything but OPower

Residential (R-1)

Years	EERF		Energy Conservation		Avg. Monthly Usage (kWh)		Total Cost (per month)
2018	$0.01859	+	$0.00250	x	516	=	$10.88
2019-2021	$0.02448	+		x		=	$13.92

Low Income (R-2)

Years	EERF		Energy Conservation		Avg. Monthly Usage (kWh)		Total Cost (per month)
2018	$0.00148	+	$0.00250	x	488	=	$1.94
2019-2021	$0.00317	+		x		=	$2.77
2016-2018	$0.00170	+		x		=	$2.05

C&I Small General Service (G-1)

Years	EERF		Energy Conservation		Avg. Monthly Usage (kWh)		Total Cost (per month)
2018	$0.00530	+	$0.00250	x	400 - 10,800	=	$3.12 - $84.24
2019-2021	$0.01501	+		x		=	$7.00 - $189.11
2016-2018	$0.01343	+		x		=	$6.37 - $172.04

Total Budget (all sectors)

2019	2020	2021	2019-2021
$44,069,124	$54,595,241	$57,679,055	$156,343,420

Benefit Cost Ratio 2019 – 2021 2.02

Next Steps for CLC Board

- No action needed on Low-Income incentives, set by regulation and statute
  - Affirm total participants = 175
  - Affirm deed-restricted properties only
- Moderate Income Customers (61%-80% SMI)
  - Affirm total participants = 175
  - Provide $1,000 incentive for Solar/PV
  - 100% of gross system cost funded through HEAT Loan
  - 100% cost of battery storage covered for participating in Demand Response Initiative
  - 100% cost of heat pumps covered via DOER and CEC grants and energy efficiency funds
  - Affirm total participants = 175

Next Steps for CLC Board

- Extended Moderate Income Customers (81%-120% SMI)
  - Affirm total participants = 175
  - No incentive for Solar/PV.
  - 100% of gross system cost funded through HEAT Loan
  - 100% cost of Battery covered for participating in Demand Response Initiative
  - Provide the following Incentives for Cold Climate Air Source Heat Pumps:
    - Electric Heat: $7,500 from energy efficiency funds ($6,650 state grants)
    - Oil/Propane Heat: $7,500 from energy efficiency funds ($5,750 state grants)
    - Balance funded through HEAT Loan
    - If grants not received, should energy efficiency funds be used?

- Standard Offer Customers Provide
  - Affirm total participants = 175
  - No incentive for Solar/PV.
  - 100% of gross system cost funded through HEAT Loan
  - 100% cost of battery storage covered for participating in Demand Response Initiative
  - Provide the following Incentives for Cold Climate Air Source Heat Pumps
    - Electric Heat: $3,000 from energy efficiency funds ($5,400 state grants)
    - Oil/Propane Heat: $7,500 from energy efficiency funds ($4,500 state grants)
    - Balance funded through HEAT Loan
    - If grants not received, should energy efficiency funds be used?

Thank You!

April Draft

https://3jy14ha9u771r7qzn35g0s6c-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/2019-2021-Three-Year-Energy-Efficiency-Plan-April-2018.pdf

Appendices

https://3jy14ha9u771r7qzn35g0s6c-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/Appendices-to-2019-2021-Energy-Efficiency-Plan-April-30-2018-No-App-G-Potential.pdf

September Draft

https://3jy14ha9u771r7qzn35g0s6c-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/2019-2021-Three-Year-Energy-Efficiency-Plan-April-2018.pdf

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Feedback

Cape Light Compact's online survey www.capelightcompact.org/eeplan

Mail or Email

Maggie Downey, Cape Light Compact,
261 Whites Path, Unit 4, South Yarmouth, MA 02664
or mdowney@capelightcompact.org

Cape Light Compact

Working Together Toward A Smarter Energy Future

Proposed 2019-2021 Cape & Vineyard Electrification Demonstration Offering

Proposed Cape & Vineyard Electrification Demonstration

- Objectives
  - 700 total non-gas heated participants, tiered services by income
    - Additional incentives for low-income (up to 60%), moderate income (61-80%) and extended moderate income (81-120%) customers
  - Convert oil, propane, electric resistance heat to cold climate heat pumps
  - Install PV systems to support electrification of heating system, reduce GHG emissions, offset increased electricity usage
  - Install battery storage for demand response and resiliency

Proposed Cape & Vineyard Electrification Demonstration

- 2018 Amendments to Green Communities Act: Amends Energy Efficiency Plan Requirements
  - Explicitly allows for cost-effective energy storage and other active demand management technologies
  - Adds cost-effective strategic electrification
  - Explicitly authorizes renewable funding through EE funds
  - Changes cost-effectiveness requirement from program level to sector level (increases flexibility)
  - Meetings with Department of Energy Resources and the Attorney General indicate Program Administrators'2019-2021 Energy Efficiency Plans should comply with amendments

Why Cape Cod and Martha's Vineyard?

- Area is constrained by demand with seasonal spikes
  - DPU Mashpee Substation Order identifies Cape Cod and Martha's Vineyard as distribution-constrained areas
- Some of the highest incidence of electric heat
  - Winter and summer peaks may increase as newly retired homeowners make their year-round homes here and climate change causes more extreme temperatures
- Lack of natural gas options in areas
  - Moratorium limits options on Lower & Outer Cape
  - No gas on Martha's Vineyard
- Highly-educated and energy-savvy population
  - Early adopters may be needed to test the concepts
- Vulnerable areas for infrastructure
  - Storm-related outages and peak demand are concerns for municipalities as well as residents and businesses

Efforts Thus Far

- ✓ Battery storage research
- ✓ Battery storage cost-effectiveness assessment
- ✓ PV/SMART research
- ✓ PV cost-effectiveness assessment (in progress)
- ✓ Heat Pump Retrofit Analysis and cost-effectiveness assessment
- ✓ Initial conversations with DOER and Clean Energy Center

Proposed Strategic Electrification Budget

Proposed Budgets, 2019-2021	Heat Pumps	PV	Storage	Total
Cape Light Compact Energy Efficiency Funding	$5.8M	$2M	$7M	$14.9M
MassCEC	$1.3	$2.2M	n/a	$3.5M
DOER	$2.0M	n/a	n/a	$2.0M
Total	$9.1M	$4.2M	$7M	$20.3M

	Participation Totals by Year
2019	60 (may move to 2020)
2020	240
2021	400

Residential Income Verification Offerings

Household Members	60% State Median Income (SMI)	61 – 80% SMI	81 – 120% SMI
1	Up to $35,510	$35,511 - $47,550	$47,551 - $68,760
2	Up to $46,437	$46,438 - $61,915	$61,916 - $89,916
3	Up to $57,363	$57,364 - $76,484	$76,485 - $111,074
4	Up to $68,289	$68,290 - $91,052	$91,053 - $132,230

Schedule of 3-Year Plan Outreach Meetings				
Town	**Date**	**Time**	**Location**	**Notes**
Eastham Board of Selectmen	9/17/2018	5pm	Eastham Town Hall	
Chilmark Board of Selectmen	9/18/2018	5pm	Chilmark Town Hall	
Chatham Board of Selectmen	9/24/2018	6pm	Chatham Town Hall Annex	
West Tisbury Board of Selectmen	9/26/2018	4:30pm	W. Tisbury Town Hall	
Harwich Board of Selectmen	10/1/2018	6:30pm	Harwich Town Hall	
Yarmouth Board of Selectmen	10/2/2018	6pm	Yarmouth Town Hall	
Sandwich Board of Selectmen	10/4/2018	7pm	Sandwich Town Hall	
Truro Board of Selectmen	10/9/2018	5pm	Truro Town Hall	
Wellfleet Board of Selectmen	10/9/2018	7pm	Wellfleet Town Hall	
Public Information Session	10/18/2018	6:30-7:30pm	Eastham Public Library	
Brewster Board of Selectmen	10/22/2018	7pm	Brewster Town Hall	
Edgartown Board of Selectmen	10/22/2018	4pm	Edgartown Town Hall	
Public Information Session	10/23/2018	7-8pm	Mashpee Public Library	
Public Information Session	10/25/2018	4-5pm	Oak Bluffs Library	
Falmouth Board of Selectmen	10/29/2018	7:30pm	Falmouth Town Hall	
Mashpee Board of Selectmen	11/5/2018	6:30pm	Mashpee Town Hall	
Dennis Board of Selectmen	11/6/2018	5:30pm	Dennis Town Hall	
Orleans Board of Selectmen	11/7/2018	6:30pm	Orleans Town Hall	
Bourne Board of Selectmen	11/13/2018	7pm	Bourne Memorial Community Center	
Barnstable Town Council	11/15/2018	7pm	Barnstable Town Hall	
Provincetown Board of Selectmen	11/26/2018	6pm	Provincetown Town Hall	
Aquinnah Board of Selectmen	11/20/2018	5pm	Aquinnah Town Hall	
Oak Bluffs Board of Selectmen	11/27/2018	4:30pm	Oak Bluffs Library Meeting Room	
Tisbury Board of Selectmen	11/27/2018	5:45pm	Tisbury Town Hall	
Barnstable Ch. 18	10/18/2018	9am	Dan Schell/Barnstable Town Hall	
Radio Interview with CCB-Media	10/22/2018	10am	Maggie Downey/Over-the-telephone	

Synapse Energy Economics, Inc.

Memorandum

TO: MAGGIE DOWNEY AND AUSTIN BRANDT, CAPE LIGHT COMPACT

FROM: ERIN MALONE AND DANIELLE GOLDBERG

DATE: OCTOBER 23, 2018

RE: SOLAR COST-EFFECTIVENESS ANALYSIS FOR 2019–2021 PLAN

Contents

1. Executive Summary

In preparation for the 2019–2021 Three-Year Energy Efficiency Plan, the Cape Light Compact (CLC or Compact) is investigating the cost-effective use of energy efficiency funding to better optimize customer energy use. Synapse Energy Economics, Inc. (Synapse) conducted a benefit-cost analysis of offering incentives for distributed solar photovoltaic (PV) to residential, income eligible, and small commercial customers on Cape Cod and Martha's Vineyard. Figure 1 summarizes the total costs and benefits of residential solar from our analysis. Every dollar spent on solar results in $1.91 in benefits, indicating it is cost-effective to incent and install PV systems on Cape Cod and Martha's Vineyard. Table 1 summarizes key cost-effectiveness results and analysis outputs.

