

**STATE OF RHODE ISLAND
PUBLIC UTILITIES COMMISSION**

IN RE: REVIEW OF NATIONAL GRID)
PROPOSED POWER SECTOR) DOCKET NO. 4780
TRANSFORMATION VISION AND)
IMPLEMENTATION PLAN)

**PRE-FILED DIRECT TESTIMONY OF MARK LeBEL,
ON BEHALF OF ACADIA CENTER**

Exhibit AC-PST-1

April 25, 2018

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1 **I. INTRODUCTION**

2 Rhode Island has laid out bold plans to embrace a consumer-friendly clean energy future,
3 which includes an ambitious set of utility regulatory reforms. National Grid filed, along with its
4 rate case, a Power Sector Transformation Plan, which was separately docketed here in Docket
5 4780. Acadia Center has concerns that the Power Sector Transformation Plan filed by National
6 Grid does not necessarily take the right steps to create a self-sustaining market that better
7 integrates distributed energy resources and moves Rhode Island toward a utility business model
8 aligned with consumer and environmental needs. Acadia Center also has significant concerns the
9 current procedural bifurcation of Dockets 4770 and 4780 may need to be adjusted by the
10 Commission to enable the comprehensive reforms contemplated in Order 22851 of Docket 4600
11 and the Power Sector Transformation Report issued in November 2017.

12 **II. QUALIFICATIONS**

13 **Q. Please state your name, title, employer, and business address.**

14 A. My name is Mark LeBel. I am a Staff Attorney for Acadia Center, located at 31 Milk
15 Street, Suite 501, Boston, MA 02109.

16 **Q. Please tell me more about Acadia Center.**

17 A. Acadia Center is a non-profit, research and advocacy organization committed to
18 advancing the clean energy future in the Northeast. Acadia Center is at the forefront of
19 efforts to build clean, low carbon and consumer friendly economies, and has offices in
20 cities throughout the Northeast, including Providence. Acadia Center's approach is
21 characterized by reliable information, comprehensive advocacy, and problem solving
22 through innovation and collaboration. Collectively, Acadia Center's staff has several
23 decades of experience on the impact of utility rate design on consumer adoption of
24 energy efficiency and clean energy technologies and the ability of consumers to control
25 their energy bills. Acadia Center has been active in Rhode Island and other northeastern
26 states in dockets and proceedings concerning grid modernization and utility business
27 model reform, and, in 2015, published UtilityVision: Reforming the Energy System to
28 Work for Consumers and the Environment. UtilityVision outlines specific steps needed to
29 modernize the power grid, including reforms to the utility business model, grid planning,

1 and rate-making that will guide infrastructure investments to a consumer-focused and
2 technology-friendly energy system.

3 **Q. Please summarize your work experience and educational background.**

4 A. I have been employed by Acadia Center since 2013. In my current position, I have
5 participated in policy advocacy on a wide range of topics, spanning clean transportation,
6 grid modernization and utility reform, renewable energy, and energy efficiency. More
7 specifically, I have led Acadia Center's efforts around vehicle electrification since 2014
8 and around electricity rate design and compensation for distributed energy resources
9 (DER) since 2015. Since the fall of 2017, I have co-lead Acadia Center's broader work
10 around grid modernization and utility reform across the region. Based on my work on
11 vehicle electrification, I was appointed to be a member of the Massachusetts Zero
12 Emission Vehicle Commission in 2015 and I chaired the subcommittee on Infrastructure,
13 Planning & Regulatory Issues as a part of the Rhode Island Zero Emission Vehicle
14 Working Group.

15 Prior to joining Acadia Center, I worked at Connecticut Fund for the Environment on
16 state-level energy and climate policy in 2012 and 2013. From 2007 to 2009, I worked as
17 an analyst at NERA Economic Consulting, performing economic analysis of energy and
18 environmental policies.

19 I received a J.D. from New York University in 2012. My classwork, extracurriculars, and
20 employment during law school focused on the law and economics of policies related to
21 energy and the environment, including my published note on sulfur dioxide trading and
22 the Clean Air Interstate Rule. I received my bachelor's degree in Applied Mathematics,
23 with a focus in economics, from Harvard College in 2007. A copy of my resume is
24 appended to this testimony as Exhibit AC-PST-2.

25 **Q. Have you previously testified before the Rhode Island Public Utilities Commission?**

26 A. I submitted direct testimony on rate design, return on equity, and procedural issues in this
27 case's companion docket, Docket 4770.

28 **Q. Have you provided expert testimony in other jurisdictions?**

29 A. Yes, I have provided expert testimony addressing rate design and electric vehicle
30 charging proposals in Eversource's recent rate case in Massachusetts, D.P.U. 17-05.

1 I have also provided expert testimony on National Grid’s electric vehicle market
2 development proposal in Massachusetts, D.P.U. 17-13, and on rate design issues in
3 National Grid’s recent rate case in New York, Case 17-E-0238.

4 **Q. Have you participated in other capacities in proceedings at the Rhode Island Public**
5 **Utilities Commission?**

6 A. Yes. I served as counsel for Acadia Center in Docket 4568 on electricity rate design and
7 participated in Docket 4600 on rate design issues.

8 **III. PURPOSE AND OVERVIEW OF TESTIMONY**

9 **Q. What is the purpose of your testimony in this proceeding?**

10 A. The purpose of my testimony is to describe how our energy and electric systems are
11 changing; to lay out Acadia Center’s vision for reforms needed to fully realize the
12 potential benefits of a modern energy system, including consideration of reforms to
13 utility revenue in conjunction with performance incentives; and to review selected
14 elements of National Grid’s power sector transformation investment proposals.
15 Specifically, my testimony addresses four different pieces of National Grid’s proposals:
16 (1) the proposed performance incentive mechanisms, including the need to consider them
17 in conjunction with the rate case currently docketed in Docket 4770, (2) the proposal for
18 advanced metering functionality and time-varying rates, (3) the electric transportation
19 initiative, and (4) the electric heat initiative.

20 **Q. Please summarize your conclusions regarding National Grid’s proposed**
21 **Performance Incentive Mechanisms.**

22 A. The 17 performance incentive mechanisms in four categories that National Grid proposes
23 are both over-inclusive – for instance, providing three different ways of measuring
24 distributed generation interconnection – and under-inclusive – excluding crucial metrics
25 on support for income-eligible customers and distribution system planning. While some
26 individual incentives may be appropriate, many metrics are not sufficiently related to the
27 desired policy goals and outcomes that they purport to encourage and may incentivize
28 undesired actions. The slate of performance incentive mechanisms proposed by the
29 Division in the April 6th testimony of Whited and Woolf in Docket 4770 are preferable,

1 though I also outline three amendments to this set that would improve the correlation
2 between intended policy goal and outcome.

3 **Q. What is your opinion on the proposed performance incentives and Docket 4770?**

4 A. The proposed performance incentive mechanisms need to be considered in conjunction
5 with the traditional returns on equity and revenue requirements at issue in the Rate Case,
6 currently docketed as Docket 4770. As the state’s “Rhode Island Power Sector
7 Transformation Phase One Report to Governor Gina M. Raimondo” (hereinafter “PST
8 Report”) concludes, “we recommend shifting the traditional utility business model away
9 from a system that rewards the utility for investment without regard to outcomes towards
10 one that relies more upon performance-based compensation...” PST Report¹ at 9). To
11 utilize the performance incentives to achieve transformation of the utility business model,
12 the way the utility is compensated must actually change. The PUC should consider
13 whether these (or other) performance incentive mechanisms should add performance-
14 based compensation in the same setting that it evaluates the traditional compensation
15 provided through the rate case, which should be proportionally reduced.

16 **Q. How does this implicate topics pending in Docket 4770?**

17 A. Chair Curran determined that National Grid’s proposed PST should be assigned to its
18 own docket to accommodate different testimony filing deadlines than in the rate case
19 assigned to Docket 4770. However, this procedural bifurcation should not dictate the
20 outcome of substantive issues or override Rhode Island’s larger policy goals. As the
21 performance incentive mechanisms and recovery for grid modernization improvements
22 filed in this proposed PST should impact the returns that National Grid earns otherwise, it
23 is important to consider such issues in the rate case docket.

24 **Q. Please summarize your conclusions regarding National Grid’s proposals related to
25 advanced metering functionality and time-varying rates.**

26 A. A rollout of advanced metering functionality (“AMF”) could be a productive investment
27 for Rhode Island, particularly if the costs are shared with other jurisdictions. Significant
28 rate innovations should also be implemented on a phased and strategic schedule to secure
29 the benefits of AMF. National Grid should make opt-in time-of-use rates available for

¹ Available at: http://www.ripuc.org/utilityinfo/electric/PST%20Report_Nov_8.pdf

1 residential and C&I rate classes as soon as possible, with significant outreach, education
2 and customer tools to achieve a reasonable adoption rate. Once AMF has been deployed,
3 it would be appropriate to transition most customers to opt-out time-varying-rates.
4 Finally, AMF deployment should come with appropriate customer protections, such as
5 protective standards that prevent remote disconnection of low-income and vulnerable
6 consumers.

7 **Q. Please summarize your conclusions regarding National Grid’s Electric**
8 **Transportation Initiative proposal.**

9 A. Among the five programs that National Grid proposes in its Electric Transportation
10 Initiative, none are ready to implement as proposed. The make-ready portion of the
11 charging station demonstration program, with site-selection targeted at multi-family
12 housing, income-eligible communities, public transit stations and public fast charging
13 would utilize the role of the utility to address market failures in the deployment of
14 electric vehicle charging stations. The off-peak charging rebate pilot carries far too high
15 administrative costs, and a similar effect could much more easily be achieved with
16 technology-neutral time-of-use rates. The demand charge discount pilot and education
17 and outreach programs have identified barriers to deployment, but should be significantly
18 improved and focused to better address specific reforms.

19 **Q. Please summarize your conclusions regarding National Grid’s Electric Heat**
20 **Initiative.**

21 A. National Grid proposes an Electric Heat Initiative with the goal of meaningfully
22 accelerating heat electrification through multiple market development strategies.
23 However, the small number of incentives and small scope of market development
24 strategies proposed are unlikely to create significant impact or achieve market
25 transformation. Acadia Center’s own analysis supports a more reasonable trajectory
26 towards achieving 1% yearly conversion rate by 2022. More work should be done to
27 identify the full scope of market barriers that are preventing the adoption of heat pumps
28 and design a proposal that addresses these barriers.

