

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

Petition of NSTAR Electric Company and)
Western Massachusetts Electric Company)
d/b/a Eversource Energy for Approval of their)
Grid Modernization Plans)

D.P.U. 15-122/123

DIRECT TESTIMONY OF

MARGARET T. DOWNEY, AUSTIN T. BRANDT AND KEVIN F. GALLIGAN

ON BEHALF OF

THE CAPE LIGHT COMPACT

MARCH 10, 2017

1 **Q: Please state your name, title, business address, and provide a brief description**
2 **of your responsibilities.**

3 A: Downey: My name is Margaret T. Downey, and I am the Administrator for the
4 Cape Light Compact (the “Compact”). My business address is c/o Cape Light
5 Compact, Open Cape Building, 3195 Main Street, Barnstable, Massachusetts
6 02630. As Administrator, I oversee the administration of the Compact and its
7 development and implementation of its energy efficiency programs, as well as its
8 provision of competitive energy supply through its municipal aggregation program.
9 Specifically, I manage the Compact’s activities as an electric energy efficiency
10 program administrator (“PA”) and as a municipal aggregator for residents and
11 businesses of Cape Cod and Martha’s Vineyard. With respect to the Compact’s
12 energy efficiency activities, I oversee the administration of the Compact’s annual
13 energy efficiency program budgets that are part of the three-year statewide
14 Department of Public Utilities (the “Department”) approved plan. I am responsible
15 for local and state regulatory reporting and approvals, as well as the oversight of the
16 participation and compliance in the ISO New England forward capacity market. I
17 represent the Compact as a non-voting member of the Energy Efficiency Advisory
18 Council, and regularly make presentations and report to customers, the Compact’s
19 Governing Board (“Board”), staff, regulatory agencies and community advocates.

20 A: Brandt: My name is Austin T. Brandt. I am the Power Supply Planner for the Cape
21 Light Compact. My business address is c/o Cape Light Compact, Open Cape
22 Building, 3195 Main Street, Barnstable, Massachusetts 02630. I am responsible for

1 the day-to-day management of the Compact's power supply program, and related
2 duties. I am also the primary person responsible for the design and implementation
3 of the Compact's Demand Response Demonstration Offering ("Offering").

4 A: Galligan: My name is Kevin F. Galligan. I am the President of Galligan Energy
5 Consulting, Inc. My business address is P.O. Box 1614, Orleans, MA 02653. I
6 have over 35 years of energy industry experience and serve as a consultant for the
7 Compact, where I assist with energy efficiency program implementation and advise
8 the Compact on certain regulatory matters. I also worked for the Cape Light
9 Compact as Energy Efficiency Program Manager from 2002 to 2012, where I was
10 the person responsible for supervising the implementation of the Compact's energy
11 efficiency programs.

12 **Q: What is the purpose of your testimony?**

13 A: The purpose of our testimony is to describe the Compact and its programs, and to
14 highlight how the grid modernization process, and specifically the deployment of
15 advanced metering functionality ("AMF"), could enhance the Compact's
16 implementation of its power supply, energy efficiency, and demand response
17 programs.

18 **Q: Please describe the Cape Light Compact.**

19 A: The Compact is made up of the twenty-one towns and two counties of Cape Cod
20 and Martha's Vineyard. As the municipal aggregator for its member towns, the
21 Compact operates an opt-out retail power supply program in accordance with its

1 approved Aggregation Plan, and administers energy efficiency programs in
2 accordance with its approved Three-Year Energy Efficiency Plan. The Compact
3 also represents the interests of its customers in regulatory and legislative matters at
4 the state level through advocacy and intervention in proceedings before the
5 Department of Public Utilities (the “Department”).

