PRE-FILED DIRECT TESTIMONY

OF

ANTHONY CARLONI

And

MELISSA A. LITTLE

November 3, 2021

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I. Introduction and Qualifications

Anthony Carloni

Q. M. Carloni, please state your full name and business address.

A. My name is Anthony Carloni. My business address is 245 S Main Street, Hopedale, MA 01747.

Q. By whom are you employed and in what capacity?

A. I am a Lead Program Manager of Rhode Island Electric Transportation for National Grid USA Service Company, Inc. (the "Service Company"), where I provide services to The Narragansett Electric Company d/b/a National Grid (the "Company").

Q. Please describe your educational background and professional experience.

A. In 2011 I earned a Bachelor of Science degree in Mechanical Engineering from the University of Massachusetts Amherst. In 2014 I earned a Master's of Science degree in Engineering Management from the University of Massachusetts Amherst. I started my career as an Energy Engineer at RISE Engineering. In 2014, I joined National Grid as an Energy Engineer as a part of the Energy Efficiency group, focused on Massachusetts. I have held various positions at National Grid including Senior Process Manager, Senior Product Manager and now, my current role, as Lead Program Manager in Rhode Island.

Q. Have you testified previously before the Rhode Island Public Utilities Commission ("PUC")?

A. No, I have not.

Melissa A. Little

Q. Ms. Little, please state your full name and business address.

A. My name is Melissa A. Little, and my business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what capacity?

A. I am Director, New England Revenue Requirements for the Service Company. The Service Company provides engineering, financial, administrative, corporate, management, and other technical support to direct and indirect subsidiary companies of National Grid USA ("National Grid"). My current duties include revenue requirement responsibilities for National Grid's electric and gas distribution activities in New England, including the electric and gas operations of the Company.

Q. Please describe your educational background and professional experience.

A. In 2000, I earned a Bachelor of Science degree in Accounting Information Systems from Bentley College (now Bentley University) in Waltham, Massachusetts. In September 2000, I joined PricewaterhouseCoopers LLP in Boston, Massachusetts, where I worked as an associate in the Assurance practice. In November 2004, I joined National Grid as an analyst in the General Accounting group. After the merger of National Grid

and KeySpan Corporation in 2007, I joined the Regulation and Pricing department as a senior analyst in the Regulatory Accounting function and also supported the revenue requirement team for the Company's upstate New York affiliate, Niagara Mohawk Power Corporation. In 2011, I joined the New England revenue requirement team and was promoted to Lead Specialist in the Regulation and Pricing department where my duties included revenue requirement responsibilities for National Grid's electric and gas distribution activities in New England, including the Company. In August 2017, I was promoted to my current position.

Q. Have you testified previously before the PUC?

A. Yes, I have testified several times before the PUC including the Company's 2017 general distribution rate case filing in Docket No. 4770 and in numerous of the Company's Electric and Gas Infrastructure, Safety and Reliability Plan filings.

II. Purpose of Testimony

Q. What is the purpose of the Panel's testimony?

A. The purpose of the testimony is to discuss the Company's July 1, 2021 request to revise and extend the DCFC Discount Pilot ("Pilot") Provision ("Tariff"), which was approved in Docket 4770 for implementation for three rate years, ending on August 31, 2021. The Tariff and the Pilot are described in further detail herein. On July 27, 2021, the PUC approved the Company's request to revise the Tariff to fix a drafting error limiting enrollment in the Pilot through Rate Year ("RY") 1 only, and allow for enrollment in the Pilot through Rate Year 3, ending August 31, 2021, as allowed under Section 17(a)(iii) of

the Amended Settlement Agreement ("ASA") approved in Docket. 4770. However, it did not approve the Company's request to extend the Pilot to new enrollees after that date through the effective date of base distribution rates approved in the Company's next general rate case. Rather, the PUC opened Docket 4770-A to review the Company's request to continue the Pilot beyond RY3.

The PUC directed the Company to file testimony supporting its request for extension of the Pilot. Our testimony will begin by addressing the Company's initial request supporting its extension of the Pilot. However, as noted herein, the Company has since determined that the potential costs of the Pilot to distribution customers appear to outweigh the benefits to continuing the Pilot beyond August 31, 2021. Accordingly, subject to feedback from the Docket. 4770 Power Sector Transformation ("PST") Advisory Group, the Company's acknowledges the potential benefit to distribution customers of not extending the Pilot to new applicants as of September 1, 2021. Moreover, the Company does not object to crediting ratepayers the balance of the deferral account for the Pilot as forecasted through RY 4.

Q. Do you have any schedules supporting your testimony?

A. Yes, the Panel is sponsoring the following attachments along with our testimony:

Attachment 1 Rate Year 3 ETI Annual Report (RY 3 Annual Report)

IV. Overview of DCFC Pilot

Q. Please provide an overview of the DCFC Pilot.

A. The Pilot for DCFC accounts was initially introduced by the Company in Docket No. 4780 as part of a suite of electric transportation initiatives. The electric transportation initiatives were consolidated into the Company's base rate proceeding, Docket No. 4770. The DCFC Pilot was a part of the ASA and approved in Docket No. 4770. The DCFC Tariff governs the operation of the DCFC Pilot.

Q. Please provide a description of the DCFC Pilot and Tariff.

A. The DCFC Tariff offers a time-limited discount on the electric bills for dedicated DCFC electric accounts. The DCFC Pilot is available on a first come, first served basis, with the annual value limited to $300,000 per year. Any existing or new customers with General C&I Rate G-02 or Large Demand Rate G-32 for dedicated DC Fast Charging purposes were eligible for the discount, provided that twenty five percent (25%) of the stations receiving the discount were required to be in stations that enable electric public transit.

Q. How does enrollment in the DCFC Pilot work?

A. Effective July 27, 2021, the DCFC Pilot allowed enrollment in RY1 through 3. The discount for participants who enroll in RY1 was equal to one hundred percent (100%) of the distribution demand charge for a period of three years from the start of service.[1]

[1] ASA §17(a)(iii).

Q. How many customers have been enrolled in the Pilot to date?

A. In RY2 there were two customers approved for the Discount Pilot for DCFC Station Accounts, which allowed them to be eligible for credits on their electric bills equal to one hundred percent (100%) of the distribution demand charge for a period of three years from the start of service.[2] During RY2, one of the customers chose to switch to a different rate class, which was not eligible for the Pilot.[3] Therefore, at the end of RY2, one customer was enrolled in the Pilot.[4] No new customers were enrolled in the Pilot during RY2.[5]

As noted in the RY2 ETI Report, for RY3 the Company proposed to maintain the current discount level (100% for a period of three years) because DCFC vendors and customers believed the Pilot addresses a key concern associated with DCFC stations, i.e. the potential high operational costs associated with DCFC stations served by rates with demand charges.[6] The discount was intended to work together with both the Company's Charging Demonstration Program and the State's "Electrify RI" Program to help site hosts install and operate DCFC stations across RI.[7] The Company expected increased participation in the Program in RY3, as more DCFC stations were expected to be built

2 RY2 ETI Report at 15, (October 30, 2020)

3 Id.

4 Id.

5 Docket. 4770, Tariff Advice, Response to Data Request 1-4

6 RY2 ETI Report at 15.

7 Id.

with support from these two programs.[8] Lastly, the Company intended to comply with the ASA requirement that "twenty five percent (25%) of the stations receiving the discount shall be in stations that enable electric public transit" through continued collaboration with Rhode Island's Public Transit Authority ("RIPTA"), as well as cities and towns interested in purchasing electric school buses.[9]

In RY3, the Company received applications for the Pilot from five customers in the process of installing DCFC stations through the Company's Charging Infrastructure Program.[10] One of these applicants is RIPTA.

Q. Did the Company have any initial estimates of Pilot participation when the Pilot was proposed for approval?

A. The Company did not anticipate a set number of participants in the Pilot. The Company stated that the number of stations incentivized through the Pilot would depend on site host participation and the specific charging configurations at each participating site.[11] However, the Company intended to limit the annual value of the discount to $300,000 per year.

At a distribution demand charge level of $4.41/KW per month (or $52.92 per kW per year), a discount value of $300,000 per year would provide a discount to approximately

8 Id.

9 Id. at 15-16.

10 RY3 ETI Report at Attachment 1, (October 29, 2021).

11 Docket. 4780 Data Request SC 1-21.

5,668 KW of Fast Charging capacity. If this power demand were incurred at 50KW per station (port), the discount value would support 113 stations (ports).

Q. What is your opinion of the reasons why actual enrollment in the Pilot differed from the Company's original estimates?

A. The primary reason for the lack of enrollment in the Pilot is due to customers with DCFC stations being placed on a rate not eligible for the Pilot.[12] Based on a review of the DCFC sites installed that the Company has visibility to, which includes DCFC sites that either participated in the DCFC Discount Pilot (2 sites) or the Charging Station Program (7 sites), all but two of the nine have been placed on the C-06 rate based on anticipated utilization rates.[13] The C-06 rate is not eligible for the Pilot.[14] The other seven DCFC sites were placed on the C-06 service rate based on the Company's review of the projected utilization of the stations and the sites' purpose of providing charging stations for use by EV drivers.[15] Increased anticipation of station utilization and placement of customers on either the G-02 or G-32 rates would have increased eligibility for the Pilot.[16] As noted above, in RY3, five additional site hosts have been approved through

12 Docket. 4770 Tariff Advice, Company Response to Data Request 1-12.

13 Id.

14 Id.

15 Id.

16 Id.

the Company's Charging Station Program and submitted applications to participate in the Pilot prior to August 31, 2021, including RIPTA.[17]

Q. What was the average electric bill reduction for the participant enrolled in the Pilot during RY3?

A. In RY3, the Pilot participant realized an average electric bill reduction of 0.03/kWh.[18] This site host had DCFC stations installed prior to the Pilot's launch and has relatively high utilization, in terms of kWh, relative to more recently installed DCFC sites.[19] Therefore, all things being equal, more recently activated sites with lower utilization placed on a demand rate would see a greater $/kWh amount reduction in their electric bill, benefitting the site host and potentially EV drivers.[20]

Q. Does the Company have any projection of overall electric savings for Pilot participants in RY4?

A. The Pilot is projected to provide electric savings of approximately $100K per year after DCFC stations serving electric public transit buses are installed and activated, currently targeted for 2022.[21] These RY3 findings are consistent with the RY1 Evaluation Report which found the "DCFC Discount Pilot helps site hosts alleviate demand charges."[22]

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17 Id.

18 RY3 ETI Report at 19.

19 Id.

20 Id.

21 Id.at 19-20.

22 Id. at 20

Q. How has the Pilot performed against its budget?

A. The budget for RY1 and RY2 of the Pilot was $274,272.[23] As of the date of the RY2 ETI Report, the Company had spent a total of $35,102 of that budget, leaving a variance of $239,170.[24] The Company is under budget for the Pilot at the end of RY3[25] by $240,395, resulting in a cumulative RY 1 – RY3 budget variance of $479,565.[26] The Company had one customer receive a full three years of payments through the program that are now finished. The Company is projecting more DCFC sites to become activated and received applications for sites to participate in the program, should they be placed on an eligible rate.[27] As noted previously, it is currently projected that five sites that applied in time for the Pilot may ultimately participate.[28]

V. Company Initial Rationale for Extension of Pilot

Q. Why did the Company request to extend the Pilot to new applicants after RY3?

A. In late spring 2021, the Company learned that the RIPTA was interested in enrolling in the Pilot. As noted above, Section 17(a)(iii) of the ASA contemplates the Pilot should allow enrollment through RY3. At that time, however, the Tariff allowed enrollment only in RY1. Accordingly, the Company proposed to revise the Tariff to remove

23 RY2 ETI Report at 17, Table 4 (October 30, 2020).

24 Id.

25 RY3 ETI Report at 30.

26 Appendix 3

27 Id. at 41.

28 Id. at 19.

references limiting enrollment period from September 1, 2018, through August 31, 2019.

Q. Why did the Company initially propose to revise the Tariff to allow for enrollment in the Pilot after RY3?

A. As noted in the Company's response to Data Request PUC 1-13 in the Docket. 4770 Tariff Advice filing, the Company's premise for the Pilot as proposed in 2018 was that a time-limited demand charge discount for DCFC stations could

> "encourage the development of [DCFC] stations, which may be prohibitively expensive to operate otherwise during the early phase of EV market growth because of relatively low station utilization levels and demand-based delivery charges. By lowering the operating cost of DC Fast Charging stations, the Company expects to increase the number of these stations operated by third-parties in Rhode Island" (Docket. 4780, Ch 5 at 108).

At the time of the Tariff Advice filing, the Company continued to support this position based on the following : (1) the Pilot demonstrated it can lower operating costs, as evidenced by a Pilot participant realizing an average electric bill reduction of 0.03/kWh; (2) the Pilot might support future DCFC station development (RY1 ETI Report at 26); (3) the interest of additional DCFC site hosts in enrolling in the Pilot, of which five ultimately applied for the Pilot as of August 31, 2021; and (4) the potential for the Pilot to support future programs to address the barrier of demand charges for EV charging.

The Company was also cognizant of the fact only one customer was participating in the Pilot at time of its Tariff Advice filing. The Pilot was intended to serve as a means to determine if demand charges posed a barrier to DCFC adoption, and ultimately, pose a barrier to transportation electrification and decarbonization efforts. As such, it was

difficult to draw conclusive lessons from the Pilot at that time. The Company concluded at that time that allowing enrollment in the Pilot beyond RY3 might result in additional data that would assist in learning about the potential benefits of removing demand charges from rates serving DCFC sites.

Q. Why did the Company propose to extend the opportunity to enroll in the Pilot through the effective date of base distribution rates approved by the PUC in the Company's next general rate case, rather than a different date?

A. The Company considered proposing to extend the opportunity to enroll in the Pilot for one rate year, rather than until the Company's next general rate case, and potentially continue to seek Pilot extensions on an annual basis if the potential benefits of the Pilot justified such a request. However, the Company decided that annual filings were likely less efficient administratively for the Company, and potentially for the PUC, than seeking a one-time extension until the Company's next base rate proceeding. Ultimately, a decision to continue the Pilot on a longer term basis or propose a long term DCFC discount rate based on Pilot results, is appropriate for consideration in a future base rate proceeding.

Q. Why has the Company now determined that it will not seek to extend the Pilot?

A. This past August, the Company was encouraged by the increase in Pilot applications noted previously. The timing appeared to be related to increased interest from customers that were considering installing DCFCs at their sites with potentially high utilization. However, the Company has also been cognizant of the data requests issued by the PUC

on the Company's Tariff Advice filing, where the PUC explored the costs of the Pilot to date in relation to Pilot participation and the potential benefits of the Pilot. Moreover, the Company participated in the workshop held by the PUC on September 22, 2021, with the Office of Energy Resources and other stakeholders. At that workshop, the Company fielded questions from workshop participants further exploring the overall costs of the Pilot borne by distribution customers versus the potential benefits of the Pilot to individual participants.

The questions raised by the PUC in discovery and by the PUC and stakeholders at the workshop caused the Company to reevaluate its original decision to seek an extension of the Pilot. The fact that potential participants to date were able to take service for their DCFCs on the Company's C-06 rate, which does not include demand charges, appeared to, on its own, limit potential participants exposure to rates that included demand charges. Moreover, as noted below, the Company has built up a deferral associated with Pilot costs paid by distribution customers to date versus the costs of the Pilot. Accordingly, subject to feedback from the Docket. 4770 PST Advisory Group, the Company sees the potential benefit to distribution customers of not extending the Pilot to new applicants as of September 1, 2021. The Company will discuss these issues at a future PST Advisory Group meeting to gather feedback from the Advisory Group.

VI. Deferral Account

Q. How has the Company managed the DCFC Pilot budget?

A. The DCFC Pilot account is significantly under budget. In RY1, RY2, and RY3, the Company spent a total of $59,195. The budget for all three years was $538,760, representing a $479,565 variance.

Q. Explain why there has been such significant underspending in the DCFC Pilot account.

A. The Pilot is underspent for several reasons. As noted previously, the first reason is that of the seven sites activated through the Company's Charging Demonstration Program, six of the sites were placed on a C-06 rate and one of the sites did not put the DCFC station on a dedicated electric service. There were two additional DCFC sites the Company was aware of, both of which participated in the DCFC Discount Program with one receiving a full three years of payments and the other choosing to switch rate classes making them ineligible to continue in the Pilot.

The second reason is that customers did not seek to install DCFCs in large numbers during RY1 or RY2 of the Pilot. As discussed above, DCFC adoption did not begin until the State of Rhode Island's "Electrify Rhode Island" program became available in early 2020. DCFC stations have high up-front capital costs and the additional funding from the "Electrify Rhode Island" program helped to reduce those upfront costs to potential site hosts and helped to accelerate DCFC adoption in the State of Rhode Island over recent months.

Lastly, the Discount Pilot underspend is explained by (i) the original budget projection of 40 DCFC stations installed in RY1-3 with 20 budgeted for RY1; and (ii) the average DCFC station size growing to 90 kW by RY3.[29]

Q. What is the projected underspend for the DCFC Pilot program through the end of RY4?

A. The projected DCFC program underspend in Rate Year 4 is $202,265, resulting in a cumulative RY1-RY4 underspend of $681,830.[30]

Q. How is underspend treated under the ASA?

A. For funds not spent for reasons other than reasonable delay, the deferral is to be held for the benefit of customers, and the PUC shall determine how it shall be applied against other programs or costs. ASA §20.d. The amount of any such deferral shall incur carrying charges at the WACC for Narragansett Electric for capital expenses and the customer deposit rate for Narragansett Electric for O&M costs. ASA §20.d.

Q. Explain whether the Commission should or should not credit customers for the balance in the deferral account now, as forecasted through RY4 rather than waiting for the time when the Company files its next rate case is filed.

A. The Company is open to crediting customers the balance of the deferral account now, as forecasted through RY4 rather than waiting for the Company's next general distribution

[29] RY3 ETI Report at 31.

[30] Appendix 3

rate case. The projected RY1-RY4 spend includes projects which will receive payments after the end of RY4 (i.e. after August 31, 2022). As noted above, for the DCFC Discount Pilot, the Company's RY4 projections are calculated based on the five applications submitted to the Company prior to the end of RY3 as required by the rate tariff. The Company's projected spend in RY4 is based on the submitted applications received in RY3, and this projected spend is included in the DCFC Discount Pilot Program RY4 budget projections. Future payments for these applications after RY4 (i.e. RY5, RY6, and RY7) are not included in the budget projections and are projected to total $363,394.[31]

The below tables outline the actual and projected spend used to calculate the deferral account amounts.

	RY1 (ACTUAL)	RY2 (ACTUAL)	RY3 (ACTUAL)	RY1-3 Totals	RY 1-3 BUDGET
OPEX					
Off-peak Charging Rebate	$182,176	$188,826	$241,325	$612,327	$538,231
Discount Pilot for DC Fast Charging	$13,408	$21,694	$24,093	$59,195	$538,760
Customer Fleet Advisory Services	$21,879	$153,687	$83,7641	$259,330	$210,000
Charging Demonstration	$80,205	$552,044	$255,085	$887,334	$1,842,328
Initiative Evaluation	$5,846	$64,797	$86,153	$156,796	$90,000
TOTAL OPEX	**$303,514**	**$981,048**	**$690,420**	**$1,974,982**	**$3,219,319**
CAPEX					
Charging Demonstration	$143,195	$1,683,666	$966,132	$2,792,993	$5,506,259
TOTAL CAPEX	**$143,195**	**$1,683,666**	**$966,132**	**$2,792,993**	**$5,506,259**

[31] RY3 ETI Report at 28

TOTAL OPEX and CAPEX	**$446,709**	**$2,664,714**	**$1,656,552**	**$4,767,975**	**$8,725,578**

	RY1 (ACTUAL)	RY2 (ACTUAL)	RY3 (ACTUAL)	RY3 Commitments + RY4 Projection	RY 4 BUDGET
OPEX					
Off-peak Charging Rebate	$182,176	$188,826	$241,325	$266,136	$227,567
Discount Pilot for DC Fast Charging	$13,408	$21,694	$24,093	$62,223	$264,488
Customer Fleet Advisory Services	$21,879	$153,687	$83,764	$144,606	$100,000
Charging Demonstration	$80,205	$552,044	$255,085	$1,210,786	$1,013,115
Initiative Evaluation	$5,846	$64,797	$86,153	$82,496	$30,000
TOTAL OPEX	**$303,514**	**$981,048**	**$690,420**	**$1,766,247**	**$1,635,169**
CAPEX					
Charging Demonstration	$143,195	$1,683,666	$966,132	$4,326,578	$3,262,316
TOTAL CAPEX	**$143,195**	**$1,683,666**	**$966,132**	**$4,326,578**	**$3,262,316**
TOTAL OPEX and CAPEX	**$446,709**	**$2,664,714**	**$1,656,552**	**$6,092,825**	**$4,897,485**

VII. Conclusion

Q. Please summarize the Panel's testimony.

A. As stated above, the Company has seen limited participation in the DCFC Pilot and will not be seeking to extend the enrollment period. The Company is open to crediting customers the balance of the deferral account now, as forecasted through RY4 rather than waiting for the Company's next general distribution rate case.

Q. Does this conclude the Panel's testimony?

A. Yes.

NARRAGANSET ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC DOCKET NO. 4770
ARTICLE II SECTION 17 - ELECTRIC TRANSPORTATION

ELECTRIC TRANSPORTATION INITIATIVE
RATE YEAR 3 ANNUAL REPORT

November 3, 2021

Contents

1 INTRODUCTION

The Narraganset Electric Company (the "Company") entered into an Amended Settlement Agreement dated August 16, 2018 (the "ASA"). The ASA includes an Electric Transportation Initiative (the "ET Initiative" or "Program") to facilitate the growth of Electric Vehicle ("EV") adoption and scaling of the market for EV charging equipment to advance Rhode Island's zero emission vehicles and greenhouse gas emissions policy goals.

Section 17(a)(v) of the ASA states in pertinent part:

". . . . Narragansett Electric will produce and publicly present an Annual Evaluation Report using metrics provided in the original filing with appropriate modifications to be made to reflect the programs as approved in this Settlement Agreement within two months following the end of each Rate Year, describing implementation of the electric transportation initiative, and documenting the information gained through this initiative and any recommendations to enhance the program."

The ET Initiative includes the following five components "(i) Off-Peak Charging Rebate Pilot ("Off-Peak Pilot"), (ii) Charging Station Demonstration Program ("Charging Demonstration Program"), (iii) Discount Pilot for Direct Current Fast Charging ("DCFC") Station Accounts ("Discount Pilot"), (iv) Fleet Advisory Services ("Fleet Advisory Program"), and (v) Electric Transportation Initiative Evaluation." (ASA, Section 17). Rate Year 3 (RY3) of the ET Initiative commenced as of September 1, 2020 and concluded on August 31, 2021. The five components of the ET Initiative are summarized in Section 2 of this report.

The ET Initiative components in RY3 built upon the successes and lessons learned over the prior two years. For the Off-Peak Pilot, the Company studied a second full years' worth of charging data from drivers who were enrolled in RY2. Additionally, the Company expanded its efforts to encourage off-peak charging through the launch of a new educational awareness campaign to participants in the Off-Peak Pilot. For the Charging Demonstration Program, the Company activated 293 new ports across RI, with an additional 37 ports approved as part of RY3 to be activated, bringing the cumulative total to 330 ports for RY1 through RY3. The Discount Pilot issued total rebates of $24,093 in RY3 and $59,195 across RY1 through RY3. The Fleet Advisory Services program completed nine fleet studies and added two new studies during RY3, bringing the cumulative total to 11 for RY1, RY2 and RY3.

Similar to prior rate years, the Company worked with DNV (formerly Energy & Resource Solutions (ERS)) to conduct an independent evaluation of the ET Initiative, which is attached hereto as Appendix 1 (Evaluation Report). For RY3, the evaluation activities include review of program materials, interviews with program staff and participants, and analysis of program tracking data and charging data available.

The key achievements and findings from the RY3 Evaluation Report are provided below:

1. The Program continues to be well-run, with participants and participating vendors highly satisfied with their experiences. Program participants expressed that the Company, along with vendors and implementation contractors, provide the necessary technical guidance and support to make their experiences "smooth and "easy." When asked to rate their experience, most participants gave the program high marks and complimented program staff and vendors for their expertise and guidance.

2. The Charging Demonstration Program has achieved 93% of ET Initiative targets for Level 2 ports and 67% of the target for DCFC ports. The Company activated 293 ports (281 L2 and 12 DCFC) across 160 stations (148 L2 and 12 DCFC) and 76 sites (69 L2 and 7 DCFC) through August 31, 2021. There are an additional 37 ports approved for RY3 but not yet activated, bringing the total number of ports for RY1 – RY3 to 330. Overall charging activity has also significantly increased in RY3 when compared to prior rate years, as more stations report data and EV drivers continue to utilize program-sponsored stations.

3. Incentives continue to be essential in enabling charging infrastructure development. The Program incentives encourage customer participation and increase EVSE development in Rhode Island. Most participants interviewed stated that they would not have installed charging stations if the incentives were not available.

4. Fleet Advisory Program participants are switching to EVs. To date, participants in the fleet program have converted 31 of their vehicles to EVs since the completion of their studies, with additional vehicles planned in the pipeline. This represents great progress from RY2 and reflects the positive impacts of the fleet studies and ongoing follow up with program participants.

5. Off-Peak Charging Rebates work. The Off-Peak Pilot pricing signal has a statistically significant positive effect on off-peak charging behavior. For the first time, participants

in the control group began receiving rebates in RY3 and increased their off—peak charging by 8.9%.

The off-peak charging education campaign encouraged additional off-peak charging. DNV found that the subset of participants receiving education materials since April 2021 increased their percentage of charging sessions started off-peak by 5.5% relative to the control group, who are not receiving the communications.

As noted in the Evaluation Report and as summarized above, the Company built upon the accomplishments from previous rate years and had an overall successful RY3. Below is a more in-depth review of the progress, lessons learned and improvements for each of the ET Initiative's components.

2 PROGRAM COMPONENTS

2.1 Off-Peak Pilot

2.1.1 Summary of RY3

On September 1, 2020, participants in the control group became eligible to receive incentives for charging at off-peak times for the first time since the program launched. The introduction of price signals to all drivers allowed for a comparison of RY2 and RY3 charging behavior to further identify and understand the impacts of the off-peak rebates. The Company was able to collect a full years' worth of off-peak charging data from the control group after getting the rebates in RY3. The off-peak rebates are 6 cents per kWh charged off-peak in the summer months (June through September) and 4 cents per kWh charged off-peak during the

non-summer months (October through May). In total, $20,329 in rebates were earned by all participating drivers for charging during off-peak times in RY3.

To continue to learn new lessons, the Company integrated an educational campaign to test the impact of customer education on off-peak charging behavior conditional of receiving off-peak rebates. The education campaign launched in March of 2021 and will continue through August of 2022, utilizing the current participant group from the off-peak charging rebate program.

To test the impact of the campaign, a similar analytical approach to the off-peak charging rebate pilot was implemented by the vendor, using a randomized controlled trial. Participants were broken into treatment and control groups in a 50/50 ratio. In this instance, the new "behavior-treatment" group received a welcome letter notifying them of their participation in the program, as well as subsequent monthly dynamic communications, beginning in April 2021.

The communications sent to the treatment group are structured in a similar fashion to the company's Home Energy Reports. The emails contain the following sections:

1. Anchor – includes dynamic, personalized information to the participant on their charging behavior in a 2-bar month-over-month visualization showcasing their percent of off-peak charging, as well as a normative comparison insight detailing how their off-peak charging compares to the entire participant segment.

2. Educator – this section includes topics that evolve thematically over time, taking participants from motivation to knowledge to action. Example topics include why shifting

charging to off-peak times is beneficial, how to shift charging, and providing practical advice to make shifting charging easier.

3. Delighter – features content of interest to EV drivers to create a tailored, lively, "feel good" approach. Topics typically include EV and charging station news, fun facts related to EVs, and a community impact statement.

4. Rebate Summary – personalized to each participant highlighting the previous month's rebate earnings for charging at off-peak times.

An example of the monthly education communication can be found below in Appendix 2. Additionally, the program vendor and the Company have been monitoring email performance metrics to understand how well the content being delivered is viewed and utilized. For example, each email can include links to helpful resources such as online EVSE mapping applications to help participants find local charging stations, or tools to help them schedule charging for their vehicle. Example metrics being tracked include delivery rate, number of times the email is opened, unique open percentage, clicks, and click through rates. Through the five months of the campaign, the Company has seen strong results in each of the metrics tracked when compared to industry averages. Email metrics continue to perform above benchmark with the unique open rate as the strongest performer with an average of 71.34% as compared to the industry benchmark of 23.31%.

2.1.2 Lessons Learned

Based on the experiences of the implementation team and as discussed in the Evaluation Report, there were several lessons learned during RY3. Key findings from the Off-Peak Pilot include the following:

- COVID-19 pandemic impacts. There was significantly less average daily charging (kWh) occurring in RY3 than in RY2 across both the treatment and control groups, likely due to ongoing impacts of the COVID-19 pandemic and reduction or elimination of a daily commute for a large number of participants. However, there was no statistically significant reduction in the share of charging off-peak due to COVID impacts.
- Charging behavior of control group after receiving rebates.
    - When comparing the charging load profile for the control group between RY2 and RY3, there is now a significant increase in charging occurring at 9 p.m. as the off-peak period begins, signifying that the rebates are having a positive effect in reducing on-peak charging, with participants now delaying their charging until off-peak times. This contrasts with the control group's RY2 profile, where there was little to no ramp up in off-peak charging[1].
    - The control and treatment groups charged at a similar level on a daily basis, however the control group's load is slightly higher during the on-peak hours and does not peak as high as the treatment group during the same post-9 p.m. period.

[1] See: "Figure 4-3 Charging Load Profile Comparing Rebate Intervention Control Group RY2 and RY3 Behavior" in Evaluation Report

This suggests that some of the original behavior in RY2 by the control group carried into RY3.

- Shift in off-peak charging due to rebates. As noted in the Attachment 1,[2] the off-peak charging rebate pricing signal has a statistically significant positive effect on off-peak charging behavior and succeeded in shifting EV owners to shift their charging to off-peak hours. The Evaluation Report found that participating drivers who started receiving off-peak rebates in RY3 shifted 8.9% of their charging off-peak. Similar to the trend observed in RY2, the effect of the Off-Peak Pilot pricing signal is not uniform across all vehicle types, with BEV owners initiating more of their charging sessions off-peak than PHEV owners.

  DNV estimated that off-peak charging rebates resulted in a shift of 86,178 kWh away from the on-peak period through RY3. The rebate impacts vary significantly by vehicle type with the highest shift in off-peak charging observed among Tesla BEV drivers.

  - 26,495 kWh shifted by PHEVs
  - 15,695 kWh shifted by Non-Tesla BEVs
  - 43,988 kWh shifted by Tesla BEVs

- Additional shift in off-peak charging due to educational campaign. The RY3 Evaluation Report[3] found that the educational campaign encouraged additional off-peak charging. After five months of getting education materials, participating drivers who

[2] RY3 Evaluation Report, page 2.
[3] Id. at 2.

received behavioral messaging increased 5.5% of their charging sessions off-peak relative to a control group of drivers who are not receiving the communications.

2.1.3 Program Improvements

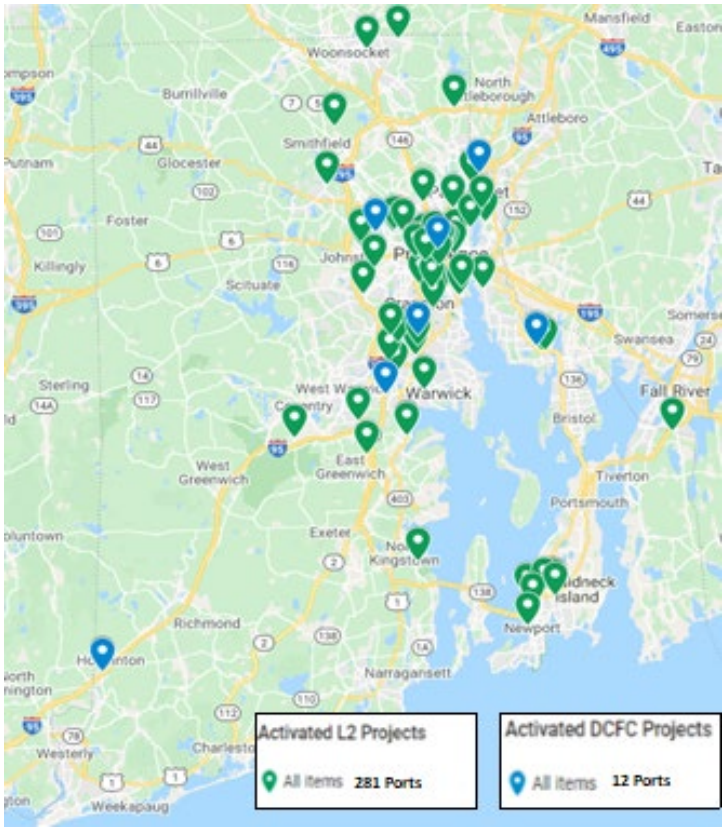
The Company will continue to monitor and analyze the results from the off-peak charging education campaign. Initial results from the education campaign are encouraging, however the Company hopes to continue to adapt the program with the goal to encourage additional shifts in kWh to off-peak times.