29

1 **IV. THE CHANGING ENERGY SYSTEM AND NECESSARY REFORMS**

2 **Q. What are the emerging trends in the energy system that are relevant to this**
3 **proceeding?**

4 A. Electric customers increasingly have access to new, lower-cost technologies that enable
5 clean, local generation, electrification of vehicles and heating, and greater customer
6 engagement. Customers are no longer just passive consumers of electricity and have even
7 greater potential to help shape a cleaner, lower cost energy system through their
8 investment decisions and behaviors. To fully realize this potential, updated regulations
9 are needed to align the utility’s financial interests with the interests of consumers and a
10 sustainable energy system. Rhode Island recently explored how policy and regulatory
11 change can enable utilities to become full partners, remove barriers to the deployment of
12 clean energy resources, and advance consumer choice and control through the Power
13 Sector Transformation process and Docket 4600. Such changes are needed to accelerate
14 the pace at which the energy system shifts to a more decentralized model with significant
15 levels of local, distributed energy resources.

16 **Q. How can energy efficiency and clean distributed generation benefit consumers and**
17 **the grid?**

18 A. Investing in clean, local energy resources like energy efficiency and distributed solar PV
19 helps avoid expensive distribution, transmission, and large-scale generation investments,
20 and provides economic benefits, including good local jobs. It is well-documented that
21 energy efficiency investments have allowed the region to defer and potentially avoid
22 major transmission upgrades. “Accounting for Big Energy Efficiency in RTO Plans and
23 Forecasts: Keeping the Lights on While Avoiding Major Supply Investments,” provides a
24 summary of transmission projects deferred due to energy efficiency in New England. I
25 submit this document as Exhibit AC-PST-3.
26 Similarly, the Tiverton/Little Compton pilot project in Rhode Island, the
27 Brooklyn/Queens Demand Management Project in New York, and the Boothbay Smart
28 Grid Reliability Project in Maine are real world examples of local clean energy resources
29 deferring or avoiding upgrades to the distribution grid. There are additional examples

1 from California and New Jersey in which distributed generation has deferred or avoided,
2 or is predicted to defer or avoid, distribution or transmission system investments.

3 **Q. How will ratepayers, citizens, and states benefit from the changing energy system?**

4 A. In addition to empowering consumers and communities, the transition to a modern, low-
5 carbon energy system will generate significant public health, environmental, and
6 economic benefits. Acadia Center assessed the greenhouse gas (GHG) emissions
7 reduction potential from transitioning to a low-carbon energy system, and the results are
8 presented in “EnergyVision: A Pathway to a Modern, Sustainable, Low Carbon
9 Economic and Environmental Future.”² The analysis shows that if the Northeast were to
10 electrify all passenger vehicles and homes heated with fossil fuels, GHG emissions from
11 these sources would be cut in half, even with today’s predominately fossil-fueled electric
12 generation. By also maximizing energy efficiency and deploying new technologies and
13 renewable resources, the region can achieve long-term GHG emissions reductions targets
14 of 80% below 1990 levels by 2050.

15 **Q. How can Rhode Island’s policies and regulations put it on a path for path for such a
16 future?**

17 A. Acadia Center’s EnergyVision 2030, submitted as Exhibit AC-PST-4, describes in detail
18 how seven Northeast states can be on a pathway towards a reliable, consumer-oriented
19 clean energy future that meets a goal to reduce climate pollution at least 45% from 1990
20 levels by 2030.³ The Resilient Rhode Island Act sets targets to reduce climate pollution
21 45% from 1990 levels by 2035 on the way to an 80% reduction from 1990 levels by
22 2050. Using a data-driven approach, EnergyVision 2030 sets technology-specific targets
23 in four key clean energy markets—grid modernization, electric generation, buildings, and
24 transportation—and proposes supporting policies to achieve those goals.
25 Acadia Center concludes, in its Rhode Island-specific Progress Report, that while Rhode
26 Island has ambitious renewable energy and greenhouse gas reduction goals and continues
27 to be a regional and national clean energy leader in some areas, to build a low-carbon
28 energy system, the state must excel across all policy areas. I submit the Rhode Island

² EnergyVision available at <https://acadiacenter.org/document/energyvision/>.

³ EnergyVision 2030 available at: <http://2030.acadiacenter.org/>

1 Progress Report as Exhibit AC-PST-5. As it describes, to reach EnergyVision 2030 goals,
2 the state should strengthen efforts to modernize the grid through current regulatory
3 proceedings and proposed legislation; expand the Renewable Portfolio Standard and
4 eliminate barriers to adoption of solar PV; continue to adopt all cost-effective energy
5 efficiency and increase support for switching to heat pumps; and continue to incentivize
6 and remove barriers to purchasing and using electric vehicles. If Rhode Island follows
7 these policy recommendations, it will be on its way to a clean energy future.

8 **Q. Has Acadia Center explored how to reform utility regulation to realize the benefits**
9 **of a modern, low-carbon energy system?**

10 A. In February 2015, Acadia Center released “UtilityVision,” a framework for reforms to
11 utility regulation to move towards a fully integrated, flexible, and low carbon electric grid
12 that empowers and protects consumers. I submit this document as Exhibit AC-PST-6.
13 The three categories of reforms are: (1) comprehensive, proactive, and coordinated
14 planning for the electric grid; (2) updated roles for regulators, utilities, and stakeholders;
15 and (3) fair pricing and consumer protection for all.

16 **Q. What aspects of UtilityVision are relevant to the current proceeding?**

17 A. Nearly every aspect of UtilityVision is implicated in the Rhode Island PST report and
18 National Grid’s PST proposals. More specifically, National Grid is requesting approval
19 of multiple new types of investment, special cost recovery, performance incentives, and a
20 transition to time-varying rates. Newly proposed investments also must be within the
21 proper role of the utility as a distribution company. National Grid’s proposed investments
22 in advanced metering functionality also comes along with a proposal for opt-out time-
23 varying rates beginning in 2023, with a year of customer education in advance.

24 **Q. Has Rhode Island taken any significant steps towards this long-term vision?**

25 A. Yes. In Docket 4600 and the Power Sector Transformation report from November 2017,
26 the PUC, Office of Energy Resources (“OER”), the Division of Public Utilities and
27 Carriers (“Division”), and Rhode Island stakeholders laid out pathways to achieve major
28 reforms to the electricity sector. In Docket 4600, the Commission ultimately endorsed
29 several categories of recommendations, including rate design principles, a benefit-cost
30 framework, and goals of the future electric system. In the Power Sector Transformation

1 report, the interagency team, primarily OER and the Division, made a wide range of
2 innovative recommendations for utility reform that Acadia Center enthusiastically
3 endorses.

4 **Q. What goals should proposals to transform the electric system strive to meet?**

5 A. In Docket 4600, the PUC adopted eight goals that the new electric system should be able
6 to accomplish, and new proposals should further. These goals are:

- 7 • Provide reliable, safe, clean, and affordable energy to Rhode Island customers over the
8 long term (this applies to all energy use, not just regulated fuels);
- 9 • Strengthen the Rhode Island economy, support economic competitiveness, retain and
10 create jobs by optimizing the benefits of a modern grid and attaining appropriate rate
11 design structures;
- 12 • Address the challenge of climate change and other forms of pollution;
- 13 • Prioritize and facilitate increasing customer investment in their facilities (efficiency,
14 distributed generation, storage, responsive demand, and the electrification of vehicles and
15 heating) where that investment provides recognizable net benefits
- 16 • Appropriately compensate distributed energy resources for the value they provide to the
17 electricity system, customers, and society;
- 18 • Appropriately charge customers for the cost they impose on the grid;
- 19 • Appropriately compensate the distribution utility for the services it provides;
- 20 • Align distribution utility, customer, and policy objectives and interests through the
21 regulatory framework, including rate design, cost recovery, and incentives.

22 **Q. How do the current utility revenue model and grid planning practices inhibit the**
23 **transition to a modern, distributed energy grid?**

24 A. A common way for utilities to earn revenue is by making capital investments on which
25 the utility earns a specified rate of return set by regulators. This system gives utilities
26 incentives to build or upgrade traditional infrastructure projects. This model is
27 increasingly at odds with new technologies that can optimize the energy system and with
28 public policy goals to increase energy efficiency and consumer adoption of distributed
29 energy technologies. As noted in the Power Sector Transformation report, there are five
30 key ways in which the traditional regulatory model's emphasis on utilities earning return

1 on investments based on the cumulative depreciated cost of the prudent capital
2 investments inhibits reforms. The first is creating a “capital bias” for a utility to deploy
3 capital-intensive solutions, rather than seeking more efficient solutions that can manage
4 system efficiency, or the ratio of peak to average demand. The second is inhibiting a
5 utility from innovating by making it both reluctant to invest in innovative technologies
6 for fear the investment might not be deemed prudent, and reluctant to remove
7 technologically obsolete systems and that require a financial loss for the un-depreciated
8 portion. One-year rate cases also provide a disincentive for a utility to incur non-capital
9 expenses in one year that only yield savings in later years. Third, distributed energy
10 resources require bi-directional energy flow, which can be poorly supported by both the
11 grid infrastructure and by the rate structure. Fourth, although a modernized electric
12 system will strongly rely on data connectivity and robust networks, a utility’s “capital
13 bias” may inhibit it from undertaking the investment in software and cloud services and
14 developing the organizational structure and capabilities needed to undertake the
15 information-oriented functions that will be key to future system savings. Finally, since a
16 utility neither benefits nor is penalized as customers’ electricity supply costs increase, it
17 has no direct incentive to lower that portion of ratepayers’ bills by maximizing
18 integration of DER, even if that is consistent with the state’s Least-Cost-Procurement
19 statute and in the public interest.

20 **Q. Please describe Acadia Center’s principles for reforming grid planning.**

21 A. Historic principles for grid planning have important elements, but implicit or explicit
22 benefit-cost analysis frameworks for grid planning should be examined and updated as
23 appropriate to reflect a state’s consumer, energy, and environmental goals. Distribution
24 company investments that create new values for consumers and society by enhancing
25 consumer choice and improving environmental performance or affordability are not
26 incentivized by the historic regulatory model; Rhode Island needs new regulatory
27 frameworks that do incentivize utilities to provide these crucial values. These new
28 regulatory frameworks can include more favorable cost recovery rules, but must come
29 with additional public interest protections, such as benefit-cost analysis, a robust
30 stakeholder process, and performance metrics and incentives that hold utilities

1 accountable. Newly proposed investments also must be within the proper role of the
2 utility as a distribution company. Conversely, traditional distribution company
3 investments for load growth or other purposes should be examined to determine whether
4 the need can be met more efficiently by clean local energy resources. Comprehensive,
5 multi-year grid plans can help identify system needs earlier and find optimal solutions
6 across multiple dimensions of electric system needs and state policy goals.