6 **Q: Please describe the Compact’s power supply program.**

7 A: As the municipal aggregator for Cape Cod and Martha’s Vineyard, the Compact
8 provides all-requirements retail power supply on an opt-out basis to any customer
9 within its service territory that opens a new account with the local electric
10 distribution company (“EDC”). The Compact began its power supply program on a
11 pilot basis in 2001, serving a relatively small number of customers. In early 2005,
12 when Standard Offer expired, the Compact expanded its power supply program to
13 include all customers within its aggregation territory. The Compact currently has
14 approximately 135,000 of the 204,000 electric customers on Cape Cod and
15 Martha’s Vineyard enrolled in its power supply program. Approximately 120,000
16 of the Compact’s power supply customers are residential customers. The Compact
17 currently only offers fixed-price options for all rate classes to its power supply
18 customers.

19 **Q: Please describe the Compact’s energy efficiency programs.**

20 A: Downey: As the municipal aggregator for Cape Cod and Martha’s Vineyard, the
21 Compact is authorized under state law to operate approved energy efficiency

1 programs within its service territory. Notably, the Compact is the only non-utility
2 energy efficiency PA in Massachusetts, and therefore the only PA that does not also
3 own the utility infrastructure serving the territory in which it operates its energy
4 efficiency programs. The Compact has been continuously administrating award-
5 winning energy efficiency programs since 2001 that are tailored to the Compact's
6 unique demographics and responsive to customer feedback. The Compact
7 administers energy efficiency programs for all customer classes, and to date has
8 achieved \$800 million in lifetime savings for ratepayers on Cape Cod and Martha's
9 Vineyard.

10 **Q: Please describe the Compact's past and current behavioral and demand**
11 **response programs.**

12 A: Galligan: In 2009, the Compact implemented a residential smart home energy
13 monitoring pilot program to evaluate the potential energy savings from in-home
14 energy monitoring systems. The Compact was the first Massachusetts PA to design
15 and implement a smart home energy monitoring demonstration/pilot project that
16 included near-real-time, in-home, and computer-based display of energy usage for
17 customers to take actions, particularly at times of peak demand, to learn what was
18 driving their usage and take steps to reduce energy use. This pilot project not only
19 demonstrated a high level of customer engagement, satisfaction and significant
20 energy savings, but also confirmed the ability of a third-party provider to interface
21 with existing utility meters to accurately collect, present and analyze electric usage
22 data for participating customers.

1 The Compact's Smart Home Energy Monitoring Pilot Program has received
2 national recognition as a successful and effectively designed program. According
3 to a report issued in April 2010 by independent evaluator, PA Consulting Group, the
4 Compact's 100 actively engaged pilot participants from Cape Cod and Martha's
5 Vineyard reduced their daily energy use by 9.3 percent or 2.9 kilowatt-hours
6 ("kWh") per day, the second highest decrease when compared to results from
7 similar smart monitoring programs tested throughout North America. Seventy-five
8 percent of program participants reduced energy consumption during the program.
9 One-third reduced average energy consumption by 4 or more kWh per day. The
10 American Council for an Energy-Efficient Economy ("ACEEE") used the
11 Compact's Smart Home Energy Monitoring Pilot Program as a case study in
12 demonstrating that behavioral change by individual consumers can lead to
13 significant energy and cost savings.

14 Over the course of one year, the Compact's Smart Home Energy Monitoring Pilot
15 Program participants conserved approximately 105,850 kWh of electricity, the
16 equivalent of CO2 emissions saved by over 16 acres of pine forest or the
17 greenhouse gas emissions avoided by recycling 25.6 tons of waste instead of
18 sending it to the landfill.

19 A: Brandt: Over the past several years, the Compact's Smart Home Energy
20 Monitoring Pilot Program evolved into its current Residential Behavior Feedback
21 Initiative, which uses near-real-time energy monitoring hardware to encourage

1 energy usage reduction through behavioral change by allowing participants to see
2 how different actions (e.g., turning on a dehumidifier) have an impact on their usage
3 and electric bills.