2.2 Charging Demonstration Program

2.2.1 Summary of RY3

The Charging Demonstration Program has been available to customers and vendors since the beginning of Q4 2019. Per the ASA, the Charging Demonstration Program defines the segments and number of charging stations within each segment to be developed as part of this initiative. In RY3 the Company activated a total of 60 ports, bringing the cumulative total of the ports to 293. In addition to the 293 ports, the Company has approved an additional 37 ports which will be counted towards the RY 1-3 program goals but will be activated after August 31, 2021. The Company reached the segment goal for the Environmental Justice segment by the end of RY2. The Company is projecting to reach its goals for the Workplace, MUD, Government Fleet, and Public DCFC segments. The Company is projecting that the Public DCFC segment goal will be reached by the end of 2021. RY3 also saw a significant increase in charging kWh reported across both Level 2 and DCFC and for all Level 2 segments, as more stations came online and began

reporting data[4]. The Company has created the below Figure to show the geographic diversity of the stations that have been activated as of October 15, 2021, for RY3.



In addition to these segments, the Company achieved significant results in the Public Transit Stations, Public Transit Buses and Municipal School Bus segments. The Company worked closely with the State of Rhode Island's "Electrify RI" program to provide funding for both Level 2 and DCFC stations within several of these segments. Below are photographs of two sites which installed both DCFC and L2 stations in Rhode Island.

[4] Additional detail on charging station utilization can be found starting on page 32 of Attachment 1.

Figure 1: DCFC Installation, Warwick, RI

Figure 2: Level 2 Installation, Warwick, RI

Tables 1 and 2 below shows the Company's progress through RY3 along with a projection of stations which the Company has approved and expects to be activated.

Table 1: Charging Demonstration Program RY1-RY3 Progress and Projections

Level 2 Segment	Segment Port Targets	RY1 Activated	RY2 Activated	RY3 Activated	RY3 Approved
Corporate light-duty fleet	24	-	2	-	6
Government light-duty fleet	24	-	20	4	-
Public transit stations	60	-	14	29	12
Environmental Justice	36	-	36	-	-
MUD	36	-	32	4	-
Workplaces	140	20	106	14	-
Total L2 Ports	320	20	210	51	18

Table 2: Charging Demonstration Program Progress and Projections (continued)

DCFC Segment	Segment Port Targets	RY1 Activated	RY2 Activated	RY3 Activated	RY3 Approved
Municipal school buses	3	-	-	-	2
Other heavy-duty (port, airport)	8	-	-	-	-
Rideshare company hub	5	-	-	-	-
Public transit buses	10	-	-	-	9
Public DCFC	20	-	3	9	8
Total DCFC Ports	46	-	3	9	19

2.2.2 Lessons Learned

As referenced in the RY3 Evaluation Report, the coordination of third-party funding provided needed additional resources to allow substantial progress in the Charging Demonstration Program. Of the 60 ports activated in RY3, 46 received additional funding through the Electrify RI program. As noted in the RY2 evaluation report,[5] "[a]s National Grid cannot offer full funding for all segments, continued availability of supplemental funding sources such as Electrify RI will be critical to achieving program goals. Particularly for the environmental justice and public sectors, interviewees reported that full funding is critical to their participation and can help contribute to program equity."

For the Public DCFC segment specifically, the Company learned that there was a need for funding for the DCFC stations and not just the make-ready costs. The charging demonstration program was designed to provide up to 100% of the make-ready work for the Public DCFC

[5] Id. at 2.

segment but no rebate towards the DCFC stations. While implementing the program, the Company found that DCFC stations are inherently more expensive in comparison to Level 2 stations, with DCFC stations costing over $50,000 and Level 2 stations costing roughly $7,000. Due to the high upfront costs, the Company did not receive any applications until the Electrify RI program was officially up and running. Electrify RI was able to provide a rebate of either $25,000 or $40,000 per station depending on the location of the project and, of the 20 stations projected to be activated for Rate Years 1-3, 19 stations received funding from Electrify RI.

Another lesson the Company learned was in reference to the Municipal School Bus segment. While implementing the program, the Company found that electric school buses cost significantly more than their gas/diesel counterparts. This initial upfront cost was a barrier for school districts interested in electrifying their fleets. To help address this barrier, the Company coordinated with the Rhode Island Department of Environmental Management ("DEM") and its 2021 Diesel Emissions Reduction Act ("DERA") program to assist a town to apply for grants for two electric school buses. The DERA grant, if awarded, will provide the town with approximately $400,000, which represents 45% of two electric school buses and charging station equipment. The Company's Charging Demonstration Program will provide a rebate for the make-ready costs for the stations along with the remaining 55% of the charging stations costs, approximately $300,000 in funding. In addition to the Charging Demonstration Program, the town is planning on enrolling in the Company's 'Connected Solutions' program in which the town can discharge energy from the buses on peak energy days during the summer and receive a yearly payment for their participation. The project is still ongoing and should help to demonstrate the benefits of electric school buses to other towns in Rhode Island.

As noted in the RY2 Annual Report and the RY3 Evaluation Report, the Company continued to experience challenges recruiting Corporate Fleet customers in the Level 2 segment and Rideshare and other heavy-duty customers in the DCFC segments. Based on the Company's interview with a heavy-duty customer, one of the barriers noted was the costly upgrades required to the existing electric grid infrastructure. The lesson learned from this project is large fleet electrification may impact the distribution system requiring more involved coordination for the customer and the Company. The Company will continue its efforts to target Corporate Fleet customers for Level 2 ports in RY4. With further maturation of the electric vehicle market, namely around electric trucks, the Company expects more fleets to start electrifying.

Another finding in the RY2 and RY3 evaluation reports was that there remains limited diversity in EVSE manufacturers. One EVSE manufacturer provided the majority of stations to site hosts in this program. Despite site hosts and vendors obtaining quotes and applications from other EVSE manufacturers, and due to the market-wide materials shortages, most projects ultimately moved forward with the prominent EVSE manufacturer as they had the shortest lead time on their equipment. To date in RY4, the Company has seen more EVSE diversity in a limited sample size with only 55% of the approved or activated ports being the prominent EVSE manufacturer versus over 80% in RY1-3.

2.2.3 Program Improvements

Based on the Evaluation Report and the implementation team's experience, the Company is only proposing one implementation update to the program. During the ET-ES PST meeting on June 10, 2021, the Company presented the following implementation update:

1. The Company proposes funding DCFC stations with only CCS connectors as well as continuing to support stations with both CCS and CHADEMO connectors.
    a. There has only been one station activated with CCS only connectors for the Public DCFC segment

This program improvement was presented at the June 2021 PST meeting as the Company received an application for a DCFC station which was going to have a CCS connector but not a CHADEMO connector. Previously, the Company had only approved DCFC stations which offered both types of connectors. For background, non-Tesla electric vehicles that can charge using DCFC stations will either connect to the stations using a CCS connector or a CHADEMO connector. As the Company noted during the meeting, the EV market is moving towards every vehicle having a CCS connector, with only one make of vehicle keeping the CHADEMO connector. As the CCS connector will be able to charge a majority of the vehicles on the road now and in the future, the Company felt this improvement would benefit the program.

2.3 Discount Pilot for DCFC Station Accounts

2.3.1 Summary of RY3

In RY3 the one customer enrolled in the Discount Pilot received credits through August 31, 2021, the last month of the customer's eligibility for the Discount Pilot. The total amount of credits to this customer received in RY3 was $24,093. In RY3, the Company accepted an additional five customers in the DCFC Discount Program. These five customers are in the process of installing DCFC stations through the Company's Charging Demonstration Program. The five customers and their projected installation dates are as follows: RIPTA (2 locations with 2022 projected installation), Twin Rivers (Quarter 4 2021 projected installation), Irving Oil (2022 projected installation), 1-energi (Quarter 4 2021 projected installation), and Town of Westerly (2022 projected installation).

Please see Section 2.5 for more details regarding the projected RY4 Discount Pilot credits and projected credits in subsequent years.

2.3.2 Lessons Learned

In RY3, the Discount Pilot participant realized an average electric bill reduction of 0.03/kWh. This site host had DCFC stations installed prior to the Discount Pilot launch and has relatively high utilization, in terms of kWh, relative to more recently installed DCFC sites. Therefore, all things being equal, more recently activated sites with lower utilization placed on a demand rate would see a greater kWh reduction in their electric bill, benefitting the site host and potentially EV drivers. Additionally, beginning in 2022, the Discount Pilot is projected to reduce operating costs by approximately $100K per year for the DCFC stations serving electric public

transit buses. These RY3 findings are consistent with the RY1 Evaluation Report which found the "DCFC Discount Pilot helps site hosts alleviate demand charges".

2.3.3 Program Improvements

Based on the current revised tariff, the Discount Pilot is only eligible to customers submitting an application prior to the end of RY3, August 31, 2021. Therefore, the Company is not proposing any additional improvements to the Program for RY4.

2.4 Fleet Advisory Program

2.4.1 Summary of RY3

The Company's Fleet Advisory Program has been providing fleet electrification studies to qualified participants since Q4, 2018. There were four studies completed in RY3, with two more underway that will be completed in RY4, bringing the total number of studies to 11 for RY1 – RY3. Segments studied to date include government, public transit, colleges/universities, corporate fleets, and a school bus transportation vendor. A total of 3,000 vehicles have been evaluated with 816 having EV options available for replacement today. Of this vehicle pool, 399 vehicles have been identified as having a positive total cost of ownership ("TCO") if replaced in the near term (within the next three years or earlier) with an EV. Average lifetime savings per vehicle across the participant base was calculated to be roughly $6,000 per vehicle. Total potential lifetime cost of ownership savings at the end of RY3 is estimated to be $1.9 million.

Participants in the Fleet Advisory Program made great strides in implementing EVs in RY3, with 31 new EV purchases made and another 13 planned or pledged. The evaluation vendor estimates that the conversion of these 31 vehicles to EVs will avoid up to 1,601 short tons of

greenhouse gases over the lifespan of the vehicles. Additionally, program participants have 48 charging ports either installed or planned to date, taking advantage of the Company's charging infrastructure incentive program and further highlighting the complimentary nature the Fleet Advisory Program can play in the development of EVSEs.

2.4.2 Lessons Learned

A key finding to come out of RY3 for the Fleet Advisory Program is the value provided by ongoing program support and communication to participants. As noted in the Evaluation Report, participants expressed that they will likely take a phased approach to electrifying their fleets and installing EVSEs. Fleet participants expressed strong interest in ongoing communication from the Company and its vendors to stay updated on the latest market trends, incentives, and technologies to guide their future decision-making. Likewise, the Company sees value in holding ongoing conversations with fleet participants, as it provides an opportunity to learn of new EVs/EVSEs purchased/installed by participants, successes achieved or barriers faced, and knowledge sharing.

2.4.3 Program Improvements

Acting on previous recommendations by the evaluation vendor and lessons learned, the Company and its vendor have been engaging past Fleet Advisory Participants on a regular cadence to obtain updates related to each fleet's progress towards electrification and provide an opportunity to share experiences and stay current on the EV landscape. In RY4, the Company and its vendor will build on this engagement, with additional follow-up discussions planned with each participant, as well as designing and implementing an ongoing newsletter to include useful

information to fleets. Example communications include information on the latest EV makes and models, incentives, case studies, and other relevant fleet news.

2.5 Rate Year 4 Commitments

As stipulated in the Amended Settlement Agreement, the Rate Year 4 budget mirrors the Rate Year 3 budget for the ET Initiative which includes the four ET programs, Evaluation, and Strategic Electrification Marketing Initiative. At this time, the Company is projecting to reach the goals for each of the programs, as documented below.

- Off-Peak Pilot: Continue the educational campaign through August 31, 2022
- Off-Peak Pilot targeted to end August 31, 2022
- Discount Pilot: Activation of the five customers with applications submitted by the program deadline of August 31, 2021
- Fleet Advisory Program: Initiate 6 studies
- Charging Demonstration Program: Commitments for a total of 269 ports, 252 Level 2 ports and 17 DCFC ports, as detailed in Table 3 below

Table 3: Rate Year 4 Charging Demonstration Program Goals, Including Activity to Date

	RY4 Goals (Ports)	In Development (Ports)	Approved (Ports)	Activated (Ports)
Level 2				
Corporate light-duty fleet	20	0	0	0
Government light-duty fleet	20	4	6	0
Public transit stations	46	0	14	0
Environmental Justice	28	2	20	0
MUD	28	0	20	10
Workplaces	110	6	72	0
Total L2 Ports	252	12	132	10
DCFC				

Municipal school buses	1	0	0	0
Other heavy-duty (port, airport)	2	0	0	0
Rideshare company hub	2	0	0	0
Public transit buses	5	5	0	0
Public DCFC	7	0	8	0
Total DCFC Ports	17	5	8	0

- Evaluation: The Company will develop an evaluation plan consistent with the evaluation metrics detailed in the Amended Settlement Agreement
- Strategic Electrification Marketing Fund: The RY4 funds were used to partially fund the Off-Peak Charging Rebate Program educational campaign. The remaining RY4 cost for the educational campaign was funded by the vendor delivering the educational messages to participants.

2.6 ET Initiative Program Budgets

The ET Initiative through RY4 is projected to have an underspend of $2.7M compared to the original estimated budgets. Below is further explanation of RY1 and RY2 actual spends and updates, RY3 actual and projected spends, RY4 projected spends and the overall program RY 1-4 variances to the original estimated budgets.

2.6.1 Rate Years 1 and 2 Adjustments

Please see Table 4 for the ET Initiative Rate Years 1 and 2 program budgets showing the amount of expenditures previously reported and the adjusted amounts for both years to include actual incremental, fully loaded labor charges and adjustments to reflect the rate year invoices were actually paid. The total net adjustment for RY1 and RY2 is $37,765.

Table 4: Rate Year 1 & Rate Year 2 Previously Reported and Adjusted Spend Amounts

	Previously Reported RY1 Spend	Adjusted RY1 Spend	Previously Reported RY2 Spend	Adjusted RY2 Spend	Total Adjustment RY1 and RY2
OPEX					
Off-peak Charging Rebate	$218,763	$182,176	$178,209	$188,826	$(25,970)
Discount Pilot for DC Fast Charging	$13,413	$13,408	$21,694	$21,694	$(5)
Customer Fleet Advisory Services	$51,050	$21,879	$88,659	$153,687	$35,857
Charging Demonstration	$66,118	$80,205	$597,437	$552,044	$(31,306)
Initiative Evaluation	$6,775	$5,846	$63,461	$64,797	$407
Strategic Electrification Marketing Fund	$0	$8,945	$0	$9,289	$18,234
TOTAL OPEX	$356,119	$312,459	$949,460	$990,337	$(2,783)
CAPEX					
Charging Demonstration	$75,204	$143,195	$1,711,110	$1,683,667	$40,548
TOTAL CAPEX	$75,204	$143,195	$1,711,110	$1,683,667	$40,548
TOTAL ET Initiative OPEX and CAPEX	$431,323	$455,654	$2,660,570	$2,674,004	$37,765

The previous amounts are the amount of spends reported in RY1 and RY2. The basis for these updates is that the labor costs included in the RY1 and RY2 reports were estimated and have been updated with the Company's actual incremental, fully loaded costs.

The original ET Initiative budget included staffing levels and labor costs for the Charging Demonstration and Off-Peak Pilot. Labor for the Fleet Advisory Program and Discount Pilot was "rolled up" into the Charging Demonstration Program and the ET Initiative Evaluation budget did not include staffing levels and labor costs. When applicable, the Company's employees tracked their time for each of the four ET Initiative programs and the above amounts reflect labor charges as applicable to each of the four ET Initiative programs.

In addition, some ET Initiative invoices for RY1 and RY2 that were originally reported as paid in one rate year were subsequently identified to have been paid in a different rate year. For example, an invoice in the program tracking spreadsheet that was reported as paid in August 2019 (RY1) was not booked and accounted for until September 2019 (RY2). These adjustments are also reflected in the above adjusted amounts.

2.6.2 Rate Year 3 Actual and Projected

Table 5 below reflects the actual and projected spends in RY3.

Table 5: Rate Year 3 Actual and Projected Spends

	RY3 Actual Spend	RY3 Projected Spend	RY3 Total Spend
OPEX			
Off-peak Charging Rebate	$241,325	$53,543	$294,868
Discount Pilot for DC Fast Charging	$24,093	$0	$24,093
Customer Fleet Advisory Services	$83,764	$8,983	$92,747
Charging Demonstration	$255,085	$240,715	$495,800
Initiative Evaluation	$86,153	$0	$86,153
Strategic Electrification Marketing Fund	$37,001	$0	$37,001
TOTAL OPEX	$727,421	$303,241	$1,030,662
CAPEX			
Charging Demonstration	$966,131	$1,301,029	$2,267,160
TOTAL CAPEX	$966,131	$1,301,029	$2,267,160
TOTAL ET Initiative OPEX and CAPEX	$1,693,552	$1,604,270	$3,297,822

The projected dollar amount for RY3 is the sum of all the remaining projects that have yet to be activated for the Charging Demonstration Program, Fleet Advisory Program, and the Off-Peak Pilot. For the Charging Demonstration Program, the Company first identified the potential for some projects to extend beyond August 31, 2021 in its Rate Year 1 Annual Report, Lessons

Learned & Modification[6]. These include projects budgeted for RY3 for Public Transit Buses, Public DCFC, Municipal School buses and a few Level 2 projects. The Fleet Advisory Program has two customers who were enrolled and budgeted in RY3 but whose activity and deliverables will continue into RY4. The projected spend in Table 5 above reflects anticipated payments to vendors in RY4 to close out RY3 activity. Similarly, projected expenditures in RY3 for the Off-Peak Pilot reflect vendor payments received to close out RY3 activity but that will did not post until RY4. These projected costs as described above were caused by a reasonable delay in implementation and can be deferred as allowed per Section 20.d of the Amended Settlement Agreement.

2.6.3 Rate Year 4 Projections

Table 6 reflects the projected spends for RY 4 of the ET Initiative program.

Table 6: Rate Year 4 Projected Spend and Budget

	RY4 Projected Spend	RY4 Budget	Budget Variance
OPEX			
Off-peak Charging Rebate	$212,593.00	$227,567.00	$14,974.00
Discount Pilot for DC Fast Charging	$62,223.00	$264,488.00	$202,265.00
Customer Fleet Advisory Services	$135,623.00	$100,000.00	($35,623.00)
Charging Demonstration	$970,071.00	$1,013,115.00	$43,044.00
Initiative Evaluation	$82,496.00	$30,000.00	($52,496.00)
Strategic Electrification Marketing Fund	$0.00	$18,750.00	$18,750.00
TOTAL OPEX	$1,463,006.00	$1,653,920.00	$190,914.00
CAPEX			
Charging Demonstration	$3,025,549.00	$3,262,316.00	$236,767.00
TOTAL CAPEX	$3,025,549.00	$3,262,316.00	$236,767.00
TOTAL OPEX and CAPEX	$4,488,555.00	$4,916,236.00	$427,681.00

6 RY1 Annual Report at 10.

For the ET Initiative programs and Evaluation, the RY4 budget equaled the budget allocated to RY3. For the Charging Demonstration Program in RY4, the Company used its findings from RY1-3 to delineate each segments' port goals as provided in Section 2.5 Table 3. Working with the budget provided in the Amended Settlement Agreement, the Company utilized its actual "per port" costs from RY1-3 for each segment to determine appropriate goals. The original "per port" costs in the budget were higher for Level 2 projects versus the actual "per port" numbers, allowing the Company to project to install more ports at a lower cost in RY4. For DCFC sites, though, the Company has seen per station costs higher than the original budget because the budget had projected installing 5 stations per site when in RY1-3 the Company had seen customers installing either 1 or 2 stations per site. The Company is projecting to hit all of their port targets in RY4, which is reflected in the budget projecting to be close to fully spent.

For the Fleet Advisory program, the Company used the average cost per study in RY1 – 3 to calculate the number of studies for RY4. As noted above, two more studies are underway that will be completed in RY4, bringing the total number of studies for RY1 – RY3 to 11.

For the Off-Peak Pilot, the RY4 budget reflects the remaining licensing costs for the monitoring device in active participants' vehicles, projected incentives, and vendor administration costs through the end of RY4.

For the Discount Pilot, the Company's RY4 projections are calculated based on the five applications submitted to the Company prior to the end of RY3 as required by the rate tariff. The Company's projected spend in RY4 is based on the submitted applications received in RY3 and this projected spend is included in the DCFC Pilot RY4 budget projections. Future payments for

these applications after RY4 (i.e. RY5, RY6, and RY7) are not included in the budget projections and are projected to total $363,394.

For Evaluation, the RY4 budget projection is based on the cost for the evaluation vendor to deliver the RY4 evaluation report as stipulated in the Amended Settlement Agreement.

The Strategic Marketing program's budget for RY4 mirrors the RY3 budget amount. These funds were spent in RY3 as shown in in Table 5 in order to launch the educational campaign.

2.6.4 Rate Years 1 – 4 ET Initiative Program Spend and Budgets

Please see the below table for the ET Initiative Rate Years 1 through 4 program budgets, spends and variance between the budget and spend amounts. Overall, the ET Initiative is projected to be underspent by $2.8 million (20%). The RY1 – 4 actual and projected amounts for each of the programs in the table below now include the incremental, fully-loaded labor costs. Further explanation of the variance by program is provided below.

Table 7: Rate Year 1 - 4 Projected Spend, Budget, and Variance

	RY1-4 Actual + Projected Spend	RY1- 4 Budget	RY 1 – 4 Budget Variance
OPEX			
Off-peak Charging Rebate	$878,463	$765,798	($112,665)
Discount Pilot for DC Fast Charging	$121,418	$803,248	$681,830
Customer Fleet Advisory Services	$403,936	$310,000	($93,936)
Charging Demonstration	$2,098,120	$2,855,442	$757,322
Initiative Evaluation	$239,292	$120,000	($119,292)
Strategic Electrification Marketing Fund	$55,235	$56,250	$1,015
TOTAL OPEX	$3,796,464	$4,910,738	$1,114,274
CAPEX			
Charging Demonstration	$7,119,571	$8,768,575	$1,649,004
TOTAL CAPEX	**$7,119,571**	**$8,768,575**	**$1,649,004**
TOTAL ET Initiative OPEX and CAPEX	**$10,916,035**	**$13,679,313**	**$2,763,277**

Charging Station Demonstration Program

As Table 7 shows, the Company is projecting to be under budget in the Charging Demonstration Program. Reasons for this underspend include, as discussed below, the lack of new electric services required for Level 2 sites, the Electrify RI program funding, and the Company projecting to not reach all of the goals in the hard to reach segments in both Level 2 and DCFC. In addition, both CAPEX and OPEX labor spends have been 50%+ lower than the original budget had projected.

The Company had originally projected that all sites, both Level 2 and DCFC, would require new services for charging station projects. For projects activated and approved in RY 1-3, 15 of the 74 customer sites installing Level 2 stations required new services, or only 20%. This helped to reduce the total cost per port for activated Level 2 sites to roughly $8,600 per port versus the budgeted amount of roughly $11,600 per port. For DCFC sites, 14 of the 15 sites required new electric services or 93% so there were no budget savings in this segment.

As section 2.2.2 of this report outlines, the Electrify RI program and other third-party funding also contributed to reducing program costs. Level 2 projects that received third party funding helped to reduce program costs for the EVSE equipment. This was significant as the costs for EVSE equipment the Company was seeing were over 20% higher than what the budget had projected. For customers, this additional funding also helped to pay for software and maintenance costs, which the Company's program would not pay for. As noted in the RY2 and RY3 Evaluation Reports, some customers were able to participate in both programs and receive

the EVSE and installation at no cost to them; without both programs, customers may not have moved forward with the projects.

The Company is projecting to not reach goals in some of its hard-to-reach segments. For the Corporate Fleet Level 2 segment, the Company is continuing its outreach to potential fleet customers but have found that the nascent electric vehicle market and the lack of incentives for electric vehicles in Rhode Island had been a barrier for EV adoption. The Company is hopeful that with more EV options, including electric all-wheel drive cars and trucks, fleets will both participate in the Fleet Advisory Program and participate in the Charging Demonstration Program. As mentioned in Section 2.2.2, the Company had discussions with a heavy-duty customer but ultimately did not lead to stations being installed due to the lack of available capacity on the electric grid in the area of the project. Lastly, the Company reached out to rideshare companies regarding our program. These conversations did not progress due to the lack of an EV rebate for their drivers. In other states, some of the ride-share companies have expanded EV deployment with the help of a rebate towards the electric vehicle itself.

Finally, program management costs originally budgeted for performing site audits and contracts negotiations with program participants were not spent because vendors completed site audits and provided customers with proposals at no cost and the Company did not negotiate contracts with participants.

Discount Pilot Program

The Company is projecting to be under budget for the Discount Pilot. When meeting with customers interested in installing DCFC stations through the Charging Demonstration Program,

the Company Sales teams and vendors would discuss the Discount Pilot and found that customers were interested in the distribution demand charge savings. In RY2, the Company further supported customers by developing a one-pager which helped customers to understand potential distribution demand charge savings. The Discount Pilot underspend is explained by lower participation rates than originally budgeted because (i) the 12 DCFC stations installed and activated in RY1-3 were assigned to the C-06 non-demand rate which is not eligible for the DCFC Discount Program, (ii) the original budget projected 40 DCFC stations installed in RY1-3 with 20 budgeted for RY1, (iii) the average DCFC station size growing to 90 kW by RY3. The Company learned during the implementation of the ET Initiative that the customers' decision to install and activate DCFC stations required more time than originally expected, customers chose to proceed when Electrify RI funding became available for the DCFC equipment (RY2) and, DCFC charging stations funded through the Charging Demonstration Program in RY1-3 have not increased in size as initially expected due to higher costs for larger DCFC stations as well as insuring the DCFC stations are "right-sized" for the specific use case (e.g. charging of electric school buses).

Off-Peak Pilot

The Company is projecting to be overspent in the Off-Peak Pilot because the vendor's costs to administer and implement the program were greater than what was originally budgeted. A number of factors helped address the overspend for the Program, including (i) the Company negotiated that the annual licensing fees for the electric vehicle monitoring devices ("C2" device) be pro-rated through the end of RY4, August 31, 2022, (ii) the Company negotiated with the vendor administering the educational campaign to co-share the campaigns costs so that the Company funded no more than $37,011, the Strategic Electrification Marketing Fund balance

which was intended for use with the Off-Peak Pilot, (iii) the actual labor costs were less than the program's budgeted labor costs. The Strategic Electrification Marketing Fund balance of slightly over $1,000 as shown in Table 7 above was not included in the deferral account balance, as originally stipulated in the Amended Settlement Agreement.

Fleet Advisory Program

The Company is projecting to be overspent in the Fleet Advisory Program budget. The projected overspend for the Fleet Advisory Program is due to the incremental, fully loaded labor costs to manage the program which were not identified in the original budget for the Fleet Advisory program, but rather may have been included in the labor section of the Charging Demonstration Program. The Fleet Advisory Program will deliver a total of 11 studies in RY1-3, with two of these 11 in progress and expected to be completed in RY4. Since its implementation, the Fleet Advisory Studies have been streamlined by combining two deliverables into one, eliminating onsite field visits which can be performed at no cost through the Charging Demonstration Program, and adding a follow-up "check in" with participants. The RY3 Evaluation found that participants value the report and that the program is effective in enabling EV purchases and driving participation in the Charging Demonstration Program.

Electric Transportation Initiative Evaluation

The Company is projecting to be overspent for the Electric Transportation Initiative Evaluation budget. Per Docket No. 4770, the approved budget for Evaluation is $30,000 per year to assess all four programs in the ET Initiative. The Amended Settlement Agreement Docket No. 4770 and 4780 expanded the scope for Evaluation without any modification in the budget. To

minimize overspend, the Company selected a third-party vendor through a competitive procurement to evaluate the electric transportation program offerings across states served by National Grid. The Company ran the evaluations as efficiently as possible by using an integrated team to evaluate the programs in order to leverage lessons learned and realize synergies and cost-effectiveness from this approach. It would not have been feasible to complete all the research activities required by the Amended Settlement Agreement to assess the ET initiative within in the original budget without the additional budget to support these tasks given the current hourly rates of consultants and evolving research needs of the programs.

2.7 Revenue Requirements – Total, Rate Year 1-3, RY4

The Company has calculated revenue requirements individually for each the five ET Initiative components and in total based on the actual costs to deliver these initiatives in Rate Years 1 through 3 as well as a projected revenue requirement on forecasted Rate Year 4 ET Initiative costs. Each Rate Year's revenue requirement consists of the operating expenses incurred for the Off-Peak Pilot, Charging Demonstration Program, Discount Pilot, Fleet Advisory Program, and Evaluation Initiatives as well as the capital investment related to the Charging Station Demonstration program. Operating expenses include rebates, participant discounts and program management costs which are described in detail in Section 2.6 of this report. The program management costs included in the actual ET revenue requirements consist of both external labor costs as well as internal labor and benefits expense incremental to the level of internal labor and benefits-related operating expense reflected in the Company's current distribution rate plan under Docket No. 4770 (exclusive of pension and post-retirement benefits expenses reconciled annually through the Pension/PBOP Adjustment Factor). The revenue

requirement on capital investments made to deliver the Charging Demonstration Program consists of annual depreciation expense, a return on the average rate base and related income taxes, and municipal property tax expense on the capital expenditures placed into service during each Rate Year. The nature of those capital investments is described in Section 2.2. These revenue requirements were calculated in a manner consistent with those presented and approved in the Company's August 16, 2018 ASA compliance filing.[7]

The table below reflects the RY1 through 3 actual ET Initiative revenue requirements in Column (a) and the RY4 projected revenue requirements in Column (b), by ET Initiative and in total. As stipulated in the ASA, recovery of ET Initiative costs under the Company's current distribution rate plan is subject to the "Special Sector" Program Costs and Revenues deferral clause.[8] Pursuant to that clause, the Company will measure the revenue requirement on actual costs incurred to deliver the five ET Initiatives in total against the level of rate recovery included in distribution base rates for those same five ET Initiatives in total, and any differential will be assessed as to the driver of that difference. As is shown in the table below in Column (e), the Company's ET Initiatives are in a total net over-recovery position of $1.6 million at the end of Rate Year 3 and are projected to remain in a total net over-recovery position through the end of Rate Year 4, at $1.3 million in Column (f), inclusive of interest due to customers. The drivers of this over-recovery are described in Sections 2.6.1and 2.6.2 of this report. For funds not spent for reasons other than reasonable delay, the deferral is to be held for the benefit of customers, and the PUC shall determine how it shall be applied against other programs or costs. ASA §20.d.

7 See Docket No. 4770, Compliance Book 5, Attachment 5.1, Bates Pages 97 through 107.
8 See ASA Book 1, Section 20, at 76 or Bates Page 78.

The amount of any such deferral shall incur carrying charges at the WACC for Narragansett Electric for capital expenses and the customer deposit rate for Narragansett Electric for O&M costs. ASA §20.d.

Electric Transportation Initiative
Deferral Summary by Category

	Actual Revenue Requirements		Base Rate Allowance		Cumulative Deferral at Rate Years Ending	
	Total RY 1 -3	Total RY 1 -4	Total RY 1 -3	Total RY 1 -4	August 31, 2021 (RY3)	August 31, 2022 (RY4)
Operation and Maintenance (O&M) Expenses:	(a)	(b)	(c)	(d)	(e)=(a)-(c)	(f)=(b)-(d)
Offpeak Charging Rebate	$612,327	$878,463	$538,232	$765,799	$74,095	$112,664
Discount Pilot for DC Fast Charging	$59,195	$121,418	$538,760	$803,248	($479,565)	($681,830)
Customer Fleet Advisory Services	$259,330	$403,936	$210,000	$310,000	$49,330	$93,936
Charging Demonstration Program	$887,334	$2,098,120	$1,842,327	$2,855,441	($954,993)	($757,321)
Initiative Evaluation	$156,796	$239,292	$90,000	$120,000	$66,796	$119,292
Total O&M component of Revenue Requirement	**$1,974,982**	**$3,741,229**	**$3,219,319**	**$4,854,488**	**($1,244,337)**	**($1,113,259)**
Capital Investment:						
Charging Demonstration Program	$467,715	$1,135,864	$765,508	$1,282,115	($297,793)	($146,251)
Total Capital Investment Component of Revenue Requirement	**$467,715**	**$1,135,864**	**$765,508**	**$1,282,115**	**($297,793)**	**($146,251)**
Total Revenue Requirement: Electric Transportation	**$2,442,697**	**$4,877,093**	**$3,984,827**	**$6,136,603**	**($1,542,130)**	**($1,259,510)**
Accumulated Interest on Deferral Balance (O&M)					($24,282)	($34,989)
Accumulated Interest on Deferral Balance (Capital)					($25,596)	($45,975)
Total ETI deferral with interest at the end of Rate Year					**($1,592,008)**	**($1,340,474)**

The detailed revenue requirement and interest calculations supporting the table above are provided with this report as Attachment 1.