7 **Q. Please describe the new benefit-cost framework approved in Docket 4600.**

8 A. The PUC Guidance Document in Docket 4600 adopted the new Rhode Island Benefit-
9 Cost Framework, as laid out in Appendix B of the Docket 4600 Stakeholder Report. This
10 framework is often referred to as the “RI Test”. The RI Test includes 34 categories of
11 benefits and costs, covering “specific ISO-New England wholesale and Rhode Island
12 retail market benefits and costs; various distribution system impacts; risk, uncertainty,
13 and option value; direct environmental compliance costs, as well as, societal level
14 externalities; customer, utility, and societal low-income customer impacts; and qualitative
15 consideration of impacts on customer choice and empowerment.” Stakeholder Report at
16 6. Significant work is needed to fully realize and quantitatively evaluate all of these
17 categories, and methodologies will have to be developed over time, as recognized by the
18 PUC. Docket 4600-A guidance document at 6. The PUC also correctly recognized that
19 the benefit-cost framework is not fully determinative, and statutory mandates and
20 qualitative considerations are often significant. Id. at 7.

21 **Q. Is the RI Test consistent with Acadia Center’s concepts for benefit-cost analysis?**

22 A. Yes, absolutely.

23 **Q. Does UtilityVision offer recommendations for how to align utility incentives with
24 consumer and environmental goals?**

25 A. Yes. Because reforms to the utility business model are needed to enable utilities to be full
26 partners in achieving a state’s consumer and environmental goals, UtilityVision offers
27 several high-level recommendations for steps that regulators can take to reward utilities
28 for achieving energy efficiency and clean energy goals, minimizing the cost of the grid,
29 and providing choices, opportunities, and control to consumers. First, states should
30 implement full revenue decoupling to reduce a utility’s financial disincentive to invest in

1 energy efficiency, distributed generation, or other initiatives that reduce consumption of
2 grid power. UtilityVision recognizes that decoupling only partially addresses the utility's
3 disincentive to promote these initiatives, and further reforms are necessary to encourage
4 full and timely implementation of policies to achieve a state's consumer and
5 environmental goals. The next recommendation is that comprehensive, multi-year grid
6 plans inform the amount of future revenue a utility is allowed to earn. States can also
7 adopt performance incentive mechanisms and standards to motivate utilities to advance
8 priorities such as system efficiency, grid enhancements, distributed generation, energy
9 efficiency, and other consumer and environmental goals. By increasing the portion of
10 revenue requirements recovered through performance incentives, while reducing the
11 portion of revenue that is linked to the rate base, performance incentive mechanisms help
12 shift the financial incentive towards achieving performance goals. The utility must still be
13 provided a reasonable opportunity for a fair rate of return on traditionally regulated
14 capital investments. UtilityVision also recommends that regulators clarify how new
15 technologies and innovative utility investments interact with the criteria that determine
16 whether the utility can recover its costs and returns.

17 **Q. Are there other recommendations on reforming the utility business model that**
18 **should be noted here?**

19 A. In "The Old Order Changeth: Rewarding Utilities for Performance, Not Capital
20 Investment," Scudder Parker from the Vermont Energy Investment Corporation and Jim
21 Lazar from the Regulatory Assistance Project describe a potential way to transition from
22 rate-of-return regulation to direct performance regulation. The authors identify three tiers
23 of utility performance incentives and offer a phased approach to move from a system
24 based on a rate of return on equity and recovery of allowed costs, with attainable adders
25 for specified objectives to long-range performance incentives tied to a major portion of
26 future performance reward. I submit this paper as Exhibit AC-PST-7.

27 The New York Public Service Commission also comments on the limits of traditional
28 utility revenue models and the need for reform in its Order Adopting A Ratemaking and
29 Utility Revenue Model Policy Framework in Case 14-M-0101. (May 19, 2016). The
30 Commission discusses that dynamic efficiency (i.e. forward-looking investment

1 efficiency) is least well-served by the current framework for ratemaking. In the Order, the
2 PSC takes several steps to design a regulatory model that they believe will better advance
3 New York’s clean energy and consumer objectives. The PSC’s proposed model provides
4 new revenue and earnings opportunities for utilities based on performance or desired
5 outcomes, instead of capital investment.

6 **Q. Do these recommendations align with the Power Sector Transformation**
7 **recommendations?**

8 A. Yes. All of them conclude that multi-year rate plans with targeted performance incentive
9 mechanisms shifting the financial incentive toward performance goals are the reasonable
10 next step to transform utility business models. The PST report specifically recommended
11 addressing these two goals through a two-part proposal – a multi-year rate plan that sets a
12 revenue cap and creates an incentive for the utility to manage costs and share savings
13 between the shareholders and customers; and a set of performance incentive mechanisms
14 that offer financial incentives based on performance against defined metrics.

15 **Q. What specific components of a multi-year rate plan did the Power Sector**
16 **Transformation recommend?**

17 A. The PST report recommended that the Company file a Business Plan that represents a
18 system-wide integrated distribution plan identifying the least-cost portfolio of distribution
19 system investments and covering all initiatives and costs for the next 3-5 years. After
20 approval of capital costs and non-capital costs in the rate case, the utility would absorb
21 the difference if it spent more than budgeted or keep the difference if it is able to spend
22 less (except for the annual ISR process providing an exception for issues crucial to
23 system reliability that were not reasonably foreseeable at the time of the MRP).

24 **Q. Please describe Acadia Center’s principles for reforms to rate design and DER**
25 **compensation.**

26 A. Based on UtilityVision, Acadia Center has articulated the following four principles:

- 1 1. Monthly customer charges should be no higher than the cost of keeping a
2 customer connected to the grid and the related customer service but can be kept
3 lower based on public policy considerations.
- 4 2. Other components of electricity rates can be reformed to better align customer
5 incentives with cost drivers and the value they can provide to the system.
- 6 3. Ratepayers must be able to understand significant reforms and have a basis on
7 which to respond and manage bills.
- 8 4. Self-generation consumed on-site should be treated the same as reductions in
9 energy usage.

10 Further details on principles for rate design are found in my testimony in the companion
11 docket for the National Grid rate case, Docket 4770.

12 **Q. What does Rhode Island law require the PUC to consider in evaluating rate design?**

13 A. Pursuant to R.I. Gen. Laws § 39-26.6-24(b), the factors to be considered in rate design
14 are: (1) The benefits of distributed-energy resources; (2) The distribution services being
15 provided to net-metered customers when the distributed generation is not producing
16 electricity; (3) Simplicity, understandability, and transparency of rates to all customers,
17 including non-net metered and net-metered customers; (4) Equitable ratemaking
18 principles regarding the allocation of the costs of the distribution system; (5) Cost
19 causation principles; (6) The General Assembly's legislative purposes in creating the
20 distributed-generation growth program; and (7) Any other factors the PUC deems
21 relevant and appropriate in establishing a fair rate structure.

22 **Q. How has the PUC interpreted this section?**

23 A. To guide its review of National Grid electric rates, the PUC adopted goals, updated rate
24 design principles, and a new Rhode Island Benefit-Cost Framework through Docket
25 4600.

26 **Q. What are the updated rate design principles that the PUC adopted in that docket?**

27 A. As stated in Guidance Document 4600-A, a proposed rate design may be found
28 reasonable if it does the following:

- 29 • Ensures safe, reliable, affordable, and environmentally responsible electricity service
30 today and in the future;

- 1 • Promotes economic efficiency over the short and long term;
- 2 • Provides efficient price signals that reflect long-run marginal cost;
- 3 • Identifies future rates and rate structures that appropriately addresses “externalities” that
4 are not adequately counted in current rate structures;
- 5 • Empowers consumers to manage their costs;
- 6 • Enables a fair opportunity for utility cost recovery of prudently incurred costs and
7 revenue stability;
- 8 • Ensures that all parties should provide fair compensation for value and services received
9 and should receive fair compensation for value and benefits delivered;
- 10 • Constitutes a design that is transparent and understandable to all customers;
- 11 • Ensures that any changes in rate structures are be implemented with due consideration to
12 the principle of gradualism in order to allow ample time for customers (including DER
13 customers) to understand new rates and to lessen immediate bill impacts;
- 14 • Provides opportunities to reduce energy burden, and address low income and vulnerable
15 customers’ needs;
- 16 • Ensures consistency with policy goals (e.g. environmental, climate (Resilient Rhode
17 Island Act), energy diversity, competition, innovation, power/data security, least cost
18 procurement, etc.);
- 19 • Evaluates rate structures based on whether they encourage or discourage appropriate
20 investments that enable the evolution of the future energy system.

21 The PUC recognizes that no one rate design proposal may advance each principle listed
22 above, but each should be addressed so that the PUC can appropriately balance the
23 interests of all parties in setting just and reasonable rates across rate classes and
24 programs.

25 **Q. Do you believe the Commission’s principles from 4600-A are consistent with Acadia
26 Center’s principles?**

27 **A.** Yes, I believe they are consistent.

1 **Q. Please describe Acadia Center’s long-term vision for rate design and DER**
2 **compensation from UtilityVision.**

3 A. In the long term, customers should be charged for the products and services they receive
4 and credited for the products and services they provide on a granular basis. Charges
5 should reflect equitable recovery of costs for use of the distribution grid. Credits for
6 exports and other services should reflect the net value, including both benefits and costs
7 to the system. This vision includes time-varying charges and credits for energy supply,
8 transmission, and distribution. There could be charges and credits for new retail-level
9 markets and products and additional values related to the environment and public health
10 could be reflected as well. All charges and credits, except those that reflect any
11 environmental or public health values, should be on a technology-neutral basis. It may
12 also include well-designed demand charges that are focused around local or system
13 peaks. For customers with distributed generation or storage, netting of energy imports
14 and exports would occur on a granular basis, instead of the current practice of monthly
15 netting for many types of customers.

16 **Q. Are there other public policy goals that must be met in this long-run vision?**

17 A. Yes. In addition to the rate design principles discussed above, this long-term vision also
18 includes increased customer control over energy costs and equitable access to clean
19 energy options, such as community solar.

20 **Q. Would this long-term vision apply to all customers?**

21 A. Not necessarily. Keeping certain consumer segments, such as low income, on simpler
22 rate structures may be justified by both economics and consumer protection principles.

23 **Q. Please describe any hurdles to this long-term vision.**

24 A. There are many reasons why this long-term vision cannot be set up overnight. It will
25 require advanced metering functionalities, billing system upgrades, energy management
26 technologies that are affordable for small customers, significant customer education
27 efforts, and processes to fairly determine the charges and credits for distinct types of
28 products and services. Statutory changes, notably to net metering structures, may also be
29 necessary to implement certain reforms.