4 The Compact also filed an Offering as an exhibit in its most recent Three-Year
5 Energy Efficiency Plan. This Offering is designed to reduce customer demand
6 through curtailment events and to encourage load-shifting through installation of
7 demand response technologies and behavioral changes. On the residential side, this
8 included installing energy monitoring equipment and WiFi thermostats in over 35
9 homes in 2016, allowing participants to view their energy usage and remotely adjust
10 their thermostats. The Compact called demand response events over the course of
11 the summer, automatically adjusting most participants' thermostats to reduce
12 electric demand from their air conditioning units. The Offering included an
13 enrollment payment and a per kWh reduction payment, measured retroactively for
14 all events. See Exhibit CLC-DBG-2.

15 In 2017 and 2018, the Compact plans to expand the residential thermostat
16 component by enrolling more participants but will discontinue installations of near-
17 real-time energy monitoring equipment for future participants, as such equipment is
18 cost-prohibitive. The Compact also plans to file a mid-term modification to its
19 Three-Year Energy Efficiency Plan with the Department in March 2017 to expand
20 the Offering by adding a load-shifting thermal storage component for small-to-
21 medium commercial customers. The thermal storage technology will mitigate

1 summer peaks largely caused by air conditioning load without impacting customers'
2 comfort. The Compact will be recruiting a small number of customers to
3 participate.

4 Along with other PAs, the Compact plans to use the collective results of the PAs'
5 demand response demonstration offerings to inform a potential expansion of
6 demand response programs in the 2019-2021 Statewide Energy Efficiency Plan.

7 **Q: How does grid modernization intersect with the Compact's operation of its**
8 **power supply, energy efficiency, and demand response programs, as described**
9 **above?**

10 A: Brandt: As laid out by the Department in its Order issued on June 12, 2014 in
11 D.P.U. 12-76-B ("Order 12-76-B"), the primary customer-facing component of grid
12 modernization that intersects with the Compact's operation of its power supply,
13 energy efficiency, and demand response programs is the deployment of AMF.

14 **Q: What is your understanding of "the deployment of AMF" in this proceeding?**

15 A: In Order 12-76-B (at 48), the Department declined to adopt an opt-in approach to
16 advanced metering infrastructure and instead required that each EDC file opt-out
17 proposals and opt-out tariffs. EDCs were instructed to file grid modernization plans
18 ("GMPs") designed to achieve the roll-out of AMF within five years of approval of
19 their GMPs, or make a business case that demonstrates that a longer timeframe is a
20 superior approach. As defined by the Department, AMF includes four main
21 functions: (1) the collection of customers' interval usage data, in near-real-time,

1 usable for settlement in the ISO New England energy and ancillary services
2 markets; (2) automated outage and restoration notification; (3) two-way
3 communication between customers and the EDC; and (4) communication with and
4 control of household appliances, with customers' permission. See Order 12-76-B at
5 3 n.1.

6 **Q: Based on that description, how does AMF have the potential to impact the**
7 **Compact's operation of its power supply program?**

8 A: Brandt: The widespread installation of AMF meters would have major implications
9 for the Compact's operation of its power supply program. If most customers
10 (across all rate classes) had AMF meters, the Compact would be able to offer its
11 customers time varying rate ("TVR") power supply product options, including time-
12 of-use ("TOU") pricing, critical peak pricing ("CPP"), peak time rebates ("PTR"),
13 and real time pricing ("RTP"). In addition to the fixed-price product that is
14 currently the default product, these power supply offerings would provide Compact
15 power supply customers a wide range of choices.

16 **Q: How does AMF metering have the potential to impact customers' power supply**
17 **choices and pricing?**

18 A: Brandt: The ability of advanced meters to collect and communicate near-real-time
19 interval-level usage data to customers would enable customers to more thoroughly
20 understand their energy usage patterns. This insight into their energy usage would
21 allow customers to evaluate the wide range of power supply products available to

1 them, either through the Compact’s power supply program or from competitive
2 suppliers. As a result, customers could choose a plan that suits their individual
3 energy needs and lifestyles and affords them the best opportunities to save money
4 on their bills through usage reduction and/or load shifting to less expensive periods.

5 The Compact could also investigate how to best utilize these power supply products
6 to provide financial benefits beyond the individual customer. For instance, by
7 enrolling a significant number of power supply customers in a CPP or PTR plan, the
8 Compact may be able to reduce supply costs for all Compact power supply
9 customers by reducing capacity costs through capacity tag management, and/or
10 shifting energy usage to off-peak periods.