2.8 Summary of Overall Lessons Learned & Future Considerations

The Company has managed the implementation and budgets for the ET Initiative during these last three years, reporting on lessons learned and program modifications in each of the three annual reports, per the ASA. Provided below are a summary of lessons learned, the budget impacts, and future considerations for program design and implementation.

2.8.1 Charging Demonstration Program

1. Number of Stations per Site: Customers were unwilling to install 8-10 Level 2 ports or 5 DCFC ports per site as originally budgeted because of costs, unwillingness to dedicate parking spaces, or limited demand by employees and/or customers for charging stations. The average number of ports installed were 4 and 1.7 ports for Level 2 and DCFC sites, respectively.

Budget Impact: The actual infrastructure costs per site were greater than originally budgeted, averaging approximately $40,000 per DCFC port as compared to the budget average of approximately $18,000 per DCFC port

Future Considerations: The Charging Infrastructure Program could allocate funds to "future-proof" sites and/or create a rebate structure that encourages more stations per site.

2. Powering the Charging Stations: The Charging Demonstration Program assumed that a new service would be required to power the Level 2 and DCFC charging stations. Only 20% of the activated Level 2 sites required new service, which reduced the cost of the installation while also reducing the time required to complete the installation. However, Medium and Heavy-Duty customers including fleet customers may require 1 – 2MW of power for their electric fleets.

Budget Impacts: The original budget for new service to power Level 2 stations was approximately $0.9M, of which less than $0.1M is projected to be spent. Electrification of fleets for M/HD customers may require substantial infrastructure upgrades easily exceeding $1M and needing to be budgeted in future programs to meet anticipated fleet projections.

Future considerations: Powering the stations through the existing electrical service is less expensive and faster than requiring a new service. But it would be beneficial to evaluate sites based on their long-term charging needs which could then require a new service. One example is corporate fleet customers that might be planning on substantially scaling up their electric fleet vehicles in the next 3 to 5 years.

3. Incremental Costs: Funding costs for charging infrastructure is one piece of the "electrification" Rubik's Cube with site hosts also needing to fund the incremental costs of electric vehicles such as school buses and electric vehicles for transportation network companies ("TNCs"), including Uber and Lyft. The Town of Westerly is proceeding with purchasing two electric buses by leveraging RI DERA funds and expected revenue from the Company's Connected Solution Program. The TNCs were unwilling to proceed with installing a ride-share DCFC charging hub (5 ports) without a rebate for electric vehicles being available for Rhode Island residents.

Budget Impact: Thirty-six of the RY1-RY3 366 ports (16%) were not installed or committed before the end of RY3.

Future Consideration: Allow ports to be re-allocated to segments where customers were willing to proceed but for which there were no longer ports and funding available.

4. Charging Station Use Cases: Drivers and site hosts' charging needs are evolving as more electric vehicles are introduced, battery range increases, and drivers and fleet managers become more experienced operating electric vehicles. The Company's own experience is that employees

were oftentimes more willing to charge using a Level 1 charger versus Level 2 in the workplace. In addition, fleet managers were unwilling to pay for Level 2 networking and reporting functionality which was not perceived as needed for fleet chargers. In addition, evolving EVSE and EV standards can impact program implementation, such as the phasing out of CHADEMO DCFC ports in favor of CCS.

Budget Impact: Installing Level 1 chargers and not requiring networking functionality reduces the installation and EVSE costs, thereby reducing the overall cost of the Charging Demonstration Program.

Future Considerations: The Charging Demonstration Program should adapt to support our customers and site hosts' evolving charging infrastructure requirements and EVSE and EV landscape.

5. Supporting the State's EV Goals: The Rhode Island PST four ET programs were some of the earliest ET programs offered in New England. Therefore, there were relatively few installers and EVSE suppliers "in Rhode Island" ready to serve customers. Since the programs launch, the number of installers has increased, distributors have begun to stock charging stations, and more EVSE suppliers are now active in the state. However, expanding the programs to help support the State's EV goals will require, similar to the energy efficiency industry in its early years, a more robust EV charging station marketplace.

Budget Impacts: The Company believes that more trained installers will drive project installation costs since the majority of work performed in the state was by a relatively small number of

vendors. Estimates of these savings are not available. However, actual EVSE rebates were approximately 20% higher than originally budgeted primarily due to a limited number of active EVSE suppliers in Rhode Island resulting in the majority of stations supplied by a single EVSE supplier (91% of all activated ports as of RY2).

Future Considerations: Additional strategies and programs to grow the competitive marketplace of EV charging station installers, EVSE suppliers, and distribution channels will be needed to support the State's EV goals.

6. Program Tracking: As reported in the Evaluation reports, these initial programs have been well run and implemented successfully. However, expanding the programs both in terms of size and scope (e.g. rebates for residential installations) requires a more robust program tracking system

Budget Impacts: The ET Initiative programs successfully tracked projects, rebates and costs using Excel spreadsheets given the relatively small size of the current programs; therefore, the Company chose not to spend the $50,000 originally budgeted for a program tracking system and $50,000 for a charging station data reporting interface.

Future Considerations: Any future program expansion involving an expanded Charging Demonstration Program and/or programs serving residential customers requires the Company's IT group to estimate the costs to implement a program tracking system.

2.8.2 Fleet Advisory Services Program

1. Information is helping fleet customers to electrify their fleets: Four participants in the Fleet Advisory Program have converted vehicles and there are additional conversions planned. The

Evaluation Report identifies the ongoing follow up as supporting these customers efforts to electrify their fleets. Continued outreach has been helpful in addressing any questions raised by the participants as well as providing updates on new electric vehicles. As reported in the Company's scorecard to the PST ET Advisory Group, only approximately 15% of the fleet vehicles currently have an equivalent electric vehicle (3,139 fleet vehicles studied with 416 electric vehicles recommended)

Budget Impacts: The original budget did not include time for follow up efforts performed by the vendor. The Company worked with the vendor to streamline the studies in order to allow time for these follow up services while staying within the original budget.

Future considerations: In addition to the fleet studies, participants benefit from the ongoing communication about changes in the electric vehicle market. Adding more time and resources to maintain robust ongoing communications would benefit fleet managers.

2.8.3 Off-Peak Pilot

1. Managing the Impacts of Charging on the Grid: The Off-Peak Pilot was successful in moving EV charging from on-peak to off-peak demonstrating that EV drivers respond to price signals which can help to mitigate the impacts of EV charging on the distribution grid. In addition, early indications suggest that sending information about off-peak charging to EV drivers also contributes to reducing the percent of time charging on-peak.

Budget Impacts: It would not be cost effective to expand the number of participants beyond the drivers that participated in the randomized, control trial these past 3 years.

Future Considerations: The Company could collect the charging data using vehicle telematics – at least for some EVs -- to report the charging data, rather than the current process of licensing and installing a separate device in the EV.

2.8.4 Discount Pilot

1. Supporting Future Development of DCFC Charging Sites: The Discount Pilot reduced the operating costs for the Pilot participant by $0.03/kWh. Future site hosts can also benefit from these operating cost reductions when utilization at the DCFC is low during the initial years after the stations have been installed and EV adoption continues to increase. Finally, as reported in the RY1 Evaluation report, program's that help to mitigate the impacts of demand charges on operating costs during periods of low utilization can "could help prioritize future DCFC station development in Rhode

Island."[9]

Budget Impacts: The DCFC Pilot was underspent because of the time required to install DCFC sites resulting in less stations installed in RY1 through RY3 than was originally projected in the budget, smaller DCFC stations (in terms of kW) being installed than originally projected, and a number of DCFC sites placed on a non-demand rate not eligible for the Discount Pilot.

Future Considerations: Programs such as the Discount Pilot should be considered in future offerings given the reduction in operating costs realized by the site hosts and that these types of programs may help accelerate the installation of DCFC stations sites in Rhode Island.

[9] Electric Transportation Initiative RY1 Evaluation Report, page 26.

2.9 EV Adoption

The Company continues to track EV registrations. Below are the number of EVs registered in the Company's territory, as reported by IHS-Markit (a.k.a IHS-Polk) on June 30, 2021. These registration figures exclude vehicles that are not fit for highway use (i.e., electric golf carts registered by manufacturer Global Electric Motors). The Company also reports EV registration figures in its periodic Performance-Based Incentive Mechanism and Scorecard Metrics reports.

Table 8: Consumer EVs Registered in RI as of June 30, 2021

Consumer EV Type	Forecast of 2021 Registered Consumer EV[10]	Registered Consumer EVs as of June 30, 2021[11]
BEV	2,600	1,706
PHEV	2,907	1,736
Total	5,507	3,442

Table 9: Fleet EVs Registered in RI as of June 30, 2021

Fleet Type	2021 Registered Fleet EV Forecast	Registered Fleet EVs as of June 30, 2021
Government	-	54
Commercial	-	155
Total	307	209

2.10 Conclusion

The Company continued to build upon its progress in RY3 for its ET Initiative. The Charging Demonstration Program is projecting to achieve 93% of its goal for L2 stations and 67% for DCFCs,

[10] Source: All forecast figures taken from pages 1983 (consumer) and page 1984 (fleet) of the ASA at http://www.ripuc.ri.gov/eventsactions/docket/4770-4780-NGrid-ComplianceFiling-Book%201%20through%207%20-%20August%2016,%202018.pdf.

[11] Source: VIO figures as of 2021-06-30 excluding 4 ZIPs that were deemed to not be NECO (02807, 02940, 02880, 02859) and excluding MAKE_NAME == 'GLOBAL ELECTRIC MOTORS', which are e-golf carts. VIO was divided among Consumer, Government, and Fleet using the REGISTRATION_TYPE field.

projecting to add 100 new charging ports as part of RY3. Company incentives continued to enable and accelerate the EVSE market in Rhode Island. This was especially true for DCFC stations where Company incentives coupled with third party rebates offered through Electrify RI proved to be crucial in alleviating high up-front equipment costs. With the availability of funding for both programs, the Company is projecting to have 20 stations installed and activated by the end of RY3.

In RY2, the effectiveness of price signals was demonstrated to encourage off-peak charging. In RY3, the effectiveness of price signals was further confirmed by the original control group participants who earned rewards for the first time, increased their off-peak charging by 8.9%. The program is estimated to have shifted over 86,000 kWh away from the on-peak period through RY3. The Company successfully launched the Off-Peak Pilot Education Campaign, providing educational materials to treatment group participants. Preliminary results from this campaign have demonstrated that behavioral messaging also encourages off-peak charging (5.5%).

In RY3, the Company expanded the reach of the Fleet Advisory Program to a greater diversity of customers and fleet vehicles with the launch of fleet studies at a port operator and public water authority. To date, the Program has influenced fleet managers to convert a total of 31 gasoline or diesel to EVs, with additional vehicles planned.

The DCFC Discount Pilot helped reduce the ongoing operating costs at the publicly accessible DCFC site as well as the customers submitting applications prior to the August 31, 2021 deadline who may be able to benefit from reduced operating costs when their DCFC stations become installed and activated in RY4.

APPENDIX 1: EVALUATION REPORT

RHODE ISLAND ELECTRIC TRANSPORTATION INITIATIVE EVALUATION

Rate Year 3 Final Report

National Grid

Date: October 25, 2021

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1 EXECUTIVE SUMMARY

This report presents the evaluation results and findings for Rate Year 3 (RY3) for National Grid Rhode Island's Electric Transportation Initiative. This is a three-year initiative containing four programs: The Off-Peak Charging Rebate Pilot, Charging Station Demonstration Program, Discount Pilot for Direct Current Fast Charging (DCFC) Station Accounts, and Fleet Advisory Services Program. Collectively, these programs are designed to accelerate electrification in Rhode Island by scaling the market for electric transportation charging equipment and increasing electric vehicle (EV) adoption. RY3 covers the period between September 1, 2020 and August 31, 2021.

The DNV Team completed the following evaluation activities for RY3:

- Reviewed and analyzed program materials, such as program tracking data and score cards
- Conducted 11 in-depth interviews with equipment vendors and program participants of the Charging Station Demonstration Program ("Infrastructure Program") and Fleet Advisory Services Program
- Analyzed charging station utilization data provided by 4 electric vehicle supply equipment (EVSE) suppliers and covering 260 individual program-supported charging ports
- Analyzed Off-Peak Charging Rebate Pilot program data to assess the effectiveness of the off-peak charging rebate and educational awareness campaign (the "education intervention") in shifting EV charging load off-peak. DNV also reviewed the allocation process conducted by the implementation vendor of the education intervention.

The DNV Team used these RY3 evaluation activities, synthesized with RY1 and RY2 results, to develop the following RY3 program findings, recommendations, and considerations grouped into program achievements, program challenges and barriers, and future program considerations.[1]

1.1 Program Achievements

Finding #1: Effective Program Management. The programs are well-run, and participants and participating vendors are highly satisfied with their program experiences. Participants expressed that National Grid staff, along with vendors and implementation contractors, provide the necessary support and technical guidance to enable smooth and easy participation. Throughout the first three years of the program, when participants were asked to provide a rating of their overall program experience, most gave the program high marks and complimented the program staff and vendors for their guidance throughout their program experience.

Finding #2: Successful Charging Station Demonstration Program Implementation. The Charging Station Demonstration Program has activated 293 ports (281 Level 2 and 12 DCFC) across 160 stations (148 Level 2 and 12 DCFC) and 76 sites (69 Level 2 and 7 DCFC) through August 31, 2021. Additionally, 37 ports are approved for RY3 but not yet activated, for a total of 330 ports. This represents 90% of the overall program target: 93% of the target for Level 2 ports and 67% of the target for DCFC ports. Overall charging activity increased dramatically in RY3 for both Level 2 and DCFC stations as more stations began their data reporting and EV drivers continue to utilize the program-sponsored stations. Consistent with prior years, there is little evidence of free ridership in the program.

Finding #3: Fleet Conversions. Participants in the Fleet Advisory Services Program have converted 31 vehicles to EVs since the completion of their studies. These vehicle conversions were reported by 4 study participants, and there are

[1] Additional details on the RY1 and RY2 activities can be found in the Annual Reports, RY1: http://www.ripuc.ri.gov/eventsactions/docket/4770-NGrid-ElectricTransportation%20RY1%20Annual%20Report%20(10-31-19).pdf. RY2: http://www.ripuc.ri.gov/eventsactions/docket/4770-NGrid-RY2%20Transportation%20Initiative%20Annual%20Report%20Combined%20(10.30.2020).pdf.

additional planned/pledged conversions in the pipeline. This is great progress for the program from RY2 and reflects the positive impacts of the fleet studies completed and ongoing follow up with participants.

Finding #4: Incentives Enable Project Development. The Charging Station Demonstration Program incentives are essential in enabling the installation of Level 2 and DCFC stations. Through RY3, these incentives continued to encourage customer participation and increase EVSE development in Rhode Island. Most participants interviewed stated that they would not have installed charging stations if the incentives were not available.

- **Consideration:** Most interviewees through RY3 indicated that the entire cost of the charging hardware and infrastructure was covered by the Charging Demonstration Program and supplemental funding sources such as Electrify RI. Many site hosts noted that without these multiple incentive sources, they would not have installed the charging stations. Since the Electrify RI funding is now fully subscribed, National Grid should consider providing additional funding for EVSE development in RY4, particularly for DCFC stations and for public segments.

Finding #5: Off Peak Rebates Work. The Off-Peak Charging Rebate Pilot pricing signal has a statistically significant positive effect on off-peak charging behavior and is succeeding in shifting EV owners to charging during off-peak hours. Key effects include the following:

- Participants in the rebate-control group during RY2 began receiving rebates for off-peak charging during RY3 and increased their off-peak charging by 8.9%.
  - In RY2, the off-peak shift for rebate-treatment group participants was 14.2%; note that the rebate-treatment group exhibited a higher off-peak shift in RY2 than the rebate-control group exhibited in RY3, suggesting that the rebate-control group participants may have settled into the SmartCharge program during RY2 that are harder to shift.
  - There was no statistically significant change in off-peak charging behavior for the rebate-treatment group between RY2 and RY3.
- We estimate that the off-peak charging rebate resulted in a shift of 86,178 kWh away from the on-peak period through RY3. By vehicle type, 26,495 kWh were shifted away from the on-peak period for PHEVs, 15,695 kWh were shifted for Non-Tesla BEVs, and 43,988 kWh were shifted for Tesla BEVs. The education intervention is estimated to have driven 1,994 kWh away from the on-peak period, or approximately 2.3% of the total shift.
- The effects of price signals are not uniform across vehicle types. Tesla and Non-Tesla BEV owners tend to initiate more of their charging sessions off-peak than PHEV owners. This trend was observed in RY2 and continued in RY3.

Finding #6. The education intervention encouraged additional off-peak charging. The program began providing educational and behavioral messaging to a subset of participants in April 2021. DNV analyzed performance to-date, and while this is preliminary based on five months of data, DNV found that conditional on receiving rebates the participants receiving these materials increased the percent of charging sessions started off-peak by 5.5% relative to the control group not receiving the communications. However, when looking at the kWh charged off-peak between the two groups, while the treatment group charged slightly more off-peak than the control group, the increase was not statistically significant.

- **Recommendation:** Implement broader education and marketing campaigns to encourage EV charging behavior that best meets program and/or grid needs. The initial success of this intervention, though the effect is smaller in magnitude than the off-peak shifts driven by the rebate, reflects an opportunity for National Grid to use information about performance to inform and influence customer EV charging behavior.

1.2 Program Challenges and Barriers

Finding #7: Targeted Segment Outreach. The Charging Station Demonstration Program continued to experience challenges recruiting corporate fleet Level 2 segments as well as heavy-duty and rideshare DCFC segments through RY3.

- **Recommendation:** The program should explore other means of outreach to complement direct outreach in RY4 to increase recruitment in underperforming segments. The program has adjusted RY4 targets to reflect the challenges in these segments and can engage existing site hosts and champions in these and other segments to promote the program benefits and encourage participation.

Finding #8: Continued COVID-19 Impacts. While charging station development and utilization increased throughout RY3, the COVID-19 pandemic continues to impact the Electric Transportation Initiative program suite, including:

- **Off-Peak Charging Rebate Pilot charging impacts**. The amount of charging done by participants in the Off-Peak Charging Rebate Pilot continues to be impacted by the COVID-19 pandemic. On average during RY3, the monthly kWh charged per month across all participants was 43% lower than in February 2020. This persistent reduction in charging activity is likely driven by continued remote work and schedule disruptions stemming from the COVID-19 pandemic. However, no statistically significant reduction in off-peak charging behavior was observed due to COVID-19.
- **Fleet electrification impacts**. Fleet Advisory Services Program interviewees noted continued reduced usage of existing fleet vehicles due to the COVID-19 pandemic's impacts on in-person business operations. Interviewees also cited reduced budgets available for vehicle purchases and increasing vehicle prices as challenges exacerbated by the COVID-19 pandemic.
  - **Consideration:** The program staff and implementation contractor should consider a long-term engagement approach to help participants navigate changing fleet needs as the COVID-19 pandemic continues. Staff currently re-engage participants after study completion, and they should continue this engagement to help participants develop a long-term electrification approach that encompasses changing business and market conditions.

1.3 Future Program Considerations and Recommendations

While DNV did not formally evaluate or consider future EV program designs or ideas, we identified the following considerations for future iterations of these programs that arose organically during the evaluation.

Finding #9: Supplier Diversity. One EVSE provider continues to provide the overwhelming majority of Charging Station Demonstration Program charging stations and utilization. This EVSE provider's equipment is used at 88% of all activated and approved ports and supplies 96% of all kWh charged in the program.

- **Recommendation:** Continue to provide resources to participating and potential site hosts about eligible EVSE providers to encourage EVSE supplier diversity. DNV observed some progress on this recommendation since RY2, as several program implementation vendors reported that they now support multiple EVSE providers and the number of ports activated and approved from other EVSE providers has increased. Continuing to provide information on all available EVSE technologies (Level 2 and DCFC) for all customers can help promote further participation and encourage use of other EVSE providers.

Finding #10: National Grid Ownership. National Grid ownership and operation of charging stations is a complex issue with diverse implications that need to be carefully explored before moving forward. During the Charging Station Demonstration Program interviews, National Grid asked DNV to explore this ownership strategy with site hosts to gauge their interest in the potential of National Grid ownership and operation of charging stations on-site host property. DNV continued to explore this during RY3 and found that most site hosts were at least initially interested and would need additional details about a

potential arrangement in order to better estimate their organization's interest. Alleviating site host time and costs were cited as the primary perceived benefits, and concern involved complexity in having to engage multiple parties, as well as potential complications for future site redevelopment opportunities.

The remainder of this report presents a summary of the Electric Transportation Initiative, DNV's evaluation methodology, and program-specific details regarding results, findings, and recommendations.

2 INTRODUCTION

This section describes National Grid's Electric Transportation Initiative in Rhode Island and the evaluation objectives for Rate Year 3 (RY3), spanning September 1, 2020, through August 31, 2021. DNV (formerly ERS) was contracted to conduct an independent evaluation of the Electric Transportation Initiative for each of the program's rate years.

2.1 Electric Transportation Initiative

National Grid's Electric Transportation Initiative consists of several programs designed to encourage charging infrastructure development and EV deployment throughout Rhode Island. The initiative includes the following four programs:

2.1.1 Off-Peak Charging Rebate Pilot

This pilot is marketed by National Grid as the "SmartCharge Rhode Island" (SCRI) program,[2] which aims to understand EV charging patterns and the effect of rebates in shifting EV charging from on-peak to off-peak hours. Participants' charging activity is measured by a Geotab monitoring device ("C2 device"), which plugs into a vehicle's onboard diagnostics port and records data while the vehicle is actively charging. The peak period is defined as the hours of 1 p.m. to 9 p.m. on all days, including weekends.

To evaluate this program and determine the effects of rebates on participant charging behavior, DNV, National Grid, and Geotab are conducting an experiment modeled after a randomized controlled trial (RCT). An RCT is a highly structured and rigorous experimental approach commonly used in the medical and social science fields to test the effect of a treatment on a group of participants, minimizing bias by randomly allocating participants across treatment and control groups. The two groups receive different treatments during the experimental period, enabling assessment of the treatment on the outcome being measured. The program's experimental design of the Off-Peak Charging Rebate Pilot is summarized in Table 2-1.

Table 2-1. Experimental Design for Off-Peak Charging Rebate Pilot

<table>
<tr><th>Participant Group</th><th>RY1 (6/19/19–8/31/19)</th><th>RY2 – Rebate Intervention (9/1/19–8/31/20)</th><th>RY3 – Rebate Intervention (9/1/20–3/31/21)</th><th>RY3 – Education Intervention (4/1/21–8/31/21)[3]</th></tr>
<tr><td>Control Group</td><td rowspan="2">Recruitment period: participants enroll and are activated in the program and receive incentive for installing device.[4]</td><td>Receives access to online dashboard showing on- and off-peak charging behavior (serves as baseline behavior)</td><td rowspan="2">All participants receive access to dashboard and the additional off-peak charging incentives</td><td>Continues to receive access to dashboard and the additional off-peak charging incentives</td></tr>
<tr><td>Treatment Group</td><td>Receives access to online dashboard plus additional incentives per kWh charged during off-peak periods</td><td>Continues to receive access to dashboard and the additional off-peak charging incentives plus monthly email-based educational awareness content designed to drive more off-peak charging</td></tr>
</table>

Key program notes:

- During RY2 – from September 1, 2019, to August 31, 2020 – participating vehicles were randomly assigned for the rebate intervention to either a rebate-control or rebate-treatment group. The first random allocation occurred in late

[2] For more information, visit https://www.fleetcarma.com/smartchargerhodeisland/

[3] Participants were randomly allocated to the control and treatment groups for the education intervention by the third-party firm implementing that new intervention; DNV verified the group assignments and tested the groups for balance based on historical RY2 charging data.

[4] Note that while charging data was collected for participants who enrolled in the program and activated their C2 devices prior to the start of RY2, this data was of insufficient quality and volume to be used in a difference-in-differences analysis assessing the impact of the online dashboard on the control group's off-peak charging performance. Any impact the dashboard alone may have on charging behavior has not been measured through this analysis.

August 2019, and additional allocations continued through March 2020 as more vehicles enrolled in this program.[5] As part of this allocation process, DNV ensured that the two groups were appropriately representative of the participating vehicles in the study (see Table 4-15 for the group breakdown). During RY2, the rebate-control group received access to an online dashboard showing their charging behavior, while the rebate-treatment group received access to the same dashboard as well as rebates for off-peak charging. These rebates are 6 cents per kWh charged off-peak in the summer months and 4 cents per kWh charged off-peak during the non-summer months[6]. All participants also received $50 for installing their C2 device and recording their first charge, as well as an additional $50 for each year they keep the device plugged in, for a maximum participation incentive of $150.

- At the start of RY3, all participants were placed in the rebate-treatment group, receiving not only access to the dashboard but also the charging incentives. This enabled a comparison between the RY2 and RY3 charging behavior for the rebate-control and rebate-treatment groups to further identify impacts of the incentives.
- In April 2021, mid-RY3, an email-based educational awareness intervention (the "education intervention") was layered into the program to test the potential to further shift charging off-peak. This email campaign was implemented by a third-party implementer and was also structured as an RCT, with participants randomly assigned to either the "education-control" or "education-treatment" group based on several criteria – including vehicle type, previous group assignment (from RY2), and historical charging behavior – to achieve balance across the two groups.
  - Participants in the education-control group continued to receive access to the online dashboard from RY2 as well as the off-peak charging rebates that were introduced to all program participants at the start of RY3.
  - Participants in the education-treatment group continued to receive the above and also began receiving monthly emails from the implementer containing personalized insights about their charging behavior, including:
    - a comparison of their off-peak charging from the previous two months
    - comparisons of their off-peak charging to other program participants with similar EVs
    - an off-peak charging rewards summary, sustainability- and environmentally-focused encouragement, and additional content geared toward EV drivers

2.1.2 Charging Station Demonstration Program

This program is commonly referred to as the "Infrastructure Program" and incentivizes Level 2[7] and DCFC[8] charging station and port deployment throughout Rhode Island. National Grid has targets for both Level 2 (320 ports) and DCFC stations (46 ports) by market segment, and the program engages both internal marketing staff and third-party vendors to recruit potential host sites and facilitate EVSE installation. Table 2-2 presents the charging port targets and incentives by segment for both Level 2 and DCFC stations.

Table 2-2. Charging Station Demonstration Program Targets and Rebate Levels

Charging Level	Segment	Target Number of Ports	EVSE Equipment Rebate Level
Level 2	Corporate light-duty fleet	24	50%
Level 2	Government light-duty fleet	24	50%
Level 2	Public transit stations	60	50%

[5] For more details on the allocation process, please see Appendix 1 of the RY1 Annual Report, http://www.ripuc.ri.gov/eventsactions/docket/4770-NGrid-ElectricTransportation%20RY1%20Annual%20Report%20(10-31-19).pdf.

[6] "Summer" months are defined as June through September and "non-summer" months as October through May.

[7] Level 2 charging uses a 240-volt AC service and typically has a power rating between 6 and 19.2 kW. Level 2 charging stations deliver charging speeds faster than Level 1 chargers (which use a standard 120-volt wall socket and charge at less than 1.8 kW) but slower than DCFC, defined below.

[8] Direct Current Fast Charging (DCFC) is the fastest type of commercially available EV charging. It typically features charging speeds of at least 50 kW and can restore approximately 80% of an EV's charge in about 30 minutes.

Charging Level	Segment	Target Number of Ports	EVSE Equipment Rebate Level
Level 2	Environmental justice communities	36	100%
Level 2	Apartment buildings (MUD)	36	75%
Level 2	Workplaces	140	50%
DCFC	Municipal school buses	3	75%
DCFC	Other heavy-duty (port, airport)	8	50%
DCFC	Rideshare company hub	5	25%
DCFC	Public transit buses	10	50%
DCFC	Public DCFC	20	0%

2.1.3 Discount Pilot for DCFC Stations

This program was designed to mitigate the impacts of demand charges on DCFC sites which may have low initial utilization by providing an electric rate discount equal to 100% of the DCFC's distribution demand charges for a three-year period. This program is available to both existing and new DCFC stations in Rhode Island.

2.1.4 Fleet Advisory Services Program

This program conducts fleet electrification and other studies for up to 12 Rhode Island fleet operators aimed at promoting vehicle electrification. These services are managed by a National Grid Program Manager, and a third-party implementation contractor has been retained to conduct these studies and present results to participating fleet operators.

2.2 Evaluation Objectives

The RY3 evaluation objectives are as follows:

1. Characterize and describe the implementation of the Electric Transportation Initiative, assessing results and progress for each individual program component.
2. Report incremental CO2 reductions resulting from incremental vehicle adoption.
3. Develop recommendations to enhance the Electric Transportation Initiative.

For the RY3 evaluation, the DNV Team completed research activities for each of the Electric Transportation Initiative's four programs. Primary data collection methods included analysis of charging data from owners and site hosts, as well as in-depth-interviews with site hosts.

3 METHODOLOGY

The DNV Team completed the following activities during RY3 of this evaluation:

- **Project manager (PM) follow-up interviews** – DNV conducted follow-up interviews with the National Grid program management team to help DNV understand how program objectives and delivery methods have evolved since RY1 to refine our survey and interview guides and analyses.
- **Participant interviews** – DNV conducted interviews with participants in the Charging Station Demonstration and Fleet Advisory Services Programs. These interviews gathered participants' experiences within the program, addressing program processes, successes and barriers, and satisfaction with their participation.
- **Vendor interviews –** In order to gather information about how the Charging Station Demonstration program continues to be implemented and delivered to customers, DNV conducted interviews with program vendors managing project installations.
- **Data analysis** – The team conducted data analysis across the suite of Electric Transportation Initiative programs to understand progress against program goals and to analyze EV charging behavior at deployed stations and vehicles. This included:
  - **Off-Peak Charging Rebate Pilot** – DNV analyzed the program's RY3 performance, described in Section 3.1.
  - **Charging Station Demonstration Program** – DNV assessed program progress against stated goals, reviewed and analyzed program data and tracking spreadsheets, and calculated charging station utilization based on charging data provided by four EVSE vendors from a total of 260 actively reporting charging ports.
  - **Discount Pilot for DCFC Stations** – DNV summarized program discounts provided to one participant in this program during RY3.

Table 3-1 summarizes the evaluation activities across the four RI programs and Table 3-2 summarizes the primary interviews conducted by the DNV Team.

Table 3-1. Summary of RY3 Evaluation Activities

Research Area	Data Analysis	Primary Research
Off-Peak Charging Rebate Pilot Evaluation	Analysis of rebate-control group charging in RY3 compared to RY2; analysis of education intervention impact	No new primary research
Charging Station Demonstration Evaluation	Review of program tracking data, program scorecards, and initial site-host charging data	Interviews with site host participants (n=5) and program vendors (n=3)
Discount Pilot for DCFC Station Evaluation	Summary of DCFC discounts provided during RY3	No new participants in the program in RY3; DNV asked about program during Charging Station Demonstration interviews with DCFC site hosts.
Fleet Advisory Services	Review of study timelines, final reports, and program scorecards	Interviews with program participants (n=4)

Table 3-2. Program Interview Summary

Interviewee	RY1 Completed	RY2 Completed	RY3 Completed	Total
National Grid RI program managers	3	2	4	9
National Grid sales staff	1	0	0	1
National Grid marketing staff	1	0	0	1
Charging Station Demonstration program participants	3	10	5	18
Charging Station Demonstration program vendors	3	0	3	6
DCFC Pilot participants	1	0	0	1
Fleet Advisory Services implementation vendors	1	0	0	1
Fleet Advisory Services participants	2	2	3	7
Total Interviews	**15**	**14**	**15**	**44**

3.1 Off-Peak Charging Rebate Pilot Analysis Methodology

The DNV Team analyzed the charging data collected through the Off-Peak Charging Rebate Pilot to determine the extent to which charging behavior was affected by the program. The scope of this analysis includes charging data recorded from

September 2019 through August 2021.[9] DNV completed the following activities: Data cleaning and quality control, initial analysis, longitudinal regression analysis, and education intervention regression analysis, which are described in the sections below.

3.1.1 Data Cleaning and Quality Control

This first phase consisted of the following steps.

1. **Tracking vehicle group assignments.** In RY2, DNV worked with National Grid and Geotab to finalize the list of initial participant group assignments. Data was provided for a total of 397 vehicles during the analysis period; of those, 20 vehicles were never assigned to a group because they either swapped out their vehicle or withdrew from the program prior to assignment.[10] DNV removed an additional 23 vehicles from the analysis because all of their data failed quality control (QC) or they did not record any post-assignment data,[11] leaving a total of 354 vehicles whose data was eligible to be included in this analysis.