1 **Q. Given this long-term vision, how does Acadia Center approach the short- and**
2 **medium-terms?**

3 A. Acadia Center believes that reforms in the short- and medium-terms must take steps
4 towards this long-term vision and satisfy the relevant rate design principles and public
5 policy goals. Gradualism and customer understanding are also key to implementing
6 reforms. Rate reforms can be phased in, and customer protections like “shadow billing,”
7 where customers can see what their bill would be under different rate structures, and
8 “hold-harmless periods,” where customers can only benefit from new rate structures, are
9 helpful transition tools. Metering costs and billing system upgrades must also be
10 considered in the short- and medium-terms.

11 **Q. Has Acadia Center proposed a set of short-term reforms?**

12 A. Yes. The Acadia Center document “Sustainable Rate Design: Near-Term Consumer-
13 Friendly Reforms for a Clean Energy Future,” attached as Exhibit AC-PST-8, lays out
14 five near-term steps that states across the region can take to begin to make rate design and
15 DER compensation fairer and more accurate, while maintaining or improving incentives
16 for energy efficiency and access to clean energy:

- 17 1. Limit reliance on fixed customer charges;
- 18 2. Implement Acadia Center’s “distribution reliability charge”⁴ proposal to begin to
19 account for any proven cross-subsidies due to distributed generation installed by
20 small customers;
- 21 3. Offer opt-in time-of-use rates;
- 22 4. Enable or maintain virtual net metering for community distributed generation,
23 with a robust low-income component; and
- 24 5. Begin to align net metering credits with ratepayer value and remove caps on net
25 metering.

26 **Q. What key issues are addressed by these proposed short-term reforms?**

27 A. These short-term reforms reflect gradualism, minimal additional metering costs and
28 billing system upgrades, and several incremental steps to better reflect the costs and
29 benefits of customer consumption patterns and exports from distributed generation. One

⁴ <https://acadiacenter.org/document/distribution-reliability-charge-transitioning-to-sustainable-rate-design/>

1 step of particular relevance in a distribution rate case is the beginning of a process to
2 unbundle distribution system costs, or otherwise distinguish between (1) the full
3 embedded costs of the distribution system that must be recovered by the utility, and
4 (2) the value of exported energy to the distribution system. Such a process is key to
5 establishing the proper level of the distribution reliability charge.

6 **Q. How does this apply in Rhode Island and other states in the region?**

7 A. Each state in the region is in a different place on these issues. For example, Rhode Island
8 currently has lower residential customer charges than Connecticut. Rhode Island is
9 having some success offering community DG, but Massachusetts has more. However,
10 unlike in Rhode Island, both Connecticut investor-owned utilities offer opt-in time-of-use
11 rates for all residential customers. Similarly, only New York has taken definitive steps to
12 align net metering credit structures with ratepayer value.

13 **Q. Has Acadia Center proposed concepts for medium-term reforms?**

14 A. Acadia Center is beginning to explore concepts for medium-term reforms. This could
15 include:

- 16 1. Default time-of-use rates for certain categories of customers, including time-of-
17 use netting for distributed generation customers;
- 18 2. Charging for embedded distribution system costs and public policy costs for
19 imports and crediting for value to the distribution system for exports;
- 20 3. Incremental avoided environmental and public health compliance costs can be
21 credited for exports on a technology-specific basis; and
- 22 4. Charges and credits corresponding to other portions of the electric system
23 (energy, capacity, and transmission) can be symmetric for imports and exports.

24 Such steps would logically link short-term steps with Acadia Center's long-term vision.
25 Default time-of-use rates and time-of-use netting is a significant step beyond current
26 practices, particularly for DG customers for whom monthly netting is currently the norm.
27 These medium-term reforms would require substantial processes to unbundle distribution
28 values and determine other appropriate credits and charges by time-of-use period and by
29 technology as appropriate.

1 **Q. Must reforms to rate design and DER compensation follow a specific sequence?**

2 A. Each individual reform has prerequisites for implementation, but not every state will need
3 to make each stop along the way. In other words, some jurisdictions may be able to skip
4 straight to reforms that I would describe as medium-term, or some may adopt short term
5 reforms for a number of years before adopting long-term reforms. Lastly, states may be
6 able to apply more advanced reforms to certain customers, primarily larger C&I
7 customers, on a shorter timetable.

8 **V. REVIEW OF NATIONAL GRID'S PROPOSED PERFORMANCE**
9 **INCENTIVES**

10 **Q. What are Performance Incentive Mechanisms?**

11 A. Performance incentive mechanisms provide a method of compensating utilities for
12 achieving specific objectives in performance areas. As Acadia Center stated in
13 UtilityVision, performance incentives can be used to ensure that utility management is
14 aligned with state policy and should address goals that provide clear benefits to
15 ratepayers and the State of Rhode Island. By increasing the portion of revenue
16 requirements recovered through performance incentives while reducing the portion
17 recovered from the rate base, performance incentives help shift the financial incentive
18 away from capital investments and towards achieving consumer-friendly outcomes. As
19 utilities, state agencies, and stakeholders get more comfortable with increasing the value
20 of delivery of benefits to customers, such as savings and carbon reductions, it will create
21 a positive feedback loop. However, even when fully effectuated, the incentive payment
22 must not exceed the value of the results.

23 **Q. Did National Grid propose performance incentives in its PST Plan?**

24 A. Yes. The Company is seeking approval of 17 new performance incentive mechanisms in
25 four categories: 1) Capital Efficiency; 2) System Efficiency; 3) Distributed Energy
26 Resources; and 4) Network Support Services. It is also seeking approval of the
27 individual metrics, measurement methodologies, targets, and associated basis points of
28 earning opportunity.

1 **Q. What did you recommend in your testimony in Docket 4770 about which docket**
2 **should contain the proposed performance incentives?**

3 A. I testified in my April 6th testimony in Docket 4770 that the PUC should reintegrate into
4 Docket 4770 the portions of this Docket 4780 that propose to change the utility's
5 business model and compensation, such as performance incentive mechanisms. By
6 considering those proposals in the rate case that sets the rest of National Grid's
7 compensation, the PUC can appropriately balance the levels of compensation between the
8 multiple sources. In doing so, the PUC can set National Grid on the path to utility
9 business model reform.

10 **Q. Did you evaluate National Grid's proposed performance incentive mechanisms in**
11 **your testimony in Docket 4770?**

12 A. I did not. To keep my evaluation of the substance of National Grid's PST proposal
13 unified, I chose to evaluate the proposed performance incentive mechanisms in this
14 docket, along with the PST investment proposals to which they relate. However, I
15 continue to believe that the performance incentive mechanisms should be integrated into
16 Docket 4770 and am happy to supplement my testimony in Docket 4770 if needed.

17 **Q. How should performance incentives be used?**

18 A. In "The Old Order Changeth," the authors recommend three tiers of utility performance
19 incentives: (1) "guiding" incentives that set long-term goals and foster integration and
20 coordination of services; (2) "directional" incentives, correlated to the guiding incentives,
21 and (3) "operational" incentives, to assure customer service and reliability. Ex. AC-PST-
22 6, at 6-1. As an initial step towards this system, this proceeding might start with a
23 lowered rate of return on equity and recovery of allowed costs, plus "attainable adders for
24 (1) maintaining reliable service and (2) attaining intermediate objectives (via AMI
25 adoption, effective demand response, improved planning, integration of distributed
26 resources.)" *Id.* at 6-10. These adders take a different form than the overarching
27 incentives – earning rewards for creating a plan or improving forecasting in the short-
28 term.

1 **Q. What principles should guide the implementation of performance incentive**
2 **mechanisms?**

3 A. In Synapse Energy Economics' "Utility Performance Incentive Mechanisms: A
4 Handbook for Regulators"⁵ the authors established principles that correlate to the steps of
5 creating performance incentive mechanisms, including (a) identifying policy goals; (b)
6 establishing metrics; (c) establishing performance targets; and (d) establishing rewards
7 and penalties. The principles for establishing policy goals include:

- 8 • Articulate policy goals
- 9 • Recognize financial incentives in the existing regulatory system
- 10 • Design incentives to modify, supplement or balance existing incentives
- 11 • Address areas of utility performance that have not been satisfactory or are not adequately
12 addressed by other incentives

13 The performance incentive mechanisms themselves are then clearly defined and tied to
14 the policy goals. *See also* Woolf/Whited Direct Testimony, Docket 4770, April 6, at 20-
15 21.

16 **Q. Do these principles mean that performance incentive mechanisms should only**
17 **reward utilities for undertaking innovation or exploring new areas of utility**
18 **performance?**

19 A. No. Performance incentive mechanisms can be useful for addressing areas where utilities
20 have historically not acted or not satisfactorily performed, but the concept of performance
21 incentives should not be used to penalize forward-looking utilities or early adopters of
22 consumer-friendly technology. As stated above, the performance incentive mechanisms
23 should lead from the policy goals, and incentives should modify, supplement or balance
24 existing incentives. It is entirely appropriate for a performance incentive mechanism to
25 supplement an existing undertaking of a utility, as long as the policy goal is advanced,
26 and the incentives do not compete or double-reward the utility. Even with this caution
27 against double compensation, however, depending on how significantly an area has been
28 ignored under existing incentive and regulatory structures, a combination of an outcome-

⁵ Available at: http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098_0.pdf.

1 based performance incentive mechanism and supplemental adders to reward intermediate
2 steps may also be appropriate.

3 **Q. What principles did National Grid use in developing this performance incentive**
4 **proposal?**

5 A. National Grid reports that it followed these principles while designing the proposed
6 performance incentive mechanisms:

- 7 • Establish incentives that will appropriately reward the Company for successful delivery
8 of activities, programs, investments, and outcomes that are foundational to power sector
9 transformation;
- 10 • Align, to the extent possible, with the proposed performance incentive mechanisms in the
11 Power Sector Transformation Phase One Report; and
- 12 • Assign values to individual performance incentive mechanisms based on a combination
13 of (1) relevance to developing a foundation for transforming the power sector in the near
14 term, and (2) the associated benefits or savings to customers due to the activity
15 encouraged by the incentive. PST Testimony at 88.

16 **Q. Do you think these principles are reasonable and align with the ones you articulate**
17 **above?**

18 A. I do, however I believe there is still a disconnect between how the Company defines the
19 policy goals that are foundational to the power sector transformation, and how other
20 stakeholders defined it through the PST process and report.

21 **Q. What is your overall impression of the performance incentive mechanisms proposed**
22 **by the Company?**

23 A. Taken together, the proposed performance incentive mechanisms are both over-inclusive
24 – for instance, providing three different ways of measuring how quickly and accurately
25 the utility can connect DER – and under-inclusive – excluding crucial metrics
26 recommended in the PST Report such as access to customer information, support for
27 income-eligible customers, and distribution system planning. Some individual incentives
28 are suitable, but others suffer from critical design flaws that may incentivize the wrong
29 behavior. Finally, several metrics are not sufficiently related to the desired policy goals
30 and outcomes they purport to encourage.