Figure 1. Solar benefit-cost results

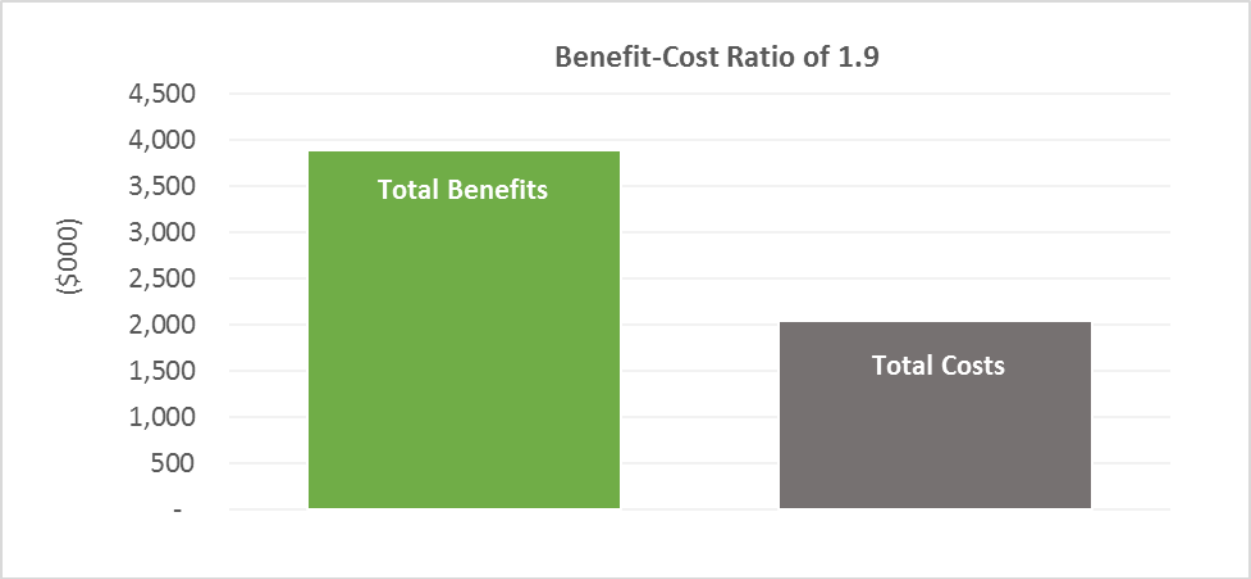


Table 1. Residential cost-effectiveness results

Results	Units	Value
Cost-Effectiveness		
Total Costs	*$000*	2,042
Total Benefits	*$000*	3,895
Net Benefits	*$000*	1,853
BCR	***ratio***	**1.91**
PV Generation		
Annual Energy	*MWh*	414
Lifetime Energy	*MWh*	10,353
Summer Capacity	*kW*	320
Costs		
Program Costs	*$000*	878
Cost of saved Summer Capacity	*$/kW*	2,747

2. Introduction

In preparation for the 2019–2021 Three-Year Energy Efficiency Plan, the Cape Light Compact is investigating the cost-effective use of energy efficiency funding to better optimize customer energy use. Optimization strategies would build off the Compact's existing successful energy efficiency programs. Those under consideration include technologies and services related to demand response, energy storage, and renewable energy generation.

The Compact engaged Synapse to conduct a benefit-cost analysis of offering incentives for distributed solar PV to residential, income eligible, and small commercial customers on Cape Cod and Martha's Vineyard. This memo summarizes Synapse's research, methodology, and results regarding the cost-effective analysis of distributed PV.

3. Background and Purpose

Distributed PV can offer the utility system, customers, and society a host of benefits, ranging from avoided energy and capacity costs to reduced environmental impacts. A cost-benefit analysis in which all relevant costs and benefits are quantified and analyzed is essential to determine the value of solar to the utility system and all electricity customers in Massachusetts.

Unlike energy efficiency resources that use less energy than baseline products, distributed PV generates electricity and thereby reduces the amount of utility scale generation required to serve load. From a utility system-perspective, distributed PV can be viewed as a reduction in load requirements.

The Cape Cod and Martha's Vineyard region has areas with distribution infrastructure constraints and customers in these areas are installing distributed PV at increasing rates. Additional renewable generation can provide benefits to all customers by aligning customer-sited sources of energy with peak load hours.

On August 9, 2018, Governor Baker signed into law An Act to Advance Clean Energy (AACE). AACE provides that an energy efficiency plan may include "programs that result in customers switching to renewable energy sources or other clean energy technologies."[1]

Consistent with the AACE, the Compact would like to offer incentives for distributed PV to an initial set of its residential, income eligible, and small commercial customers. The Compact is in the beginning stages of investigating the implementation of such a program, and program design details are still in development. We suspect the results of this cost-effectiveness analysis will further inform the Compact's program implementation decisions. Ultimately the Compact will propose for the Department of Public Utilities' (DPU or Department) approval a cost-effective distributed PV demonstration offering

[1] An Act to Advance Clean Energy, Bill H.4857, §4. Available at: https://malegislature.gov/Bills/190/H4857.

as part of its 2019–2021 Plan to be filed with the DPU in October 2018. This analysis is intended to support the cost-effectiveness of such an offering.

4. Total Resource Cost test

Synapse developed an Excel model to screen distributed PV for cost-effectiveness using the Massachusetts Total Resource Cost (TRC) test used to screen energy efficiency programs. Table 2 lists the benefits and costs that were considered and analyzed for this study, although not all costs or benefits are included in the results, as explained throughout this memo.

Table 2. Distributed solar Total Resource Cost test costs and benefits

Utility System Impacts	
Costs	PV system installation incentives Program administration Marketing Technical assistance Evaluation System integration System interconnection Loan interest
Benefits	Avoided energy Avoided RPS compliance Energy price suppression (DRIPE) Electric cross price suppression (DRIPE) Electric GWSA compliance Avoided capacity Capacity price suppression (DRIPE) Reliability Avoided transmission Avoided distribution Avoided T&D line losses Non-energy benefits
Participant Impacts	
Costs	PV system installation Application fee Annual maintenance
Cost Reductions	SMART program Federal tax credit State income tax credit
Benefits	Non-energy benefits

AACE stipulates that cost-effectiveness be determined at the customer sector level.[2] The Compact anticipates its solar offering will be contained within its programs for the residential, income eligible, and commercial and industrial (C&I) customer sectors. For the sake of this analysis, we have isolated all the costs and benefits from solar to determine cost-effectiveness on a measure-level basis.

5. Program Design

Overview

The Compact is still investigating and developing a solar program. Our assumptions are based on the best information available at the time we drafted the analysis. Many of the numbers and assumptions are subject to change as the Compact further details its offering.

Our analysis only focused on 2019 installation for the sake of limiting its scope. We expect the results can be extrapolated to 2020 and 2021 with minor modifications, such as adjusting PV system incentives and avoided costs.

We assume solar installers will continue to serve customers and install the solar panels. The Compact will simply provide an incentive and/or the HEAT Loan to customers to overcome the upfront costs of installing solar.

Target Customers

The Compact is investigating offering solar to residential, income eligible, and small commercial customers. This analysis focuses on residential customers only. The Excel model accompanying this memo can be adjusted to reflect results for income eligible and small commercial customers.[3]

We assume the Compact will serve 45 residential customers in 2019, which includes moderate-income, extended moderate-income, and market rate customers. We understand the Compact intends to ramp enrollment over the course of the three-year term. Table 3 summarizes planned participants by each residential customer group.

Table 3. Planned residential participants

Residential Customer Groups	2019	2020	2021	2019-2020
Moderate-Income	15	60	100	175
Extended Moderate-Income	15	60	100	175
Market Rate	15	60	100	175
Total Residential	**45**	**180**	**300**	**525**
Low-Income	15	60	100	175
Total Residential and LI Customers	**60**	**240**	**400**	**700**

[2] An Act to Advance Clean Energy, Bill H.4857, §6. Available at: https://malegislature.gov/Bills/190/H4857.

[3] Adjusting the model for income eligible customers produces similar cost-effectiveness results as residential customers.

Distributed PV system

The average PV system size in our analysis is 7.4 kilowatts (kW) DC. We derived this value using Massachusetts Clean Energy Center solar data for residential PV system installed on Cape Cod in 2017.[4] We assume the PV system produces 7.1 kW AC (96 percent DC to AC derating), has a 14 percent annual capacity factor, and generates about 9,200 kilowatt hours (kWh) per year for 25 years.

6. Cost Assumptions

Distributed PV system participant costs

Using the same Massachusetts Clean Energy Center solar data used for the PV system size, we calculated the weighted average cost per kW of installed PV, which is $4.14 per kW DC.[5] For our average residential 7.4 kW PV system, this results in total purchase and installation costs of about $31,000 per system.

We assume the customer's annual maintenance cost are $150 per year.[6] This assumption is meant to approximate maintenance costs over the life of the PV system. A customer is unlikely to incur $150 in expenses every year, because actual maintenance costs will vary annually, and may be zero for many years.

We assume the PV system is small enough to not require additional fees, such as for interconnection or for applying to the net metering cap.

Distributed PV system utility costs

Eversource could incur costs as greater volumes of solar PV operate on its electric distribution system. Specifically, Eversource could experience interconnection costs (customer-specific costs for interconnecting a solar facility to the distribution grid) and integration costs (costs for upgrading the distribution grid to account for the generation of the distributed solar facility). We researched industry average values to incorporate into our benefit-cost analysis but could not identify relevant sources. As a placeholder, and without better information available at this time, we guessed $1,000 per PV system for system interconnection and $1,000 per PV system for system integration costs.

[4] Massachusetts Clean Energy Center, Production Track System Data and Reports, filtered to residential facilities in the Compact's cities for 2017 as of August 31, 2018. Available at: http://www.masscec.com/data-and-reports

[5] The 2017 weighted average cost to install PV was $3.99, which we adjusted to 2019 dollars.

[6] Home Advisory, "How Much Does it Cost to Clean and Maintain Solar Panels?" Available at: https://www.homeadvisor.com/cost/cleaning-services/solar-panel-maintenance/

TRC costs

Market rate and extended moderate-income customers are likely to qualify for state and federal tax credits for solar installations (discussed below). We consider their upfront costs to be the cost of the PV system purchase and installation less the state and federal tax credits.

Low-income and moderate-income customers are less likely to qualify for state and federal tax credits. Therefore, their TRC costs are the cost of the PV system purchase and installation.

Table 4 summarizes our TRC assumptions for each residential customer group. These costs reflect the cost for the PV system only. The customer's annual maintenance costs and the utility's system costs are also incorporated into the benefit-cost analysis.