   In RY3, DNV worked with National Grid, Geotab, and the education intervention vendor to verify that new group assignments made prior to the rollout of the email-based education intervention were balanced. DNV also updated the tracking data from RY2 to reflect the latest program design and to feed into downstream analysis activities. A total of 343 participants were assigned to a "new" group for the education intervention, though a portion of those participants later became "inactive" or dropped out of the program. By the end of RY3, 272 of these drivers were considered "active" in the Geotab device summary report, which tracks participant charging activity.

2. **Quality control.** DNV performed QC checks to ensure that blank, invalid, and inaccurate data was flagged for removal from the analysis. Examples of data the team omitted from the analysis include negative kWh or kW data, charge rates that exceeded a given EV model's maximum charge acceptance rate (kW), and vehicles belonging to National Grid employees who might have knowledge of the program and could introduce bias into the results. Of the nearly 2.7 million charging intervals analyzed across over 196,000 charging sessions, 89% of data points passed QC.[12]

3. **Filtering for eligible data.** As stated above, DNV filtered the data to remove all charging intervals that failed QC, were recorded prior to the RY2 analysis period, or were recorded prior to a vehicle's group assignment date. Through the end of RY3, 254 vehicles reported charging activity during the education intervention.

3.1.2 Initial Analysis

DNV conducted an initial analysis to quantify high-level program statistics and develop charging load profiles with 15-minute resolution. Only data that met the above criteria was included in this analysis, which included the following steps:

1. DNV calculated vehicle-level and program-level statistics, including total kWh charged and number of charging sessions by month, group, and vehicle type. In addition, the team used the program-level data to identify the aggregate impacts of the COVID-19 pandemic.
2. We constructed per-vehicle average charging load profiles with 15-minute resolution, based on post-assignment RY2 and RY3 data, and aggregated them by vehicle type and group (treatment vs. control); we further segmented load profiles by month and day type (weekday vs. weekend).

[9] Note that while charging data was collected for participants who enrolled in the program and activated their C2 devices prior to the start of RY2, this data was of insufficient quality and volume to be used in a difference-in-differences analysis assessing the impact of the online dashboard on the control group's off-peak charging performance. Any impact the dashboard alone may have on charging behavior has not been measured through this analysis.

[10] Over the course of RY2, several vehicles either withdrew from the program or were swapped out for a newer EV with the owner continuing to participate in the program with their new vehicle; data from these vehicles that was recorded during RY2 and passed QC was included in the analysis.

[11] ERS tracked the date of each vehicle's assignment and excluded "pre-assignment" data from the analysis, since charging activity recorded prior to a vehicle's assignment to a group is not representative of the behavior this analysis seeks to understand.

[12] Some amount of out-of-bounds or blank data is typically expected with remote data collection equipment such as Geotab's C2 device; the QC process is designed to remove suspect data so as not to bias the analysis results.

3. To assess the program's effectiveness, we calculated the percentage of kWh charged off-peak by month for each vehicle. We also calculated a similar metric representing the percentage of charging sessions initiated off-peak by month for each vehicle to identify potential differences in observed behavior with that metric.

3.1.3 Statistical Regression Analysis

DNV developed multiple linear regression models[13] to test the effect of several independent variables on two separate dependent variables representing off-peak charging performance: 1) the per-vehicle monthly percentage of kWh charged off-peak (charging load approach), and 2) the per-vehicle monthly percentage of charging sessions initiated off-peak (session start time approach). Both metrics provide valuable insight into how Rhode Island EV drivers charge their vehicles.

- The charging load approach reflects the program design of rewarding drivers who shift charging off-peak; however, the timing of when a vehicle consumes kWh is a function of several factors, including the plug-in time, the state of charge at plug-in, the battery size, and the level of the charger.
- The session start time approach focuses on when charging sessions are initiated and more directly captures how participants have internalized the intent of the off-peak charging rebate. While we present both models throughout this section, we consider the session start time approach to be the better estimate of the program's impact.

DNV restructured the regression analysis conducted in RY3 to reflect changes in the program design since RY2. In RY2, a single intervention was being piloted; as such, the regression analysis focused on measuring the effect of the price signal (off-peak charging rebates) plus the online dashboard on the rebate-treatment group's charging behavior relative to that of the rebate-control group, which received access to the online dashboard but did not receive off-peak charging rebates. In RY3, DNV focused on two analyses:

- **Longitudinal analysis:** Measuring changes in charging behavior over time for the rebate-control and rebate-treatment groups as they moved from RY2 to RY3. This analysis simultaneously captured behavior changes observed among the rebate-control group as they were given off-peak charging rebates in RY3 and any behavior changes the rebate-treatment group may have exhibited as the program continued.
- **Education intervention analysis:** Measuring the effect on off-peak charging behavior of the introduction of the education intervention in April 2021 to the education-treatment group following the group reassignment process developed in spring 2021.

For each of the above analyses, DNV developed two models – one following the charging load approach described above and the other following the session start time approach. During this process, DNV iteratively introduced variables to determine the impact they had on the estimator values and the statistical significance of each estimator. These models also control for charging behavior changes that occur over time or due to factors outside the scope of the experiment in order to fully capture the effect of the interventions and minimize the potential for bias in the results; the fact that the control and treatment groups were randomly assigned for each intervention also minimizes bias. The two analyses are discussed in greater detail below.

3.1.3.1 Longitudinal Regression Analysis

DNV developed linear regression models to assess changes in behavior observed between RY2 and RY3 for both the rebate-control and the rebate-treatment group. The observations fed into these models represented the monthly percent of off-peak charging (both percent of kWh charged off-peak and percent of charging sessions initiated off-peak) for each

[13] DNV selected a linear model over other types of models (e.g., the logit model) because the behavior being modeled could take any value between 0% and 100%. Had the observed behavior gravitated toward either end of that spectrum, suggesting that most drivers tended to charge either all on-peak or all off-peak, the logit model would have been more appropriate, as it is designed to model such pass/fail events.

vehicle in the pilot. These separate "longitudinal" analyses excluded data received following the introduction of the email-based education intervention in April 2021 (mid-RY3) and were designed to measure the following:

- For the rebate-control group: the effect on off-peak charging of the introduction of off-peak charging rebates at the start of RY3
- For the rebate-treatment group: any changes in off-peak charging behavior observed over time
- These models have the following structure, where C is a dummy variable for the control group, P is a dummy variable for the post-intervention period (the first seven months of RY3), and C x P is the interaction of the two variables (rebate-control group participants in the first seven months of RY3):

$$y = \beta_0 + \beta_1 C + \beta_2 P + \beta_3 (C \times P)$$

The coefficients represent the modeled incremental per-vehicle percentage of off-peak charging introduced by turning on the respective variable, as follows:

- β_0 represents the level of off-peak charging for the rebate-treatment group in RY2,
- β_1 represents the incremental off-peak charging of the rebate-control group in RY2 relative to the rebate-treatment group in RY2,
- β_2 represents the incremental off-peak charging of all participants between RY2 and RY3, and
- β_3 represents the incremental off-peak charging of the rebate-control group in RY3 relative to the rebate-treatment group in RY3.

3.1.3.2 Education Intervention Regression Analysis

DNV developed separate linear regression models to measure the effect of the education intervention launched in RY3. The observations fed into these models represented the monthly percent of off-peak charging (both percent of kWh charged off-peak and percent of charging sessions initiated off-peak) for each vehicle in the pilot. These models excluded RY2 data and were designed to measure the effect of the education intervention on off-peak charging.

These models have the following structure, where T is a dummy variable for the treatment group and P is a dummy variable for the post-intervention period (the last five months of RY3), and T x P is the interaction of the two variables (education-treatment group participants in the last five months of RY3):

$$y = \beta_0 + \beta_1 T + \beta_2 P + \beta_3 (T \times P)$$

The coefficients represent the modeled incremental per-vehicle percentage of off-peak charging introduced by turning on the respective variable:

- β_0 represents the level of off-peak charging for the education-control group in RY2,
- β_1 represents the incremental off-peak charging of the education-treatment group prior to the launch of the behavioral messaging program,
- β_2 represents the incremental off-peak charging of all participants following the launch of the behavioral messaging program, and
- β_3 represents the incremental off-peak charging of the education-treatment group following the launch of the behavioral messaging program.

4 RESULTS AND FINDINGS

This section contains the RY3 results and findings for each of the Rhode Island Electric Transportation Initiative programs evaluated.

4.1 Off-Peak Charging Rebate Pilot (SmartCharge Rhode Island or SCRI)

DNV conducted a full analysis covering all RY3 data in September 2021 to evaluate the effectiveness of the off-peak price signal and the email-based education intervention, introduced in April 2021 (mid-RY3), in shifting EV charging load to off-peak hours. As part of these efforts, DNV cleaned and analyzed the charging data to characterize the vehicles participating in the program, developed average charging load profiles across multiple time horizons, and assessed the prevalence and timing of both on-peak and off-peak charging to determine the impact of the off-peak charging rebate.

This section presents the results of the Off-Peak Charging Rebate Pilot analyses, which includes program summary statistics, charging load profile analysis, statistical regression results, and key findings.

4.1.1 Program Statistics

DNV analyzed the overall program charging activity recorded during RY3, summarized in Table 4-1 and Table 2-1 below. Table 4-1 summarizes charging behavior from September 2019 through March 2021, which coincides with the rebate intervention period, prior to the implementation of the education intervention. Table 4-2 summarizes charging behavior from April through August 2021 – the period of the education intervention. Behavior from these two periods was assessed separately because the control and treatment groups were reshuffled for the education intervention and were not consistent between the two periods.

The vehicle strata presented in this analysis reflect the allocation of participating vehicles into the control and treatment groups as individuals enrolled in the program. Tesla BEVs are defined as any Tesla vehicle – Model S, Model 3, or Model X – while non-Tesla BEVs are defined as any non-Tesla all-electric vehicle. This distinction was made for this study to capture the fact that Tesla has the highest market share among EV manufacturers and its vehicles have access to its proprietary Supercharger network of DC fast chargers. PHEVs are those that have both an electric battery and an internal combustion engine.

Table 4-1. Program Summary Statistics – Rebate Intervention (9/2019 – 3/2021)

Group	Vehicle Stratum	Vehicle Count*		kWh Charged**		Charge Sessions‡	
		Total	Percent of Group	Overall	Per Vehicle Per Month	Overall	Per Vehicle Per Month
Rebate-Control	PHEV	73	44%	159,655	115	44,243	32
	Non-Tesla BEV	50	30%	166,391	175	17,094	18
	Tesla BEV	42	25%	237,699	298	26,548	33
Total	**All**	**165**	**100%**	**563,746**	**180**	**87,885**	**28**
Rebate-Treatment	PHEV	62	39%	122,794	104	34,499	29
	Non-Tesla BEV	50	32%	178,895	188	22,057	23
	Tesla BEV	45	29%	280,753	328	21,762	25
Total	**All**	**157**	**100%**	**582,442**	**195**	**78,318**	**26**
Overall Total		**322**		**1,146,188**	**187**	**166,203**	**27**

* DNV ran a Chi Square Test to test the equivalency of the rebate-control and rebate-treatment groups. With a p-value of 0.670, the test indicates there is no statistically significant difference in the groups' composition.

** DNV ran an independent samples t-test to assess the statistical significance of differences in the amount of kWh charged per vehicle per month. Across all vehicle types, the differences observed between the rebate-control and rebate-treatment group were not found to be statistically significant, which indicates that the drivers in each group behave similarly in terms of the overall volume of charging they do (though, as will be discussed later, the timing of that charging differs significantly between the two groups).

‡ DNV ran an independent samples t-test to assess the statistical significance of differences in the number of charge sessions per vehicle per month. Across all vehicle types, the differences observed between the rebate-control and rebate-treatment group were not found to be statistically significant, which indicates that the drivers in each group behave similarly in terms of how often they plug in (though, as will be discussed later, the timing of those charging sessions differs significantly between the two groups).

Table 4-2. Program Summary Statistics – Education Intervention (4/2021 – 8/2021)

Group	Vehicle Stratum	Vehicle Count*		kWh Charged**		Charge Sessions‡	
		Total	Percent of Group	Overall	Per Vehicle Per Month	Overall	Per Vehicle Per Month
Education-Control	PHEV	50	38%	28,282	113	6,769	27
	Non-Tesla BEV	41	32%	32,719	160	3,624	18
	Tesla BEV	39	30%	75,165	385	6,449	33
Total	**All**	**130**	**100%**	**136,166**	**209**	**16,842**	**26**
Education-Treatment	PHEV	49	40%	33,212	136	6,616	27
	Non-Tesla BEV	38	31%	32,898	173	3,823	20
	Tesla BEV	37	30%	56,845	307	4,331	23
Total	**All**	**124**	**100%**	**122,956**	**198**	**14,770**	**24**
Overall Total		**254**		**259,122**	**204**	**31,612**	**25**

* DNV ran a Chi Square Test to test the equivalency of the education-control and education-treatment groups. With a p-value of 0.654, the test indicates there is no statistically significant difference in the groups' composition.

** DNV ran an independent samples t-test to assess the statistical significance of differences in the amount of kWh charged per vehicle. Across all vehicle types, the differences observed between the education-control and education-treatment group were not found to be statistically significant, which indicates that the drivers in each group behave similarly in terms of the overall volume of charging they do (though, as will be discussed later, the timing of that charging differs significantly between the two groups).

‡ DNV ran an independent samples t-test to assess the statistical significance of differences in the number of charge sessions per vehicle. Across all vehicle types, the differences observed between the education-control and education-treatment group were not found to be statistically significant, which indicates that the drivers in each group behave similarly in terms of how often they plug in (though, as will be discussed later, the timing of those charging sessions differs significantly between the two groups).

Several observations can be drawn by examining the high-level program charging data. This analysis was conducted to provide an overview of aggregate charging behavior and to allay concerns that the groups are fundamentally unbalanced, which could hinder drawing conclusions throughout the rest of the analysis.

- Similar to our findings from RY2, we continue to see that charging volume and frequency reflect differences in vehicle strata composition.
  - Across both periods and both groups, Tesla BEVs charged the most kWh/month, followed by non-Tesla BEVs and PHEVs
  - In both periods, PHEVs recorded the most charging sessions per month among treatment group participants, while Tesla BEVs recorded the most charging sessions per month among control group participants
  - In general, these trends are related to the battery sizes found among each vehicle type, with PHEVs requiring more frequent charging due to their small batteries and Tesla BEVs tending to be used as participants' primary vehicles
- During the rebate intervention period, the overall amount of charging (kWh) is statistically equivalent between the rebate-control and rebate-treatment groups, when normalized by the count of vehicles in each group.
  - The rebate-control group charged 180 kWh/vehicle-month and the rebate-treatment group charged 195 kWh/vehicle-month (a delta of around 8.5%).
  - This observation is consistent with the program goal of shifting when charging occurs, rather than the amount of charging taking place.
- During the education intervention period, the overall amount of charging (kWh) is statistically equivalent between the education-control and education-treatment groups, when normalized by the count of vehicles in each group.
  - During this period, the education-control group charged 209 kWh/vehicle-month and the education-treatment group charged 198 kWh/vehicle-month (a delta of around 5%).
  - This observation is also consistent with the program goal of shifting when charging occurs, rather than the amount of charging taking place.

We estimate that the off-peak charging rebate resulted in a shift of 86,178 kWh away from the on-peak period through RY3. By vehicle type, 26,495 kWh were shifted away from the on-peak period for PHEVs, 15,695 kWh were shifted for Non-Tesla BEVs, and 43,988 kWh were shifted for Tesla BEVs. The education intervention is estimated to have shifted 1,994 kWh away from the on-peak period.

To-date, $33,171 in off-peak charging rebates were earned by the treatment group, based on a total of 485,803 kWh charged off-peak during non-summer months and 228,984 kWh charged off-peak during the summer months. A total of $20,329 in rebates were earned in RY3, when the rebate-control group gained access to the price signal, with $12,842 earned by the rebate-treatment group alone in RY2. Table 4-3 below summarizes the rebates earned by rate year and rebate period.

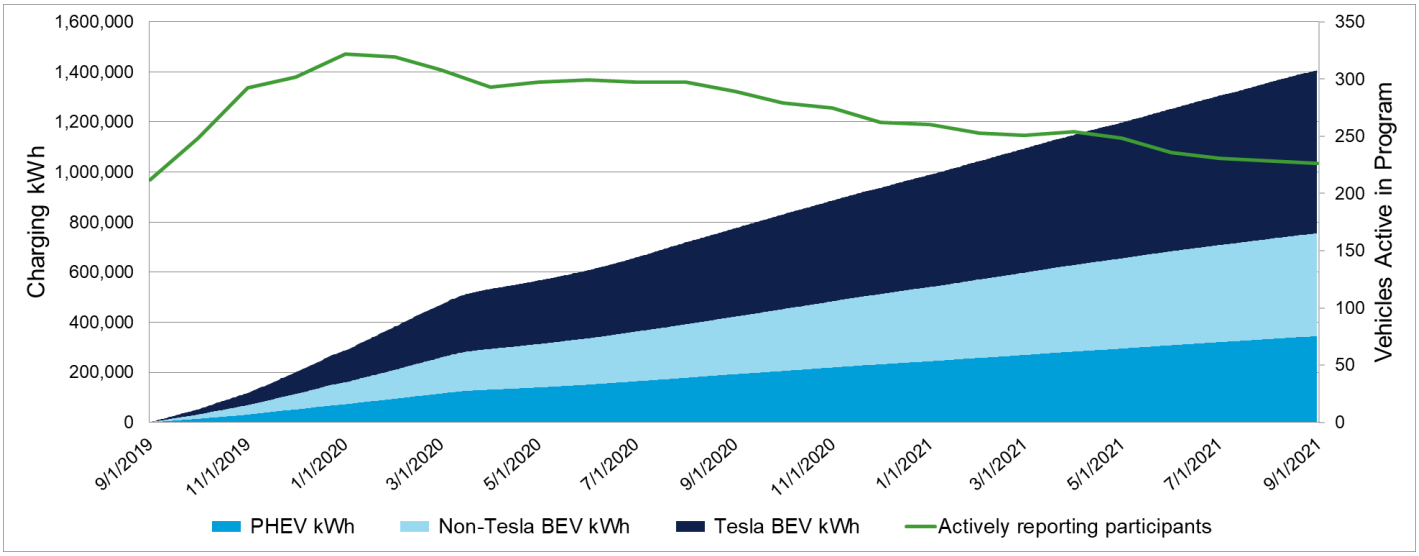
Table 4-3. Off-Peak Charging Rebate Pilot – Rebates Earned Through RY3*

	Non-Summer		Summer		Total	
Year	**Total**	**Per-vehicle per-month**	**Total**	**Per-vehicle per-month**	**Total**	**Per-vehicle per-month**
RY2	$7,993	$5.84	$4,850	$7.13	$12,848	$6.05
RY3	$11,439	$4.98	$8,889	$7.51	$20,334	$5.68
Total	**$19,432**	**$5.11**	**$13,739**	**$7.20**	**$33,176**	**$5.83**

*Note that the per-vehicle per-month values are estimates and do not fully account for instances where participants joined the program late or dropped out early.

Figure 4-1 below provides another view of the program activity through RY3; it highlights the simultaneous growth of the charging load and the number of assigned program participants. Note that, because group assignments were conducted monthly, the participant count did not increase smoothly. Note also that the growth rate of the aggregate charging load slowed significantly in mid-March 2020 as the COVID-19 pandemic emerged. We will discuss more granular program trends, including COVID-19 impacts, in the next subsection.

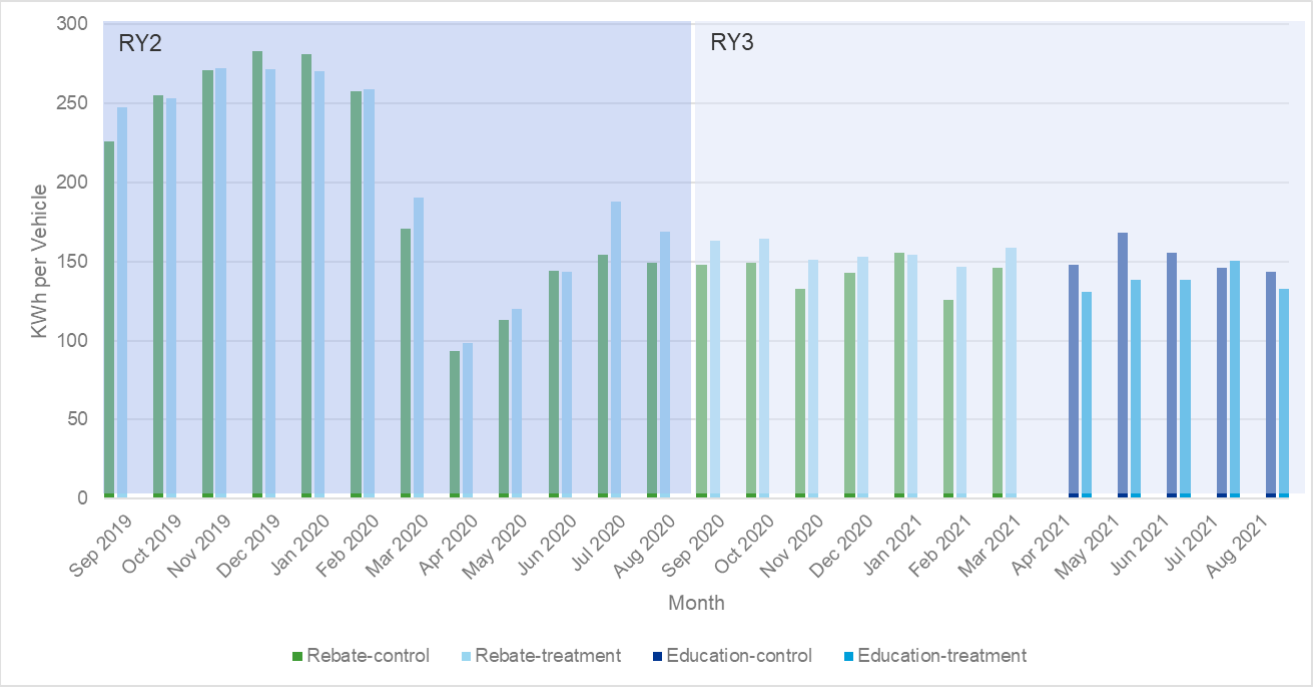
Figure 4-1. Charging kWh and Actively Reporting Participants Through RY3



4.1.1.1 Continuing COVID-19 Pandemic Impacts

In addition to calculating high-level program statistics, DNV developed higher resolution statistics to evaluate time-varying EV charging behavior, including ongoing impacts of the COVID-19 pandemic. The COVID-19 pandemic's effects on charging behavior continue to be observed throughout RY3. Figure 4-2 provides a month-by-month view of the average kWh charged per vehicle throughout the program to date.

Figure 4-2. Monthly kWh Per Vehicle – Through RY3



In RY2 we observed that overall charging activity fell initially due to the pandemic, as social distancing measures, bans, or limitations on group gatherings, and disrupted school and work schedules led to reduced demand for travel and changes in many EV drivers' business-as-usual charging behavior. Analysis of month-over-month data[14] showed a 63% decline in per-vehicle charging load in April relative to February, highlighting how deeply travel and charging demand were impacted. (March, which was partially impacted by the COVID-19 pandemic, showed a 28% reduction in per-vehicle charging load relative to February.) Charging then increased, relative to April, each month from May to July before falling again slightly in August; this observed behavior aligned with general nationwide trends around "reopening" during summer 2020 and showed that participants were beginning to drive and charge more following initial pandemic closures.

As of August 2020, six months removed from the initial emergence of the COVID-19 pandemic, the average per-vehicle charging load was 38% lower than it was in January and February 2020. All of the above comparisons of the average monthly per-vehicle charging load (kWh) were found to be statistically significant (p-value < 0.05); in each case, data from a post-pandemic month was compared to February 2020 (prior to the COVID-19 pandemic).

Since September 2020 (the start of RY3), the normalized level of charging has remained roughly constant, indicating that charging activity has not returned to pre-pandemic levels. On average during RY3, the monthly kWh charged per-month across all participants has been 43% lower than in February 2020. This persistent reduction in charging activity is likely driven by continued remote work and schedule disruptions stemming from the COVID-19 pandemic.

4.1.2 Charging Load Profile Analysis

DNV developed 24-hour charging load profiles with 15-minute resolution for several combinations of the control and treatment groups during different periods of the program using the following method:

[14] For this analysis, we treated March 2020 as the first month in which COVID-19 effects could be observed. Since the full impacts of the COVID-19 pandemic took effect mid-March, it should be noted that part of that month represents "normal" charging behavior before State efforts directly impacted people's daily lives and driving patterns.

- For each vehicle included in the analysis, we calculated a full charging load profile (kW) spanning the vehicle's group assignment date through the end of RY3; for participants who withdrew or vehicles that were swapped out mid-program, the last day they provided data was used as their endpoint. This approach considers periods during which data was not available because the vehicle was not charging (as having 0 kW of charging load) and ensures that the average load profile is not diluted for vehicles that were assigned to a group after the RY2 start date of September 1, 2019.
- We then calculated an average hourly charging load profile (kW) for each vehicle, weighting every hour and day in the analysis period equally.
- We constructed average charging load profiles by vehicle type and group, weighting every vehicle equally, to identify differences in charging behavior driven by the availability of the off-peak pricing signal as well as vehicle type.

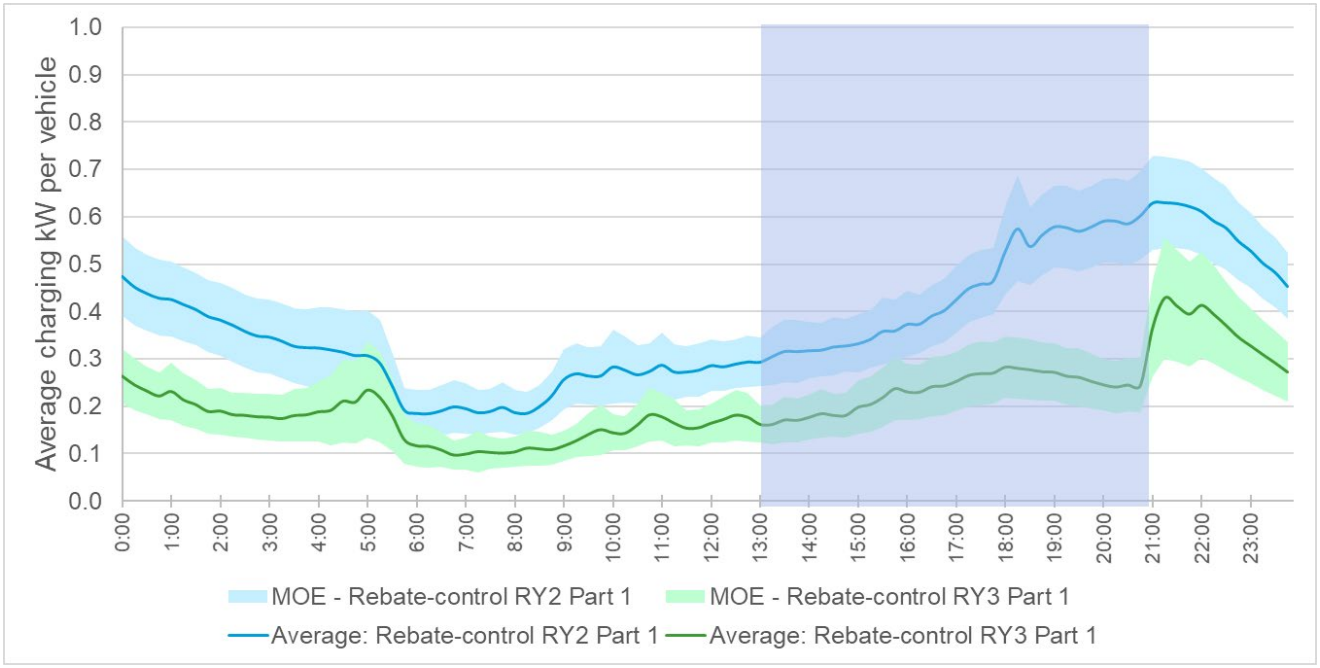
Note that the shaded box in the following figures represents the on-peak window of 1:00 p.m. to 9:00 p.m., ending slightly before the 9:00 p.m. interval to indicate that charging occurring at and after 9:00 p.m. is classified as off-peak.

Longitudinal Load Profile Comparisons

The figures below show comparisons between the rebate-control and rebate-treatment group load shapes, respectively, between RY2 and RY3. These load shapes contain data from the first six months of RY2 to mitigate noise introduced by the COVID-19 pandemic during the second half of the year and from the first seven months of RY3, prior to the launch of the education intervention. Note that in the figures below, the shaded (purple) box represents the on-peak window of 1:00 p.m. to 9:00 p.m., ending slightly before the 9:00 p.m. interval to indicate that charging occurring at and after 9:00 p.m. is classified as off-peak. The shaded bars in these figures also represent the margin of error (MOE) at the 90% confidence level.

Figure 4-3 shows a comparison between the rebate-control group's behavior in RY2 and RY3, following the introduction of the off-peak charging rebates at the start of RY3 and Figure 4-4 shows a comparison between the rebate-treatment group's behavior in RY2 and RY3.

Figure 4-3. Charging Load Profile Comparing Rebate Intervention Control Group RY2 and RY3 Behavior



In Figure 4-3 there is a visible difference between the RY2 and RY3 load shapes for the rebate-control group. The primary takeaway is that there is significantly less average daily charging (kWh) taking place in RY3 (5 kWh per vehicle per day) than in RY2 (9 kWh per vehicle per day), as gauged by the "area" under each curve. This is likely due to ongoing impacts of the COVID-19 pandemic, namely the reduction or elimination of a daily commute for a large number of program participants. We also see that the RY3 load does not ramp up as significantly during the on-peak period and increases sharply at 9 p.m., as the off-peak period begins. This observed behavior aligns with the fact that this group began receiving the off-peak charging rebates at the start of RY3, which has had an effect in reducing on-peak charging and delaying charging until the off-peak hours.

Figure 4-4 compares the rebate-treatment group's behavior in RY2 and RY3, and shows noticeably less average daily charging (kWh) taking place in RY3 (5.5 kWh per vehicle per day) than in RY2 (9 kWh per vehicle per day), as gauged by the "area" under each curve. This overall reduction is similar in magnitude and proportion to the observed reduction for the rebate-control group over the same period. However, the load shapes for each period of time still closely resemble each other, with the RY3 load shape simply being "pushed down" by a relatively constant offset of approximately 0.1 kW/vehicle - 0.25 kW/vehicle throughout much of the day. This offset is particularly constant during the on-peak hours, with the RY3 load coming in 0.1 kW/vehicle lower on average over the 8-hour window, while the gap widens late at night and in the early morning hours. The amount of on-peak load ramp and the stark increase in charging at 9 p.m. for both periods closely mirror each other, suggesting that the behavior instilled in the rebate-treatment group participants by the price signal in RY2 has not changed over time.