11 **Q: Are there any other elements of the grid modernization order(s) that impact**
12 **the Compact’s operation of its power supply program?**

13 A: Brandt: Other than the metering deployment, a key element of the grid
14 modernization process will be the ability for third-party suppliers, including the
15 Compact’s power supplier, to access the interval-level metering data in a reasonable
16 manner and timeframe. In Order 12-76-B (at 36), the Department recognized that
17 “meter data access for third parties is an important component of maintaining and
18 supporting the competitive electricity market” and ordered that GMPs address
19 “procedures for allowing an authorized third party to access customer usage data
20 with the customer’s permission” as well as “procedures for making aggregate usage
21 data available to third parties and ensuring that it cannot be linked to any individual

1 customer.” These issues are critically important to the Compact. If data is truly
2 accessible to third parties, it will enhance the Compact’s power supply program,
3 whereas if data is inaccessible or not timely provided to third parties, then the
4 Compact would not be able to provide a TVR power supply product that utilizes the
5 advanced meter infrastructure to advance the demand optimization goal of grid
6 modernization that was set forth by the Department. In addition, forcing customers
7 to enroll in basic service in order to have a TVR power supply product
8 disadvantages the Compact in competing with basic service. Without access to the
9 interval-level metering data, the suppliers would not be able to offer TVR products,
10 despite the ability of the meter to collect the necessary data.

11 The ability of competitive suppliers to offer TVR-based power supply products and
12 leverage associated customer-specific and program-wide benefits is based on the
13 assumption that the necessary metering infrastructure is deployed on a widespread
14 basis, as is laid out in the Department’s grid modernization orders. Competitive
15 suppliers require access to customers’ energy usage data in order to develop
16 competitively priced offers and communicate savings opportunities in real time to
17 the customers who participate in their programs.

18 **Q: How does AMF have the potential to impact the Compact’s operation of its**
19 **energy efficiency programs?**

20 A: Downey: AMF data of customers across Massachusetts would be of great value to
21 the Compact when developing its energy efficiency plans. As mentioned

1 previously, the Compact makes concerted efforts to tailor its energy efficiency
2 programs to its customer base on Cape Cod and Martha's Vineyard. Access to
3 interval-level metering data for the Compact's customers (of all rate classes) would
4 give the Compact a deeper understanding of how the usage patterns of customers
5 may differ both within the Compact's service territory and as compared with areas
6 outside of the Compact's service territory that are served by other PAs. Such data
7 would allow the Compact to better estimate energy savings potential and better
8 tailor its program for Cape Cod and Martha's Vineyard customers.

9 A: Galligan: For example, Eversource has testified in connection with its pending rate
10 case proceeding, D.P.U. 17-05, Exhibit ES-GMBC-1 at 45, "[i]n most areas of the
11 Eversource service territory the peak is between 2PM and 6PM during a weekday
12 afternoon. In southeastern MA, the peak most likely occurs between 5PM and 8PM
13 potentially even on the weekend." Given that Eversource's data is currently
14 substation based and not at a customer level, advanced metering data would provide
15 a richer data set that would allow the Compact to understand at a more nuanced
16 level what the real drivers of demand are and how they relate to Massachusetts'
17 diverse communities. With this data, the Compact could better understand how
18 customers on Cape Cod and Martha's Vineyard contribute to the system-wide load
19 and energy markets throughout Eversource's eastern territory (referred to as
20 "Eversource East" in D.P.U. 17-05). The Compact would apply the lessons it learns
21 to develop more cost-effective customer-driven solutions for optimizing demand.

1 A: Downey: For its residential energy efficiency programs, interval-level metering
2 data could help inform program design by allowing the Compact (and other PAs) to
3 better evaluate the effectiveness (at reducing energy usage and/or peak demand) of
4 certain installed measures. For small-to-medium commercial customers this impact
5 may be amplified, as the Compact and its vendors often work one-on-one with these
6 customers to implement energy conservation measures (“ECMs”) that are tailored
7 to the customer on a building-by-building basis. Interval-level usage data for these
8 small-to-medium commercial customers would be a powerful tool to assess usage
9 patterns, pinpoint ECMs that would be most effective, and evaluate savings.