Table 4. Planned TRC costs for residential customers

Residential Customer Groups	PV Cost	Federal Tax Credit	State Tax Credit	TRC Cost
Low-Income	$30,760	$0	$0	$30,760
Moderate-Income	$30,760	$0	$0	$30,760
Extended Moderate-Income	$30,760	$9,228	$1,000	$20,532
Market Rate	$30,760	$9,228	$1,000	$20,532

Incentives

For market rate and extended moderate-income customers, the Compact intends to offer zero interest financing through the HEAT Loan used for energy efficiency measures. In this way the customer's costs are reduced, although this does not impact cost-effectiveness using the TRC test. For a customer who borrows the HEAT Loan maximum of $25,000 at a six percent interest rate for seven years, interest over the life of the loan is about $6,000.

For extended moderate-income customers, the Compact intends to offer a $5,000 incentive in addition to the HEAT Loan. For low-income customers, the Compact intends to offer a 100 percent incentive for the PV system purchase and installation. Table 5 summarizes incentives for each residential customer group.

Table 5. Planned incentive costs for residential customers

Residential Customer Groups	Incentive Cost	HEAT Loan
Low-Income	$30,760	n/a
Moderate-Income	$5,000	Yes
Extended Moderate-Income	$0	Yes
Market Rate	$0	Yes

Program costs

The Compact's cost to implement a solar program include customer incentives as discussed above, program administration and implementation, marketing, technical assistance, and evaluation. The

administration, marketing, and technical assistance costs we assume will be roughly consistent with the Compact's cost for implementing its storage program. Evaluation costs are equal to administration costs.

In the model, all program-level costs can be adjusted to reflect sector-specific allocations of the total program costs. We assume 75 percent of the costs will be associated with the residential offering.

7. Benefit Assumptions

Solar provides benefits from avoiding energy, capacity, transmission, and distribution costs. Energy benefits include avoided energy costs, avoided Renewable Portfolio Standard (RPS) compliance costs, energy price suppression effects (DRIPE), cross DRIPE,[7] and avoided costs of complying with the Global Warming Solutions Act (GWSA).[8] Capacity benefits include the avoided capacity costs, capacity DRIPE, and improved reliability. Avoided energy costs include avoided line losses.

For the energy, capacity, and transmission benefits, we relied on the avoided cost values provided in AESC 2018.[9] While AESC estimates avoided costs from energy efficiency resources, we assume the values are within a reasonable range for the value of solar because we are assuming projects that primarily act as load reducers.

Avoided distribution costs are consistent with the Compact's 2016-2018 Planned avoided distribution costs, provided by Eversource. If Eversource can work with the Compact to reliably target those areas with distribution constraints, the average avoided distribution costs used in our model are too low and understate the benefits.

We assume participants and the utility system experience additional non-energy benefits from greater solar installations. While such values are likely non-zero, to be conservative we have not entered non-energy benefits into our analysis.

The Compact provides competitive supply rates to customers on Cape Cod and Martha's Vineyard. The Compact's wholesale supplier relies on average customer load profiles published by Eversource to settle load. The Compact's power supply contracts could be impacted by changes in customer load profiles from greater solar penetration. We suspect customers in the Compact's service territory would need to

[7] Cross DRIPE measures the impact that a reduction in one commodity (i.e., electricity or natural gas) has on a different commodity. Electric-to-gas cross DRIPE measures the benefits to gas consumers from a reduction in electricity demand. Electric power accounts for 1/3 of the region's gas demand, so reducing electricity demand should reduce gas prices. See Synapse Energy Economics, "Avoided Energy Supply Costs in New England," June 1, 2018, at 185. Available at: http://www.synapse-energy.com/project/avoided-energy-supply-costs-new-england

[8] The user also has the option to include avoided non-embedded environmental costs, but such benefits are not included in our analysis. DRIPE stands for demand reduction induced price effects.

[9] Synapse Energy Economics, "Avoided Energy Supply Costs in New England," June 1, 2018. Available at: http://www.synapse-energy.com/project/avoided-energy-supply-costs-new-england

install significant levels of solar before the average load profile would be materially impacted. Therefore, we did not consider this benefit as part of our analysis.

8. PV System Incentives

Distributed PV is an expensive voluntary endeavor for an individual customer to undertake. Without incentives to overcome market barriers, customers would face significant financial hurdles to installing solar PV systems. As a result, there are multiple incentives available to customers to motivate solar installations. In this section, we discuss each incentive policy and explain how we treated the policy's impacts within the cost-effectiveness analysis.

Treatment of PV system incentives in analysis

We struggled with how best to treat incentive costs in our cost-effectiveness analysis. For efficiency measures, the total resource cost of a measure represents the incremental cost of an efficient technology relative to a baseline, non-efficient technology. For example, if a baseline furnace costs $10,000 and a more efficient furnace costs $12,000, then the incremental cost is $2,000. The incremental $2,000 is the total resource cost in the TRC test. A Program Administrator such as the Compact pays a portion of the incremental cost as an incentive to the customer to install the more efficient technology, and the customer pays the remaining balance. Both the Program Administrator and customer portions of the incremental costs are included in the Massachusetts Total Resource Cost test.

For distributed PV, there is no baseline technology to compare the cost of the distributed PV. With a theoretical application of the TRC test, the full cost of installation and maintenance of distributed PV are included in the TRC test. Incentives in the form of tax credits or other rebates motivate participation by reducing the customer's costs, but do not reduce the cost to install the distributed PV.

However, Massachusetts' policy indicates an alternative approach to customer incentives. The DPU was previously asked by the River Run Condominium Trust to rule that "in calculating the cost-effectiveness of a renewable energy project, distribution companies should calculate the net cost of project equipment by deducting the amount of the tax credit, rather than using its 100 percent initial cost."[10] The DPU determined:

> Although tax credits represent transfer payments from taxpayers to energy efficiency programs, the resulting liability constitutes a societal cost outside the scope of the Total Resource Cost Test. Because societal costs and benefits are excluded from the Total Resource Test, it is both proper and consistent to exclude the societal consequences of tax credits as well. Therefore, the Department finds that River Run's proposal to interpret "net cost of energy efficient equipment" from Section 3.2.3 of the Guidelines

[10] Massachusetts Department of Public Utilities, "Petition of River Run Condominium Trust for ruling on whether tax credits may be included in determining the net cost of energy efficient equipment under the guidelines for Energy Efficiency Programs, as approved in D.T.E. 98-100 and established by G.L. c. 25, § 19," July 9, 2008, D.P.U. 07-49, at 2.

as incorporating tax credits in benefit-cost analyses is consistent with the Department's interpretation and application of the Total Resource Cost Test.[11]

The National Standard Practice Manual (NSPM) provides guidance on this issue.[12] One of the NSPM's six universal principles states that "a jurisdiction's primary cost-effectiveness test should account for its energy and other applicable policy goals and objectives. These goals and objectives may be articulated in legislation, commission orders, regulations, advisory board decisions, guidelines, etc., and are often dynamic and evolving."[13]

Based on Massachusetts precedent and the NSPM, we have treated tax credits as a reduction in costs to the customer. However, the model user has the option to adjust whether any PV system incentive reduces costs.

Net metering

Policy

In Massachusetts, customers who generate electricity qualify for net metering. Net metering allows customers to offset their electric usage with energy they generate. Meters can track whether electricity is drawing from the grid or if electricity is exporting to the grid. If a customer imports more electricity than they export, the difference will appear in the form of a reduced electric bill. If a customer exports more electricity than they import, they will earn net metering credits. Facilities can generate net metering credits for 25 years from the date of interconnection.[14]

Along with most other renewable technologies, solar facilities must apply to net meter under a capacity cap. The cap stipulates the amount of resources that can net meter at a given time within each utility, based on the sum of their capacities. To receive net metering credits, a facility must be approved under the cap. Facilities that are exempt from the cap are those with a nameplate capacity less than 10 kW on a single-phase circuit or 25 kW on a three-phase circuit. Cap exempt facilities can net meter even if the relevant cap is full. Utilities implement net metering caps on private and public generation facilities. The caps are a percentage of the highest historical peak load, with the private cap set at 7 percent and the

[11] Massachusetts Department of Public Utilities, "Petition of River Run Condominium Trust for ruling on whether tax credits may be included in determining the net cost of energy efficient equipment under the guidelines for Energy Efficiency Programs, as approved in D.T.E. 98-100 and established by G.L. c. 25, § 19," July 9, 2008, D.P.U. 07-49, at 11-12.

[12] The NSPM is a publication of the National Efficiency Screening Project (NESP), a group of organizations and individuals working to update and improve the way that utility customer-funded electricity and natural gas energy efficiency resources are assessed for cost-effectiveness and compared to other resource investments. The NSPM provides a comprehensive framework for assessing the cost-effectiveness of energy efficiency resources. It incorporates lessons learned over the past 20 years, responds to current needs, and addresses the relevant policies and goals of each jurisdiction undertaking efficiency investments.

[13] National Efficiency Screening Project, "National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources," May 18, 2017, at viii, available at: https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf

[14] Mass.Gov, "Net metering guide." Available at: https://www.mass.gov/guides/net-metering-guide

public cap set at 8 percent. Eversource (NSTAR) has a private cap of 350 megawatts (MW) and a public cap of 400 MW.[15]

Solar net metering credits are unique to other renewable distributed sources because of regulations that went into effect in 2017. For renewable resources other than solar and for solar projects that received a cap allocation before January 8, 2017, customers are compensated for 100 percent of the excess energy they produce. However, for solar net metering facilities that received a cap allocation after January 8, 2017, customers are only compensated for 60 percent of the energy produced beyond their electric bill. The distribution company calculates credits by multiplying 60 percent of the excess energy produced by the local basic service charge, the distribution charge, the transmission charge, and the transition charge, all on a per unit of energy basis (kWh).[16]

Modeling assumptions

In our cost-effectiveness analysis, we were careful to avoid double counting avoided energy costs and reduction in customer load. We assume a customer's reduction in load from solar generation is akin to reductions in load from installing energy efficiency measures. For efficiency, the Program Administrators use adjusted wholesale prices to calculate avoided energy costs. The participant's bill reductions are not accounted for, because doing so would double count the avoided energy costs. Similarly, we assume the energy benefits from solar account for the customer's net bill reduction.

For excess generation, we assume PV systems are sized roughly equal to or less than a customer's load on an annual basis. While this may not be true for every month, especially in the summer when a customer generates more solar energy, we assume it nets out over the course of a year.

Therefore, we do not include any impacts from net metering in our cost-effectiveness analysis.