Figure 4-4. Charging Load Profile Comparing Rebate Intervention Treatment Group RY2 and RY3 Behavior

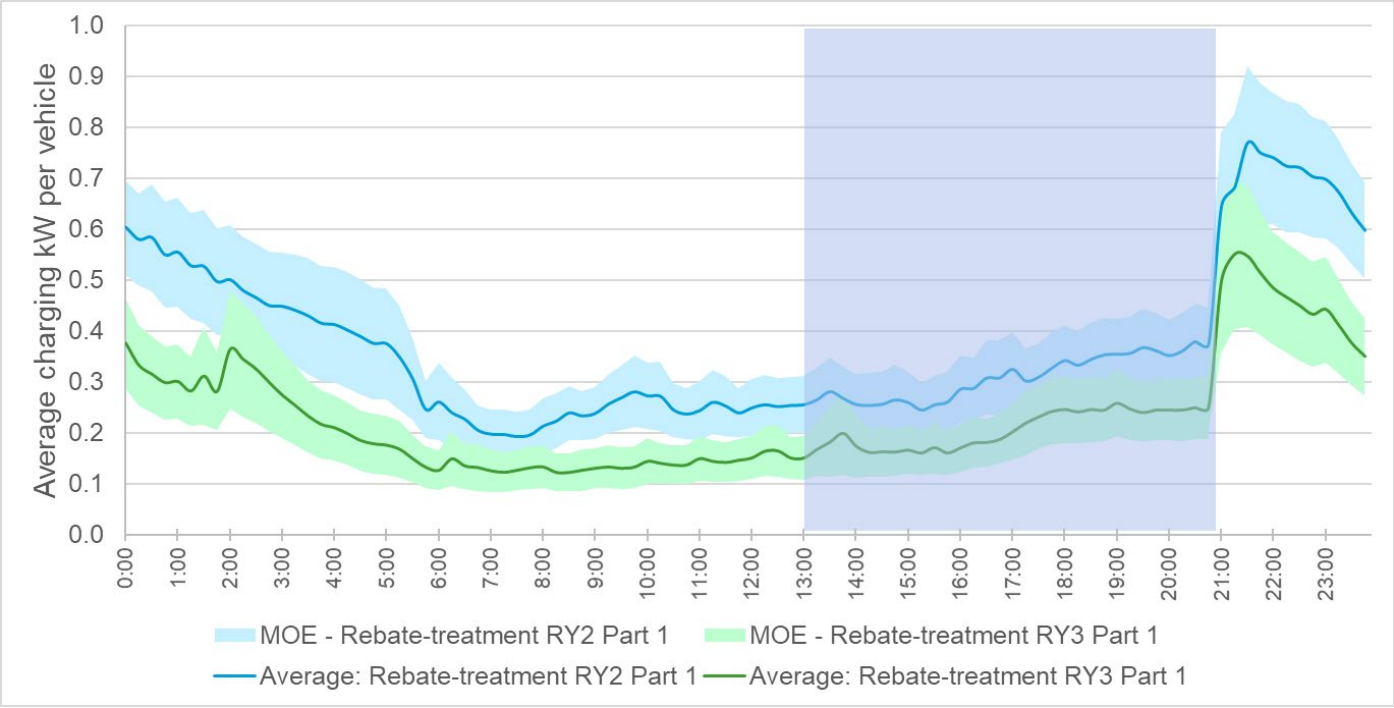
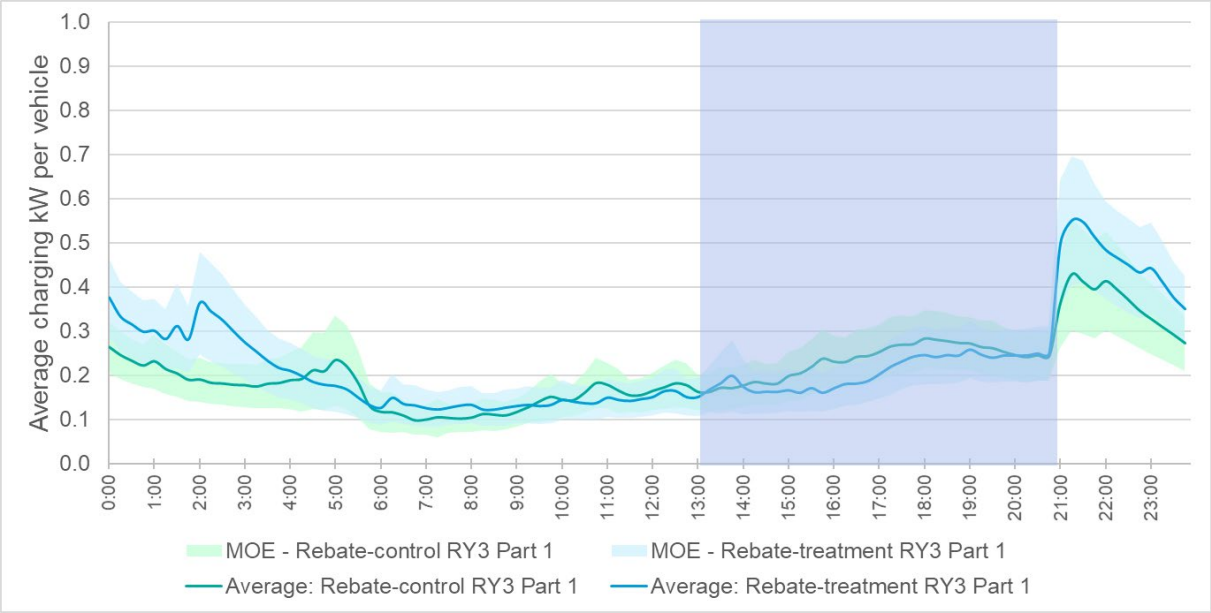


Figure 4-5 compares the rebate-control and rebate-treatment group load shapes during the first seven months of RY3; during this time, both groups were receiving identical interventions – the online dashboard plus off-peak charging rebates – though the rebate-treatment group had been receiving rebates for 12 months longer. This figure shows that the load shape of each of the rebate intervention experimental groups from RY2 largely mirrored each other during the first half of RY3, prior to the launch of the education intervention. The two groups charged at roughly similar levels on a daily basis, with 5.5

kWh/vehicle-day for the rebate-treatment group and 5 kWh/vehicle-day for the rebate-control. Based on a visual review of Figure 4-5, the rebate-control group's load does not reach the same post-9 p.m. peak as the rebate-treatment group, suggesting that some of the behavior the rebate-treatment group adopted in RY2 has persisted into RY3; however, the statistical significance of these differences was not tested. It is also possible that notifications of the potential to earn off-peak charging rebates did not reach all of the rebate-control group participants, and some of them may not be aware that they can earn rebates or may not know how to schedule charging to occur off-peak.

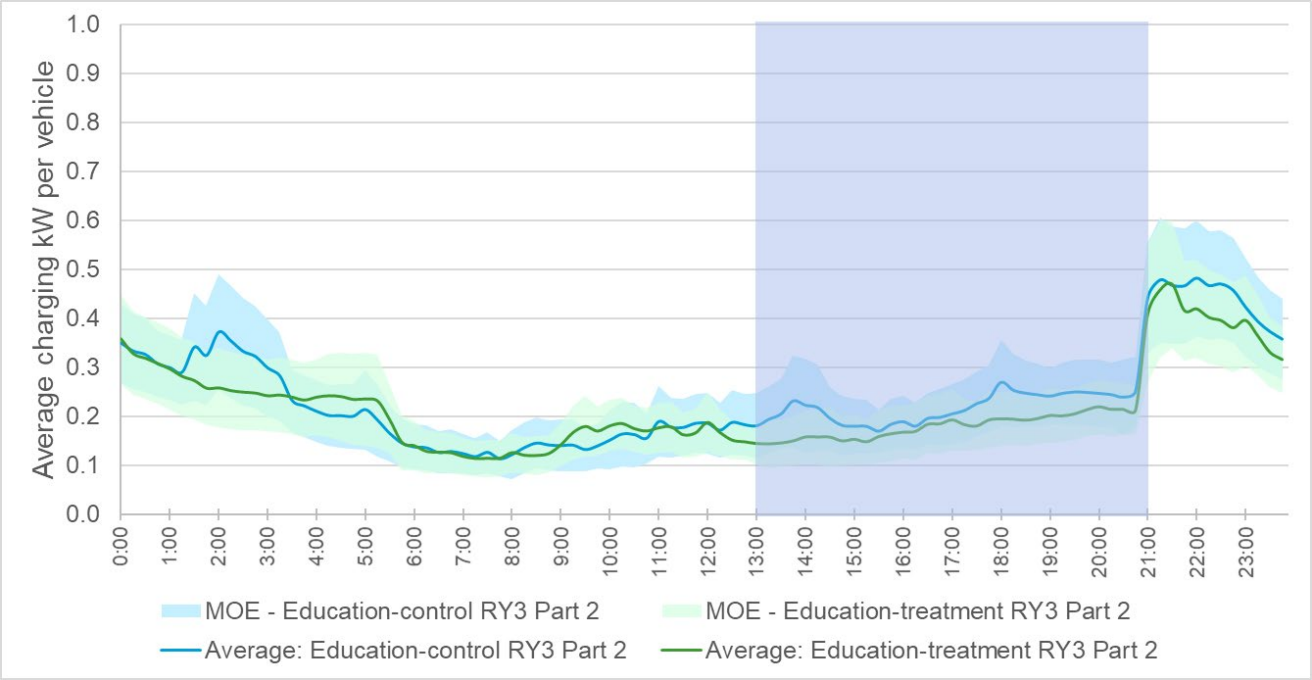
Figure 4-5. RY3 Pre-intervention Charging Load Profiles for Rebate Intervention Control and Treatment Groups



Education Intervention Load Profile Analysis

Figure 4-6 below shows a comparison between the education-control and education-treatment group load shapes during the education intervention, during which time the education-treatment group was receiving monthly email notifications about their recent charging behavior, the behavior of their peers, and additional details on how to charge more off-peak. The load shapes of each of the new experimental groups closely resemble each other. The two groups charged at roughly similar levels on a daily basis, with 5.7 kWh/vehicle-day for the education-control group and 5.2 kWh/vehicle-day for the education-treatment. Based on a visual review of Figure 4-6, the two groups exhibit remarkably similar post-9 p.m. peaks, unlike in the first half of RY3. This may be due to the randomized group reassignment process, which resulted in a rebalancing of the two groups based, in part, on historical charging behavior from RY2.

Figure 4-6. RY3 Education Intervention Charging Load Profiles for Control and Treatment Groups



Education Intervention Demand Reductions

DNV compared the average demand reduction between the education-control and education-treatment groups across the entire peak period (1 p.m.– 9 p.m.) as well as the second half of the peak (5 p.m.–9 p.m.) and found that there was not a statistically significant difference between the two groups' average peak demand. This aligns with the regression results for the Charging Load Approach model, discussed in 4.1.3.2.

As discussed in RY2, however, there is still a risk to designing an off-peak pricing signal that incentivizes all EV drivers to act in tandem, as it risks introducing a new peak after 9:00 p.m. as a large amount of EV charging load hits the grid simultaneously. In a future high-EV adoption scenario, this concentration of new load could create grid reliability concerns, particularly on networks or feeders with a high concentration of long-range EVs or fleet vehicles. We expect that a similar effect would be observed with customers on EV or whole-house time-of-use rates; the effect could potentially be mitigated by staggering several off-peak windows starting between 9:00 p.m. and midnight, for example, or by active managed charging using tailored schedules to avoid concentrating all EV charging load at a single hour.

4.1.3 Statistical Regression Results

DNV developed multiple linear regression models[15] to test the effect of several independent variables on two separate dependent variables representing off-peak charging performance: 1) the per-vehicle monthly percentage of kWh charged off-peak (charging load approach), and 2) the per-vehicle monthly percentage of charging sessions initiated off-peak (session start time approach). Both metrics provide valuable insight into how Rhode Island EV drivers charge their vehicles.

[15] DNV selected a linear model over other types of models (e.g., the logit model) because the behavior being modeled could take any value between 0% and 100%. Had the observed behavior gravitated toward either end of that spectrum, suggesting that most drivers tended to charge either all on-peak or all off-peak, the logit model would have been more appropriate, as it is designed to model such pass/fail events.

- The charging load approach reflects the program design of rewarding drivers who shift charging off-peak; however, the timing of when a vehicle consumes kWh is a function of several factors, including the plug-in time, the state of charge at plug-in, the battery size, and the level of the charger.
- The session start time approach focuses on when charging sessions are initiated and more directly captures how participants have internalized the intent of the off-peak charging rebate. While we present both models throughout this section, we consider the session start time approach to be the better estimate of the program's impact.

For the RY3 regression analysis, DNV restructured the regressions to reflect changes in the program design since RY2. In RY2, a single intervention was being piloted; as such, the regression analysis focused on measuring the effect of the price signal (off-peak charging rebates) plus the online dashboard on the rebate-treatment group's charging behavior relative to that of the rebate-control group, which received access to the online dashboard but did not receive off-peak charging rebates. In RY3, DNV focused on two analyses:

- **Longitudinal analysis:** Measuring changes in charging behavior over time for the rebate-control and rebate-treatment groups as they moved from RY2 to RY3. This analysis simultaneously captured behavior changes observed among the rebate-control group as they were given off-peak charging rebates in RY3 and any behavior changes the rebate-treatment group may have exhibited as the program continued.
- **Education intervention analysis:** Measuring the effect on off-peak charging behavior of the introduction of the education intervention in April 2021 to the education-treatment group following the group reassignment process developed in spring 2021.

For each of the above analyses, DNV developed two models – one following the charging load approach described above and the other following the session start time approach. During this process, DNV iteratively introduced variables to determine the impact they had on the estimator values, the statistical significance of each estimator, and the goodness of fit of each model. The final results for each model are presented in the subsections below.

4.1.3.1 Longitudinal Analysis

DNV examined historical differences in charging behavior for the rebate-control and rebate-treatment group participants between RY2 and RY3 ("longitudinal study" component) to measure the effect of the off-peak rebates being introduced to the rebate-control group at the start of RY3 and any changes in the rebate-treatment group's behavior over time. To simplify these models, minimize confounding exogenous factors introduced by COVID-19 (second half of RY2), maintain a balanced regression, and exclude data recorded during the RY3 educational intervention (which began in April 2021 and covered the last five months of RY3), the team included only charging data from the following two periods:

- The first half of RY2, spanning September 2019 through February 2020
- The first seven months of RY3, spanning September 2020 through March 2021

Overarching difference-in-differences models were developed, following both the kWh and session start time approaches, to assess differences in behavior between the two groups and time periods. Then, the team iteratively developed subsequent models to quantify the impact of this change in program design on each of the three vehicle types and accurately capture the statistical significance of the relevant variables in each model.

Charging Load (kWh) Approach Model

Table 4-4 summarizes the results of the overarching kWh model, which excludes vehicle type as a variable. The unstandardized coefficients, presented as percentages, represent the percent of kWh charged off-peak by the corresponding group of participants during either RY2 or RY3.

Table 4-4. Overall Rebate Intervention Charging Load (kWh) Model*

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	70.3%	0.00	0.9
β_1	Rebate-control group participants in RY2	-12.0%	0.00	1.2
β_2	All participants in RY3	-2.3%	0.05	1.2
β_3	Rebate-control group participants in RY3	6.1%	0.00	1.7

* For this model and all subsequent models, the p-value represents the statistical significance of a measured effect, with a value of less than 0.05 meaning that it is not likely the observed difference/effect is the result of randomness or chance.

This model leads us to several initial findings regarding how the overall population's charging behavior changed between RY2 and RY3:

- Participants in the rebate-treatment group charged more of their kWh off-peak in RY2 (70.3%) than the rebate-control group (70.3-12.0 = 58.3%). This result aligns closely with the findings from RY2 and estimates that the rebate-control group charged 12% less off-peak than the rebate-treatment group in RY2.
- After being given the off-peak charging rebate at the start of RY3, rebate-control group participants charged more off-peak (6.1%, statistically significant) in RY3 relative to RY2,
  - This aligns with expectations following the introduction of the price signal to this group.
  - However, the 6.1% increase in off-peak charging for this group is offset by the initial 12.0% lag in off-peak charging, suggesting that participants in this group may have grown accustomed to their charging practices during RY2 and there may be some underlying inertia that makes it difficult for participants to adjust to changing signals over time.
- There is a moderate decrease in off-peak charging across all participants (-2.3%, statistically significant) between RY2 and RY3 due to exogenous factors.

Table 4-5 through Table 4-7 summarize the results of each of these vehicle type-specific models.

Table 4-5. Rebate Intervention PHEV Charging Load (kWh) Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	62.8%	0.00	1.4
β_1	Rebate-control group participants in RY2	-8.5%	0.00	1.9
β_2	All participants in RY3	-2.5%	0.20	2.0
β_3	Rebate-control group participants in RY3	5.2%	0.05	2.7

Table 4-6. Rebate Intervention Non-Tesla BEV Charging Load (kWh) Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	72.6%	0.00	1.3
β_1	Rebate-control group participants in RY2	-10.0%	0.00	1.9

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_2	All participants in RY3	-4.7%	0.01	1.8
β_3	Rebate-control group participants in RY3	2.6%	0.33	2.6

Table 4-7. Rebate Intervention Tesla BEV Charging Load (kWh) Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	78.1%	0.00	1.6
β_1	Rebate-control group participants in RY2	-18.0%	0.00	2.3
β_2	All participants in RY3	-0.4%	0.85	2.1
β_3	Rebate-control group participants in RY3	11.6%	0.00	3.1

These three models lead us to several additional findings regarding how vehicle type impacts the change in charging behavior between RY2 and RY3:

- As observed in RY2, rebate-treatment group Tesla BEVs charged the most off-peak (78.1%), followed by non-Tesla BEVs (72.6%), and PHEVs (62.8%):
  - Tesla and non-Tesla BEV rebate-control group participants charged 60.1% and 62.6% of the time, respectively, representing the starting point for BEV participants prior to any treatment. PHEV participants started at a lower level of off-peak charging, 54.3%.
  - While Tesla and non-Tesla BEVs started at approximately similar levels of off-peak charging in RY2, Tesla BEV participants increased off-peak charging by almost double the amount of non-Tesla participants in RY2 (18% vs 10%). Non-Tesla BEV participant increases were similar to PHEV increases at 8.5%.
- Rebate-control group participants increased off-peak charging across all vehicle types in RY3, after being given the off-peak charging rebate at the start of RY3. However, these effects varied and were not always statistically significant:
  - PHEVs charged roughly 5.2% more off-peak in RY3 (statistically significant)
  - Tesla BEVs charged roughly 11.6% more off-peak in RY3 (statistically significant)
  - There was no statistically significant effect observed for non-Tesla BEVs; this effect was also observed in RY2 for the rebate=treatment group
  - PHEV and Tesla BEV increases in off-peak charging rates for rebate-control group participants are smaller but proportionally consistent with the effects observed with the rebate-treatment group. This is reasonable given that the rebate-control group effects represent only 6 months of access to incentives compared to 12 for the rebate-treatment group. The results for non-Tesla BEV rebate-control participants appear anomalous, as we would expect them to be similar to PHEV levels. The differences between PHEV and non-Tesla BEV increases are not statistically significant, however.[16]

[16] Note: The non-Tesla BEV group features a wide range of vehicle types and specifications, including battery size and electric range (miles), which results in less consistent charging behavior across the group as a whole. This variety in vehicle models and attributes may explain the anomalous results for this vehicle type.

- The change over time across all participants (β_2) indicates slightly less off-peak charging across all vehicle types in RY3 compared to RY2. These effects were not uniform and were not always statistically significant:
  - This parameter controls for exogenous change over time, unrelated to the treatment variable, and is primarily essential for a balanced model.
  - The relatively large and statistically significant exogenous change for non-Tesla BEVs may help explain the seemingly low increase in off-peak charging for that group of rebate-control group participants.

Session Start Time Approach Model

Unlike the charging load approach model, this approach focuses on when charging sessions are initiated. As noted earlier, we consider the session start time approach to be the better estimate of the program's impact because it more directly captures how participants have internalized the intent of the off-peak charging rebate.
Table 4-8 summarizes the results of the overarching session start time model, which excludes vehicle type as a variable. The unstandardized coefficients, presented as percentages, represent the percent of charging sessions initiated off-peak by the corresponding group of participants during either RY2 or RY3.

Table 4-8. Overall Rebate Intervention Session Start Time Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	63.2%	0.00	0.9
β_1	Rebate-control group participants in RY2	-14.2%	0.00	1.3
β_2	All participants in RY3	0.5%	0.69	1.3
β_3	Rebate-control group participants in RY3	8.9%	0.00	1.8

This model leads us to several initial findings regarding the overall population's charging behavior changes between RY2 and RY3:

- Participants in the rebate-treatment group initiated more of their charging sessions off-peak in RY2 (63.2%) than the rebate-control group (63.2-14.2 = 49.0%). This result also aligns with the RY2 findings and suggests that the rebate-control group initiated 14.2% fewer of their sessions off-peak in RY2.
- After being given the off-peak charging rebate at the start of RY3, rebate-control group participants started more charging sessions off-peak (8.9%, statistically significant) in RY3 relative to RY2.
  - This aligns with expectations following the introduction of the price signal to this group.
  - However, the roughly 8.9% increase in off-peak session starts for this group is offset by the initial 14.2% lag in off-peak session starts, suggesting that participants in this group may have grown accustomed to their charging practices during RY2 there may be some underlying inertia that makes it difficult for participants to adjust to changing signals over time.
  - These findings also align directionally with what we observed in the kWh model.
- Unlike in the kWh model, there was no statistically significant change in off-peak session start times across all participants between RY2 and RY3.

Table 4-9 through Table 4-11 summarize the results of each of these vehicle type-specific models.

Table 4-9. Rebate Intervention PHEV Session Start Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	55.5%	0.00	1.4
β_1	Rebate-control group participants in RY2	-7.9%	0.00	2.0
β_2	All participants in RY3	0.8%	0.70	2.0
β_3	Rebate-control group participants in RY3	7.3%	0.01	2.7

Table 4-10. Rebate Intervention Non-Tesla BEV Session Start Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	64.1%	0.00	1.5
β_1	Rebate-control group participants in RY2	-19.3%	0.00	2.2
β_2	All participants in RY3	-1.9%	0.37	2.1
β_3	Rebate-control group participants in RY3	6.1%	0.05	3.1

Table 4-11. Rebate Intervention Tesla BEV Session Start Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; rebate-treatment group participants in RY2	73.2%	0.00	1.7
β_1	Rebate-control group participants in RY2	-16.6%	0.00	2.4
β_2	All participants in RY3	1.7%	0.44	2.2
β_3	Rebate-control group participants in RY3	13.7%	0.00	3.2

These three models lead us to several additional findings regarding how vehicle type impacts the change in session start time behavior between RY2 and RY3.

- As observed in RY2, rebate-treatment group Tesla BEVs started the most sessions off-peak (73.2%), followed by non-Tesla BEVs (64.1%), and PHEVs (55.5%):
  - Tesla BEV rebate-control group participants initiated sessions off-peak 56.6% of the time, while non-Tesla BEV and PHEV participants started at a lower level of off-peak session starts (44.8% and 47.6%, respectively).
  - While non-Tesla BEVs and PHEVs started at approximately similar levels of off-peak session starts in RY2, they showed starkly different increases in their rate of off-peak session starts, with PHEVs shifting off-peak by 7.9% and

non-Tesla BEVs shifting off-peak by 19.3%, over double the increase. Tesla BEV participants showed a similar shift off-peak to non-Tesla BEVs (16.6%).

- Rebate-control group participants started more of their sessions off-peak across all vehicle types in RY3, after being given the off-peak charging rebate at the start of RY3. These effects varied but were all statistically significant:
  - PHEVs started 7.3% more of their sessions off-peak in RY3 (statistically significant)
  - Non-Tesla BEVs started 6.1% more of their sessions off-peak in RY3 (statistically significant)
  - Tesla BEVs started 13.7% more of their sessions off-peak in RY3 (statistically significant)
  - The Tesla BEV and PHEV increases in off-peak session starts are proportionally consistent and similar in magnitude to the difference observed between the rebate-control and rebate-treatment groups in RY2. It is unclear why these results differ in magnitude to the effects observed through the kWh model.
  - Non-Tesla BEVs in the rebate-control group shifted off-peak at a lower rate than was observed in the pre-period. These results appear anomalous, as we would expect the shift to be larger given the behavior observed between the two groups in RY2.
- Across all vehicle types, there was no statistically significant observable change in when participants started their charging sessions in RY3 compared to RY2.

4.1.3.2 Education Intervention Analysis

To assess the effect of the education intervention launched in April 2021, DNV developed a linear regression model to measure the effect of the email-based education intervention materials distributed to the education-treatment group in the final five months of RY3. To simplify this model and focus solely on charging activity recorded after the emergence of the COVID-19 pandemic, the team focused only on RY3 data, treating the first seven months (September 2020 through March 2021) as the "baseline" for this intervention – the period during which all participants had access to the off-peak charging rebates – and the period from April 2021 through August 2021 as the "intervention" period.

Overarching difference-in-differences models were developed, following both the kWh and session start time approaches, to assess the effect of the education intervention. The team also ran vehicle-type focused models; however, the observed effects here were not statistically significant, hence the exclusion of these models from the discussion below.

Education Intervention Charging Load (kWh) Approach Model

Table 4-12 summarizes the results of the overarching kWh model, which excludes vehicle type as a variable. The unstandardized coefficients, presented as percentages, represent the percent of kWh charged off-peak by the corresponding group of participants either before or after the launch of the educational intervention in April 2021.

Table 4-12. Overall Education Intervention Charging Load (kWh) Model

Coefficient Symbol	Variable	Unstandardized Coefficient	P-value (statistical significance)	Standard Error
β_0	Base case; education-control group, RY3 pre-intervention	63.9%	0.00	0.9
β_1	Education-treatment group, RY3 pre-intervention	2.5%	0.04	1.2
β_2	RY3 post-intervention, all participants	3.0%	0.03	1.4
β_3	Education-treatment group in RY3 post-intervention	2.6%	0.19	2.0

This model leads us to several initial findings regarding how participants' charging behavior changed following the launch of the education intervention:

- Participants in the education-control group for this intervention charged about 63.9% of their kWh off-peak prior to the start of the education intervention, in the first seven months of RY3:
  - This value is roughly halfway between the off-peak charging rates observed for the rebate-control and rebate-treatment groups in RY2 and is consistent with the fact that the rebate-control and rebate-treatment group participants were reassigned to new education-control and education-treatment groups for this experiment in roughly equal proportions.
  - Despite efforts to achieve balance across the new groups, education-treatment group participants charged a statistically significant 2.5% more off-peak prior to the launch of the educational intervention.
- There is a moderate increase in off-peak charging across all participants (3.0%, statistically significant) following the launch of the education intervention due to exogenous factors.
- There is a moderate but not statistically significant 2.6% increase in off-peak charging due to the education intervention. This effect persists across each vehicle type, remaining moderately positive or slightly negative but never becoming statistically significant. Because these effects were not significant, we have not included them in this report.

Education Intervention Session Start Time Approach Model

Table 4-13 summarizes the results of the overarching session start time model, which excludes vehicle type as a variable. The unstandardized coefficients, presented as percentages, represent the percent of charging sessions initiated off-peak by the corresponding group of participants either before or after the launch of the education intervention in April 2021.

Table 4-13. Overall Education Intervention Session Start Time Model

Coefficient Symbol	Variable	Unstandardized Coefficient	t	P-value (statistical significance)	Standard Error
β_0	Base case; education-control group, RY3 pre-intervention	61.6%	65.6	0.00	0.9
β_1	Education-treatment group, RY3 pre-intervention	-0.9%	-0.7	0.50	1.3
β_2	RY3 post-intervention, all participants	-2.1%	-1.4	0.16	1.5
β_3	Education-treatment group in RY3 post-intervention	5.5%	2.6	0.01	2.1

This model leads us to several initial findings regarding how participants' charging behavior changed following the launch of the education intervention:

- Participants in the education-control group for this intervention started 61.6% of their charging sessions off-peak prior to the start of the education intervention:
  - This value is between the off-peak session start rates observed for the rebate-control and rebate-treatment groups in RY2, though it is closer in magnitude to the rebate-treatment group's off-peak session start rate (63.2%).
  - There is no statistically significant difference between the education-control and education-treatment groups prior to the launch of the education intervention for this regression model.

- There is a positive statistically significant shift in off-peak session starts of 5.5% due to the educational intervention. This observed effect aligns with expectations in that it is positive but smaller in magnitude than the off-peak shifts driven by the price signal in RY2 (which ranged from 7.9% to 19.3% for the session start model).

4.1.4 Off-Peak Charging Rebate Pilot Program Key Findings

The following are the key findings from the evaluation of the Off-Peak Charging Rebate Pilot program:

- **Off-peak rebates are effective in shifting EV charging.** Participants in the rebate-control group during RY2 began receiving rebates for off-peak charging during RY3 and increased their off-peak charging by 8.9%.
- **The education intervention had a small but significant impact on session start times**. After five months of the education intervention, participants receiving educational and behavioral messaging in addition to rebates increased the percent of charging sessions started off-peak by 5.5% compared to the education-control group not receiving the messaging.
- **Impacts vary significantly by vehicle type**. Tesla BEVs shifted more kWh away from the on-peak period than PHEVs and Non-Tesla BEVs.
- **EV charging under time-of-use (TOU) incentives can create new demand peaks.** Participants consistently increased charging activity immediately after the end of on-peak periods, resulting in demand spikes at the start of the off-peak period. In a future high-EV adoption scenario, this concentration of load could create grid reliability concerns that could be mitigated by staggering peak windows and/or active managed charging to avoid concentrating load at a single hour.
- **The lingering impacts of the COVID-19 pandemic have resulted in a persistent reduction in charging activity but have not affected off-peak charging behavior**. On average during RY3, the monthly kWh charged across all participants was 43% lower than February 2020.

4.2 Charging Station Demonstration Program

National Grid's Charging Infrastructure Program seeks to increase the deployment of Level 2 and DCFC stations throughout Rhode Island. The program covers 100% of the cost of electric service upgrades and distribution equipment needed to power and install the charging stations and also provides a rebate for the cost of the EVSE equipment. This rebate varies by target charging segment (see Table 2-2) and covers station hardware. The program requires network and station monitoring for a minimum of five years after installation.

4.2.1 Program Implementation Approach

The Charging Station Demonstration Program leverages National Grid's existing sales staff and vendor networks to assist program staff in implementation. Sales staff solicit initial customer interest and provide leads to program staff, who provide program details and engage the vendor network as appropriate. Typically, the vendors navigate customers through the application and installation activities. National Grid is actively expanding this network, qualifying additional vendors to deliver this program.

4.2.2 Program Results

The following sections outline program results for the Charging Station Demonstration Program through RY3.

4.2.2.1 Charging Station Development

National Grid has made great progress through RY3 across several Level 2 segments, most notably in workplaces, and also in environmental justice communities, government fleet customers and multi-unit dwellings (MUD). In RY3, the program has

also seen progress in activating public DCFC ports. Participants through RY3 activated 281 Level 2 ports and 12 DCFC ports at 76 sites, for a total of 293 ports across 160 stations. The program also has a pipeline of an additional 18 Level 2 and 19 DCFC approved ports for RY3, resulting in a total program achievement of 299 Level 2 ports and 31 DCFC ports (Table 4-16) through RY3. Of the activated and approved ports through RY3, 22% are located within environmental justice communities (as DNV verified in Section 4.2.2.4), defined as host sites within environmental justice areas (per the criteria outlined by the RI Department of Environmental Management) and located at MUD or public parking lots. The program has also been extended for an additional year (RY4), with many additional Level 2 and DCFC stations already in the pipeline for installation.

Progress through RY3 continued to be slower for corporate fleets, heavy duty DCFC, and rideshare DCFC. National Grid has set separate RY4 targets for all segments to continue to pursue both Level 2 and DCFC station development.

Table 4-14 and Table 4-15 present the program goals and progress through RY3 for both Level 2 and DCFC infrastructure development, measured in the total number of charging ports by segment. Table 4-16 shows overall progress against port targets, including both activated and approved stations for RY3.

Table 4-14. Charging Infrastructure Program Progress Through RY3 – Total Level 2 Charging Ports by Segment

Level 2 Segment	Target Port Count	Activated	Approved*	Waitlisted	Total	Percent Ports Activated or Approved
Corporate Fleet	24	2	6	0	8	33%
Environmental Justice	36	36	0	0	36	100%
Government Fleet	24	24	0	0	24	100%
MUD	36	36	0	8	44	100%
Public Transit	60	43	12	0	55	92%
Workplace	140	140	0	82	222	100%
Total Level 2	**320**	**281**	**18**	**90**	**389**	**93%**

* Approved charging ports are included in RY3, while some of the ports that are “waitlisted” may be moved to RY4.

Table 4-15. Charging Infrastructure Program Progress Through RY3 – Total DCFC Charging Ports by Segment

DCFC Segment	Target Port Count	Activated	Approved*	Waitlisted	Total	Progress Toward RY3 Station Activation Goal (%)
Municipal school buses	3	0	2	0	2	67%
Other heavy-duty (port, airport)	8	0	0	0	0	0%
Rideshare company hub	5	0	0	0	0	0%
Public Transit Buses	10	0	9	0	9	90%
Public DCFC	20	12	8	0	20	100%
Total DCFC	**46**	**12**	**19**	**0**	**31**	**67%**

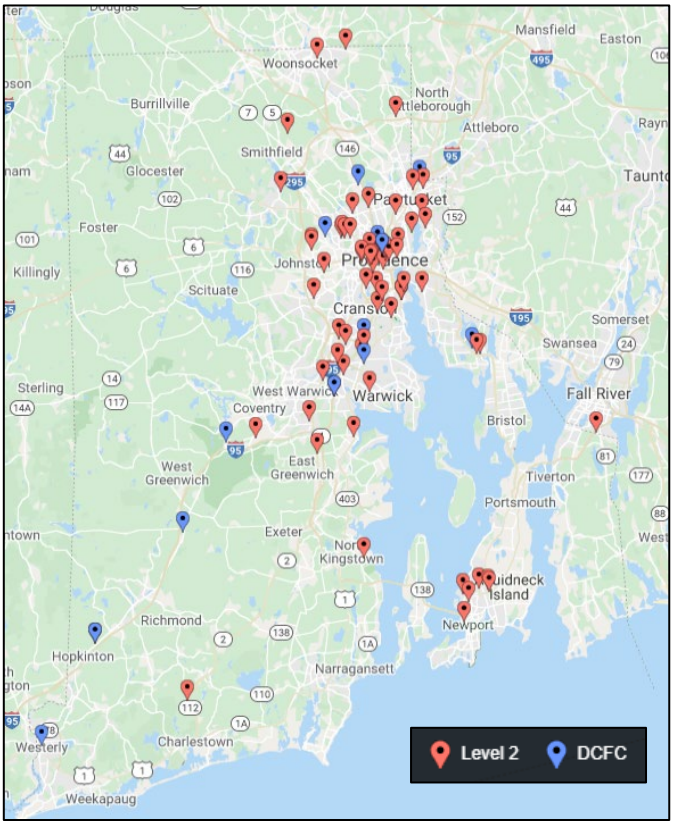
* Approved charging ports are included in RY3.