10 Additionally, the availability of this information and education on customer choice
11 could spur a market for controllable devices designed to manage energy usage,
12 which may have the ability to dispatch based on pricing information directly from
13 the AMF meter. Leveraging these devices to achieve energy savings could be
14 beneficial for the continued success of the energy efficiency programs.

15 As with power supply, these advantages are dependent on widespread deployment
16 of AMF meters.

17 **Q: How does AMF metering have the potential to impact the Compact’s operation**
18 **of its behavioral and demand response programs?**

19 A: Brandt: Interval metering and near-real-time reporting are essential to encouraging
20 load shifting through behavioral change and accurately measuring demand
21 reductions achieved through demand response events, which is the reason that the

1 Compact deployed near-real time interval metering technology for participants in its
2 behavioral and demand response programs. However, the cost and difficulties
3 associated with installing the metering technology and maintaining connectivity are
4 a significant part of the reason that the Compact has stopped enrolling new behavior
5 initiative participants and does not plan to deploy metering technology on Offering
6 participants. Having advanced metering infrastructure in place with the ability to
7 communicate interval-level usage data with customers in near-real time would
8 eliminate the need for expensive workaround energy monitoring equipment that the
9 Compact has deployed as a workaround for interval meters in the past through its
10 Behavior Feedback Core Initiative and Offering. The monitoring equipment used
11 as part of its Offering costs several hundred dollars to purchase, and requires an
12 electrician to install, adding to the total cost. AMF deployed on a widespread basis
13 would provide a solution to this problem, and enable a more cost-effective approach
14 to future demand response and behavioral programs across Massachusetts.

15 Besides enabling expanded and more cost-effective behavioral and demand
16 response programs, AMF metering capability could also impact enrollment in these
17 programs by allowing for a more straightforward and efficient disbursement of
18 participation incentives. This could be achieved by coupling participation in the
19 program with a TVR power supply product (also enabled by AMF metering) that
20 would allow the incentive to directly appear on the monthly bill, in the form of a
21 peak time rebate or reduced on-peak energy charges. Not only does this create

1 enhanced customer incentive to reduce or shift load, but it also makes for a
2 smoother customer experience and more effective program implementation than, for
3 instance, issuing one or multiple per-kWh reduction incentive checks to participants
4 as the Compact does now, after the event or cooling season is over.

5 **Q: Does AMF relate to your demand response offerings?**

6 A: Brandt: Widespread AMF has the potential to make demand response a much more
7 powerful resource for reducing demand and changing customers' behavior. As
8 described above and illustrated through the Compact's Behavior Feedback Initiative
9 and Offering, access to near-real-time, interval-level energy usage data provides
10 customers with information that they can use to better manage their electric loads,
11 especially in response to time-varying price signals. This allows customers to make
12 changes that, when aggregated, could provide significant system benefits in the
13 form of demand reductions during specific times.

14 The incentive for the customers to make a behavioral change to reduce their
15 demand at certain times could be pricing signals through a TVR offering (e.g., a
16 peak time rebate for reductions during peak periods). The AMF meter would
17 provide both the capability to offer a TVR power supply product and the ability for
18 the meter to send pricing signals to the customer and/or the customer's load
19 management connected devices.

1 More specifically, the ability to offer a TVR pricing plan will increase customer
2 value for participants with load shifting technology (such as participants in the
3 Compact's proposed thermal storage offering) and encourage increased
4 participation in future demand response and load shifting programs, which results in
5 associated benefits from reduction in peak demand, including demand optimization
6 and possibly the deferment of infrastructure upgrades associated with peak demand
7 growth.

8 This combination of near-real-time, interval-level usage information and ability for
9 the customer to have a TVR both allows and motivates the customer to play a role
10 in optimizing system demand, and so the Compact would like to leverage that
11 added-value to scale up its demand response initiatives.