We do, however, include calculations to estimate net metering credits in our modeling. This allows the user to see the extent of the credits, and the calculations are required to determine the SMART program incentives as discussed below.

SMART program

Policy

Historically, Massachusetts incented customers to install solar power through the Solar Carve-Out and Solar Carve-Out II programs. Customers enrolled in this program earn Solar Renewable Energy Certificates (SRECs) for each megawatt hour (MWh) produced from solar and sell them in a competitive

[15] Mass.Gov, "Net metering guide." Available at: https://www.mass.gov/guides/net-metering-guide

[16] Department of Public Utilities, 220 CMR 18, "Net Metering." Available at: https://www.mass.gov/files/220_cmr_18.00_final_12-1-17_1.pdf

SREC market. While this market will continue for existing solar producers, we assume enrollment in the SREC program is no longer an option for new solar installations.[17]

Instead, when the Compact's solar program begins implementation, we assume new Massachusetts solar customers will receive incentives through the SMART program.[18] Under this program, customers are incented through a fixed compensation rate per kWh of solar produced. A portion of the rate is based on the value of energy (as calculated by formula), and a portion is based on the incentive rates in the SMART program. Customers earn the compensation rate for a set period, typically 10 or 20 years, depending on the customer type and PV system.

Customer enrollment in the SMART program is managed in capacity blocks, each consisting of 200 MW of statewide solar capacity. There are eight blocks in total and 1,600 MW for the entire SMART program across blocks and utilities. Eversource's NSTAR territory has 91.5 MW of solar capacity in each of the eight blocks.[19]

The SMART compensation rate varies depending on several factors. The compensation rate varies depending on the customer type and size of the PV system. As more customers enroll in the program, the compensation rate decreases. Customers in the first block will have higher compensation rates than customers in the second block, and so on. Finally, each utility has distinct compensation rates for their service territory.

Table 6 shows Eversource's SMART compensation rates for the first capacity block by customer class and PV system size.[20] With the exception of income eligible customers, compensation rates decrease as system size increases.

As an example, a residential customer participating in the first block with an 8 kW PV system in Eversource's territory would be compensated a total of $0.34 per kWh of solar generated. However, the $0.34 per kWh includes the value of energy, which would be experienced as bill reductions, and the remainder would be a separate incentive provided through the SMART program.

[17] EnergySage, "Solar Massachusetts Renewable Target (SMART) Massachusetts' SREC II replacement program." Available at: https://news.energysage.com/solar-massachusetts-renewable-target-smart-massachusetts-srec-replacement-program/

[18] The DPU approved the SMART tariff with modifications on September 26, 2018.

[19] DOER, "Solar Massachusetts Renewable Target (SMART) Program Summary," April 26, 2018, slide 9. Available at: https://www.mass.gov/files/documents/2018/04/26/SMART%20Program%20Overview%20042618.pdf

[20] EnergySage, "Solar Massachusetts Renewable Target (SMART) Massachusetts' SREC II replacement program." Available at: https://news.energysage.com/solar-massachusetts-renewable-target-smart-massachusetts-srec-replacement-program/

Table 6. Eversource (NSTAR) SMART Incentives, Block 1

PV System Size	Compensation Term Length	Compensation Rate ($/kWh)
Residential		
Less than or equal to 25 kW	10-year	0.34
Income Eligible		
Less than or equal to 25 kW (low income)	10-year	0.39
Commercial and Industrial		
25 kW – 250 kW	20-year	0.26
250 kW – 500 kW	20-year	0.21
500 kW – 1,000 kW	20-year	0.19
1,000 kW – 5,000 kW	20-year	0.17

In addition to the solar incentive values above, customers can earn additional incentives through compensation adders that reward configurations deemed more valuable. One adder focuses on storage. Solar systems paired with batteries receive an additional benefit per kWh of solar generated. The adder varies primarily based on the ratio of solar capacity to battery storage.[21] Another adder focuses on the customer served. Solar panels providing energy to income eligible customers or to community or municipal buildings may be eligible for adders. Table 7 summarizes the available adders for the different customer types and system configurations.[22]

Like the solar capacity blocks, the adders have capacity tranches that fill as more customers enroll in the program. Each adder will decrease by four percent to the next tranche. The first tranche is 80 MW statewide per adder; the remaining tranches have yet to be quantified.[23]

[21] DOER, "Guideline on Energy Storage". Available at: https://www.mass.gov/files/documents/2018/07/13/Energy%20Storage%20Guideline%20DRAFT%20071318.pdf

[22] DOER, "Guidance on Capacity Blocks, Base Compensation Rates, and Compensation Rate Adders." January 11, 2018.

[23] DOER, "Solar Massachusetts Renewable Target (SMART) Program Summary." April 26, 2018. Available at: http://masmartsolar.com/_/documents/SMART-Program-Overview.pdf

Table 7. SMART Tariff Incentive Adders, Tranche 1

Configuration	Adder ($/kWh)
Energy storage	
Energy storage adder	0.025-0.076[24]
Off-taker based	
Community shared solar tariff generation unit	0.05
Low income property solar tariff generation unit	0.03
Low income community shared solar tariff generation unit	0.06
Public entity solar tariff generation unit	0.02
Solar tracking	
Solar tracking adder	0.01
Location based	
Building mounted solar tariff generation unit	0.02
Floating solar tariff generation unit	0.03
Solar tariff generation unit on a brownfield	0.03
Solar tariff generation unit on an eligible landfill	0.04
Canopy solar tariff generation unit	0.06
Agricultural solar tariff generation unit	0.06

Modeling assumptions

We only considered the SMART tariff and did not consider SRECs because they are no longer available to new solar customers.

We assume SMART credits will not reduce the cost to install solar PV because there is no Department precedent to indicate otherwise. However, our cost-effectiveness model allows the user to include SMART credits as a cost reduction.

The following assumptions are applicable if the user chooses to incorporate SMART credits into the benefit-cost analysis. The net present value of the future stream of SMART incentives offsets up-front PV system costs. We multiplied the annual PV generation by the compensation rate less the net metering rate. We used Eversource's residential block one compensation rate of $0.34 per kWh.[25] The value of energy rate is from DOER's SMART tool.[26] The model user can include assumptions for a battery storage adder as desired.

[24] EnergySage, "Solar Massachusetts Renewable Target (SMART) Massachusetts' SREC II replacement program." Available at: https://news.energysage.com/solar-massachusetts-renewable-target-smart-massachusetts-srec-replacement-program/

[25] It is possible that by the time the Compact implements a solar program, customers could be enrolling in the second block.

[26] DOER, "SMART BTM Value of Energy Workbook," Eversource, South Shore CC Vineyard, R-1. Available at: https://www.mass.gov/doc/smart-btm-value-of-energy-calculator-0

Federal tax credits

Policy

The Bipartisan Budget Act of 2018 extended federal tax credits for solar power through 2021.[27] The federal government provides a solar tax credit to residential and commercial customers who purchase solar panels. The solar credit, also referred to as the investment tax credit (ITC), deducts a percentage of the total cost of a solar installation from the customer's federal taxes with no cap. The credit may be carried over to subsequent filings if the credit exceeds the federal tax.

The current credit is 30 percent of the upfront PV system purchase and installation costs, however this decreases after 2019. Table 8 lists the available credit by year and sector. Customers can claim the tax credit as soon as system construction is complete.[28]

Table 8. Federal tax credits by year

Year	Sector	Solar credit
2019	Residential and commercial	30%
2020	Residential and commercial	26%
2021	Residential and commercial	22%
2022+	Commercial	10%

Modeling assumptions

We calculated 30 percent of the upfront PV system purchase and installation costs (not including additional fees or annual maintenance costs) and subtracted that value from the upfront PV system purchase and installation costs. Our analysis focuses on 2019, so we did not model the decrease in the credit for each year. The model user can adjust the start year of the analysis and the credit will update accordingly.

State tax credits: residential renewable energy income tax credit

Policy

A residential renewable energy income tax credit is available to any owner or occupant of a residential property. Massachusetts will provide a 15 percent tax credit up to $1,000 for the net expenditure of a renewable energy system. The net expenditure includes the installation costs, but not the costs recovered through federal tax credits and rebates/grants from the U.S. Department of Housing and

[27] Energy.Gov, "Residential Renewable Energy Tax Credit." Available at: https://www.energy.gov/savings/residential-renewable-energy-tax-credit

[28] EnergySage, "Solar tax credit – everything you need to know about the federal ITC for 2018." Available at: https://news.energysage.com/congress-extends-the-solar-tax-credit/

Urban development. The credit is subtracted from the resident's state income tax and may be carried over to subsequent filings if the credit exceeds the income tax.

Technologies that qualify for this credit are photovoltaics, solar water and space heating, and wind energy systems. The technology should be expected to operate for at least five years.[29]

Modeling assumptions

We assume that distributed PV qualifies for the income tax credit. We calculated 15 percent of the net costs up to a maximum of $1,000 and reduced the cost to install PV by that amount. The net costs remove the federal tax credit, but we do not account for any additional rebates or grants in our analysis.

State tax credits: sales and property tax incentives

Policy

Additional tax incentives exist for Massachusetts residents looking to install solar. Equipment directly related to solar is fully exempt from the Massachusetts sales tax. The exemption qualifies that the solar installation is the primary or auxiliary heat or energy source at the customer's main residence.[30] Similarly, the owner does not have to pay property taxes on the installation for 20 years. This can apply to customers in the residential, commercial, industrial, and agricultural sector. Once again, the system must be used as the primary or auxiliary heat or energy source on the property.[31]

Modeling assumptions

We assume the costs used in our analysis, as explained above, do not include sales tax.

We do not account for property taxes in our analysis.

Solar finance loan

Policy

Massachusetts offers fixed interest loans for residential customers who install solar panels. Customers can choose from a list of participating banks or credit unions whose terms and conditions may vary slightly. The loans range between $3,000 and $35,000, with lenders maintaining the option to go as high

[29] DSIRE, NC Clean Energy Technology Center, "Residential Renewable Energy Income Tax Credit." Available at: http://programs.dsireusa.org/system/program/detail/144

[30] Mass.Gov, "Sales and Use Tax." Available at: https://www.mass.gov/guides/sales-and-use-tax

[31] DSIRE, NC Clean Energy Technology Center, "Renewable Energy Property Tax Exemption." Available at: http://programs.dsireusa.org/system/program/detail/146

as $60,000, and feature 10-year repayment plans at low interest rates. For customers who do not qualify as income eligible, the maximum allowable interest rate is 7.75 percent.[32]

Additional benefits exist for income eligible customers. Customers who qualify as income eligible have a maximum allowable interest rate of 6.25 percent, or 1.5 percent below the market rate charged by the lender. Low- and moderate-income customers may also qualify for income-based loan support. Income eligible customers (defined as below 80 percent of state median income) are eligible for 30 percent loan principal reduction, and moderate-income customers (defined as below 120 percent of state median income) are eligible for 10 percent loan principal reduction.[33]

Modeling assumptions

The Compact proposes to enroll solar customers in the HEAT Loan, which has different financial factors than the solar finance loan, therefore we did not consider the solar finance loan directly. We included the HEAT Loan interest costs as a cost to the Compact in our cost-effectiveness analysis.