Table 4-16. Charging Infrastructure Program Progress Against Goals Through RY3 by Charging Port Type

Charging Level	RY3 Port Development Goal	Activated and Approved Ports Through RY3	Progress Toward RY3 Station Activation Goal (%)
Level 2	320	299	93%
DCFC	46	31	67%
Total	**366**	**330**	**90%**

Figure 4-7 below shows the distribution of the active and approved Level 2 and DCFC stations throughout Rhode Island as of August 31, 2021.

Figure 4-7. Activated and Approved Level 2 and DCFC Stations in Rhode Island



4.2.2.2 Charging Station Utilization

The Charging Station Demonstration Program requires a minimum of 5 years of network monitoring for each station installed through the program. Charging data is reported to National Grid by the EVSE suppliers. The DNV Team analyzed charging data from 251 Level 2 ports and 9 DCFC ports (260 ports in total) in RY3 to help National Grid understand station utilization in Rhode Island. Many of these stations recorded their first charging events during the summer of 2020 (near the end of RY2) and thus there was much more charging station utilization in RY3. The charging data for the program spans from September 2019 through August 2021.

It should be noted that, while charging station utilization is a valuable metric to track, it should not be seen as the only indicator of a successful installation. Charging stations deployed throughout National Grid's service territory can help improve the awareness of EVs and the availability of charging infrastructure for drivers who currently drive gas-powered vehicles while providing reassurance for EV drivers with range anxiety. In addition, tracking station utilization provides insight into how often, how long, and when charging stations are used, information that can be used to inform future station deployment and charging infrastructure programs, support new rate designs, and develop marketing materials for prospective program participants.

Charging Station Data Description. Data from participating stations was provided to DNV by the EVSEs via National Grid. For each charging session, the charging data includes, but is not limited to, the following fields:

- Charging session starting and ending timestamp
- Unique station identification code (Station ID)
- Unique charging session identification code (Session ID)

- The total charged energy per plug-in event (kWh)

DNV conducted an early EVSE data review in August 2021 to verify whether the vendors were providing data according to National Grid's EV charging data standards. We made several recommendations to improve data quality ahead of the full RY2 analysis. DNV observed that the quality and amount of data varied across vendors, though all vendors that delivered data provided all of the fields listed above.

Utilization Analysis Results. Table 4-17 provides an overview of the charging data analyzed through RY3. Overall, 86% of charging sessions and 77% of the total charged energy (kWh) came from Level 2 stations. Note that this utilization analysis does not include all stations in the Project Tracking spreadsheet that have an "activated" status; charging data was only provided for 260 of the 293 "activated" ports through RY3, and the analysis is therefore limited to only those stations for which data sets were available. Further, all of the analysis results in this section are based on charging data from chargers that could be matched to a project in the tracker and that passed quality control checks designed to flag invalid or inaccurate data.[17]

Table 4-17. RY3 Charging Station Utilization Data Overview

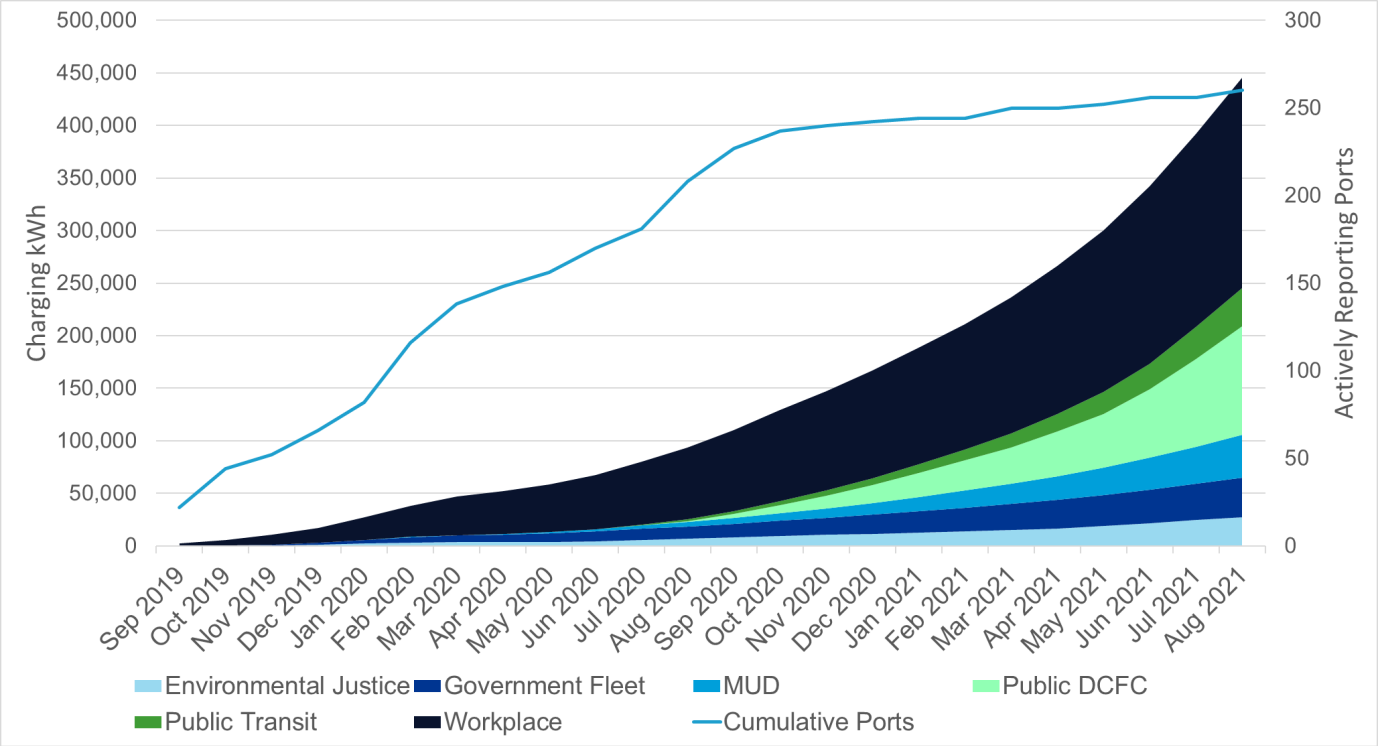
Metric	Level 2	DCFC	Total
Number of ports	251	9	260
Number of charging sessions	25,482	4,183	29,665
Charging energy consumed (kWh)	342,168	103,274	445,442
Average charging energy per port (kWh)	1,363	11,475	1,713
Average charging energy per session (kWh)	13	25	15

The 260 charging stations that reported data in RY3 are located at a total of 63 facilities, with several facilities containing multiple stations and ports. Because drivers tend to choose whichever port or station is available when they arrive at a charging location with multiple options, we have considered co-located stations as a single station-location; this approach also streamlines the utilization analysis. Table A-1, in Appendix A, summarizes the utilization of the co-located chargers for RY3 across multiple metrics; the anonymized stations are ordered based on the RI EVSE ID they were assigned in the program tracking spreadsheet.

Station Development and Charging kWh. Figure 4-8 show the growth over time in both the number of stations reporting data and in charging activity for program-funded stations through RY3. While RY2 saw large increases in the number of stations reporting data, charging activity lagged behind, in part due to shutdowns related to the COVID-19 pandemic. While the COVID-19 pandemic continues, the charging stations have seen increased utilization in RY3 as folks increase their travel and workplace visits. These increases can be seen across the program's target segments.

[17] In addition to data that did not align with the project tracker or failed quality control checks, some EVSEs have had a time lag from station activation to the start of data reporting.

Figure 4-8. Growth in Reporting Station Count and Charging Activity Over RY2



Station Utilization by Station Use and Segment. Table 4-18 below provides an overview of the utilization data by segment and charging type. In RY3, there was a large increase in charging kWh reported across both Level 2 and DCFC and for all Level 2 segments. Workplace charging continues to represent the largest share of Level 2 charging, though the other segments all saw growth with a full year of charging activity. The overall kWh per port increased with the additional charging activity, from 420 kWh per port at the end of RY2 to 1,713 kWh per port. However, the kWh per session remains similar at 15 kWh per session in RY3 compared to 14 kWh per session in RY2.

Table 4-18. Charging Station Utilization Breakdown by Segment (Level 2 and DCFC)

Charging Level	Segment	Port Count	Charge Session Count	Sessions per Port	Total kWh	kWh per Session	kWh per Port
Level 2	Environmental Justice	36	2,300	64	27,517	12	764
	Government Fleet	18	2,689	149	37,409	14	2,078
	MUD	34	2,255	66	40,571	18	1,193
	Public Transit	41	3,100	76	36,719	12	896
	Workplace	122	15,138	124	199,952	13	1,639
Total Level 2		**251**	**25,482**	**102**	**342,168**	**13**	**1,363**
DCFC	Public DCFC	9	4,183	465	103,274	25	11,475
Total		**260**	**29,665**	**114**	**445,442**	**15**	**1,713**

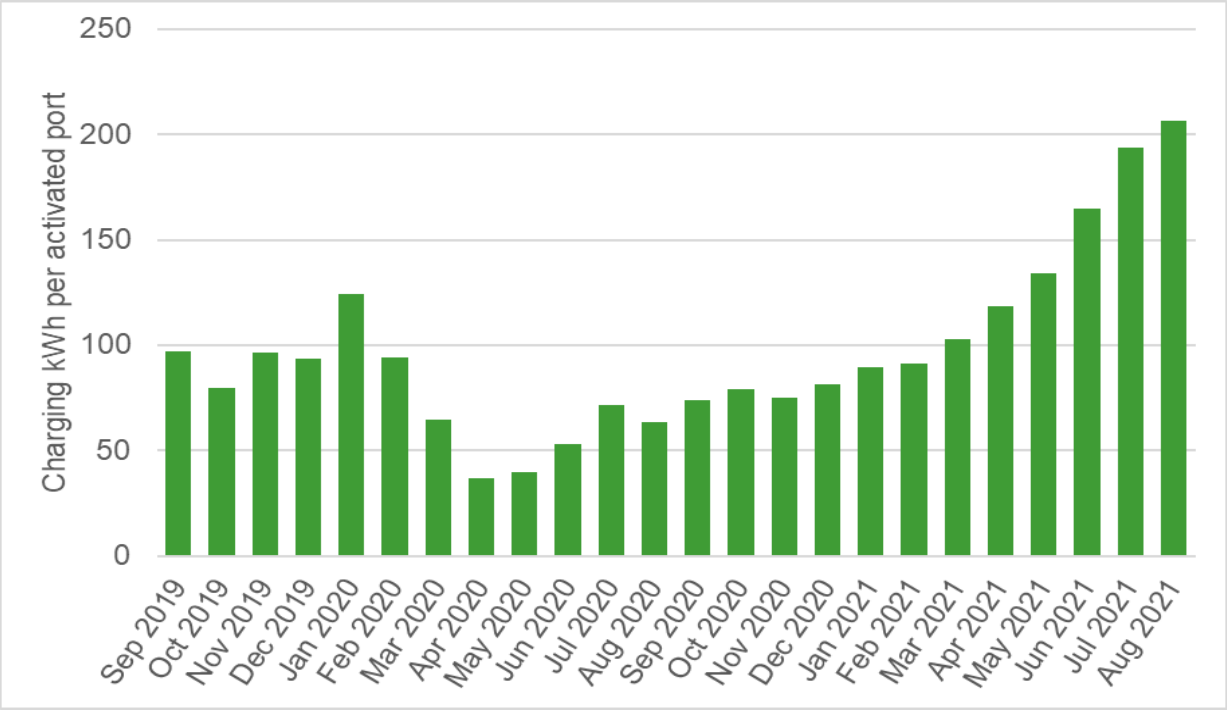
While workplace charging represents the largest number of ports activated and the largest share of overall charging, examination of charging activity normalized by the average time in service for each segment's ports highlights differences in utilization across segments. Per Table 4-19, for Level 2 charging, government fleet stations were the most utilized segment, followed by similar utilization for workplace, public transit, and MUD segments.

Table 4-19. Charging Station Utilization Normalized by Time in Service (Level 2 and DCFC)

Charging Level	Segment	Average Port Time in Service (Months)	Sessions per Port per Month	kWh per Port per Month
Level 2	Environmental Justice	19	3.5	41.3
	Government Fleet	15	10.2	141.7
	MUD	14	4.7	85.2
	Public Transit	11	6.8	80.5
	Workplace	20	6.4	84.0
Total Level 2		**17**	**6**	**81**
DCFC	Public DCFC	11	42	1,043
Total		**11**	**10**	**156**

Figure 4-9 below shows the monthly per-port utilization of the activated charging ports. Note the drop-off in charging at the start of the COVID-19 pandemic in March and April 2020, which is followed by a bounce back at the end of RY2 that continued throughout RY3. Charging continues to increase as the number of new activated ports slowed as several of the segments were fully subscribed.

Figure 4-9. Charging Station Utilization Breakdown by Month



Stations with the highest utilization. The increase in charging activity throughout RY3 warrants additional investigation into the DCFC and Level 2 stations with the highest utilization in the program.

- **DCFC Stations**. Through RY3, there were 9 DCFC ports reporting charging activity across 5 distinct locations. Figure 4-10shows these five locations, color-coded by charging activity. The two DCFC stations with the highest utilization each have charging activity that is an order of magnitude greater than the other three locations; these two stations are located along the Interstate 95 corridor to provide charging opportunities for EV drivers traveling in Rhode Island.
- **Level 2 Stations**. Figure 4-11 shows the 15 Level 2 stations that together comprise approximately two thirds of all Level 2 charging activity reported. While there is some variability across these locations, the majority are located along Interstate or other major roadways and/or clustered in and around Providence.

Figure 4-10. DCFC Most Utilized Stations through RY3

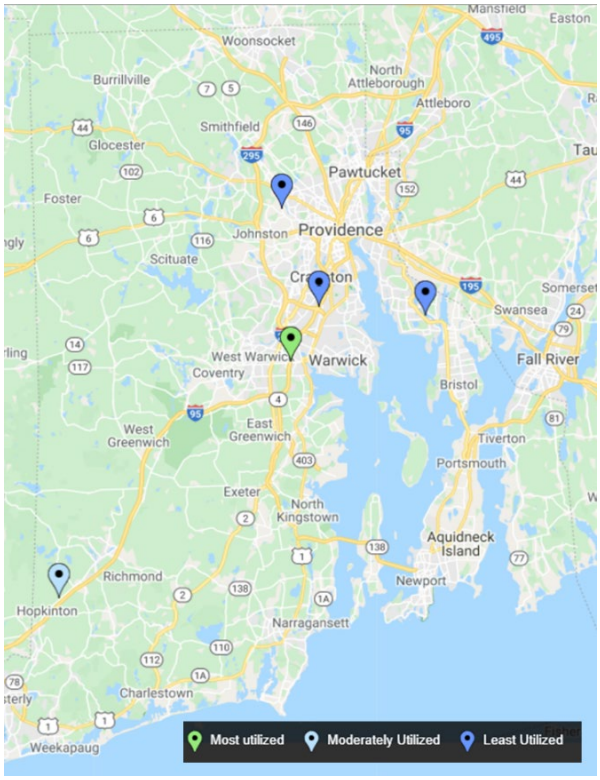
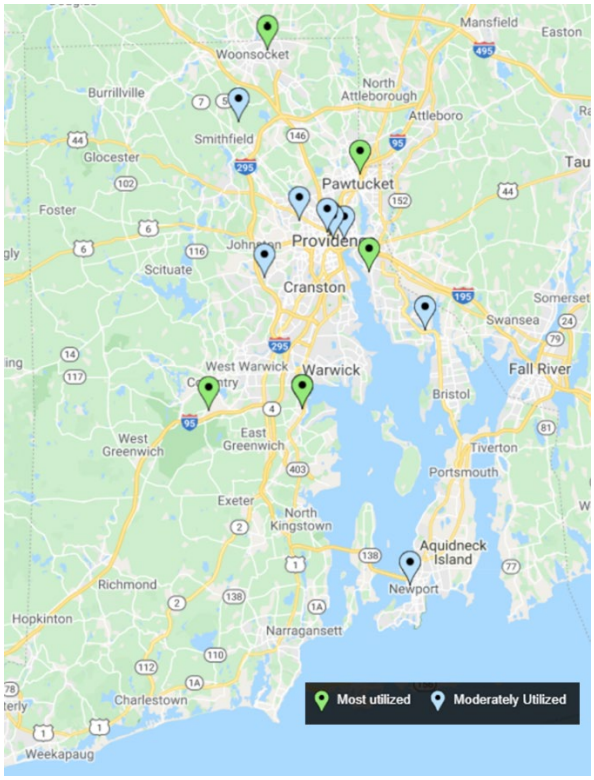


Figure 4-11. Level 2 Most Utilized Stations Through RY3



4.2.2.3 Incremental EV Adoption above National Grid Forecasts

National Grid's Amended Settlement Agreement, Docket Nos. 4770 and 4780, filed in August 2018, established annual company forecasts for incremental EV registrations in Rhode Island and set company targets for CO_2 reductions resulting from incremental EV adoption beyond these forecasts. DNV compared the annual company forecasts to data provided by National Grid from IHS Markit, an organization that tracks EV registrations in Rhode Island and other states on a quarterly basis. Note that the Electric Transportation Initiative Rate Year runs from September through August and this does not align with the IHS Markit calendar year quarters, but we can report on available data at the time of this report.

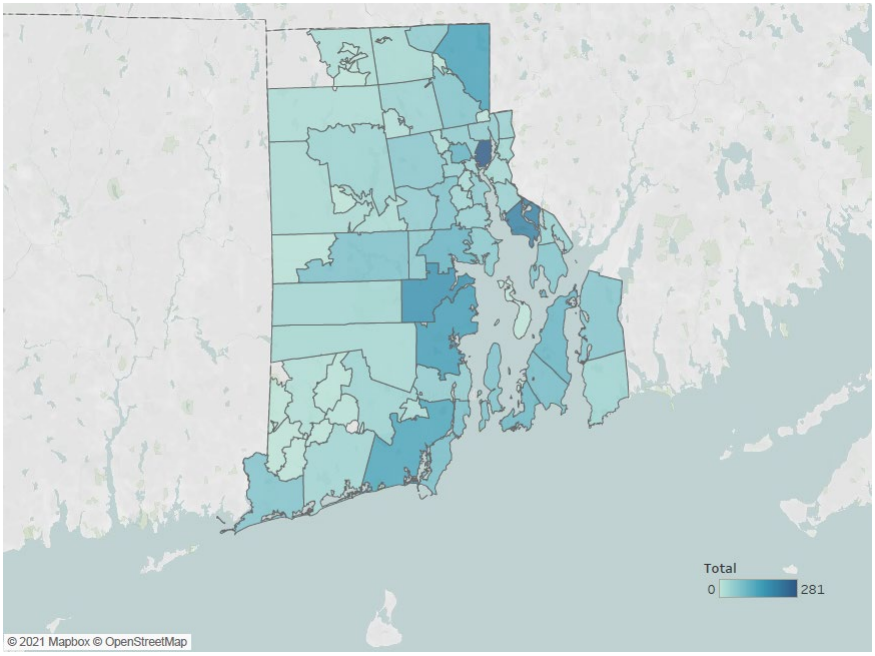
The National Grid forecast for 2019 was 857 vehicles, 1,180 vehicles for 2020, and 1,644 for 2021. In 2020, the IHS Markit data included 481 incremental BEV registrations and 212 incremental PHEV registrations, for a total of 693 incremental EV registrations. For 2021, IHS Markit data is available through Q2, and it shows 409 incremental BEV registrations and 303 incremental PHEV registrations, for a total of 712 incremental EV registrations over the first two quarters. Table 4-20 provides the total Rhode Island EV registrations and the incremental increases for 2019, 2020, and through Q2 2021.

Table 4-20. Rhode Island EV Total and Incremental Registrations, 2019 through 2021 Q2[18]

Time period	BEV (Non-Tesla)	BEV (Tesla)	PHEV	Total
Total RI Registrations as of Q4 2018	318	275	1,140	1,733
Total RI Registrations as of Q4 2019	404	515	1,327	2,246
2019 Incremental Change	**86**	**240**	**187**	**513**
Total RI Registrations as of Q4 2020	506	894	1,539	2,939
2020 Incremental Change	**102**	**379**	**212**	**693**
Total RI Registrations as of Q2 2021	696	1,113	1,842	3,651
2021 Incremental Change To-date	**190**	**219**	**303**	**712**

In 2019 and 2020, incremental EV registrations fell short of the National Grid forecast. While Q3 and Q4 2021 data is not yet available from IHS, the initial results suggest that actual EV registrations likely will fall short of National Grid forecasts. As a result, there are no emissions reductions resulting from incremental EV registrations beyond the forecast. DNV will plan to revisit this analysis in RY4 to provide full 2021 data and all available 2022 data. Figure 4-12 shows the spatial distribution of Rhode Island's EV population by ZIP code as of 2021 Q2, with darker colors indicating greater EV penetration; this information is also presented in tabular format in Appendix B.

Figure 4-12. Rhode Island EVs by ZIP Code – Through 2021 Q2



[18] This analysis excludes EV registrations in four zip codes that are outside of National Grid service territory: 02807, 02940, 02880, and 02859.

4.2.2.4 Environmental Justice (EJ) Communities

In addition to covering the cost of electric service upgrades and other installation costs, National Grid provides rebates to cover 100% of the equipment cost of EVSE located in EJ communities. EJ communities, as defined by the program, are locations that meet the following three criteria:

- They must be located within an environmental justice area as defined by the Department of Environmental Management. [19]
- The project(s) must be located at either a multi-unit dwelling (MUD) facility or a public parking location.
- The project cannot be located at a workplace or a part of a college campus.

The DNV Team reviewed the tracking data and verified the EJ communities identified for activated, approved, and in-development charging stations by overlaying geospatial data for these stations with EJ map data downloaded from the RI Department of Environmental Management.

Based on the verification analysis performed by DNV,

Table 4-21 shows that 71 activated and approved ports meet the program's EJ requirements as of August 31, 2021, which exceeds National Grid's program goal of 36 activated ports. Since the EJ segment goal has been achieved, National Grid allocated the additional ports meeting EJ criteria to other program segments.

Table 4-21. Results of DNV Environmental Justice Community Status Verification

EJ Community Status	Project Tracking Spreadsheet Ports	DNV Team Verified Ports
Activated	36	62
Approved	0	9
In Development	6	30
Total	**42**	**101**

DNV also reviewed all activated ports in the program and identified 14 additional ports that are located within EJ communities but do not meet all three criteria, primarily because they are classified as workplaces and/or campus locations. While not officially designated as EJ community ports, they may also help serve those communities.

4.2.3 Charging Demonstration Program Evaluation Key Findings

In RY3, the DNV Team interviewed 5 site hosts with activated stations and 3 EVSE vendors. The following are key takeaways from these interviews, interviews with the program managers and the analysis of program data:

- **The Charging Demonstration Program has made great progress toward its goals.** Overall, the program has reached 93% of the target activated and approved Level 2 ports and 67% of the target DCFC ports through RY3. Four of the six Level 2 segments (environmental justice, government fleet, MUD, and workplace) have been fully subscribed, and the program has been extended through RY4 with new program goals for each segment. Program participants

[19] Rhode Island Department of Environmental Management Resource Map, http://www.dem.ri.gov/maps/index.php

consistently expressed high satisfaction with the program throughout its first three rate years; satisfaction ratings across all interviewed participants to-date (n=16) averaged 9.25 out of a maximum rating of 10.

- **The incentives provided by National Grid are driving EVSE adoption and customer participation.** Every participant in RY3 mentioned that the incentives and support provided by National Grid were critical to install charging stations. All site hosts said they do not have the budget to install charging stations, or that they would have installed stations in the future but it is likely the installation would have been delayed. Table 4-14 shows that through RY3, the program still has many customers in the pipeline looking to take advantage of the program incentives.
- **The Charging Demonstration program has greatly exceeded its goal of activating ports in EJ communities.** In Section 4.2.2.4, DNV verified that 22% (71 ports) of the activated and approved ports (330) are located within EJ communities, which exceeds National Grid's program goal of 36 activated ports, 197% of the target. DNV also verified with the RI DEM map that an additional 14 ports are activated in EJ communities that do not meet the program's requirements but do serve these disadvantaged communities.
- **Utilization is increasing for EVSEs installed through the Charging Demonstration program**. At the time of the RY2 report, many stations had recently been activated and/or just started recording charging activity. With an additional year of activity, station utilization increased dramatically, both for Level 2 and DCFC stations. Normalized by time in service, government fleet ports charged the most, followed by workplace, public transit, and MUD. There was also marked growth in public DCFC charging, particularly along the Interstate 95 corridor.
- **There continues to be little evidence of free ridership in the Charging Demonstration program.** Most participants who were interviewed said that they would not have installed charging stations in the absence of the program and its incentives. One interviewed participant said "[EV's] will be something needed in the future and we are trying to keep ourselves aware [of the technology] and always ahead of the curve. We would have [installed the stations] eventually but we would not have moved so quickly [in the absence of the program]."
- **Electrify RI incentives helped drive the installation of EVSE, especially for DCFC stations.** Funding from the VW Settlement Agreement became available in RY2 through the Electrify RI program and though the program is now fully subscribed, it helped site hosts alleviate the costs of charging station equipment that was not covered by National Grid's program. During the program participant interviews, many participants continue to highlight the importance of the Electrify RI funding, saying that they would not have participated in National Grid's program if additional funding offered by the State had not been available to cover the entire cost of the stations. The Electrify RI program was particularly helpful for DCFC stations, as in RY3, 22 DCFC ports were activated and/or approved, increasing the program's progress towards DCFC port targets.
- **Several site hosts identified opportunities for improvement in the site and layout guidance provided for EVSE development.** Site hosts consistently praised the engineering guidance and technical expertise provided as part of the program but identified opportunities to improve the detail provided regarding site design. Specifically, site hosts identified a lack of guidance regarding where to place bollards, signs, and how to comply with ADA (U.S. Americans with Disabilities Act) requirements and guidelines.
- **Continued education on EVs, charging station equipment, and energy efficiency is recommended to encourage future EV adoption.** Two vendors reported that RI residents and program participants still vary in their level of knowledge and familiarity with EVs, EVSE and energy efficiency. While many program participants are aware of the charging station technology and even own EVs themselves, these vendors mentioned that continued education and marketing to advertise the benefits of EVs and energy efficiency measures are crucial when it comes to engaging with new prospective customers. The vendors specifically noted that many potential customers have heard of EVs, but the average consumer will require continued education to learn about the benefits before actually taking action. For example, one participant that was interviewed in RY3 had installed Level 2 stations and thought that Level 2 charging

was the fastest available on the market; he was not presented with information regarding DCFC technology or station development opportunities.

- **Program vendors are expanding services and covering EVSE equipment for a variety of EVSE equipment manufacturers**. In RY1, the DNV Team found that all activated stations, and most customers chose a single EVSE provider. Now in RY3, program vendors shared in interviews that they represent all EVSE manufacturers, and customers are beginning to install stations from other EVSE providers as they become more familiar with new equipment and see them installed on the road.
- **Program participants continue to express that their main motivation for program participation is largely due to long-term visions to support vehicle electrification and GHG emissions reductions.** When asked about their primary motivations for installing their charging stations, all site hosts mentioned a long-term vision of increasing penetration of vehicle electrification and a desire to prepare for the market to change. Common themes heard during interviews included reducing GHG emissions and personal carbon footprint, encouraging EV ownership, planning for the uptick in future EV adoption for personal and fleet vehicles and Rhode Island state goals of becoming net-zero by 2050. DNV recommends building on these themes of carbon footprint reduction, Rhode Island's net-zero goals, greening of the workplace etc., in recruitment materials to encourage additional site hosts to participate in the program.

> "WE ARE THOUGHT OF AS A 21ST CENTURY CITY, AND ONE THAT IS THREATENED BY SEA LEVEL RISE AND CLIMATE CHANGE AND DEPEND GREATLY ON TOURISM. WE ARE LOOKING TO PROTECT OUR HISTORIC ASSET THAT ATTRACTS TOURISTS AND PROTECTS EMISSIONS IN THE AREA."
>
> —Charging Station Demonstration program participant

- **Most site hosts were open to an arrangement regarding National Grid ownership and operation of charging stations.** National Grid asked DNV to solicit site hosts' initial perspective regarding a potential future arrangement where National Grid would own and operate charging stations on site host property.[20] DNV asked site hosts in RY2 and RY3 about this potential arrangement, and site host responses continued to be mixed. Most were interested in learning more about the details of what these arrangements would look like. Site hosts stated that the benefits of this opportunity included a reduction in staff time and upfront costs, in addition to possibly increasing the number of stations they can install on site, while other site hosts raised potential challenges with having multiple parties involved and more difficult approval processes.

4.3 Discount Pilot for DCFC Station Accounts

The Discount Pilot for DCFC Station Accounts Program provides incentives to owners of existing and new DCFC charging stations to offset demand charges incurred from usage of these high-kW-drawing stations (typically 150 kW and up).

[20] The topic of utility ownership of EV stations has been discussed and debated regularly in the industry, with multiple reports published on the benefits and challenges of different ownership models. One such report identified by the ERS team can be found here: https://www.mjbradley.com/sites/default/files/MJBA_Accelerating_the_Electric_Vehicle_Market_FINAL.pdf.

4.3.1 Program Implementation Approach

National Grid has established a process to identify and enroll eligible site hosts and works across its Marketing, Customer Solutions, Sales Processing, and Accounts Processing teams to calculate and process monthly credits. National Grid program staff manage the program, regularly monitoring and reporting program progress.

4.3.2 Program Results

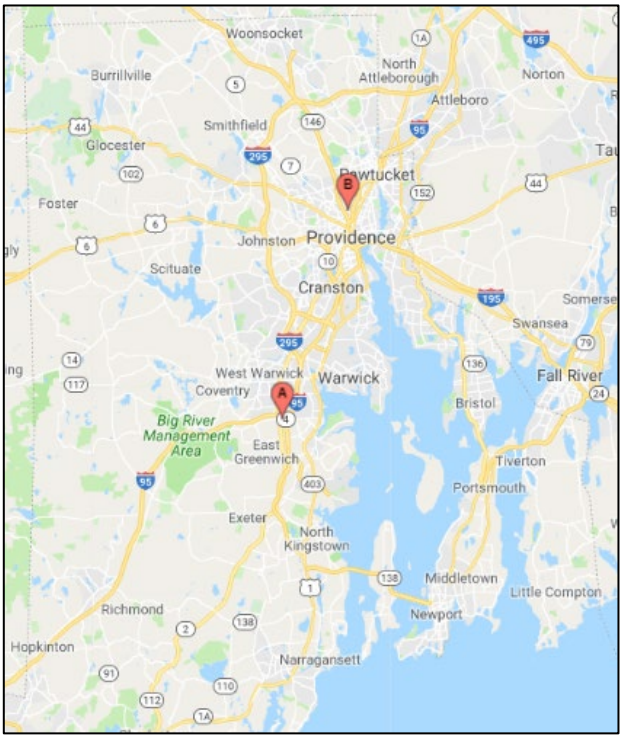
Two sites were eligible for the DCFC program through the first three rate years, but only one of those sites received benefits during RY3.[21] In RY3, a total of five DCFC **sites** were activated and potentially eligible for the DCFC Program. However, these DCFC sites were assigned to rate classes that were not eligible to participate in the program per the Amended Settlement Agreement. Therefore, DNV and National Grid agreed that it was not necessary to conduct participant interviews during RY3. Table 4-22 shows the total charging kWh, peak site kW, and total discounts provided through RY3. Figure 4-13 below shows the locations of the DCFC stations that received the DCFC discount rate pilot through RY3.

Table 4-22. DCFC Program Summary Metrics through RY3

Program Participant	In-Service Date	RY3 Charging kWh	RY3 Peak Site kW	Total Discount Received RY3	Total Program Charging kWh (RY1 through RY3)	Total Program Discount (RY1 through RY3)
DCFC A	Existing site	866,800	588	$24,093.35	2,043,800	$56,243.57
DCFC B	Existing site	0	0	$0	21,000	$2,951.87
Totals		**866,800**		**$21,694.17**	**2,064,800**	**$59,195.44**

[21] The second site received benefits through this program during RY2 but in May 2020 this site changed their billing rate, making them ineligible for the DCFC Discount Pilot program.

Figure 4-13. Location of DCFC Pilot Program Participants



4.4 Fleet Advisory Services

National Grid's Fleet Advisory Services program offers fleet electrification studies and other services to qualifying fleet operators throughout RI, including corporate light-duty, government light/medium/heavy-duty, public transit, and municipal school buses.