1 **Q. What specific issues do you have with the Capital Efficiency performance incentive**
2 **mechanisms?**

3 A. For both of its proposed “Capital Efficiency” incentives – the Complex Capital Projects
4 Capital Cost Incentive and the Construction Costs Per Mile Productivity Incentive –
5 National Grid is proposing to retain some percentage of the savings between an average
6 budgeted spend under the ISR and the actual expenditure. I have three concerns about
7 these performance incentive mechanisms. First, the incentive is asymmetrical, delivering
8 a reward if the Company’s behavior can save money from the estimates, but no penalty if
9 they spend more than budgeted (as occurs at least as often, per Attachment DIV-1-29).
10 Second, they provide an incentive for the Company to overestimate its costs through the
11 ISR process. Regardless of whether the Company would act in response to that incentive,
12 this runs counter to the objectives of aligning consumer and utility interests. Third, if the
13 intent of these incentives is to drive the Company to explore more inexpensive, non-wires
14 alternatives (“NWAs”) there are more direct ways to drive that behavior – for instance,
15 providing a performance incentive mechanism based on the percentage of complex
16 capital projects meeting criteria for exploration of NWAs in which an NWA option is
17 chosen.

18 **Q. What specific issues do you have with the System Efficiency performance incentive**
19 **mechanisms?**

20 A. National Grid proposes three system efficiency performance incentive mechanisms, two
21 of which – Monthly Transmission Peak Demand Reduction and Forward Capacity
22 Market Peak Demand Reduction – it proposes to measure as year-over-year reductions.
23 Measurement relative to a baseline that accounts for other drivers of peak demand, as
24 proposed by the Division, makes far more sense. Mere year over year reductions might
25 reward the Company for reductions that have no correlation with its activities.
26 The other performance incentive mechanism that National Grid proposes under this
27 category is the number of participants in the Off-Peak Charging Rebate Pilot. As I note
28 below in my testimony on the electric vehicle proposal, this pilot is likely not worth
29 pursuing. Consequently, there is no need for a correlating metric. Should the PUC
30 determine that the policy goal of furthering off-peak EV charging is sufficiently

1 important to drive an incentive, offering opt-in time of use rates and designing a
2 performance incentive mechanism based on the percentage of EV load that is charged
3 during off-peak hours may be a more effective way of both measuring and incentivizing a
4 successful program.

5 **Q. What issues do you have with the remaining performance incentive mechanisms?**

6 A. Many of the remaining performance incentive mechanisms do not correlate well with the
7 policy goals which they are intended to support. For instance, National Grid's proposed
8 metric for their EV initiative is the incremental increase above predicted levels of
9 personal EVs in the state on an annual basis, which would both exclude the work that the
10 Company is doing to incentivize fleets, and potentially secure an incentive for factors
11 entirely outside of the Company's control. Many of the network support services
12 performance incentive mechanisms are also a poor fit for correlation to the policy goals.
13 This proceeding does not need three separate metrics to track interconnection speed and
14 quality – rather, a more appropriately designed single metric. Finally, while adders for
15 interim efforts can be appropriate, the step by step rewards proposed in the AMF
16 consumer engagement and deployment are duplicative. As the Company would need to
17 complete a consumer engagement plan and commence mass-scale meter deployment
18 before it could achieve the 30% deployment and customer access point identified as
19 2021's goal, only the final goal is appropriate as an intermediate adder.

20 **Q. Have any other parties proposed a set of performance incentive mechanisms that
21 you support more?**

22 A. Yes. I far prefer the set of performance incentive mechanisms proposed by the Division
23 in the April 6, 2018 direct testimony of Tim Woolf and Melissa Whited in Docket 4770.
24 Table 2 from page 13 of their Testimony is reproduced here and provides a summary of
25 the Division's proposed performance incentive mechanisms.

Table 2. The Division’s Proposed PIMs

Type	PIM	Description
System Efficiency	Transmission Peak	Reduce monthly transmission peaks relative to forecast
	FCM Peak	Reduce annual FCM peak relative to forecast
Distributed Energy Resources	Demand Response – Res.	Increase MW enrollment in cost-effective DR
	Demand Response - C&I	Increase MW enrollment in cost-effective DR
	Electric Heat Initiative	Reduce GHG emissions relative to baseline
	Electric Vehicle Initiative	Reduce GHG emissions relative to baseline
	Behind-the-Meter Storage	Install MW of cost-effective storage
	Utility-Scale Storage	Install MW of cost-effective storage
PST Support	Non-Wires Alternatives	Procure cost-effective NWA from third-parties
	Low Income: Participation	Increase LI participation in DER initiatives
	Low Income: Enrollment	Increase customer enrollment in LI rate A60
	Customer Information	Provide key data to customers and third-parties
	Peak Demand Forecasting	Improve and expand current forecasting practices

1

2 **Q. Do you agree with this slate of performance incentive mechanisms?**

3 A. I agree with the Division’s proposed high-level categories and most of the specific
 4 proposals, but I would suggest several amendments. I believe that for electric vehicles a
 5 different metric would more accurately measure the desired outcome, and that the two
 6 demand response performance incentive mechanisms should stay tied to the energy
 7 efficiency programs that deliver them, rather than the PST process. The proposed
 8 incentives for provision of customer information and peak demand forecasting may need
 9 to be reconsidered as well.

10 **Q. What would you change from the Division’s recommendations on electric vehicles?**

11 A. As I describe in my below testimony on the electric vehicle initiative, the appropriate
 12 metric for measuring success is the utilization of the charging stations installed through
 13 the initiative. This will more accurately track whether the utility has appropriately chosen
 14 high-demand areas or increased utilization of EVs through the initiative than reductions
 15 in GHGs relative to a baseline. Although GHG reductions are a key outcome of Rhode
 16 Island’s overall efforts on EVs, it makes more sense to tie the metric of this fledgling
 17 program to a figure over which the Company has more control.

1 **Q. What is your recommendation regarding the two demand response performance**
2 **incentive mechanisms?**

3 A. The demand response performance incentive mechanisms proposed by both National
4 Grid and the Division would provide incentives for the Company to expand its new
5 residential Connected Solutions demand response program and its existing C&I demand
6 response program. The Division proposes metrics for both based on the number of peak-
7 targeted MW enrolled in the programs, which is better than National Grid's proposal to
8 use the number of customers enrolled for the residential program, as it would more
9 effectively incentivize targeting larger users and achieving higher MW reductions.
10 However, given that these programs will be operated through the energy efficiency plan
11 and the targets set within that process, the incentives should be developed and rewarded
12 through that plan as well. Although the different efforts that are pushing Rhode Island
13 towards its energy future are very intertwined, to the extent that there is a rational basis to
14 separate the programs, that division should remain. In addition, both the way that the
15 effort is funded, the utility is compensated for performing its role, and the reward, if any,
16 it receives for performing that role well should remain closely connected.

17 **Q. What is your opinion on the Customer Information and Peak Demand Forecasting**
18 **performance incentive mechanisms?**

19 A. I think these are appropriate uses of intermediate goals and adders to reflect emphasis on
20 areas in which there have been substantial barriers to utility action. Although providing
21 information to consumers and securing accurate forecasts will be necessary to achieve
22 other outcome-based metrics like peak demand reduction, the Division's proposal of a
23 single metric (as distinguished from the Company's step-by-step rewards) will more
24 effectively achieve the needed emphasis on these essential activities.

1 **VI. REVIEW OF SELECTED ELEMENTS OF NATIONAL GRID’S PST**
2 **INVESTMENT PROPOSALS**

3 **a. AMF Investments and Time-Varying Rates**

4 **Q. Please describe what National Grid is proposing with respect to advanced metering**
5 **functionality (“AMF”).**

6 A. National Grid is proposing that the PUC approve a \$2 million budget for design work for
7 AMF. This would lead to a full proposal for AMF, which would be filed by Dec. 1, 2018.
8 PST Testimony at 37.

9 **Q. What is the justification for the rollout of AMF?**

10 A. At a high level, National Grid has identified a wide range of benefits to customers, the
11 electric system, and societal benefits, as well as reduced theft, writeoffs, and higher bill
12 accuracy. PST Testimony at 38.

13 **Q. What are key variables in determining the costs and benefits of AMF?**

14 A. One key variable in the costs of an AMF rollout is whether National Grid will be
15 pursuing similar investments in other jurisdictions, which can lead to investment
16 synergies. National Grid’s analysis shows significant cost savings, on the order of \$70
17 million, if Rhode Island and New York authorize AMF investments that can be
18 coordinated. Another key variable is the adoption of time-varying rate options, and the
19 resulting customer response. National Grid examined four different scenarios with
20 respect to time-varying rates, including opt-in and opt-out time varying-rates and high
21 and low customer response scenarios.

22 **Q. What are time-varying rates, and how can they reduce the costs of the energy**
23 **system?**

24 A. Time-varying rates are rates that vary based on the time the energy is taken from the grid.
25 Many cost drivers in the electric system are determined by the timing of electricity
26 consumption. For example, system-wide energy supply costs are driven by wholesale
27 energy and capacity markets. Because of the structures of these markets, time-varying
28 rates can provide better economic incentives to reduce overall costs and provide
29 customers with opportunities to save money by taking advantage of low cost hours.

1 **Q. Which electric system benefits did National Grid quantify for time-varying rates?**

2 A. National Grid appears to have only quantify energy and capacity benefits from time-
3 varying rates, leaving other electric system benefits unquantified. Appendix 4.2 at 24.

4 **Q. What do you conclude from the presented benefit-cost analysis?**

5 A. My high-level review leads me to conclude that an AMF rollout could be a productive
6 investment for Rhode Island, particularly if the costs are shared with other jurisdictions.
7 There are also significant unquantified benefits, although further scrutiny of National
8 Grid's benefit and cost calculations are entirely appropriate.

9 **Q. Are there considerations to ensure that consumers understand and benefit from
10 time-varying rates?**

11 A. Significant rate innovations should be implemented on a phased and strategic schedule to
12 ensure customers benefit from time-varying rates and other rate changes. Consumers
13 must be able to understand significant reforms and have a basis on which to respond and
14 manage bills. Clear information and education should be provided to allow consumers to
15 understand their electricity bill and what actions they can take to reduce it.

16 **Q. What are time-of-use rates?**

17 A. Time-of-use rates are a narrower category of time-varying rates with predefined time
18 periods and prices, such as a higher price from noon to 8 pm on non-holiday weekdays
19 and a lower price at all other times. Time-of-use rates can have more than two periods per
20 billing cycle, but generally they are fixed and defined in advance, unlike more granular
21 options that are not always completely predictable in advance.