Summary

Table 9 summarizes how we approached each PV system incentive in the cost-effectiveness analysis and our rationale for that decision.

Table 9. PV system incentive treatment in cost-effectiveness analysis

PV system incentive	Modeling assumption	Rationale
Net Metering	Not included in analysis	Not double counting energy benefits
SMART Program	Not included in analysis	No MA policy indicating otherwise
Federal Tax Credit	Reduces costs	Consistent with MA policy
State Income Tax Credit	Reduces costs	Consistent with MA policy
State Sales Tax Credit	Not included in analysis	Assumed not included in installation costs
States Property Tax Credit	Not included in analysis	Not considered in analysis
Solar Finance Loan	Included as a cost	Consistent with HEAT Loan

Figure 2 illustrates how each PV system incentive impacts the benefit-cost ratio. All scenarios are cost-effective with a benefit-cost ratio greater than 1.0. The modeled scenarios are as follows.

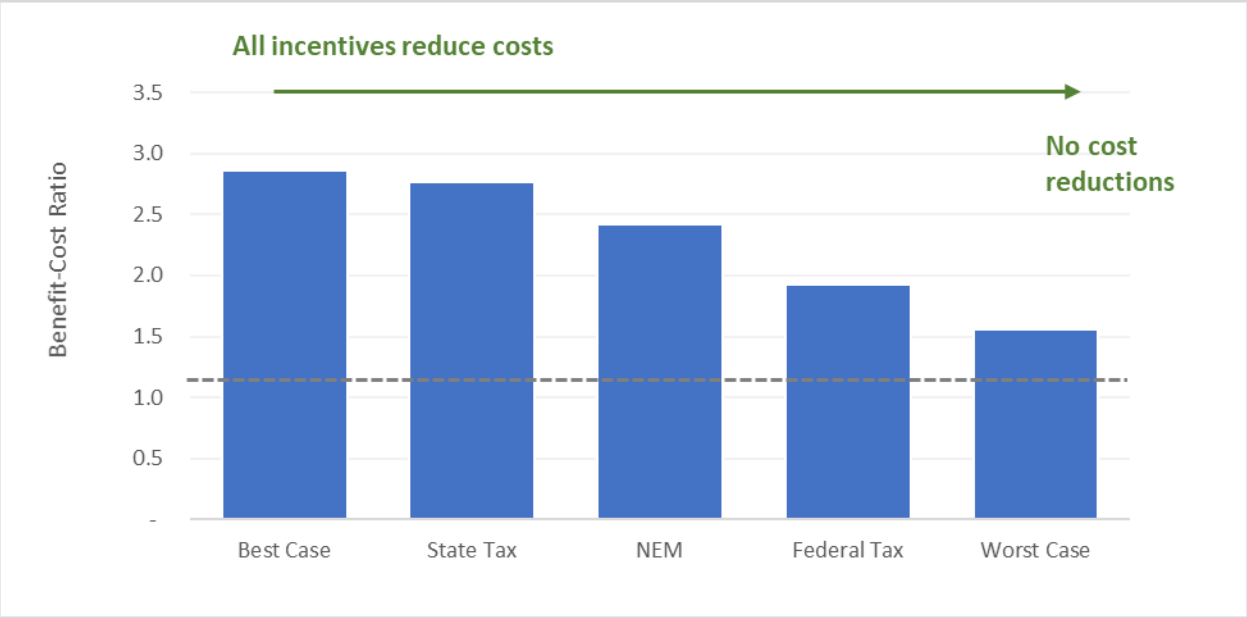
- **Best Case**. All incentives (SMART program, federal tax credit, net metering, and state income tax credit) reduce system costs.

[32] Mass Solar Loan, "For Consumers and Residents." Available at: http://www.masssolarloan.com/

[33] Mass Solar Loan, "Looking for an affordable clean energy option?" Available at: http://files.masscec.com/solar-loan/MassSolarLoanFlyer.pdf

- **State Tax**. Consistent with the best case scenario, except that the state income tax credit does not reduce system costs.
- **NEM**. Consistent with the state tax scenario, except that net metering credits do not reduce system costs.
- **Federal Tax**. Consistent with the NEM scenario, except that the federal tax credit does not reduce system costs.
- **Worst Case**. No incentives (SMART program, federal tax credit, net metering, and state income tax credit) reduce system costs.

Figure 2. PV incentives impact on cost-effectiveness



9. Cost-Effectiveness Results

Primary results

The assumptions discussed in this memo produce a solar benefit-cost ratio of 1.9, meaning solar is cost-effective for the Compact to incent for residential customers. Table 10 summarizes key cost-effectiveness results and analysis outputs. Figure 3 summarizes the magnitude of each benefit, while Figure 4 summarizes the magnitude of each cost. The customer PV installation costs reflect reductions for federal and state credits.

Table 10. Cost-effectiveness results

Results	Units	Value
Cost-Effectiveness		
Total Costs	*$000*	2,042
Total Benefits	*$000*	3,895
Net Benefits	*$000*	1,853
BCR	***ratio***	**1.91**
PV Generation		
Annual Energy	*MWh*	414
Lifetime Energy	*MWh*	10,353
Summer Capacity	*kW*	320
Costs		
Program Costs	*$000*	878
Cost of saved Summer Capacity	*$/kW*	2,747