4.4.1 Program Implementation Approach

National Grid program staff have retained an implementation contractor for this program to evaluate the current fleet inventory of a participating fleet operator and propose fleet electrification options for consideration. The implementation contractor works closely with National Grid during the selection of participants, and National Grid regularly monitors study progress. At the end of each study, the implementation contractor delivers final reports to participants and National Grid.

4.4.2 Program Results

The Fleet Advisory Services program has enrolled eleven participants to-date. Fleet studies are complete for nine of the participants, and the remaining two are expected to be completed in late 2021. Table 4-23 summarizes the program participants to date.

Table 4-23. Fleet Advisory Study Participants Through RY3

Fleet Type	Number of Participants
Corporate light duty fleet	1
Corporate medium/heavy duty fleet	1
Corporate medium/heavy duty fleet /School bus	1
Government	3
Public Transit	1
University/Corporate light duty fleet	2
Utility/Corporate Fleet	1
Utility/Corporate light duty fleet	1
Total	**11**

Table 4-24 summarizes the metrics for this program through RY3. National Grid has made great progress through RY3 electrifying vehicles through the Fleet Advisory Services program, most notably in the government and utility/corporate light duty fleet sectors. From RY2 to RY3, the program has seen a jump in vehicle purchases and has helped participants electrify 31 vehicles, both battery electric (BEV) and plug-in hybrids (PHEVs). The program has also helped install 26 charging ports and helped feed participants into the Charging Demonstration program to install EVSE.

Table 4-24. Fleet Advisory Study Metrics

Program Metric	Results through RY3
Total number of vehicles leased/purchased	31 vehicles purchased
Total number of fleet vehicles converted to EVs	31 vehicles converted to EVs
Total number of EVs planned/pledged (in addition to vehicles leased/purchased)	18 vehicles
Total number of EVSE charging ports planned or installed	48 ports
Total number of vehicles recommended for replacement	399 vehicles
Estimated greenhouse gases avoided due to fleet vehicles converted to EVs (short tons)	1,601 short tons[22]

[22] To estimate this value, DNV leveraged a table provided in one of the final fleet reports from the implementation contractor that estimated the total lifetime greenhouse gas criteria air pollutant emissions from the Argonne National Lab GREET model. This table is provided in Appendix C. DNV applied the same assumptions in this table across all program participants who purchased EVs following the completion of the fleet study. For each EV purchase, DNV calculated the difference in GHG emissions between gasoline vehicles and the corresponding BEV/PHEV purchased.

4.4.3 Fleet Advisory Services Program Interview Results

In RY3, the DNV Team interviewed four participants who completed fleet electrification studies, including one who was previously interviewed back in RY1, bringing the total number of completed interviews to eight participants to-date. The following are key takeaways from these interviews:

- **Participants continue to report high satisfaction with the program and final reports.** All four program participants interviewed in RY3 provided positive feedback about their program experience. Program participants commended the expertise and professionalism of the implementation contractor and complimented the very detailed final reports.
- **The Fleet Advisory Services is an effective approach to enable EV and EVSE purchases.** Participants expressed interest in installing EVSEs for their fleets, purchasing EVs, and converting their existing fleet vehicles after completing their study; of the 9 completed participants, there are 44 EVs expected to be purchased, and through RY3, 31 EVs have been purchased following Fleet Advisory studies. These participants have also planned, or already installed 48 charging ports through the program. Program participants noted in their interviews that the guidance and technical advice provided by the program allowed them to make educated decisions and push the process along, whereas in the absence of the program, many participants would not be able to prioritize vehicle electrification efforts. Two of the participants interviewed during RY3 also commented that their electrification study was a helpful resource in promoting vehicle electrification within their company, educating their staff on the available technology options, and understanding the full cost of ownership of EVs compared to the upfront purchase price.

> As much as anything else, [the program] brought certain things to the forefront relative to the fleet vehicles that we have, and [the report] was educational with regard to EVs moving in that direction.
>
> –Fleet Advisory Services Program Participant

- **The Fleet Advisory Services Program is driving participation in other EV programs.** All four participants interviewed in RY3 are already involved in the Charging Station Demonstration Program. As additional fleet electrification studies are completed, and participants begin to implement the recommendations from their reports, we expect participants who pursue electrification will take advantage of available incentives for Level 2 and/or DCFC stations in RY4.
- **Participants value ongoing program support and continue to advocate for guidance after the final report**. Most interviewed participants indicated that they would likely take a phased approach to electrifying their fleet and installing charging stations, and they mentioned that while they generally plan to follow the electrification recommendations from their report, the timing of their fleet upgrades may not reflect the timing in the report and would likely span at least 3-5 years. Many of these delays stem from existing replacement plans, limited budget, and staff resources. Participants expressed interest in ongoing communication from National Grid and/or the implementation contractor, suggesting it would be useful to receive a brief annual update on market trends or new vehicles and/or technologies to help guide their future decision-making regarding vehicle electrification.
- **Participants expressed interest in more site-specific reports, detailing actionable recommendations specific to their business type and location.** While all participants interviewed in RY3 noted that their reports provided valuable information, two participants stated that they would have benefited from the report being more tailored to their specific site. For example, one participant is a government agency with charging stations subject to federal EVSE requirements. The participant noted that the final report did not consider these requirements in its recommendations and thus they were not actionable. Another site mentioned that their report could have benefited from actionable recommendations on how to efficiently electrify their fleet. For example, they noted that guidance on where to install charging stations on their site would be helpful, rather than suggesting just the number of EVSE to install.

- **The COVID-19 pandemic has hindered fleet electrification efforts.**, Several participants noted that the COVID-19 pandemic has restricted their available funds for new vehicle purchases in the short term, identifying budget freezes and/or limitations. Additionally, participants cited high vehicle costs due to supply chain disruptions as an additional barrier to moving forward with EV purchases.

APPENDIX A. PROJECT-LEVEL UTILIZATION METRICS

Table A-1 summarizes the utilization of the co-located chargers for RY3 across multiple metrics; the anonymized stations are ordered based on the RIEVSE ID they were assigned in the project tracking spreadsheet.

Table A-1. Charging Station Utilization by Station through RY

Rhode Island Tracking ID	Charger Type	Activation Date (from tracking)	First Charge Date (in data)	Charge Session Count	Charged kWh	Charged kWh per charge session	Project Segment	Port Count
RIEVSE-1	Level 2	5/14/2019	9/3/2019	1,364	16,848	12.4	Workplace	4
RIEVSE-2	Level 2	12/1/2019	6/11/2020	68	2,217	32.6	MUD	4
RIEVSE-4	Level 2	9/9/2019	9/3/2019	426	9,433	22.1	Workplace	2
RIEVSE-6	Level 2	11/27/2019	1/10/2020	304	3,149	10.4	Workplace	4
RIEVSE-7	Level 2	11/27/2019	2/5/2020	596	8,227	13.8	Workplace	4
RIEVSE-8	Level 2	11/27/2019	2/10/2020	557	8,884	15.9	Workplace	2
RIEVSE-9	Level 2	1/2/2020	2/20/2020	1,153	24,066	20.9	Workplace	6
RIEVSE-13	Level 2	3/10/2020	3/1/2020	800	5,309	6.6	Workplace	4
RIEVSE-14	Level 2	3/10/2020	3/2/2020	1,455	13,154	9.0	Workplace	2
RIEVSE-16	Level 2	3/10/2020	8/25/2020	23	469	20.4	Workplace	4
RIEVSE-18	Level 2	12/1/2019	12/31/2019	1,538	10,372	6.7	Workplace	8
RIEVSE-20	Level 2	3/4/2020	5/2/2020	193	4,883	25.3	Workplace	2
RIEVSE-22	Level 2	11/18/2019	11/16/2019	1,738	25,883	14.9	Government Fleet	2
RIEVSE-23	Level 2	11/18/2019	11/16/2019	1,014	16,422	16.2	Workplace	4
RIEVSE-24	Level 2	6/1/2020	5/5/2020	94	1,538	16.4	Government Fleet	8
RIEVSE-27	Level 2	8/23/2019	9/3/2019	1,504	17,258	11.5	Workplace	4
RIEVSE-29	Level 2	11/18/2019	10/30/2019	259	5,349	20.7	Workplace	2
RIEVSE-30	Level 2	11/18/2019	10/26/2019	245	5,171	21.1	Government Fleet	2
RIEVSE-31	Level 2	11/18/2019	10/10/2019	667	4,720	7.1	Workplace	4
RIEVSE-35	Level 2	9/20/2019	9/13/2019	684	7,648	11.2	Workplace	4
RIEVSE-37	Level 2	10/14/2019	10/14/2019	814	7,276	8.9	Environmental Justice	4
RIEVSE-38	Level 2	2/5/2020	2/19/2020	11	140	12.8	Workplace	4
RIEVSE-39	Level 2	6/24/2020	6/2/2020	692	16,580	24.0	Workplace	6
RIEVSE-46	Level 2	8/20/2019	9/5/2019	17	108	6.4	Workplace	4
RIEVSE-47	Level 2	8/20/2019	9/5/2019	16	113	7.1	Workplace	4
RIEVSE-48	Level 2	8/28/2019	10/11/2019	29	201	6.9	Workplace	4
RIEVSE-49	Level 2	9/9/2019	9/16/2019	408	7,049	17.3	Workplace	2
RIEVSE-50	Level 2	2/26/2020	2/11/2020	89	2,063	23.2	MUD	4
RIEVSE-51	Level 2	12/18/2019	11/28/2019	393	5,786	14.7	Environmental Justice	6
RIEVSE-52	Level 2	4/9/2020	3/29/2020	892	14,011	15.7	MUD	4

Rhode Island Tracking ID	Charger Type	Activation Date (from tracking)	First Charge Date (in data)	Charge Session Count	Charged kWh	Charged kWh per charge session	Project Segment	Port Count
RIEVSE-54	Level 2	10/25/2019	10/30/2019	45	418	9.3	Workplace	2
RIEVSE-55	Level 2	9/25/2019	10/23/2019	125	1,026	8.2	Environmental Justice	6
RIEVSE-57	Level 2	12/3/2019	12/3/2019	148	1,213	8.2	Workplace	2
RIEVSE-58	Level 2	10/31/2019	10/29/2020	212	4,087	19.3	Environmental Justice	4
RIEVSE-61	Level 2	12/13/2019	1/6/2020	28	402	14.4	Workplace	4
RIEVSE-62	Level 2	9/10/2020	8/25/2020	899	5,718	6.4	Public Transit	7
RIEVSE-69	Level 2	3/23/2020	6/4/2021	13	159	12.3	Government Fleet	2
RIEVSE-72	Level 2	3/27/2020	9/3/2020	4	112	28.0	MUD	4
RIEVSE-73	Level 2	12/3/2019	12/1/2019	155	1,180	7.6	Environmental Justice	6
RIEVSE-75	Level 2	5/11/2020	6/28/2020	389	6,890	17.7	Environmental Justice	4
RIEVSE-76	Level 2	4/27/2020	4/14/2020	692	13,854	20.0	Workplace	4
RIEVSE-77	Level 2	5/15/2020	4/30/2020	113	948	8.4	Workplace	4
RIEVSE-81	Level 2	3/10/2020	3/10/2020	917	15,943	17.4	MUD	6
RIEVSE-83	Level 2	2/15/2020	2/25/2020	210	1,929	9.2	Workplace	4
RIEVSE-88	Level 2	3/26/2020	8/7/2020	212	1,273	6.0	Environmental Justice	4
RIEVSE-93	DCFC	8/5/2020	7/29/2020	271	4,974	18.4	Public DCFC	1
RIEVSE-94	Level 2	1/23/2020	1/21/2020	170	740	4.4	Workplace	4
RIEVSE-101	Level 2	3/15/2020	2/19/2020	22	65	2.9	Workplace	4
RIEVSE-103	Level 2	8/20/2021	8/27/2021	3	35	11.6	Public Transit	6
RIEVSE-106	Level 2	9/2/2020	8/27/2020	229	1,575	6.9	Public Transit	8
RIEVSE-106	DCFC	9/2/2020	8/28/2020	2,055	53,339	26.0	Public Transit	2
RIEVSE-107	Level 2	9/2/2020	8/27/2020	204	3,314	16.2	Public Transit	8
RIEVSE-107	DCFC	9/2/2020	8/26/2020	1,376	35,088	25.5	Public Transit	2
RIEVSE-108	Level 2	3/10/2020	3/15/2020	240	2,094	8.7	Government Fleet	4
RIEVSE-109	Level 2	3/26/2020	5/3/2020	121	2,597	21.5	MUD	4
RIEVSE-114	Level 2	6/24/2020	7/12/2020	865	11,076	12.8	Public Transit	6
RIEVSE-117	Level 2	8/7/2020	8/11/2020	327	3,971	12.1	Public Transit	4
RIEVSE-118	Level 2	5/26/2020	3/3/2021	23	430	18.7	MUD	2
RIEVSE-119	Level 2	10/28/2020	9/3/2020	77	1,463	19.0	MUD	4
RIEVSE-120	Level 2	8/13/2020	9/3/2020	64	1,735	27.1	MUD	4
RIEVSE-121	DCFC	8/19/2020	8/20/2020	380	7,534	19.8	Public DCFC	2
RIEVSE-122	Level 2	5/20/2020	5/15/2020	495	10,007	20.2	Public Transit	4
RIEVSE-127	Level 2	9/15/2020	9/22/2020	359	2,563	7.1	Government Fleet	4
RIEVSE-128	DCFC	5/25/2021	5/10/2021	101	2,339	23.2	Public DCFC	2

Rhode Island Tracking ID	Charger Type	Activation Date (from tracking)	First Charge Date (in data)	Charge Session Count	Charged kWh	Charged kWh per charge session	Project Segment	Port Count
RIEVSE-133	Level 2	4/3/2021	3/24/2021	78	1,024	13.1	Public Transit	4
Totals				**29,665**	**445,442**			**260**

APPENDIX B. ELECTRIC VEHICLE POPULATION BREAKDOWN BY ZIP CODE, 2021 Q2

Table B-1 provides the count of EVs by zip code and vehicle type as of Q2 2021. This data was developed by IHS Markit and provided to DNV by National Grid for analysis.

Table B-1. Number of EVs by ZIP code and Vehicle Type, 2021 Q2

Zipcode	BEV (Non-Tesla)	BEV (Tesla)	PHEV	Total
02801	0	0	1	1
02802	0	0	3	3
02804	0	0	1	1
02806	36	89	81	206
02808	0	3	0	3
02809	14	27	31	72
02812	1	1	6	8
02813	7	8	20	35
02814	7	5	8	20
02815	0	1	1	2
02816	8	20	50	78
02817	5	10	17	32
02818	29	74	72	175
02822	7	5	16	28
02825	6	3	14	23
02826	0	0	1	1
02827	1	1	4	6
02828	0	7	8	15
02829	0	1	1	2
02830	3	8	9	20
02831	4	7	11	22
02832	3	3	10	16
02833	1	1	0	2
02835	17	23	40	80
02836	1	0	0	1
02837	7	11	19	37
02838	0	1	3	4
02839	0	0	1	1
02840	20	40	43	103
02841	0	0	1	1
02842	17	22	52	91
02852	34	57	62	153
02857	2	13	24	39

Zipcode	BEV (Non-Tesla)	BEV (Tesla)	PHEV	Total
02858	0	0	1	1
02860	13	12	30	55
02861	8	12	24	44
02863	0	3	2	5
02864	22	53	68	143
02865	16	29	27	72
02871	24	27	56	107
02872	0	0	0	0
02874	15	22	18	55
02876	2	0	1	3
02877	0	0	3	3
02878	11	30	28	69
02879	39	26	73	138
02881	6	5	13	24
02882	18	21	49	88
02885	13	11	22	46
02886	18	38	52	108
02888	13	8	30	51
02889	13	19	31	63
02891	14	28	32	74
02892	10	7	22	39
02893	12	12	36	60
02894	1	0	3	4
02895	8	15	36	59
02896	4	8	14	26
02898	0	1	5	6
02901	0	0	0	0
02903	5	13	22	40
02904	8	17	32	57
02905	16	14	30	60
02906	46	96	139	281
02907	5	4	15	24
02908	25	13	73	111
02909	9	11	28	48
02910	6	8	23	37
02911	7	3	12	22
02912	0	2	0	2
02914	4	6	19	29
02915	6	12	26	44
02916	10	6	17	33

Zipcode	BEV (Non-Tesla)	BEV (Tesla)	PHEV	Total
02917	5	12	25	42
02919	11	22	31	64
02920	19	20	39	78
02921	4	26	25	55
Totals	**696**	**1113**	**1842**	**3651**

APPENDIX C. VEHICLE EMISSIONS TO ESTIMATE FLEET ADVISORY SERVICES EV CONVERSION IMPACTS

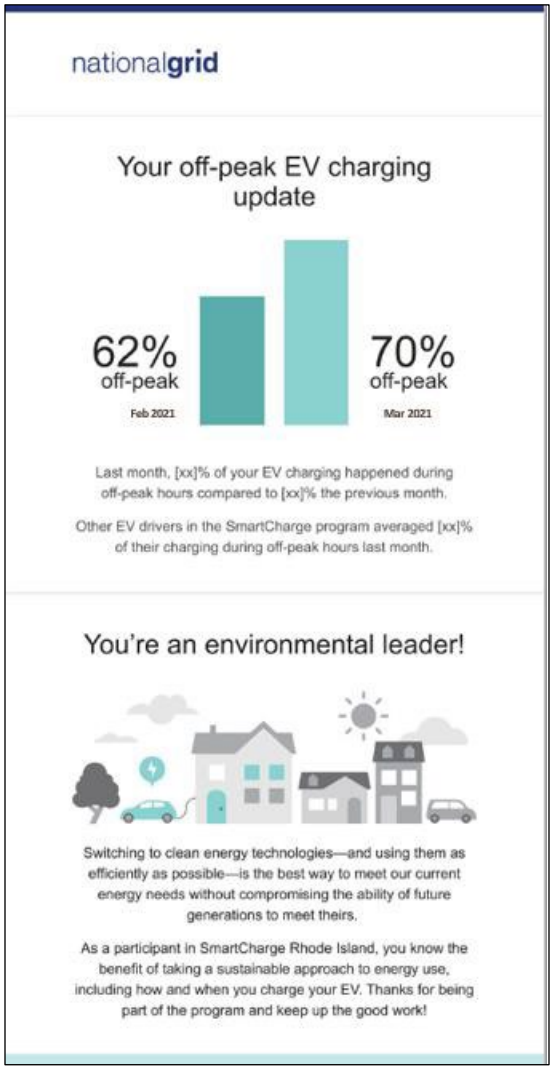
Table C-1 was extracted from one of the Fleet Advisory Services final reports and was used as the basis for estimating lifetime emissions savings from converting vehicles from gasoline to EVs. The implementation contractor noted in the report that the data from this table is from the Argonne National Lab GREET model and that they assumed PHEVs will travel 50% of total miles on electricity.

Table C-1. Lifetime Emissions Comparison from Fleet Study Participant Final Report

	Sedan (104,000 miles)			SUV (139,000 miles)		
Values	**PHEV**	**Gas**	**BEV**	**PHEV**	**Gas**	**BEV**
CO (lb)	359	370	15	558	572	21
NOx (lb)	31	63	15	59	107	21
PM10 (lb)	11	13	10	16	19	15
PM2.5 (lb)	3	5	2	5	7	3
VOC (lb)	30	70	3	45	104	3
SOx (lb)	8	22	9	16	36	12
Greenhouse Gases (short tons)	15	62	8	31	103	11

APPENDIX D. SAMPLE EDUCATION INTERVENTION EMAIL

The images below are an example of the monthly emails distributed to education-treatment group participants as part of the education intervention.



nationalgrid

Your off-peak EV charging update

62% off-peak
Feb 2021

70% off-peak
Mar 2021

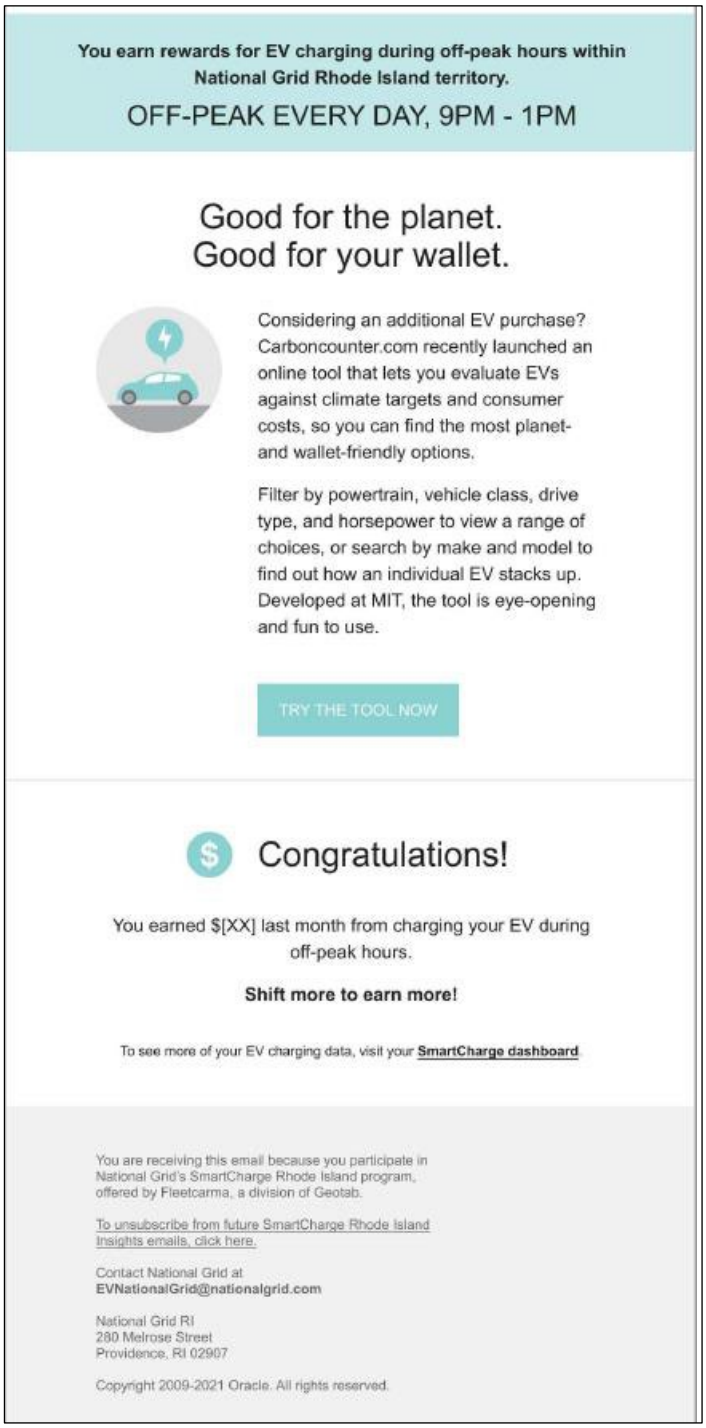
Last month, [xx]% of your EV charging happened during off-peak hours compared to [xx]% the previous month.

Other EV drivers in the SmartCharge program averaged [xx]% of their charging during off-peak hours last month.

You're an environmental leader!

Switching to clean energy technologies—and using them as efficiently as possible—is the best way to meet our current energy needs without compromising the ability of future generations to meet theirs.

As a participant in SmartCharge Rhode Island, you know the benefit of taking a sustainable approach to energy use, including how and when you charge your EV. Thanks for being part of the program and keep up the good work!



You earn rewards for EV charging during off-peak hours within National Grid Rhode Island territory.

OFF-PEAK EVERY DAY, 9PM - 1PM

Good for the planet.
Good for your wallet.

Considering an additional EV purchase? Carboncounter.com recently launched an online tool that lets you evaluate EVs against climate targets and consumer costs, so you can find the most planet- and wallet-friendly options.

Filter by powertrain, vehicle class, drive type, and horsepower to view a range of choices, or search by make and model to find out how an individual EV stacks up. Developed at MIT, the tool is eye-opening and fun to use.

TRY THE TOOL NOW

Congratulations!

You earned $[XX] last month from charging your EV during off-peak hours.

Shift more to earn more!

To see more of your EV charging data, visit your **SmartCharge dashboard**.

You are receiving this email because you participate in National Grid's SmartCharge Rhode Island program, offered by Fleetcarma, a division of Geotab.

To unsubscribe from future SmartCharge Rhode Island Insights emails, click here.

Contact National Grid at
EVNationalGrid@nationalgrid.com

National Grid RI
280 Melrose Street
Providence, RI 02907

About DNV

DNV is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas, power and renewables industries. We also provide certification, supply chain and data management services to customers across a wide range of industries. Operating in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.

APPENDIX 2: OFF-PEAK CHARGING EDUCATION CAMPAIGN EXAMPLE

nationalgrid

Your off-peak EV charging update

Last month, 63% of your EV charging happened during off-peak hours compared to 69% the previous month.

Your charging compared to other participants

July 2021

Other EV drivers in the SmartCharge program averaged 71% of their charging during off-peak hours last month.

Ready to set a schedule? Just pick up your phone!

It's true—many EVs come with smart-phone enabled ways to schedule charging. You likely already have the tools to set up an off-peak charging schedule using your vehicle's dashboard settings, a companion app, or a smart home charging station. Take a moment to learn the details today!

SCHEDULE MY TESLA

Schedule off-peak charging. Earn rewards*

OFF-PEAK EVERY DAY, 9PM - 1PM

* Within National Grid Rhode Island territory only

It's a great time to invest in an at-home charging station

Today's at-home charging stations are one of the easiest and most effective ways to keep charging smart.

Most at-home models are WiFi-enabled for maximum flexibility and convenience. And, depending on which charger you choose, you could qualify for a federal tax credit of up to $1000.

SHOP AT-HOME CHARGERS

Congratulations!

You earned $8.91 last month from charging your EV during off-peak hours.

Summer pricing ends September 30th!

Until then, SmartCharge rewards are $.06/kWh versus $.04/kWh—a higher rate than any other time of year.

Shift more to earn more!

To see more of your EV charging data, visit your SmartCharge dashboard.

APPENDIX 3: DEFERRAL ACCOUNT SUMMARY and REVENUE REQUIREMENT CALCULATIONS

The Narragansett Electric Company
d/b/a National Grid
Power Sector Transformation (PST)
Electric Transportation Initiative
Deferral Summary by Category

Line No.		Rate Year Ended August 31, 2019			Rate Year Ended August 31, 2020			Rate Year Ending August 31, 2021			Cumulative Deferral at Rate Years Ending		
		Actual	Allowance	Delta	Actual	Allowance	Delta	Actual	Allowance	Delta	August 31, 2019 (RY1)	August 31, 2020 (RY2)	August 31, 2021 (RY3)
	Operation and Maintenance (O&M) Expenses:	(a)	(b)	(c)=(a)-(b)	(d)	(e)	(f)	(g)	(h)	(i)	(j)=(c)	(k)=(j)+(f)	(l)=(k)+(i)
1	Offpeak Charging Rebate	$182,176	$133,745	$48,431	$188,826	$176,920	$11,906	$241,325	$227,567	$13,758	$48,431	$60,337	$74,095
2	Discount Pilot for DC Fast Charging	$13,408	$103,622	($90,214)	$21,694	$170,650	($148,956)	$24,093	$264,488	($240,395)	($90,214)	($239,170)	($479,565)
3	Customer Fleet Advisory Services	$21,879	$40,000	($18,121)	$153,687	$70,000	$83,687	$83,764	$100,000	($16,236)	($18,121)	$65,566	$49,330
4	Charging Demonstration Program	$80,205	$326,831	($246,626)	$552,044	$502,382	$49,662	$255,085	$1,013,114	($758,029)	($246,626)	($196,964)	($954,993)
5	Initiative Evaluation	$5,846	$30,000	($24,154)	$64,797	$30,000	$34,797	$86,153	$30,000	$56,153	($24,154)	$10,643	$66,796
6	**Total O&M component of Revenue Requirement**	**$303,514**	**$634,198**	**($330,684)**	**$981,048**	**$949,952**	**$31,096**	**$690,420**	**$1,635,169**	**($944,749)**	**($330,684)**	**($299,588)**	**($1,244,337)**
	Capital Investment:												
7	Charging Demonstration	$8,856	$47,102	($38,246)	$125,742	$201,799	($76,057)	$333,117	$516,607	($183,490)	($38,246)	($114,303)	($297,793)
8	**Total Capital Investment Component of Revenue Requirement**	**$8,856**	**$47,102**	**($38,246)**	**$125,742**	**$201,799**	**($76,057)**	**$333,117**	**$516,607**	**($183,490)**	**($38,246)**	**($114,303)**	**($297,793)**
9	**Total Revenue Requirement: Electric Transportation**	**$312,370**	**$681,300**	**($368,930)**	**$1,106,790**	**$1,151,751**	**($44,961)**	**$1,023,537**	**$2,151,776**	**($1,128,239)**	**($368,930)**	**($413,891)**	**($1,542,130)**

1-7 Cols (a),(d), (g) - Per Page 4 of 17
1-7 Cols (b),(e), (h) - per RIPUC Docket 4770 Aug 16, 2018 Compliance filing, Compliance Attachment 5.1, Page 1
6 Sum of Lines 1 through 5
8 Line 7
9 Line 6 + Line 8

The Narragansett Electric Company
d/b/a National Grid
Electric Transportation Initiative
Deferral Summary by Category (continued)

Line No.		Rate Year Ending August 31, 2022			Cumulative Deferral at Rate Years Ending			
		Forecast	Allowance	Delta	August 31, 2019 (RY1)	August 31, 2020 (RY2)	August 31, 2021 (RY3)	August 31, 2022 (RY4)
	Operation and Maintenance (O&M) Expenses:	(a)	(b)	(c)=(a)-(b)	(d)= Page 1 Col (j)	(e)=Page 1 Col (k)	(f)=Page 1 Col (l)	(g)=(f)+(c)
1	Offpeak Charging Rebate	$266,136	$227,567	$38,569	$48,431	$60,337	$74,095	$112,664
2	Discount Pilot for DC Fast Charging	$62,223	$264,488	($202,265)	($90,214)	($239,170)	($479,565)	($681,830)
3	Customer Fleet Advisory Services	$144,606	$100,000	$44,606	($18,121)	$65,566	$49,330	$93,936
4	Charging Demonstration Program	$1,210,786	$1,013,114	$197,672	($246,626)	($196,964)	($954,993)	($757,321)
5	Initiative Evaluation	$82,496	$30,000	$52,496	($24,154)	$10,643	$66,796	$119,292
6	**Total O&M component of Revenue Requirement**	**$1,766,247**	**$1,635,169**	**$131,078**	**($330,684)**	**($299,588)**	**($1,244,337)**	**($1,113,259)**
	Capital Investment:							
7	Charging Demonstration	$668,149	$516,607	$151,542	($38,246)	($114,303)	($297,793)	($146,252)
8	**Total Capital Investment Component of Revenue Requirement**	**$668,149**	**$516,607**	**$151,542**	**($38,246)**	**($114,303)**	**($297,793)**	**($146,252)**
9	**Total Revenue Requirement: Electric Transportation**	**$2,434,396**	**$2,151,776**	**$282,620**	**($368,930)**	**($413,891)**	**($1,542,130)**	**($1,259,511)**

Col (a)- per Page 4 of 17
Col (b)- per RIPUC Docket 4770 Aug 16, 2018 Compliance filing, Compliance Attachment 5.1
6 Sum of Lines 1 through 5
8 Line 6 + Line 8

The Narragansett Electric Company
d/b/a National Grid
Power Sector Transformation (PST)
Electric Transportation Initiative
Interest on ET Initiative Deferrals

Line No.	Rate Year	(a)=(h) Beginning Balance	(b) Actual	(c) Allowance	(d)=Sum (a) -(c) Ending Balance	(e)=(a)+(d)/2 Average Balance	(f) Interest Rate	(g)=(e)*(f) Interest	(h)=(d)+(g) Ending Balance
EV Deferral: Operating & Maintenance expense									
1	RY1	$0	$303,514	($634,198)	($330,684)	($165,342)	2.620%	($4,332)	($335,016)
2	RY2	($335,016)	$981,048	($949,952)	($303,920)	($319,468)	2.525%	($8,067)	($311,987)
3	RY3	($311,987)	$690,420	($1,635,169)	($1,256,736)	($784,362)	1.515%	($11,883)	($1,268,619)
4	RY4	($1,268,619)	$1,766,247	($1,635,169)	($1,137,541)	($1,203,080)	0.890%	($10,707)	($1,148,248)
EV Deferral : Capital Investment									
5	RY1	$0	$8,856	($47,102)	($38,246)	($19,123)	8.230%	($1,574)	($39,820)
6	RY2	($39,820)	$125,742	($201,799)	($115,877)	($77,849)	8.230%	($6,407)	($122,284)
7	RY3	($122,284)	$333,117	($516,607)	($305,774)	($214,029)	8.230%	($17,615)	($323,389)
8	RY4	($323,389)	$668,149	($516,607)	($171,848)	($247,618)	8.230%	($20,379)	($192,227)
9	**Total Forecasted ETI deferral with interest at the end of Rate Year 3**						Line 3 + Line 7		**($1,592,008)**
10	**Total Forecasted ETI deferral with interest at the end of Rate Year 4**						Line 4 + Line 8		**($1,340,475)**

Col (b & c) Per Page 1 of 16 and Page 2 of 16
Col (f) Lines 1 - 3: Customer deposit rate effective each March 1, 2018 through 2021 respectively of 2.33%, 2.91%, 2.14% and 0.89%.
Col (f) Lines 4: Forecasted Customer deposit rate of 0.89% based on actual rate effective March 1, 2021.
Col (f) Lines 5-8: Company's approved pre-tax weighted average cost of capital of 8.23%.