22 **Q. What are opt-in time-of-use rates?**

23 A. Opt-in time-of-use rates are elective for consumers, where the default is typically the
24 current flat rate structure.

25 **Q. What does Acadia Center recommend with respect to opt-in time-of-use rates?**

26 A. Opt-in time-of-use rates should be made available for residential and C&I rate classes as
27 soon as possible, with significant outreach, education, and customer tools to achieve a
28 reasonable adoption rate. This includes shadow billing and hold-harmless periods, as
29 described above. Once AMF has been rolled out, it would then be appropriate to
30 transition most customers to opt-out time-varying rates.

1 **Q. How is this different than National Grid’s recommendation for time-varying rates**
2 **in its Power Sector Transformation testimony?**

3 A. National Grid recommends rollout of opt-out time-varying rates in 2023, after a year of
4 customer education efforts. National Grid PST Testimony, page 36. This means that no
5 time-varying rates would be available for most Rhode Island citizens for the next five
6 years. I believe this approach would miss significant opportunities in the meantime (1) to
7 get meaningful customer response through load shifting, energy efficiency investments
8 targeted at peaks, and customer-sited storage, (2) to earn more hands-on experience for
9 Rhode Island customers, (3) to create a market for energy management technologies, and
10 (4) to learn lessons for the rollout of opt-out time-varying rates.

11 **Q. Do opt-in time-of-use rates require advanced metering?**

12 A. No, they do not. In many states, including National Grid’s service territory in New York,
13 opt-in time-of-use rates can be offered using an upgrade to existing AMR meters. This
14 upgrade does have some incremental capital costs, and this offering may require modest
15 changes to existing billing systems.

16 **Q. What did Docket 4600 and the Power Sector Transformation recommend for opt-in**
17 **time-of-use rates?**

18 A. Although no firm recommendation was made on this point, the stakeholder report for
19 Docket 4600 noted that “An opt-in approach should be considered for any transition
20 period to any opt-out requirement.” Docket 4600 Stakeholder Report at 13. Acadia
21 Center believes that this approach for the transition period is beneficial for customers and
22 the electric system and ultimately necessary to facilitate successful opt-out time-varying
23 rates.

24 **Q. How does your recommendation on opt-in time-of-use rates relate to the rate design**
25 **principles from Guidance Document 4600-A?**

26 A. Offering opt-in time-of-use rates in the short term meets most of those rate design
27 principles and is consistent with the others. Correctly designed opt-in time-of-use rates
28 promote economic efficiency and efficient price signals, empowers consumers to manage
29 their costs, are transparent and understandable, is consistent with policy goals, encourage
30 appropriate investments, and provide a pathway to innovations with future rates that

1 provide fair compensation for services and addressing externalities. This recommendation
2 allows for safe and reliable electricity service, and a fair opportunity for utility cost
3 recovery. This recommendation is designed to smooth the transition to opt-out time-
4 varying rates in the longer term and is necessary to meet the principle of gradualism from
5 that perspective.

6 **Q. Did National Grid examine the possibility of opt-in time-of-use rates with AMR**
7 **meters?**

8 A. National Grid discusses the possibility of opt-in time-of-use rates with AMR meters as an
9 alternative to a full AMF rollout. Schedule PST-1, Chapter 4 at 17-18. This discussion
10 notes that opt-in time-of-use rates can be made available without an AMF rollout, but
11 notes that such an option doesn't present the full range of benefits of AMF. I agree that
12 opt-in time-of-use rates using simpler metering options does not achieve this full range of
13 benefits, which is why Acadia Center proposes it as a necessary transition measure and
14 not as an alternative to AMF. This discussion by National Grid does not estimate the
15 costs of making opt-in time-of-use rates available in the short term.

16 **Q. What other recommendations do you have with respect to AMF and time-varying**
17 **rates?**

18 A. First, although remote disconnection is one of the typical capabilities of AMF, the PUC
19 should ensure that disconnection standards are appropriately protective of all customers,
20 particularly low-income and vulnerable customers. Second, although a large segment of
21 residential customers can be transitioned to opt-out time-varying rates, it could be
22 appropriate to leave some customer segments on simpler rate structures and allow those
23 customers to opt into time-varying rates if they wish. Lastly, differentials for time-
24 varying rates should be considered for transmission and distribution, as well as energy
25 and capacity, as noted in the Docket 4600 Stakeholder Report. P. 14, so that those bill
26 components also more accurately reflect cost drivers.

1 **b. Electric Transportation Initiative**

2 **Q. How does Acadia Center view electric vehicles (EVs)?**

3 A. Acadia Center views electric vehicles as key to a clean energy future. Acadia Center’s
4 EnergyVision,⁶ shows that the replacement of a gasoline vehicle with an electric vehicle
5 significantly reduces greenhouse gas (GHG) emissions and pairing increasing levels of
6 renewable electricity with electric vehicle adoption provides a viable pathway to our
7 long-term GHG emissions reductions requirements. Using EVs as a distributed energy
8 resource to help manage the grid is also an important aspect of grid modernization policy.

9 **Q. What policies do you recommend to accelerate the adoption of electric vehicles in**
10 **Rhode Island and the region?**

11 A. First, it is important to recognize that Rhode Island has adopted California’s zero-
12 emission vehicle (ZEV) regulation, which will require increasing levels of electric
13 vehicle sales in the coming years. The ZEV regulation is the original source of Rhode
14 Island’s commitment to 43,000 EVs by 2025. Second, Acadia Center recommends a suite
15 of policies to (1) make EVs more affordable, (2) increase the availability of consumer-
16 friendly charging infrastructure, and (3) ensure that consumers are aware of EVs and their
17 benefits. Acadia Center issued a joint report with Conservation Law Foundation and
18 Sierra Club, titled Charging Up,⁷ with a full agenda to increase EV adoption.

19 **Q. What are examples of these policies that have been implemented to date?**

20 A. To make EVs more affordable in recent years, Rhode Island offered a consumer rebate
21 program, Driving Rhode Island to Vehicle Electrification (“DRIVE”), but that program
22 has been out of funds since July 2017. To support wider availability of charging
23 infrastructure, Rhode Island used funding from the American Recovery and
24 Reinvestment Act to install 50 charging stations across the state in 2013. The recent
25 settlements with Volkswagen and other automakers related to emissions violations are
26 also providing new sources of funds that can be used for EV programs in Rhode Island,
27 although the details depend on the terms of the individual settlements.

⁶ <https://acadiacenter.org/document/energyvision/>

⁷ <http://acadiacenter.org/document/charging-up/>

1 **Q. Are there new developments in the electric vehicle market that have a bearing on**
2 **optimal policies?**

3 A. Yes, automakers have been releasing new models of more affordable EVs with longer
4 battery ranges, notably the Tesla Model 3 and the Chevrolet Bolt.

5 **Q. What levels of EV adoption have been seen in Rhode Island to date?**

6 A. It appears that adoption of EVs, both plug-in hybrids (“PHEVs”) and full battery electric
7 vehicles (“BEVs”), was roughly flat from 2012 to 2015, but saw significant increases in
8 2016 and 2017. According to data from the Alliance of Automobile Manufacturers, EV
9 adoption rose from 143 vehicles in 2015 to 299 vehicles in 2016 and 433 vehicles in
10 2017.⁸ This strong recent growth pattern must be continued in order to reach the 2025
11 goal of 43,000 vehicles because the adoption level of just over 1300 vehicles by the end
12 of 2017 is only 3% of that goal.

13 **Q. Are more policy advances needed to enable increased electric vehicle adoption?**

14 A. Absolutely. Dedicated programs to enable low-income residents to adopt electric
15 vehicles, amendments to residential and commercial building codes to enable cheaper
16 installation of charging infrastructure in the future, more education and outreach, and a
17 wide range of other policies are needed to efficiently and equitably achieve Rhode
18 Island’s goals for EV adoption and the requirements for GHG emissions reductions.

19 **Q. What are the relevant details of the VW settlements that are worth noting?**

20 A. The federal settlements and a multi-state settlement are managed differently and have
21 different restrictions. First, Rhode Island should soon receive over \$14 million from two
22 federal Volkswagen settlements⁹, and the Rhode Island Department of Environmental
23 Management (DEM) has been designated as the lead agency to administer these funds.¹⁰
24 Pursuant to Appendix D of the 2.0 Liter partial settlement, DEM can assign up to 15
25 percent of these funds, approximately \$2.1 million, for light-duty EV charging
26 applications. Second, the Rhode Island Attorney General’s office will receive \$4.1

⁸ See <https://autoalliance.org/energy-environment/advanced-technology-vehicle-sales-dashboard/>; in 2015, 87 PHEVs and 56 BEVs; in 2016, 204 PHEVs and 95 BEVs; and in 2017, 267 PHEVs and 166 BEVs.

⁹ The 2.0 Liter Partial Settlement and the 3.0 Liter Partial Settlement. See <https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement>

¹⁰ <http://www.dem.ri.gov/programs/air/vwsettle.php>

1 million as a part of a multi-state settlement with Volkswagen, which may be used for any
2 environmentally beneficial purpose.¹¹

3 **Q. Do you have relevant recommendations for how these VW settlement funds should**
4 **be used?**

5 A. Yes. For the federal VW settlements, the full 15% eligible should be allocated for light-
6 duty EV charging. These funds can be spent over a 10-year period, but they should be
7 used on a more accelerated 3- or 4-year period to jump start the market. For the multi-
8 state settlement, a significant percentage of the funds should be used to replenish the
9 DRIVE rebate program and create a new low-income initiative within that program.
10 Although these VW settlement funds are not within the control of the PUC, they are
11 relevant here as any significant EV programs in Rhode Island must be coordinated with
12 the programs created and investments made with those funds.

13 **Q. Do electric distribution companies have a role in advancing electric vehicles?**

14 A. Yes, there are several different areas where electric distribution companies should play a
15 productive role. This includes certain investments, rate design, outreach and education,
16 and other programs. In each area, the right policy approach is subject to several
17 constraints, beyond just the advancement of electric vehicles, that must be carefully
18 considered. Distribution companies are not the answer for every public policy issue and
19 Rhode Island needs to establish a modern utility regulatory system that works for
20 consumer-friendly clean energy across the board, including energy efficiency,
21 distribution generation, heat pumps, electric vehicles, and other storage.

22 **Q. What is National Grid proposing in its Electric Transportation Initiative?**

23 A. National Grid is proposing five programs under this initiative:

- 24 • Off-peak charging rebate pilot;
- 25 • Charging station demonstration program;
- 26 • Demand charge discount pilot;
- 27 • Education and outreach program; and
- 28 • National Grid adoption of electrified heavy-duty trucks.