Figure 3. Solar benefits

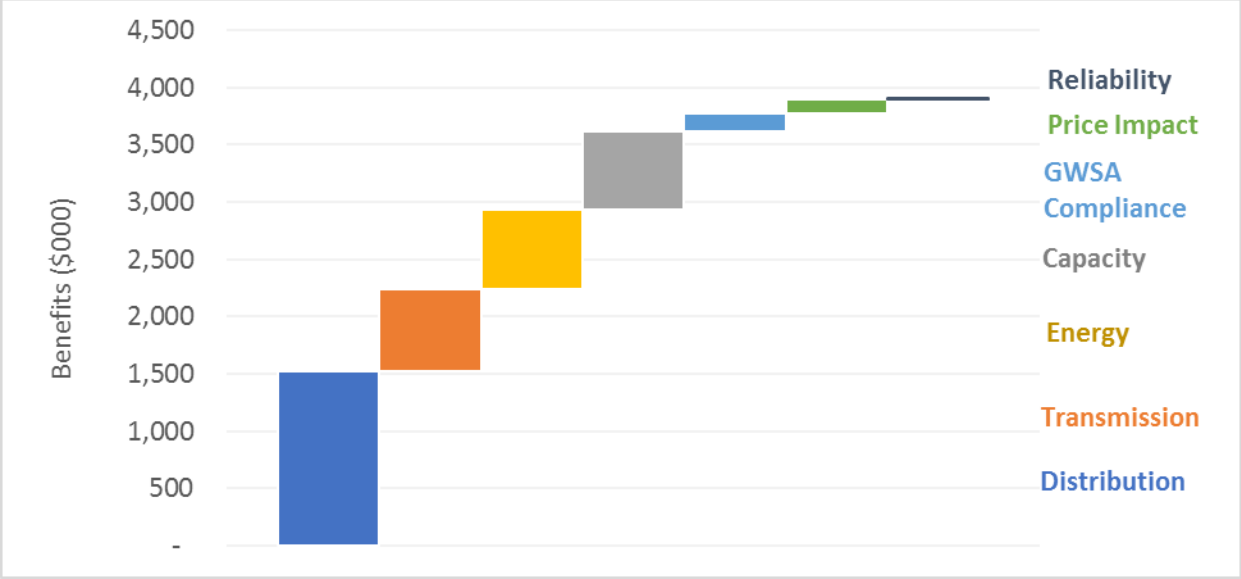


Figure 4. Solar costs

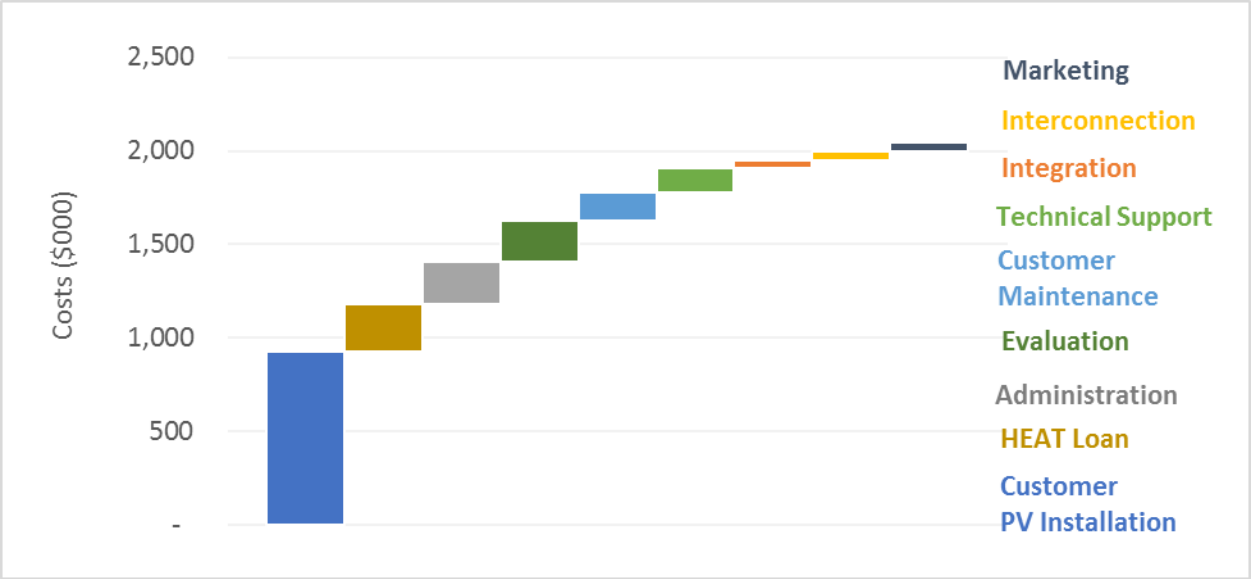
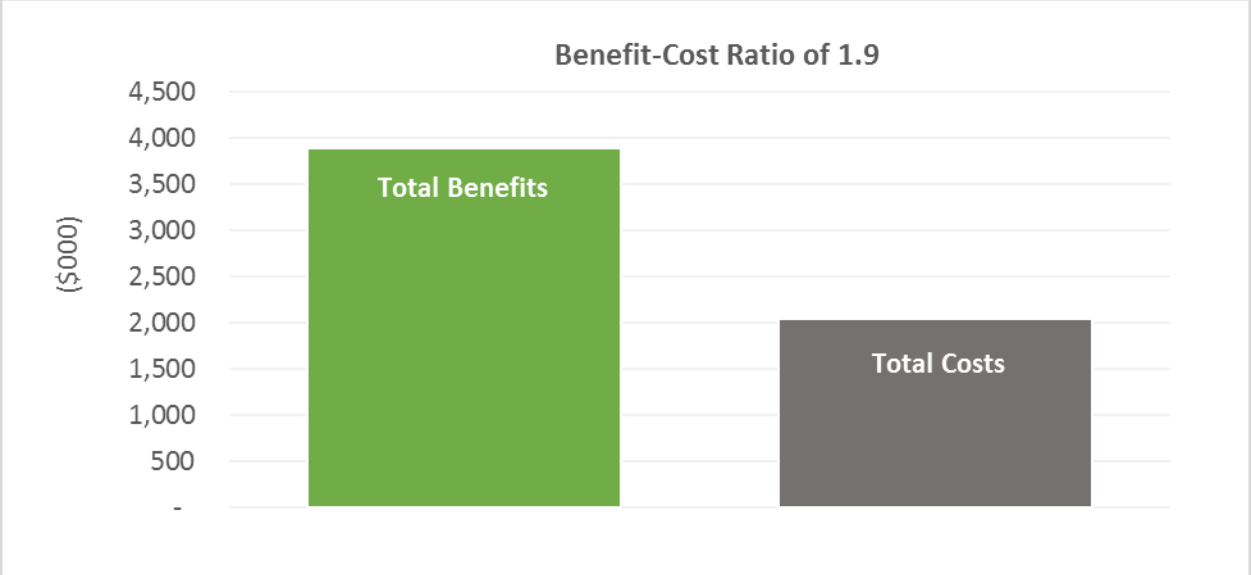


Figure 5 summarizes the total costs and benefits of solar. Every dollar spent on solar results in $1.91 in benefits, indicating it is cost-effective to incent and install PV systems in the Compact's service territory.

Figure 5. Solar benefit-cost results



Ultimately, we find that solar is cost-effective and the Compact should include incentives for residential customers in its 2019–2021 Three-Year Plan.

Forward Capacity Market sensitivity

The DPU is currently investigating how solar capacity is bid into ISO-NE's Forward Capacity Market (FCM).[34] Due to the uncertainty of that on-going proceeding, we ran a sensitivity to see whether benefit-cost results are materially impacted by bidding solar capacity into the FCM.

Bidding capacity into the FCM only impacts the avoided capacity, capacity price impacts (DRIPE), and reliability components of our analysis. Regardless of how capacity is bid into the FCM, avoided capacity costs make up about 22 percent of total benefits, capacity price impacts are $0 because solar has a long measure life (25 years) and benefits only extend out 15 years, and reliability makes up one percent or less of total benefits. The capacity price impacts are likely understated due to the way ISO forecasts load requirements and the way capacity DRIPE is presented in AESC.

We found that bidding capacity into the FCM produces a slightly lower benefit-cost ratio than not bidding capacity into the FCM. This counter intuitive result is a function of how the AESC calculates capacity benefits and how it accounts for the lag in ISO-NE's forecasting process. We recommend bidding solar capacity into the FCM to ensure ISO-NE has the most accurate information and data for system planning, regardless of what the cost-effectiveness results may indicate.

Ultimately, whether solar capacity is bid into the FCM has little impact on cost-effectiveness results. Our analysis assumed that all capacity is bid into the FCM.

10. Cost Impact Analysis

Synapse analyzed the monthly cost impact to moderate-income and extended moderate-income customers installing solar PV, a battery,[35] and a cold climate air source heat pump (ccASHP). Customer installation of all three technologies is the premise of the Compact's proposed Cape and Vineyard Electrification Offering (CVEO).[36]

A customer can install a ccASHP to replace or displace an existing oil furnace heating system.[37] We looked at both options for moderate- and extended moderate-income customers, for a total of four scenarios. We considered the multiple ways the CVEO would impact customers' monthly costs, as described in this section.

The technology assumptions used in this cost impact analysis are consistent with the Compact's 2019–2021 plan. Specifically, solar inputs are consistent with this memo, ccASHP inputs are consistent with

[34] See D.P.U. 17-146.

[35] See Synapse's Storage Cost-Effectiveness memo dated October 23, 2018.

[36] See the Compact's Pre-Filed Joint Testimony of Downey, Song, and Brandt in D.P.U. 18-116.

[37] Our analysis focused on an oil furnace. A similar analysis could be conducted for a propane furnace, oil boiler, or propane furnace.

the energy efficiency benefit-cost screening tool, battery inputs are consistent with the active demand management benefit-cost screening tool, and billing inputs are consistent with the bill impacts calculated in support of the energy efficiency surcharge.

Bill impact

Installing a ccASHP will result in a decreased oil bill ($0 for a customer that replaces their oil heating system) and increased electric bill. The net effect should be a bill decrease.

Massachusetts customers can net meter their solar generation against their electricity consumption, as discussed in Section 8. *PV System Incentives*. The solar generation offsets electricity consumption, thereby lowering the electric bill.

A battery will slightly increase electricity consumption, because less electricity can be retrieved from a battery compared to the electricity used to charge a battery. This will result in an increased electric bill.

The combination of the ccASHP bill savings, solar net metering bill savings, and battery bill increase substantially reduce a customer's total bills. Annually, we found bills decrease about $2,160 per year when replacing an oil furnace, or about $2,450 per year when displacing an oil furnace. This is the case for both moderate- and extended moderate-income customers, because we assume both customer types consume similar levels of oil and electricity and that they install similarly sized solar PV systems. Most of the bill savings are from solar PV.

The ccASHP bill savings primarily occur during the winter, while solar bill savings are likely to be greater in the summer. For our analysis, we calculated monthly savings simply by dividing annual savings by the 12 months of the year. A customer replacing their heating system saves about $180 per month and a customer displacing their heating system saves about $200 per month.

SMART credit

The solar PV and battery will earn a customer financial credit through the SMART program, as discussed in Section 8. *PV System Incentives*. We determined a customer will receive about $1,840 per year in SMART payments, or about $154 per month from the SMART program.

Equipment costs

Based on the Compact's proposed 2019–2021 plan, a customer can use the HEAT loan to finance the cost of solar and ccASHP not covered by incentives. The HEAT loan is repaid over seven years at zero percent interest. Different incentives are available to moderate- and extended moderate-income customers, so the total loan amount varies between the customer types.

We found the HEAT loan will increase costs by about $4,000 per year or $330 per month for a moderate-income customer, and about $4,800 per year or $400 per month for an extended moderate-income customer.

Net impact

Table 11 summarizes the impact of the Cape and Vineyard Electrification Offering for each of the scenarios. The net impact of installing a ccASHP, solar PV, and a battery is that moderate-income customers will see monthly savings ranging from $3 to $28 per month, while extended moderate-income customers will see increased costs ranging from $41 to $66 per month for seven years. Extended moderate-income customers will only see increased costs for the seven years it takes to repay the HEAT loan. After repayment, both moderate- and extended moderate-income customers will experience only cost decreases from bill savings and SMART credits ranging from $330 to $360 per month.

Table 11. Cost impact of Cape and Vineyard Electrification Offering

	Moderate Income		Extended Moderate Income	
Heat Pump option:	**Replacement**	**Displacement**	**Replacement**	**Displacement**
BILL SAVINGS				
Bill before ccASHP and PV	$3,101	$3,101	$3,101	$3,101
Bill after ccASHP and PV	$947	$648	$947	$648
Annual bill savings	-$2,155	-$2,453	-$2,155	-$2,453
Monthly bill savings	-$180	-$204	-$180	-$204
SMART CREDIT				
Annual SMART credit	-$1,846	-$1,846	-$1,846	-$1,846
Monthly SMART credit	-$154	-$154	-$154	-$154
EQUIPMENT COSTS				
ccASHP and PV costs after incentives	$27,760	$27,760	$33,509	$33,509
Annual loan (7 years, 0% interest)	$3,966	$3,966	$4,787	$4,787
Monthly loan payment	$330	$330	$399	$399
NET MONTHLY IMPACT - first seven years				
Bill Savings	-$180	-$204	-$180	-$204
SMART Credit	-$154	-$154	-$154	-$154
Loan Payment	$330	$330	$399	$399
Net Impact	**-$2.93**	**-$27.79**	**$65.51**	**$40.65**
NET MONTHLY IMPACT - after seven years				
Bill Savings	-$180	-$204	-$180	-$204
SMART Credit	-$154	-$154	-$154	-$154
Loan Payment	$0	$0	$0	$0
Net Impact	**-$333.40**	**-$358.26**	**-$333.40**	**-$358.26**

Note: Savings/Credits are negative. Costs/Payments are positive.

Memorandum

TO: MAGGIE DOWNEY, BRIANA KANE, AUSTIN BRANDT – CAPE LIGHT COMPACT

FROM: ERIN MALONE, DOUG HURLEY, DANIELLE GOLDBERG

DATE: OCTOBER 23, 2018

RE: STORAGE COST-EFFECTIVENESS ANALYSIS FOR 2019–2021 PLAN

Contents

1. Executive Summary

Synapse Energy Economics, Inc. (Synapse) studied the cost-effectiveness of small-scale energy storage technologies for potential implementation on Cape Cod and Martha's Vineyard. Batteries can provide benefits to all customers by aligning customer-sited sources of energy with peak-load hours.

We found that the value of a battery is in its ability to reduce peak demand, and thus avoid capacity and T&D costs. Batteries use a bit more energy than they save because of round-trip efficiency losses,[1] so energy benefits are minimal.

Table 1 summarizes the cost-effectiveness of the residential program, small commercial program, and the two programs combined. The result is a benefit-cost ratio of 2.5.