12 **Q: Are there other benefits from AMF that are related to the implementation of**
13 **energy efficiency and demand response programs?**

14 A: Galligan: Perhaps one of the most important advantages that could be provided by
15 customer-specific interval-level metering data for all customer classes would be the
16 ability to better geo-target energy efficiency and demand response programs to
17 provide both grid-facing and customer-facing benefits that could potentially reduce
18 customer costs associated with distribution infrastructure. For example, if the
19 Compact were provided interval level metering data for all customers, the Compact
20 would be able to more effectively reduce peak loads by targeting the specific
21 customers that are contributing the most to those loads. If coupled with feeder-level

1 data from the EDC, this could enable the Compact to geo-target energy efficiency
2 and demand response customers in such a way that it could potentially defer
3 expensive upgrades to the distribution system, which are borne by all ratepayers.
4 As the PA for Cape Cod and Martha's Vineyard, energy efficiency and demand
5 response program design and implementation rests with the Compact, rather than
6 the EDC – a unique situation in Massachusetts, as noted above. As such,
7 Eversource was strongly encouraged as part of the Department's approval of the
8 Mashpee substation expansion and upgrades (D.P.U. 14-03 at 20 (April 13, 2015))
9 to work with the Compact in order to leverage the Compact's energy efficiency and
10 demand response programs to alleviate the need for infrastructure upgrades, thereby
11 benefiting all distribution customers.

12 These potential program benefits include customer-facing and grid-facing benefits
13 but rely on widespread deployment of AMF meters. As the Compact has
14 demonstrated with the success of programs like the Smart Home Energy Monitoring
15 Pilot Program (and others), customers on Cape Cod and Martha's Vineyard are
16 eager to participate and be involved in energy efficiency and demand response
17 solutions as part of a modern, reliable and efficient power system.

18 A: Downey: To add to Mr. Galligan's last point, the Compact has investigated
19 customer engagement through its Behavior Feedback Core Initiative. The Compact
20 retained independent consultants to evaluate customers' experiences and feedback
21 as part of this initiative, and the Compact has presented the results to the

1 Massachusetts PAs and the Energy Efficiency Advisory Council. The Compact
2 found high levels of customer interest in monitoring energy use and motivation to
3 save energy. In my personal experience, I have observed that many residential
4 customers on Cape Cod and Martha's Vineyard want to be able to better track their
5 energy use and to take advantage of opportunities to save money on their energy
6 bills.

7 **Q: Does this conclude your testimony?**

8 A: Yes, it does.

BULK DOCUMENT

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AFFIDAVIT OF MARGARET T. DOWNEY

Margaret T. Downey does hereby depose and say as follows:

I, Margaret T. Downey, certify that the direct testimony and exhibits submitted on behalf of the Cape Light Compact in the above-captioned proceeding, which bear my name, were prepared by me or under my supervision and are true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury.



Margaret T. Downey
Administrator, Cape Light Compact

Dated: March 10, 2017

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AFFIDAVIT OF AUSTIN T. BRANDT

Austin T. Brandt does hereby depose and say as follows:

I, Austin T. Brandt, certify that the direct testimony and exhibits submitted on behalf of the Cape Light Compact in the above-captioned proceeding, which bear my name, were prepared by me or under my supervision and are true and accurate to the best of my knowledge and belief.

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Austin T. Brandt
Power Supply Planner, Cape Light Compact

Dated: March 10, 2017

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AFFIDAVIT OF KEVIN F. GALLIGAN

Kevin F. Galligan does hereby depose and say as follows:

I, Kevin F. Galligan, certify that the direct testimony and exhibits submitted on behalf of the Cape Light Compact in the above-captioned proceeding, which bear my name, were prepared by me or under my supervision and are true and accurate to the best of my knowledge and belief.

Signed under the pains and penalties of perjury.



Kevin F. Galligan
President, Galligan Energy Consulting, Inc.

Dated: March 10, 2017