29 National Grid lists as a sixth component the evaluation of the above five programs.

¹¹ <http://www.ri.gov/press/view/30001>

1 **Q. Please describe the proposed off-peak charging rebate pilot.**

2 A. National Grid proposes to provide rebates for EV charging off-peak to customers who
3 sign up for the program. The rebates will be based on the estimated energy and capacity
4 value of off-peak charging. Schedule PST-1, Chapter 5 at 2-3.

5 **Q. What are the issues with this proposal?**

6 A. First, the overall costs of this program are estimated to be approximately \$750,000, but
7 only \$63,750 of these costs are the actual rebates. Schedule PST-1 at 15. This indicates
8 that this program has substantially outsized overhead costs and is likely not worth
9 pursuing at this time, unless it can be significantly restructured. Second, offering opt-in
10 time-of-use rates, as described above, and targeting certain marketing efforts at EV
11 adopters would be a better technology-neutral approach that achieves other policy goals
12 and is synchronized with other efforts.

13 **Q. Please describe the proposed charging station demonstration program.**

14 A. National Grid's proposal for the charging station demonstration program is multi-faceted,
15 incorporating a number of different investment and incentive approaches for a wide array
16 of market segments. For the consumer vehicles, National Grid proposes to target
17 workplaces, apartment buildings, income-eligible communities, public transit stations,
18 and public fast-charging locations. For these segments, except public fast-charging,
19 National Grid proposes two different models: "make-ready" and company-owned.

20 **Q. What is the make-ready model?**

21 A. Under the make-ready model, National Grid would be responsible for investments and
22 expenses that are needed to install a charging station but would not own or operate the
23 actual end-use charging station. This is the approach that National Grid has proposed in
24 Massachusetts in the currently pending docket, D.P.U. 17-13. This approach can be
25 paired with rebates to defray the costs of the end-use charging station. National Grid has
26 proposed to include significant ratepayer-funded rebates with this approach, but other
27 sources of funding could be used for rebates instead, such as the eligible portion of the
28 federal VW settlement funds. In this model, the EV charging station would be a separate
29 customer account and National Grid would bill the account under the appropriate rate
30 schedule assigned to that account, but would not necessarily have a role in determining

1 the prices paid by drivers who utilize the charging station. The owner or operator of these
2 charging stations would generally be able to choose the price of EV charging at these
3 stations, subject to generally applicable consumer protection laws, any laws and
4 regulations specifically applicable to EV charging stations (notably including weights and
5 measures requirements), and any other conditions imposed as a result of participation in
6 government programs.

7 **Q. Please describe the proposed company-owned model.**

8 A. Under the proposed model for company-owned charging stations, National Grid would
9 bear all of the costs of installing, owning, and operating the charging station in the first
10 instance. National Grid proposes a “Site Host Participation Payment” under this model,
11 with amounts to be determined in the future. Schedule PST-1, Chapter 5 at 5-6. Under
12 this model, National Grid would determine the prices for EV charging, subject to PUC
13 approval, at these stations and bill drivers appropriately. National Grid has proposed a
14 Daily Charging Rate with a number of components: (1) an energy commodity charge
15 calculated twice a year, (2) a delivery rate, including other programs that are typically
16 reflected in delivery service, (3) a program recovery factor to recover a portion of
17 charging station program costs from EV drivers, and (4) a capacity component that would
18 only apply in summer peak hours. *Id.* at 7. The company-owned model would be capped
19 at 50% of the targeted installations in each segment. *Id.* at 6.

20 **Q. What model does National Grid propose for public fast-charging?**

21 A. National Grid proposes four company-owned public fast-charging projects.

22 **Q. What model does National Grid propose for fleet vehicle segments?**

23 A. National Grid is proposing the make-ready model for all of these segments.

24 **Q. What is your opinion of the make-ready model?**

25 A. Acadia Center supports the make-ready model because it addresses the cost barrier that is
26 most suitable to be resolved by an electric distribution company, namely system upgrades
27 and certain wiring expenses. The costs of such a program should be reasonably defined
28 and can come with clear limit on expenditures per site or per charging station. Combined
29 with a well-designed charging station rebate program and appropriate consumer
30 protections, this model is the best way to jointly satisfy a number of different policy

1 goals. The make-ready model can also be less expensive than the utility ownership
2 model, particularly if rebate funding comes from sources other than ratepayers.

3 **Q. What is your opinion on the company-owned model?**

4 A. In general, Acadia Center does not believe that charging station ownership is within the
5 appropriate role of a distribution company because it interferes with competitive markets
6 and the need for private (non-ratepayer funded) investment. It also incentives additional
7 capital investment and ownership, which is counter to power sector transformation
8 principles. There may be exceptions to this presumption, where other charging station
9 owners and operators will not be able to serve certain market segments effectively.
10 National Grid's proposals for Site Host Participation Payments and a Program Recovery
11 Factor do appear to be sensible improvements on the utility ownership model that has
12 been proposed in other states.

13 **Q. Has National Grid made sensible decisions with regards to site selection for the EV
14 charging program?**

15 A. Generally, yes. Multi-family housing, income-eligible communities, public transit
16 stations, and public fast charging are all situations where charging station installation
17 costs can be significant and there is a collective action problem where no one actor has
18 the incentive to pay. Workplace charging has its role, but the need may become less
19 significant over time as battery ranges improve. Similarly, this program addresses a real
20 cost barrier for fleets, even if fleet charging does not face the same collective action
21 problem as other settings.

22 **Q. Do you have concerns with any aspects of the National Grid proposal for EV
23 charging infrastructure in disadvantaged communities?**

24 A. Installing charging stations in low-income communities is a laudable effort but must be
25 paired with robust programs to ensure that residents in those communities can adopt EVs.
26 However, these programs for low-income residents do not necessarily need to be
27 ratepayer funded.

1 **Q. Has National Grid included sufficient measures to maximize the benefits of these**
2 **investments and expenditures?**

3 A. I do not believe so. The time-based capacity element of the proposed Daily Charging
4 Rate is a good starting place, but time-based differentials are also needed for commodity,
5 and should be considered for transmission and distribution. Furthermore, the proposed
6 Daily Charging Rate would only apply to EV drivers who use company-owned charging
7 stations, and not the accounts for the charging stations installed under the make-ready
8 model.

9 **Q. What do you recommend with respect to rate design for new accounts under the**
10 **Charging Station Demonstration Program?**

11 A. All the new accounts under the Charging Station Demonstration Program should be put
12 on a technology-neutral time-of-use rate as soon as possible. As discussed above and in
13 my testimony in the companion docket to this case, Docket 4770, I recommend that the
14 PUC should direct National Grid to begin offering opt-in TOU rates as soon as possible.
15 Applying such a rate as a default to accounts in this program would be a productive step
16 to increase the benefits of the program. TOU rates incentivize off-peak charging and
17 simultaneously provide an economically justified way to lower fueling costs for EVs,
18 with lower electricity costs during off-peak hours.

19 **Q. Please describe National Grid's proposal for a discount pilot for fast-charging**
20 **stations.**

21 A. Any new fast-charging stations that would be served on the general C&I rate (G-02) or
22 large C&I rate (G-32) would receive a monthly bill credit effectively equal to the
23 incremental demand charge payment due to operation of the charging station for three
24 years. This pilot would be limited to \$300,000 per year in discounts.

25 **Q. Are demand charges a barrier to EV charging?**

26 A. Yes, demand charges can serve as a major barrier for EV charging, particularly DC fast
27 charging applications with a high power draw for short periods of time.

28 **Q. What is your opinion on the specifics of National Grid's discount pilot proposal?**

29 A. The intent behind the proposal is laudable, but the details could be significantly improved
30 and broader reforms should be considered.

1 **Q. How could the details of this proposal be improved?**

2 A. In Connecticut, Eversource established a similar program in 2014. Instead of merely a
3 demand charge discount, the demand charges were replaced with an equivalent per-kWh
4 charge based on the class average load factor. Connecticut Public Utilities Regulatory
5 Authority Docket 13-12-11, Final Decision dated June 4, 2014. This program was
6 renewed and broadened in the recent Eversource rate case. Connecticut Public Utilities
7 Regulatory Authority Docket 17-10-46, Final Decision dated April 18, 2018.

8 **Q. What broader reforms to rate design should be considered?**

9 A. The above recommendation to make opt-in time-of-use rates available applies equally to
10 the C&I rate classes which have demand charges. When creating the time-of-use rate
11 structure for the G-02 rate class, for example, each part of the rate should be designed
12 with cost causation and efficiency in mind, as well as the impacts on energy efficiency
13 and a wide range of technologies. Application of these principles could very well lead to
14 significant changes from the current G-02 rate structure, including lower monthly
15 customer charges and lower demand charges. If accounts for stand-alone EV charging
16 stations are placed by default on the time-of-use rate for the appropriate rate class, then
17 there may be significantly less need for a demand charge discount.

18 **Q. Please describe National Grid's proposed transportation education and outreach
19 program.**

20 A. National Grid proposes to spend approximately \$500,000 on a variety of different
21 education and outreach activities, including ride-and-drive events, advertising on
22 billboards, the radio, and online, and bill inserts. About \$180,000 of the proposed budget
23 is for staff time and an outside content development agency. Workpaper 5.1 at 10.

24 **Q. What is your opinion on this proposed education and outreach program?**

25 A. Acadia Center believes that general outreach and education on electric vehicles is not the
26 proper role of a distribution company. The proper role should be limited to outreach and
27 recruitment for well-designed programs being run by the distribution companies, such as
28 the charging station demonstration program or time-of-use rate offerings. However, if
29 there is a pressing need that cannot be reasonably filled by other entities in Rhode Island,
30 there may be a role for ratepayer funding of certain activities, such as a limited number of

1 yearly ride-and-drive events, which can have significant synergies with program
2 recruitment.

3 **Q. Are there precedents for this principle in other states?**

4 A. Yes, in Massachusetts, the Department of Public Utilities ruled that general customer
5 education marketing plan was not properly a part of Eversource's EV infrastructure
6 program. Massachusetts D.P.U. 17-05, Order Establishing Eversource's Revenue
7 Requirement, November 30, 2017, at 499-500.

8 **Q. How else should National Grid's electric transportation initiative proposals be
9 integrated with related proceedings?**

10 A. Unlike other states, Rhode Island's approach to the Power Sector Transformation process
11 as a consolidated effort – rather than piecemeal dockets – puts it at a distinct advantage,
12 given the intricate ways in which grid modernization, utility business model reform, and
13 efficient advancement of clean energy technologies are interrelated. Although I urge the
14 PUC to consider the performance incentive mechanisms in Docket 4770, it is important
15 to establish appropriate metrics related to EVs and utilize this program as one to promote
16 the utility's business model transformation. At a minimum, a performance metric for EV
17 charging station utilization rate under the charging station demonstration program should
18 be adopted. This could be benchmarked to the current utilization rates of the 50 Level 2
19 charging stations funded under the American Recovery and Reinvestment Act.