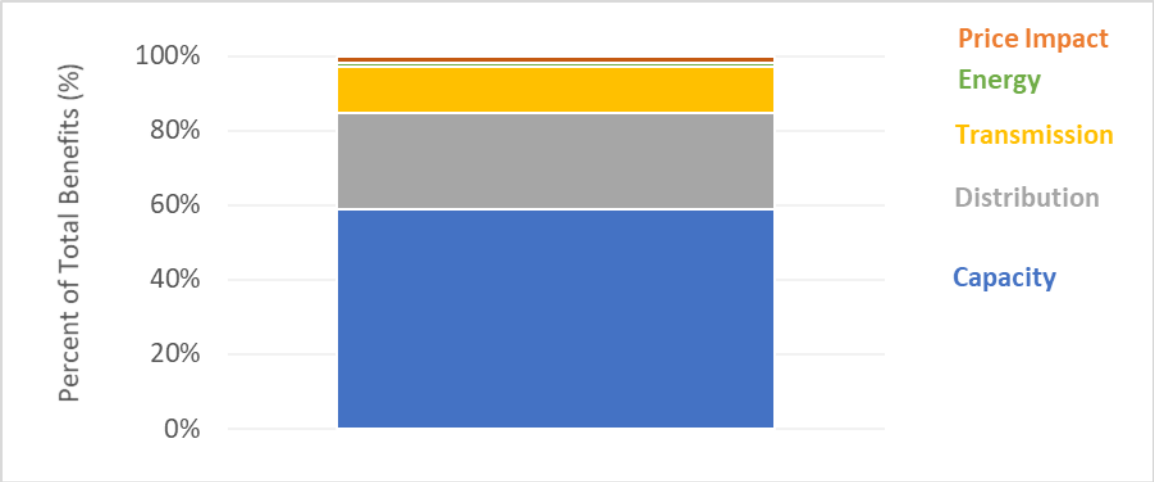
Table 1. Cost-Effectiveness Summary

Results	Units	Residential	Small Commercial	Total
Benefit-Cost Results				
Total Costs	$000	4,855	697	5,552
Total Benefits	$000	12,304	1,538	13,843
Net Benefits	$000	7,449	841	8,290
BCR	**ratio**	**2.53**	**2.21**	**2.49**
Savings				
Annual Energy	MWh	(146)	(18)	(165)
Lifetime Energy	MWh	(1,464)	(182)	(1,647)
Summer Capacity	kW	1,620	203	1,823
Cost Detail				
Program Costs	$000	4,855	697	5,552
Cost of saved Summer Capacity	$/kW	2,997	3,443	3,047

Figure 1 summarizes the composition of benefits for the program in total. Capacity and distribution benefits comprise most of the total benefits, while energy and price impact (DRIPE) benefits are negligible.

[1] Definitions for key terms used throughout this memo are provided in Appendix A.

Figure 1. Benefit Composition



2. Introduction

In preparation for the 2019–2021 Three-Year Energy Efficiency Plan, the Cape Light Compact (Compact or CLC) is investigating approaches to reducing customers' energy consumption and/or shifting peak usage through demand response resources. The Compact engaged Synapse to conduct a cost-benefit analysis of offering small-scale energy storage technologies to residential and small commercial customers on Cape Cod and Martha's Vineyard. This memo summarizes Synapse's research, methodology, and results regarding the cost-effective implementation of small-scale energy storage.

We first analyzed storage cost-effectiveness for the Compact in October 2017. We updated the analysis in October 2018 to reflect current information and assumptions in preparation for the 2019–2021 Plan filing to the Department of Public Utilities' (Department or DPU) on October 31, 2018 (see D.P.U. 18-116).

3. Background and Purpose

As discussed by the Compact and Eversource staff, the Cape Cod and Martha's Vineyard region has areas with distribution infrastructure constraints, and customers are installing solar panels at increasing rates. Storage technology has the potential to act like a demand response resource and better integrate solar resources. Batteries can provide benefits to all customers by aligning customer-sited sources of energy with peak-load hours.

On August 9, 2018, Governor Baker signed into law *An Act to Advance Clean Energy* (AACE). AACE provides that an energy efficiency plan may include "energy storage and other active demand management technologies."[2] Consistent with the AACE, the Compact proposes in its 2019–2021 Plan for

[2] *An Act to Advance Clean Energy*, Bill H.4857, §2. Available at: https://malegislature.gov/Bills/190/H4857.

the Department's approval to offer small-scale energy storage, such as the Tesla Powerwall, to an initial set of its residential and small commercial customers. The Compact is still investigating and developing its storage program. Our assumptions are based on the best information available at the time we drafted the analysis.[3] Many of the numbers and assumptions are subject to change as the Compact further details its offering.

4. Methodology and Assumptions

Research Summary

We attempted to base our analysis on models and assumptions used in other states, but we were unable to find sufficiently detailed examples. The most notable example is the Green Mountain Power (GMP) pilot, on which we relied as much as reasonable. A summary of our research is presented in Appendix B.

Battery Technology

We completed a cursory search of small-scale storage technologies, as summarized in Appendix C. For this analysis, we chose to focus only on the Tesla Powerwall 2.0 for its name recognition with customers. Appendix C summarizes the technology details of the Tesla Powerwall 2.0. Other storage technologies are available to customers, and our reliance on the Tesla Powerwall is not meant to limit the technologies that the Compact could offer to customers as part of a potential storage program. The Compact should investigate competing products for their abilities and cost.

Program Design Assumptions

Synapse investigated and modeled several potential program design options. The most obvious ones included dispatch based upon customer's peak-load hours and dispatch based upon wholesale prices. After several rounds of internal review, we settled upon an initial, cost-effective program that charges the battery each night, and discharges each day from June through September. This is an initial program design that we found to be both simple to understand and model, and cost-effective. There are likely other dispatch scenarios that could further optimize cost-effectiveness or customer appeal. Further investigation and discussion may inform improvements to this design. Our intent here is to describe the simple design that we have modeled.

[3] There are ongoing proceedings at the DPU that could impact storage as well as solar deployment in Massachusetts. See, e.g., D.P.U. 17-146.

Cycling

We assume the battery will cycle once per day, charging at night (2am–5am) and discharging in the afternoon (4pm–7pm). We assume this cycle repeats for every day in June through September and in December through March, without customer or other dispatch intervention.

This is an over-simplified approach, intended to be illustrative and easier to model. Our understanding is that the Powerwall is capable of being dispatched by a centralized controller or managed directly by the customer. Further, it is dynamic enough to charge and discharge at different hours then we assumed. We also understand the Compact intends to follow a different dispatch strategy for winter, where it will target fewer peak event days, rather than cycle batteries daily. However, the Compact will follow a similar dispatch strategy in the summer.

We analyzed a few alternative approaches to battery cycling, including cycling in response to the customer's peak load and in response to system peak pricing. Ultimately, these scenarios proved overly complicated while producing similar results to cycling regularly once per day.

Customer incentives

We assume the Compact will pay 100 percent of the customer's initial cost to purchase and install the Tesla Powerwall. The customer will own the battery but will grant the Compact the authority over the battery's dispatch and operation for 10 years. After 10 years, the customer can operate the battery as they choose.

Back-up generation

Customers are more likely to install batteries if they can be used as back-up power during system outages. We have built into our model the ability for a program designer to set the amount of back-up power they would like to reserve in the battery for customer use. As an initial assumption, we assume 10 percent of the energy is available for back-up power.

Solar

We assume the installed batteries can operate independently of the customer's onsite load profile and can directly discharge to and charge from the electric grid. We assume the batteries are not required to charge only from solar generation. We also assume the batteries can discharge more energy than the customer's on-site load at the time of dispatch. We find such a structure is in the best interest of the electric grid.

Based on this assumption, whether a customer has installed solar PV does not impact how a battery will cycle or perform. In our analysis, cost-effectiveness is not impacted by whether a customer has installed solar PV, provided that a customer can obtain an interconnection agreement with the local distribution company without having or installing solar PV. It is likely that a customer with a battery and solar PV will have a flatter load shape than a customer without either technology, but we found no incremental savings resulting from synergies between the two technologies (just additive).

Customers with solar PV are likely more aware of their energy consumption and impact, and therefore could be more likely to participate in an energy storage program. In that regard, we view customers with solar PV as a promising market to achieve the desired adoption.

If a customer has not already installed solar PV, there may be cost savings from installing solar PV and storage at the same time. We do not account for any such cost savings in our analysis.

Rates

Consistent with the electric rates currently available to customers on Cape Cod and Martha's Vineyard, we assumed a fixed rate structure without time variation or demand charges.

Time of use (TOU) rates would encourage greater battery participation, because customers could potentially see bill savings if they shift usage from high to low priced periods. TOU rates are not currently available in the Compact's service territory due to lack of advanced meter availability.

Under DOER's SMART tariff approved by the DPU on September 26, 2018, customers who install both solar PV and storage would be eligible to receive a higher renewable compensation rate via a variable storage adder. The storage adder is based on the ratio of storage capacity to solar capacity as well as the duration for which the battery can provide power. We do not account for the SMART tariff in our current analysis, but we do in our solar cost-effectiveness analysis for the Compact dated October 23, 2018. Such a revenue stream is likely to increase customers' battery adoption but is not likely to impact cost-effectiveness.

We assume small commercial customers do not pay a demand charge, consistent with current rate structures. If a customer with a demand charge installed a battery, they could potentially see bill savings if they use the battery to reduce their peak consumption.

Customer eligibility

We assume that any customer within the Compact's Cape Cod and Martha's Vineyard territory can participate in a potential Compact storage program, regardless of whether the customer takes service under the Compact's power supply program or participates in the Compact's energy efficiency programs.

It is our understanding that Massachusetts' utilities currently require batteries to undergo the interconnection review process, but that such a practice has not been formally adjudicated by the Department.

Costs

We accounted for three types of costs: one-time installation costs, annual costs, and one-time program costs.

One-time installation costs are the cost to purchase the battery and supporting hardware, and the cost to install the system. The costs for the battery and hardware are consistent with Tesla's stated

Powerwall costs. The cost to install the system are estimated by the model user. We assume these costs total $10,000 per battery. As stated above, we assume the Compact will pay for these costs, although the user can adjust this assumption in the model.

Annual costs are the participant's annual operation and maintenance costs. These costs are estimated by the model user and are assumed to be incurred by participants every year for the life of the battery.

One-time program costs are the Compact's cost to administer, implement, market, and study the program. These costs are based on the Compact's current research and estimated program costs for each budget category.