20 **c. Electric Heating Initiative**

21 **Q. Please describe National Grid's proposed Electric Heat Initiative.**

22 A. The Electric Heat Initiative is made up of four components:
23 • Ground-source heat pump pilot involving partial utility ownership that aims to install one
24 commercial-sized ground-source heat pump by 2020;
25 • Equipment incentives to reduce the upfront cost barrier for air and ground-source heat
26 pumps for residential customers, including a 50% set aside supplying additional
27 incentives for income-eligible customers;
28 • Community-based outreach through two municipal partnerships per year, setting heat
29 pump conversion goals for those communities;

- 1 • Oil and propane dealer training programs on installation and sales to support up to 20
2 dealers' diversifying into the heat pump industry per year.

3 **Q. Why does National Grid propose an Electric Heat Initiative?**

4 A. National Grid's stated purpose is to "launch new and innovative electric heat services for
5 customers, while meaningfully accelerating electric heat electrification in Rhode Island
6 through multiple supporting market development strategies." PST Plan at 121. This
7 initiative is intended to fill in the gaps between the energy efficiency offerings and the
8 scale of heat pump deployment contemplated needed for greenhouse gas reductions. It is
9 also intended to fast forward the market transformation.

10 **Q. How many heat pumps does Rhode Island need to meet the targets in the Resilient
11 Rhode Island Act to reduce greenhouse gas emissions 45% from 1990 levels by 2035,
12 on the way to an 80% reduction by 2050?**

13 A. The Rhode Island Executive Climate Change Coordinating Council (EC4) issued on
14 December 31, 2016 its "Rhode Island Greenhouse Gas Emissions Reduction Plan" (the
15 EC4 Plan).¹² The EC4 Plan concludes that electric heat, deployed at scale is an
16 opportunity for deep mitigation of greenhouse gases. The plan recommends serving 33%
17 of residential and 30% of commercial heating load with electric heat pump systems by
18 2035, escalating to 81% of residential and 67% of commercial main heating load met by
19 electric heat pumps by 2050. This 2050 pathway envisioned by the EC4 report implies an
20 annual conversion rate of approximately 13,000 customers per year to heat pumps every
21 year between now and 2050. Although Meister Consulting Group estimated, in the
22 background for the EC4 report, that 18,700 single-family heating system replacements
23 (for all fuel types) occur in Rhode Island each year, heat pump adoption rates are
24 currently far lower than this.

25 **Q. Are these recommended adoption rates consistent with what Acadia Center
26 recommends in EnergyVision 2030?**

27 A. Acadia Center recommends a slightly less aggressive timetable in EnergyVision 2030,
28 with heat pumps serving at least 13% of residential heat load and 5% of business heat

¹² Available at: <http://climatechange.ri.gov/documents/riggerr16.pdf>

1 load by 2030. Exh. AC-PST-4 at 5. However, these levels should be achievable by Rhode
2 Island. Acadia Center's recommendations are based on the rates of heat pump conversion
3 that other states in the region have already achieved – namely Maine, which converted
4 nearly 3% of its residential heating stock to heat pumps in just 3 years. Rhode Island, by
5 comparison, converted only 0.2% of its residential heating stock to heat pumps in 2016.
6 Exh. AC-PST-5 at 4.

7 **Q. Are the residential incentives duplicative of the heat electrification program of the**
8 **Energy Efficiency programs?**

9 A. It appears so, but the Company intends that residents are not eligible for both. RI has a
10 limited heat electrification program, introduced through the 2018-2020 EE and System
11 Reliability Procurement Plan (Docket No. 4684) and the 2018 Energy Efficiency
12 Program Plan (Docket 4755). It proposes incentives to convert approximately 60 fuel-oil
13 customers to electric heating per year. The Company has indicated that it intends this
14 initiative to build on this number by dedicating additional resources, targeted at the
15 customers with highest energy costs and largest emissions footprints. PST Plan at 121.

16 **Q. What reasons does the Company give for having two separate programs addressing**
17 **electric heat?**

18 A. The Company notes three advantages through pursuing heat electrification through the
19 PST framework in addition to EE. In summary: (1) the PST framework would allow
20 more transparent and targeted incentives linked to reducing emissions, not just reduced
21 kWh and demand load like in the EE incentives; (2) the PST program will allow creative
22 business approaches and financing options not possible through the EE program; and (3)
23 the PST program will broaden the offerings tailored to income-eligible customers, and
24 large institutional and commercial customers interested in ground-source heat pumps.
25 (Co. Response to DIV-1-26).

26 **Q. Do you agree with these cited advantages?**

27 A. I agree that the PST platform gives the Company more leeway to try out different
28 targeted incentives and business models. It is not entirely clear how the programs'
29 incentives will stack or complement each other. It is not ideal for the two programs to
30 substantially overlap, but given the budget constraints of the EE programs, allowing

1 another program to address electric heating is a benefit to Rhode Island. Given that it will
2 be the same program administrator – and presumably the same set of contractors –
3 installing heat pumps under the two incentive programs, I encourage National Grid to
4 create a program that is seamless and fair to customers, regardless of through which
5 initiative they are being served.

6 **Q. Does this proposed initiative achieve the numbers of heat pumps called for in the**
7 **EC4 Plan?**

8 A. No. That plan calls for around 13,000 conversions per year. Combining the impacts of the
9 EE Program and this initiative, National Grid estimates that they would install 45
10 residential units in 2018, 112 in 2019, 130 in 2020, and 74 in 2021, for a total of 361
11 residential units. The two programs combined would support the installation of 1
12 commercial-scale ground source heat pump in 2020. Co. Response to Div. 5-1.

13 **Q. Is this a sufficient scale to achieve market transformation?**

14 A. It does not appear so. Rhode Island should consider incentive programs at a larger scale,
15 as well as additional components such as incentives for air-source heat pumps in
16 commercial and multi-family residential buildings; targeted programs aimed at the home
17 types that are the best fit for heat pump conversions; education programs for the building
18 community to encourage more use of heat pumps in new construction; partnerships to
19 lead by example in state or municipal facilities; and working with manufacturers to lower
20 costs and improve heat pump products.

21 **Q. What would be a more reasonable trajectory to ramp up adoption of residential**
22 **heat pumps in Rhode Island?**

23 A. A more reasonable trajectory would be 1,000 residential heat pumps in 2019, 2,000
24 residential heat pumps in 2020, and 3,000 residential heat pumps in 2021. That would
25 start at 0.2% of residential households in 2019, and ramp up to 0.7% of residential
26 households in 2021. That trajectory would lay the groundwork for achieving 1% yearly
27 conversions in 2022 or shortly thereafter.

1 **Q. Do you have other concerns about the proposed initiative, beyond the size and**
2 **scope?**

3 A. Yes. I have two additional concerns, one related to the comprehensiveness of the program
4 and a clear identification of market barriers and another about National Grid's proposal
5 for a partial ownership model for ground source heat pumps.

6 **Q. Please describe your first concern.**

7 Neither the PST Report nor National Grid has identified the full scope of market barriers
8 that are preventing more adoption of heat pumps. It's highly likely that there are barriers
9 that the Company has not addressed through its 4-component proposal. Before you can
10 design a program to transform a market, you need to know what you want to change and
11 why. I recommend that the Company, DPUC, OER, and other stakeholders have a more
12 robust discussion about market barriers to adoption and explain how potential programs
13 will overcome these barriers.

14 **Q. Please describe your concern about National Grid proposed partial ownership**
15 **model for ground source heat pumps.**

16 National Grid's proposal for partial utility ownership of the ground source heat pumps at
17 one industrial facility, with the intention to create a program that replicates this business
18 model, further perpetuates infrastructure-driven returns, rather than actual transformation.
19 It also violates one of the objectives established in Docket 4600 – that Rhode Island
20 should prioritize and facilitate increasing customer investment in their facilities where
21 that investment provides recognizable net benefits. I recommend that, as part of the
22 Company's analysis of market barriers and how to overcome them, it should evaluate
23 innovative ideas, beyond varying degrees of utility ownership.

24 **VII. CONCLUSION**

25 **Q. Do you believe that the current division of issues between Dockets 4770 and 4780**
26 **should be maintained?**

27 A. No. This procedural bifurcation should not dictate the outcome of substantive issues or
28 override Rhode Island's larger policy goals. As the performance incentive mechanisms
29 and recovery for grid modernization improvements filed in the proposed PST should

1 impact the returns that National Grid earns otherwise, it is important to consider such
2 issues with the rest of National Grid's compensation structure in Docket 4770.

3 **Q. Do you believe the Commission should adopt National Grid's proposed**
4 **performance incentive mechanisms?**

5 A. No, for the reasons I have outlined above, the Division's proposed performance incentive
6 mechanisms, modified to track the utilization rate of electric vehicle charging stations
7 and to maintain the demand response incentives within the demand response portion of
8 the energy efficiency programs, should be adopted.

9 **Q. Do you believe the Commission should order National Grid to implement opt-in**
10 **time of use rates immediately?**

11 A. Yes. The Commission should order National Grid to make opt-in time of use rates
12 available for residential and small business rate classes as soon as possible, with
13 significant outreach, education, and customer tools to achieve a reasonable adoption rate.
14 Once AMF has been deployed, it would be appropriate to transition most customers to
15 opt-out time-varying-rates, along with protections for low-income and vulnerable
16 customers.

17 **Q. Do you believe the Commission should approve National Grid's Electric**
18 **Transportation Initiative?**

19 A. Not without substantial changes. The Commission could approve a modified version of
20 the make-ready model charging station demonstration program with site-selection
21 targeted at multi-family housing, income-eligible communities, public transit stations and
22 public fast charging. The Commission should also order National Grid to implement
23 technology-neutral time-of-use rates for EV charging, and explore new approaches for
24 addressing demand charges, particularly for DC fast charging.

25 **Q. Do you believe the Commission should approve National Grid's Electric Heat**
26 **Initiative?**

27 A. Not without substantial changes. As proposed, the small number of incentives and small
28 scope of market development strategies proposed are unlikely to create significant impact
29 or achieve market transformation. The Commission should order the stakeholders to
30 engage in a full analysis of the full scope of market barriers that are preventing the

1 adoption of heat pumps and design a proposal that addresses these barriers. Such a
2 proposal should include a more aggressive timetable for ramping up deployment of heat
3 pumps. Acadia Center's own analysis supports a trajectory towards achieving 1% yearly
4 conversion rate by 2022.

5 **Q. Does this conclude your testimony?**

6 A. Yes, it does.