Savings

Because all batteries currently available on the market have a round-trip efficiency of less than 100 percent, a customer is likely to use more total energy with a battery. Ideally the customer's energy use will be shifted to different hours, resulting in a flatter load shape and energy cost savings. The battery should also allow the customer to use less energy during system peak periods.

For energy savings, we assume a customer will experience overall increased energy use equivalent to the round-trip efficiency losses. In aggregate, a customer will use more energy during off-peak hours as the battery charges but will save energy during peak hours, when the battery is discharged.

For capacity savings, we assume the battery will discharge the most energy it can during the peak hour of the year (i.e., it is 100 percent coincident with summer peak) because our chosen program design discharges the battery every day from 4pm–7pm in the summer, and dispatch hours can be adjusted as needed based on load forecasts. This approach is most likely to involve discharging the battery during the annual and monthly system peak-load hours, although it is possible that peak hours may occur outside this timeframe. Using the terminology common with energy efficiency programs, it has a 100 percent coincidence factor.[4]

Benefits

We use the same avoided costs as used for active demand management measures for the 2019–2021 plan.

If targeting specific, capacity-constrained areas in coordination with Eversource, then batteries could result in greater T&D benefits. In the model, we allow the user to adjust avoided T&D costs to account for this. The default value in the model is the same avoided T&D cost rate as used for energy efficiency measures, which we understand to be a utility-specific, system-wide average.

[4] Note that a customers' peak usage is likely to occur at a different time from the electric system's peak. Customers with demand charges would experience bill savings from reducing their peak consumption. This benefit would be separate from and incremental to the avoided system capacity peak costs.

Batteries are likely to result in non-energy benefits, both to the utility system and to the participant. Such benefits could include, but are not limited to: increased reliability, increased property value, availability of back-up generation, or reduced risk in energy prices from a flatter load shape.

The cost-effectiveness model allows the user to account for non-energy benefits using an adder applied to the energy and capacity benefits. We used a percentage adder for ease of application and due to lack of supporting documentation. We applied a zero percent adder both for participant and utility system related benefits to be conservative, but this value is easily adjusted in the model.

5. Cost-Effectiveness Results

One key finding is that a battery's ability to avoid capacity charges drives its overall cost-effectiveness. Batteries use a bit more energy than they save because of round-trip efficiency losses, so energy benefits are minimal. The real value of a battery is in its ability to reduce peak consumption, and thus avoid capacity and T&D costs.

Consistent with Massachusetts' energy efficiency policy, we relied on the Total Resource Cost (TRC) test to determine cost-effectiveness, including all costs and benefits to the utility system and the participant.

Table 2 summarizes the cost-effectiveness of the residential program, small commercial program, and the programs combined. The result is a benefit-cost ratio of 2.5.

Table 2. Cost-Effectiveness Summary

Results	Units	Residential	Small Commercial	Total
Benefit-Cost Results				
Total Costs	$000	4,855	697	5,552
Total Benefits	$000	12,304	1,538	13,843
Net Benefits	$000	7,449	841	8,290
BCR	**ratio**	**2.53**	**2.21**	**2.49**
Savings				
Annual Energy	MWh	(146)	(18)	(165)
Lifetime Energy	MWh	(1,464)	(182)	(1,647)
Summer Capacity	kW	1,620	203	1,823
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Program Costs	$000	4,855	697	5,552
Cost of saved Summer Capacity	$/kW	2,997	3,443	3,047

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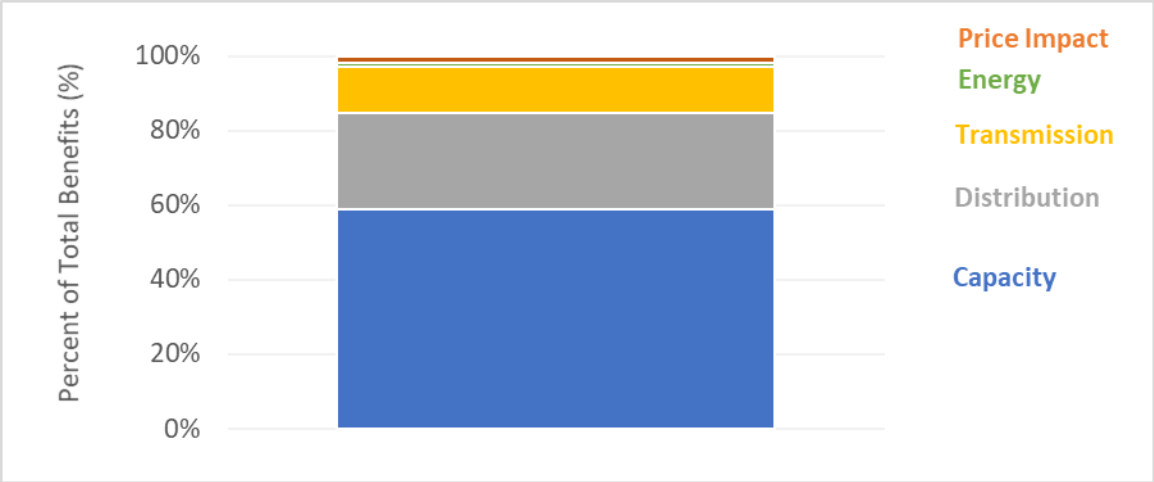
Figure 2. Benefit Composition



Appendix A: Definition of Key Terms

- **Round-Trip Efficiency.** The round-trip efficiency is the amount of energy that can be retrieved from a battery compared to the amount of energy used to charge the battery. In other words, energy out divided by energy in. Round-trip efficiency is expressed as a percentage. If a battery's round trip efficiency is 90 percent and is charged with 100 kWh, it would be able to discharge 90 kWh of electricity.[5]

- **Depth of Discharge (DOD).** Depth of discharge is the percentage a battery has been discharged. A DOD of 0 percent means the battery is fully charged, while a DOD of 100 percent means the battery is fully discharged. If a battery's DOD is 80 percent and is charged with 100 kWh, it would be able to discharge 80 kWh of electricity.[6]

- **State of Charge (SOC).** The state of charge is available capacity stored in a battery at any given time, expressed as a percentage. An SOC of zero percent indicates an empty battery, while an SOC of 100 percent indicates a fully charged battery.[7]

- **Cycling.** Cycling is the switch from charging to discharging, regardless of how much energy is being charged or discharged at a given point in time.

[5] Homer Energy. "Battery Roundtrip Efficiency." http://www.homerenergy.com/support/docs/3.10/battery_roundtrip_efficiency.html.

[6] Best Go Power. "What is Depth of Discharge (DOD)?" http://www.bestgopower.com/faq/30-what-is-depth-of-discharge-dod.html.

[7] Electropaedia. "State of Charge (SOC) Determination." http://www.mpoweruk.com/soc.htm.

Appendix B: Research Summary

Overview

We researched other small-scale battery programs and non-wire alternatives (NWA), focusing on how program administrators addressed cost-effectiveness. Specifically, we looked at Green Mountain Power (GMP) in Vermont, a 2016 study on residential PV and the Powerwall I in the German energy market,[8] the Brooklyn Queens Demand Management (BQDM) NWA project through Consolidated Edison in New York,[9] as well as Eversource's Mashpee substation upgrade.[10] The most closely analogous project to our analysis is GMP's pilot, which is summarized in more detail below.

Green Mountain Power

In 2016, Green Mountain Power in Vermont started offering Tesla Powerwall batteries to customers on a pilot basis. The program is designed to lower energy bills through reduced transmission and capacity costs during peak times, while increasing reliability. GMP has one of the few small-scale energy storage programs in the country, and it is the one of the first US utilities to partner with Tesla.

Tesla and GMP will install and operate the Powerwall for $15/month for 10 years for an upfront price of $1,500.[11] The standard price for a Powerwall purchased directly through Tesla is $5,500. While the Powerwall can provide up to 100 percent backup reserve, with GMP's program, 20 percent backup reserve is available 95 percent of the time. The Powerwall can be charged with solar panels, or from the grid. Tesla's standard Powerwall allows users to shift their load for TOU rates, however GMP's program does not allow for that feature.

GMP uses the Powerwall to reduce grid load when it is most congested and lower the overall system cost. The amount of backup power available to a customer is dependent on how the battery was most recently dispatched and will likely be only a few hours of power. If the Powerwall is used in conjunction with solar panels, a customer may be secure for an extended outage.

GMP charges customers a fine of $450 to remove the Powerwall if they no longer wish to continue with the program. GMP owns the battery under the arrangement but will transfer it to a new owner if the house is sold.

We continue researching the details of this pilot's cost-effectiveness to improve our analysis.

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[8] Electrical Energy Storage Technology and the Technical University of Munich, "The Economics of Residential Photovoltaic Battery Systems in Germany: The Case of Tesla's Powerwall."

[9] Utility Dive, "ConEd awards 22 MW of demand response contracts in Brooklyn-Queens project," 2016.

[10] See, D.P.U. 14-03.

[11] See, https://www.tesla.com/green-mountain-power.

Appendix C: Storage Technologies

The Tesla Powerwall is one of the most recognized small-scale storage technologies available and is the model used by GMP in its pilot.

Other small-scale at-home batteries exist apart from the Tesla Powerwall. These are summarized in the table below.[12] As battery technology continues to evolve and the popularity of at-home storage grows, more companies will develop competitors to the Tesla Powerwall.

Using other technologies could result in different costs and savings, and therefore cost-effectiveness results.

The table below provides some of our initial research into other storage technologies, as compared to the Tesla Powerwall.

Table C.1: Tesla Powerwall and Competitor Comparison

Company/Battery	Storage (kWh)	Price ($)	Inverter Included?
Tesla's Powerwall	**13.5**	**5,500**	**Yes**
RESU by LG Chem	6.5	4,000	No
Orison	2.2	1,600	N/A
Sonnen	4-16	Start at 5,950	Yes
Sunverge	6-23	8,000-20,000	N/A
Mercedes	2.5	9,000-10,000	No
ElectrIQ	10	13,000	Yes
Nissan's xStorage	4.2	4,500	N/A
Pika Energy	10.6-15.9	N/A	N/A

[12] Business Insider. "11 Home Batteries that Rival Tesla's Powerwall 2.0". http://www.businessinsider.com/home-battery-rival-tesla-powerwall-2-2016-10/#1-teslas-powerwall-20-is-a-269-pound-lithium-ion-battery-that-you-can-mount-on-your-wall-panasonic-makes-the-cells-for-the-battery-while-tesla-builds-the-battery-module-and-pack-the-whole-thing-costs-5500-including-the-inverter-and-stores-135-kwh-of-energy-1.