The Narragansett Electric Company
d/b/a National Grid
Electric Transportation Initiative
Annual Revenue Requirement Summary

Line No.			Rate Years Ending August 31, 2019 (a)	2020 (b)	2021 (c)	2022 (d)
	Operation and Maintenance (O&M) Expenses:					
1	Offpeak Charging Rebate		$182,176	$188,826	$241,325	$266,136
2	Discount Pilot for DC Fast Charging		$13,408	$21,694	$24,093	$62,223
3	Customer Fleet Advisory Services		$21,879	$153,687	$83,764	$144,606
4	Charging Demonstration Program		$80,205	$552,044	255,085	1,210,786
5	Initiative Evaluation		$5,846	$64,797	$86,153	$82,496
6	Total O&M costs	Sum of Lines 1 through 5	$303,514	$981,048	$690,420	$1,766,246
7	Other O&M Expenses and Program Administration Costs:					
8	Program Administration Costs - NG Heavy Duty Fleet Lease and O&M					
9	Program Administration Costs - Off-Peak Rebate					
10	Program Administration Costs - Commercial Rate Discount					
11	Program Administration Costs - Evaluation					
12	Total Other O&M Expenses and Program Administration Costs	Sum of Lines 8 through 11	$0	$0	$0	$0
13	**Total O&M Costs, Other O&M Costs and Program Administration Costs**	Line 6 + Line 12	**$303,514**	**$981,048**	**$690,420**	**$1,766,246**
14	Participation Payment Offset					
15	**Total Net O&M Expense Component of Revenue Requirement**	Line 13 + Line 14	**$303,514**	**$981,048**	**$690,420**	**$1,766,246**
16	Capital Investment:					
17	Estimated Revenue Requirement on Rate Year 1 Capital investment	Page 5 of 16	$8,856	$21,549	$20,283	$19,265
18	Estimated Revenue Requirement on Rate Year 2 Capital investment	Page 8 of 16		$104,193	$253,497	$238,598
19	Estimated Revenue Requirement on Rate Year 3 Capital investment	Page 11 of 16			$59,336	$144,604
20	Estimated Revenue Requirement on Rate Year 4 Capital investment	Page 14 of 16				$265,682
21	**Total Capital Investment Component of Revenue Requirement**	Sum of Lines 17 through 20	**$8,856**	**$125,742**	**$333,117**	**$668,149**
22	**Total Revenue Requirement**	Line 15 + Line 21	**$312,370**	**$1,106,790**	**$1,023,537**	**$2,434,395**

The Narragansett Electric Company
d/b/a National Grid
Docket No. 4770-A
Attachment 1

The Narragansett Electric Company
d/b/a National Grid
Power Sector Transformation (PST)
Revenue Requirement on Capital Investment 12 months ending August 31, 2019
Electric Transportation Initiative

Line No.				RY1 2019 (a)	RY2 2020 (b)	RY3 2021 (c)	RY4 2022 (d)
				Rate Years Ending August 31,			
	Estimated Capital Investment						
1	EDC Costs (Make-Ready)			$1,434	$0	$0	$0
2	Premise Work Costs (Make-Ready)			$123,870	$0	$0	$0
3	EVSE Costs (Utility-Operated Charging Program Sites, and Company Fleet EVSE)			$0	$0	$0	$0
4	Total Capitalized Labor & Tool Costs			$17,891	$0	$0	$0
5	Total Estimated Capital Investment	Sum of Lines 1 through 4		$143,195	$0	$0	$0
	Depreciable Net Capital Included in Rate Base						
6	Total Allowed Capital Included in Rate Base in Current Year	Line 5		$143,195	$0	$0	$0
7	Retirements	Line 6 * 0%		$0	$0	$0	$0
8	Net Depreciable Capital Included in Rate Base	Col (a) = Line 6 - Line 7; Col (b) = Prior Year Line 8		$143,195	$143,195	$143,195	$143,195
	Change in Net Capital Included in Rate Base						
9	Capital Included in Rate Base	Line 5		$143,195	$0	$0	$0
10	Cost of Removal			$0	$0	$0	$0
11	**Total Net Plant in Service Including Cost of Removal**	**Line 9 + Line 10**		**$143,195**	**$143,195**	**$143,195**	**$143,195**
	Tax Depreciation						
12	Vintage Year Tax Depreciation:						
13	2020 Spend	Page 6 of 16, Line 21		$28,639	$45,822	$27,493	$16,496
14	Cumulative Tax Depreciation	Previous Year Line 14 + Current Year Line 13		$28,639	$74,461	$101,954	$118,450
	Book Depreciation						
15	Composite Book Depreciation Rate	As filed per R.I.P.U.C. Docket No. 4770		2.50%	2.50%	2.50%	2.50%
16	Book Depreciation	Col (a) = Line 1 * Line 15 * 50% ; Col (b) = Line 1 * Line 15		$18	$36	$36	$36
17	Cumulative Book Depreciation	Previous Year Line 17 + Current Year Line 16		$18	$54	$90	$125
18	Composite Book Depreciation Rate	As filed per R.I.P.U.C. Docket No. 4770		5.00%	5.00%	5.00%	5.00%
19	Book Depreciation	Col (a) = Line 2 * Line 18 * 50% ; Col (b) = Line 2 * Line 18		$3,097	$6,194	$6,194	$6,194
20	Cumulative Book Depreciation	Previous Year Line 20 + Current Year Line 19		$3,097	$9,290	$15,484	$21,677
21	Composite Book Depreciation Rate	As filed per R.I.P.U.C. Docket No. 4770		10.00%	10.00%	10.00%	10.00%
22	Book Depreciation	Col (a) = Line 3 * Line 21 * 50% ; Col (b) = Line 3 * Line 21		$0	$0	$0	$0
23	Cumulative Book Depreciation	Previous Year Line 23 + Current Year Line 22		$0	$0	$0	$0
24	Composite Book Depreciation Rate	As filed per R.I.P.U.C. Docket No. 4770		2.50%	2.50%	2.50%	2.50%
25	Book Depreciation	Col (a) = Line 4 * Line 24 * 50% ; Col (b) = Line 4 * Line 24		$224	$447	$447	$447
26	Cumulative Book Depreciation	Previous Year Line 26 + Current Year Line 25		$224	$671	$1,118	$1,565
27	Total Cumulative Book Depreciation	Line 17 + Line 20 + Line 23 + Line 26		$3,338	$10,015	$16,692	$23,368
	Deferred Tax Calculation:						
28	Cumulative Book / Tax Timer	Line 14 - Line 27		$25,301	$64,446	$85,262	$95,082
29	Effective Tax Rate			21.00%	21.00%	21.00%	21.00%
30	Deferred Tax Reserve	Line 28 * Line 29		$5,313	$13,534	$17,905	$19,967
31	Less: FY 2020 Federal NOL			$0	$0	$0	$0
32	Net Deferred Tax Reserve	Sum of Lines 30 through 31		$5,313	$13,534	$17,905	$19,967
	Rate Base Calculation:						
33	Cumulative Incremental Capital Included in Rate Base	Line 11		$143,195	$143,195	$143,195	$143,195
34	Accumulated Depreciation	- Line 27		($3,338)	($10,015)	($16,692)	($23,368)
35	Deferred Tax Reserve	- Line 32		($5,313)	($13,534)	($17,905)	($19,967)
36	Year End Rate Base	Sum of Lines 33 through 35		$134,543	$119,646	$108,598	$99,859
	Revenue Requirement Calculation:						
37	Average Rate Base	Col (a) = Current Year Line 37 ÷ 2; Col (b & c) = (Prior Year Line 26 + Current Year Line 26) ÷ 2		$67,272	$127,094	$114,122	$104,229
38	Less: Proration Adjustment	Page 7 of 16		($228)	($353)	($188)	($89)
39	Average Rate Base adjusted for proration	Line 37 + Line 38		$67,043	$126,742	$113,934	$104,140
40	Pre-Tax ROR		1/	8.23%	8.23%	8.23%	8.23%
41	Return and Taxes	Line 39 * Line 40		$5,518	$10,431	$9,377	$8,571
42	Book Depreciation	Line 16 + Line 19 + Line 22 + Line 25		$3,338	$6,677	$6,677	$6,677
43	Property Taxes	Yr 1 = 0, Yr 2 forward = Prior Yr (Line 8 + Line 34)* 3.176%	2/	$0	$4,442	$4,230	$4,018
44	**Annual Revenue Requirement**	**Sum of Line 41 through Line 43**		**$8,856**	**$21,549**	**$20,283**	**$19,265**

1/ Weighted Average Cost of Capital as filed in R.I.P.U.C. Docket No. 4770, Schedule MAL-1-ELEC

	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	48.35%	4.62%	2.23%		2.23%
Short Term Debt	0.60%	1.76%	0.01%		0.01%
Preferred Stock	0.10%	4.50%	0.00%		0.00%
Common Equity	50.95%	9.2750%	4.73%	1.26%	5.99%
	100.00%		6.97%	1.26%	8.23%

2/ Composite Mill Rate of 3.176% per Compliance Attachment 2, Schedule 7-ELEC

The Narragansett Electric Company
d/b/a National Grid
Calculation of Tax Depreciation and Repairs Deduction on Rate Year 2019 Capital Investments
Electric Transportation Initiative

Line No.			RY1 2019 (a)	RY2 2020 (b)	RY3 2021 (c)	RY4 2022 (d)
				Rate Years Ending August 31,		
	Capital Repairs Deduction					
1	Plant Additions	Page 5 of 16, Line 5	$143,195			
2	Capital Repairs Deduction Rate	Per Tax Department	0.00%			
3	Capital Repairs Deduction	Line 1 * Line 2	$0			
	Bonus Depreciation					
4	Plant Additions	Line 1	$143,195			
5	Less Capital Repairs Deduction	Line 3	$0			
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5	$143,195			
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department	100.00%			
8	Plant Eligible for Bonus Depreciation	Line 6 * Line 7	$143,195			
9	Bonus Depreciation Rate (April 2019 - December 2019)	1 * 75% * 0%	0.00%			
10	Bonus Depreciation Rate (January 2020 - Mar 2020)	1 * 25% * 0%	0.00%			
11	Total Bonus Depreciation Rate	Line 9 + Line 10	0.00%			
12	Bonus Depreciation	Line 8 * Line 11	$0			
	Remaining Tax Depreciation					
13	Plant Additions	Line 1	$143,195			
14	Less Capital Repairs Deduction	Line 3	$0			
15	Less Bonus Depreciation	Line 12	$0			
16	Remaining Plant Additions Subject to 5 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15	$143,195	$143,195	$143,195	$143,195
17	5 YR MACRS Tax Depreciation Rates	Per IRS Publication 946	20.00%	32.00%	19.20%	11.52%
18	Remaining Tax Depreciation	Line 16 * Line 17	$28,639	$45,822	$27,493	$16,496
19	FY20 Loss incurred due to retirements	Per Tax Department	$0			
20	Cost of Removal	Page 5 of 16, Line 10	$0			
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19, and 20	$28,639	$45,822	$27,493	$16,496

The Narragansett Electric Company
d/b/a National Grid
Calculation of Rate Year 2019 Net Deferred Tax Reserve Proration
Electric Transportation Initiative

Line No.			(a)=Sum of (b) through (e) Total	(b) 2019	(c) 2020	(d) 2021	(e) 2022
				Rate Years Ending August 31,			
	Deferred Tax Subject to Proration						
1	Book Depreciation	Page 5 of 16, Line 27	$23,368	$3,338	$6,677	$6,677	$6,677
2	Bonus Depreciation	Page 6 of 16, Line 12	$0	$0	$0	$0	$0
3	Remaining MACRS Tax Depreciation	Page 6 of 16, Line 18	($118,450)	($28,639)	($45,822)	($27,493)	($16,496)
4	FY20 tax (gain)/loss on retirements	Page 6 of 16, Line 19	$0	$0	$0	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($95,082)	($25,301)	($39,145)	($20,816)	($9,819)
6	Effective Tax Rate		21.00%	21.00%	21.00%	21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	($19,967)	($5,313)	($8,221)	($4,371)	($2,062)
	Deferred Tax Not Subject to Proration						
8	Capital Repairs Deduction	Page 6 of 16, Line 3	$0	$0	$0	$0	$0
9	Cost of Removal	Page 6 of 16, Line 20	$0	$0	$0	$0	$0
10	Book/Tax Depreciation Timing Difference at 3/31/2020		$0	$0	$0	$0	$0
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	$0	$0	$0	$0	$0
12	Effective Tax Rate		21.00%	21.00%	21.00%	21.00%	21.00%
13	Deferred Tax Reserve	Line 11 * Line 12	$0	$0	$0	$0	$0
14	Total Deferred Tax Reserve	Line 7 + Line 13	($19,967)	($5,313)	($8,221)	($4,371)	($2,062)
15	Net Operating Loss	Page 5 of 16, Line 31	$0	$0	$0	$0	$0
16	Net Deferred Tax Reserve	Line 14 + Line 15	($19,967)	($5,313)	($8,221)	($4,371)	($2,062)
	Allocation of FY 2020 Estimated Federal NOL						
17	Cumulative Book/Tax Timer Subject to Proration	Col (b) = Line 5	($64,446)	($25,301)	($39,145)	($20,816)	($9,819)
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$0	$0	$0	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($64,446)	($25,301)	($39,145)	($20,816)	($9,819)
20	Total FY 2020 Federal NOL	(Page 5 of 16, Line 31) / 21%	$0	$0	$0	$0	$0
21	Allocated FY 2020 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	$0	$0	$0	$0	$0
22	Allocated FY 2020 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	$0	$0	$0	$0	$0
23	Effective Tax Rate		21.00%	21.00%	21.00%	21.00%	21.00%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	$0	$0	$0	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($19,967)	($5,313)	($8,221)	($4,371)	($2,062)

		(i) Number of Days in Month	(j) Proration Percentage	(k)= Sum of (l) through (o)	(l)	(m)	(n)	(o)
	Proration Calculation							
26	April 2019	30	91.78%	($1,527)	($406)	($629)	($334)	($158)
27	May 2019	31	83.29%	($1,386)	($369)	($571)	($303)	($143)
28	June 2019	30	75.07%	($1,249)	($332)	($514)	($273)	($129)
29	July 2019	31	66.58%	($1,108)	($295)	($456)	($243)	($114)
30	August 2019	31	58.08%	($966)	($257)	($398)	($212)	($100)
31	September 2019	30	49.86%	($830)	($221)	($342)	($182)	($86)
32	October 2019	31	41.37%	($688)	($183)	($283)	($151)	($71)
33	November 2019	30	33.15%	($552)	($147)	($227)	($121)	($57)
34	December 2019	31	24.66%	($410)	($109)	($169)	($90)	($42)
35	January 2020	31	16.16%	($269)	($72)	($111)	($59)	($28)
36	February 2020	28	8.49%	($141)	($38)	($58)	($31)	($15)
37	March 2020	31	0.00%	$0	$0	$0	$0	$0
38	Total	365		($9,127)	($2,429)	($3,757)	($1,998)	($943)
39	Deferred Tax Without Proration	Line 25		($19,967)	($5,313)	($8,221)	($4,371)	($2,062)
40	Average Deferred Tax Without Proration	Line 39 * 50%		($9,984)	($2,657)	($4,110)	($2,186)	($1,031)
41	Proration Adjustment	Line 38 - Line 40		$857	$228	$353	$188	$89

Column Notes:

(j) Sum of remaining days in the year (Col (i)) ÷ 365

(l) through (r) = Current Year Line 25 ÷ 12 * Current Month Col (j)

The Narragansett Electric Company
d/b/a National Grid
Revenue Requirement on Capital Investment 12 months ending August 31, 2020
Electric Transportation Initiative

Line No.				RY2 Rate Years Ending August 31, 2020 (a)	RY3 2021 (b)	RY4 2022 (c)
	Estimated Capital Investment					
1	EDC Costs (Make-Ready)			$106,765		
2	Premise Work Costs (Make-Ready)			$1,461,801		
3	EVSE Costs (Utility-Operated Only)			$0		
4	Total Capitalized Labor & Tool Costs			$115,101		
5	Total Estimated Capital Investment	Sum of Line 1 through Line 4		$1,683,666	$0	$0
	Depreciable Net Capital Included in Rate Base					
6	Total Allowed Capital Included in Rate Base in Current Year	Line 5		$1,683,666	$0	$0
7	Retirements	Line 6 * 0%		$0	$0	$0
8	Net Depreciable Capital Included in Rate Base	Col (a) = Line 6 - Line 7; Col (b) = Prior Year Line 8		$1,683,666	$1,683,666	$1,683,666
	Change in Net Capital Included in Rate Base					
9	Capital Included in Rate Base	Line 5		$1,683,666	$0	$0
10	Cost of Removal			$0	$0	$0
11	**Total Net Plant in Service Including Cost of Removal**	**Line 9 + Line 10**		**$1,683,666**	**$1,683,666**	**$1,683,666**
	Tax Depreciation					
12	Vintage Year Tax Depreciation:					
13	2021 Spend	Page 9 of 16, Line 21		$336,733	$538,773	$323,264
14	Cumulative Tax Depreciation	Previous Year Line 14 + Current Year Line 13		$336,733	$875,506	$1,198,770
	Book Depreciation					
15	Composite Book Depreciation Rate	As filed per R.I.P.U.C. Docket No. 4770		2.50%	2.50%	2.50%
16	Book Depreciation	Col (a) = Line 1 * Line 15 * 50% ; Col (b) = Line 1 * Line 15		$1,335	$2,669	$2,669
17	Cumulative Book Depreciation	Previous Year Line 17 + Current Year Line 16		$1,335	$4,004	$6,673
18	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		5.00%	5.00%	5.00%
19	Book Depreciation	Col (a) = Line 2 * Line 18 * 50% ; Col (b) = Line 2 * Line 18		$36,545	$73,090	$73,090
20	Cumulative Book Depreciation	Previous Year Line 20 + Current Year Line 19		$36,545	$109,635	$182,725
21	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		10.00%	10.00%	10.00%
22	Book Depreciation	Col (a) = Line 3 * Line 21 * 50% ; Col (b) = Line 3 * Line 21		$0	$0	$0
23	Cumulative Book Depreciation	Previous Year Line 23 + Current Year Line 22		$0	$0	$0
24	Composite Book Depreciation Rate	As filed per R.I.P.U.C. Docket No. 4770		2.50%	2.50%	2.50%
25	Book Depreciation	Col (a) = Line 4 * Line 26 * 50% ; Col (b) = Line 4 * Line 26		$1,439	$2,878	$2,878
26	Cumulative Book Depreciation	Previous Year Line 26 + Current Year Line 25		$1,439	$4,316	$7,194
27	Total Cumulative Book Depreciation	Line 17 + Line 20 + Line 23 + Line 26		$39,318	$117,955	$196,592
	Deferred Tax Calculation:					
28	Cumulative Book / Tax Timer	Line 14 - Line 17		$297,415	$757,551	$1,002,178
29	Effective Tax Rate			21.00%	21.00%	21.00%
30	Deferred Tax Reserve	Line 28 * Line 29		$62,457	$159,086	$210,457
31	Less: FY 2021 Federal NOL			$0	$0	$0
32	Net Deferred Tax Reserve	Sum of Lines 30 through 38		$62,457	$159,086	$210,457
	Rate Base Calculation:					
33	Cumulative Incremental Capital Included in Rate Base	Line 11		$1,683,666	$ 1,683,666	$ 1,683,666
34	Accumulated Depreciation	- Line 27		($39,318)	($117,955)	($196,592)
35	Deferred Tax Reserve	- Line 32		($62,457)	($159,086)	($210,457)
36	Year End Rate Base	Sum of Lines 33 through 35		$1,581,891	$1,406,626	$1,276,617
	Revenue Requirement Calculation:					
37	Average Rate Base	Col (a) = Current Year Line 37 ÷ 2; Col (b) = (Prior Year Line 37 + Current Year Line 37) ÷ 2		$790,946	$1,494,258	$1,341,622
38	Less: Proration Adjustment	Page 10 of 16		($2,681)	($4,148)	($2,205)
39	Average Rate Base adjusted for proration	Line 37 + Line 38		$788,265	$1,490,111	$1,339,417
40	Pre-Tax ROR		1/	8.23%	8.23%	8.23%
41	Return and Taxes	Line 39 * Line 40		$64,874	$122,636	$110,234
42	Book Depreciation	Line 16 + Line 19 + Line 22 + Line 25		$39,318	$78,637	$78,637
43	Property Taxes	Yr 1 = 0, Yr 2 forward = Prior Yr (Line 8 + Line 34)* 3.176%	2/	$0	$52,224	$49,727
44	**Annual Revenue Requirement**	**Line 37 through Line 43**		**$104,193**	**$253,497**	**$238,598**

1/ Weighted Average Cost of Capital as file in R.I.P.U.C. Docket No. 4770, Schedule MAL-1-ELEC

	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	48.35%	4.62%	2.23%	0.00%	2.23%
Short Term Debt	0.60%	1.76%	0.01%	0.00%	0.01%
Preferred Stock	0.10%	4.50%	0.00%	0.00%	0.00%
Common Equity	50.95%	9.2750%	4.73%	1.26%	5.99%
	100.00%		6.97%	1.26%	8.23%

2/ Composite Mill Rate of 3.176% per Compliance Attachment 2, Schedule 7-ELEC

The Narragansett Electric Company
d/b/a National Grid
Calculation of Tax Depreciation and Repairs Deduction on Rate Year 2020 Capital Investments
Electric Transportation Initiative

Line No.			RY2 Rate Years Ending August 31, 2020 (a)	RY3 2021 (b)	RY4 2022 (c)
	Capital Repairs Deduction				
1	Plant Additions	Page 8 of 16, Line 5	$1,683,666		
2	Capital Repairs Deduction Rate	Per Tax Department	0.00%		
3	Capital Repairs Deduction	Line 1 * Line 2	$0		
	Bonus Depreciation				
4	Plant Additions	Line 1	$1,683,666		
5	Less Capital Repairs Deduction	Line 3	$0		
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5	$1,683,666		
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department	100.00%		
8	Plant Eligible for Bonus Depreciation	Line 6 * Line 7	$1,683,666		
9	Bonus Depreciation Rate (April 2020 - December 2020)	0%	0.00%		
10	Bonus Depreciation Rate (January 2021 - Mar 2021)	0%	0.00%		
11	Total Bonus Depreciation Rate	Line 9 + Line 10	0.00%		
12	Bonus Depreciation	Line 8 * Line 11	$0		
	Remaining Tax Depreciation				
13	Plant Additions	Line 1	$1,683,666		
14	Less Capital Repairs Deduction	Line 3	$0		
15	Less Bonus Depreciation	Line 12	$0		
16	Remaining Plant Additions Subject to 5 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15	$1,683,666	$1,683,666	$1,683,666
17	5 YR MACRS Tax Depreciation Rates	Per IRS Publication 946	20.000%	32.000%	19.200%
18	Remaining Tax Depreciation	Line 16 * Line 17	$336,733	$538,773	$323,264
19	FY21 Loss incurred due to retirements	Per Tax Department	$0	$0	$0
20	Cost of Removal	Page 8 of 16, Line 10	$0	$0	$0
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19, and 20	$336,733	$538,773	$323,264

The Narragansett Electric Company
d/b/a National Grid
Calculation of Rate Year 2020 Net Deferred Tax Reserve Proration
Electric Transportation Initiative

Line No.			(a)=Sum of (b) through (d) Total	(b) Rate Years Ending August 31, 2020	(c) 2021	(d) 2022
	Deferred Tax Subject to Proration					
1	Book Depreciation	Page 8 of 16, Line 27	$196,592	$39,318	$78,637	$78,637
2	Bonus Depreciation	Page 9 of 16, Line 12	$0	$0	$0	$0
3	Remaining MACRS Tax Depreciation	Page 9 of 16, Line 18	($1,198,770)	($336,733)	($538,773)	($323,264)
4	FY21 tax (gain)/loss on retirements	Page 9 of 16, Line 19	$0	$0	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($1,002,178)	($297,415)	($460,136)	($244,627)
6	Effective Tax Rate		21.00%	21.00%	21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	($210,457)	($62,457)	($96,629)	($51,372)
	Deferred Tax Not Subject to Proration					
8	Capital Repairs Deduction	Page 9 of 16, Line 3	$0	$0	$0	$0
9	Cost of Removal	Page 9 of 16, Line 20	$0	$0	$0	$0
10	Book/Tax Depreciation Timing Difference at 3/31/2021		$0	$0	$0	$0
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	$0	$0	$0	$0
12	Effective Tax Rate		21.00%	21.00%	21.00%	21.00%
13	Deferred Tax Reserve	Line 11 * Line 12	$0	$0	$0	$0
14	Total Deferred Tax Reserve	Line 7 + Line 13	($210,457)	($62,457)	($96,629)	($51,372)
15	Net Operating Loss		$0	$0	$0	$0
16	Net Deferred Tax Reserve	Line 14 + Line 15	($210,457)	($62,457)	($96,629)	($51,372)
	Allocation of FY 2021 Estimated Federal NOL					
17	Cumulative Book/Tax Timer Subject to Proration	Col (b) = Line 5	($1,002,178)	($297,415)	($460,136)	($244,627)
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$0	$0	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($1,002,178)	($297,415)	($460,136)	($244,627)
20	Total FY 2021 Federal NOL		$0	$0	$0	$0
21	Allocated FY 2021 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	$0	$0	$0	$0
22	Allocated FY 2021 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	$0	$0	$0	$0
23	Effective Tax Rate		21.00%	21.00%	121.00%	221.00%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	$0	$0	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($210,457)	($62,457)	($96,629)	($51,372)

		(i) Number of Days in Month	(j) Proration Percentage	(k)= Sum of (l) through (n)	(l)	(m)	(n)
	Proration Calculation						
26	April 2020	30	91.78%	($16,097)	($4,777)	($7,391)	($3,929)
27	May 2020	31	83.29%	($14,607)	($4,335)	($6,707)	($3,566)
28	June 2020	30	75.07%	($13,166)	($3,907)	($6,045)	($3,214)
29	July 2020	31	66.58%	($11,676)	($3,465)	($5,361)	($2,850)
30	August 2020	31	58.08%	($10,187)	($3,023)	($4,677)	($2,486)
31	September 2020	30	49.86%	($8,745)	($2,595)	($4,015)	($2,135)
32	October 2020	31	41.37%	($7,255)	($2,153)	($3,331)	($1,771)
33	November 2020	30	33.15%	($5,814)	($1,725)	($2,669)	($1,419)
34	December 2020	31	24.66%	($4,324)	($1,283)	($1,986)	($1,056)
35	January 2021	31	16.16%	($2,835)	($841)	($1,302)	($692)
36	February 2021	28	8.49%	($1,490)	($442)	($684)	($364)
37	March 2021	31	0.00%	$0	$0	$0	$0
38	Total	365		($96,195)	($28,548)	($44,167)	($23,481)
39	Deferred Tax Without Proration	Line 25		($210,457)	($62,457)	($96,629)	($51,372)
40	Average Deferred Tax Without Proration	Line 39 * 50%		($105,229)	($31,229)	($48,314)	($25,686)
41	Proration Adjustment	Line 38 - Line 40		$9,033	$2,681	$4,148	$2,205

Column Notes:

(j) Sum of remaining days in the year (Col (i)) ÷ 365

(l) through (r) = Current Year Line 25 ÷ 12 * Current Month Col (j)

The Narragansett Electric Company
d/b/a National Grid
Revenue Requirement on Estimated Capital Investment 12 months ending August 31, 2021
Electric Transportation Initiative

Line No.				RY3 Rate Years Ending August 31, 2021 (a)	RY4 Rate Years Ending August 31, 2022 (b)
	Estimated Capital Investment				
1	EDC Costs (Make-Ready)			$55,745	
2	Premise Work Costs (Make-Ready)			$801,468	
3	EVSE Costs (Utility-Operated Only)			$0	
4	Total Capitalized Labor & Tool Costs			$108,918	
5	Total Estimated Capital Investment	Sum of Line 1 through Line 4		$966,131	$0
	Depreciable Net Capital Included in Rate Base				
6	Total Allowed Capital Included in Rate Base in Current Year	Line 5		$966,131	$0
7	Retirements	Line 6 * 0%		$0	$0
8	Net Depreciable Capital Included in Rate Base	Col (a) = Line 6 - Line 7; Col (b) = Prior Year Line 8		$966,131	$0
	Change in Net Capital Included in Rate Base				
9	Capital Included in Rate Base	Line 5		$966,131	$0
10	Cost of Removal			$0	$0
11	**Total Net Plant in Service Including Cost of Removal**	**Line 9 + Line 10**		**$966,131**	**$966,131**
	Tax Depreciation				
12	Vintage Year Tax Depreciation:				
13	2022 Spend	Page 12 of 16, Line 21		$193,226	$309,162
14	Cumulative Tax Depreciation	Previous Year Line 14 + Current Year Line 13		$193,226	$502,388
	Book Depreciation				
15	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		2.50%	2.50%
16	Book Depreciation	Col (a) = Line 1* Line 15 * 50%		$697	$1,394
17	Cumulative Book Depreciation	Previous Year Line 17 + Current Year Line 16		$697	$2,090
18	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		5.00%	5.00%
19	Book Depreciation	Col (a) = Line 2 * Line 18 * 50%		$20,037	$40,073
20	Cumulative Book Depreciation	Previous Year Line 20 + Current Year Line 19		$20,037	$60,110
21	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		10.00%	10.00%
22	Book Depreciation	Col (a) = Line 3 * Line 21 * 50%		$0	$0
23	Cumulative Book Depreciation	Previous Year Line 23 + Current Year Line 22		$0	$0
24	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		2.50%	2.50%
25	Book Depreciation	Col (a) = Line 4 * Line 24 * 50%		$1,361	$2,723
26	Cumulative Book Depreciation	Previous Year Line 26 + Current Year Line 25		$1,361	$4,084
27	Total Cumulative Book Depreciation	Line 17 + Line 20 + Line 23 + Line 26		$22,095	$66,285
	Deferred Tax Calculation:				
28	Cumulative Book / Tax Timer	Line 14 - Line 27		$171,131	$436,103
29	Effective Tax Rate			21.00%	21.00%
30	Deferred Tax Reserve	Line 28 * Line 29		$35,938	$91,582
31	Less: FY 2022 Federal NOL			-	-
32	Net Deferred Tax Reserve	Sum of Lines 30 through 38		$35,938	$91,582
	Rate Base Calculation:				
33	Cumulative Incremental Capital Included in Rate Base	Line 11		$966,131	$966,131
34	Accumulated Depreciation	- Line 27		($22,095)	($66,285)
35	Deferred Tax Reserve	- Line 32		($35,938)	($91,582)
36	Year End Rate Base	Sum of Lines 33 through 35		$908,098	$808,264
	Revenue Requirement Calculation:				
37	Average Rate Base	Col (a) = Current Year Line 27 ÷ 2		$454,049	$858,181
38	Less: Proration Adjustment	Page 13 of 16		($1,543)	($2,388)
39	Average Rate Base adjusted for proration	Line 37 + Line 38		$452,507	$855,793
40	Pre-Tax ROR		1/	8.23%	8.23%
41	Return and Taxes	Line 39 * Line 40		$37,241	$70,432
42	Book Depreciation	Line 16 + Line 19 + Line 22 + Line 25		$22,095	$44,190
43	Property Taxes	Yr 1 = 0, Yr 2 forward = Prior Yr (Line 8 + Line 34)* 3.176%	2/	$0	$29,983
44	**Annual Revenue Requirement**	**Line 41 through Line 43**		**$59,336**	**$144,604**

1/ Weighted Average Cost of Capital as file in R.I.P.U.C. Docket No. 4770, Schedule MAL-1-ELEC

	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	48.35%	4.62%	2.23%	0.00%	2.23%
Short Term Debt	0.60%	1.76%	0.01%	0.00%	0.01%
Preferred Stock	0.10%	4.50%	0.00%	0.00%	0.00%
Common Equity	50.95%	9.28%	4.73%	1.26%	5.99%
	100.00%		6.97%	1.26%	8.23%

2/ Composite Mill Rate of 3.176% per Compliance Attachment 2, Schedule 7-ELEC

The Narragansett Electric Company
d/b/a National Grid
Calculation of Tax Depreciation and Repairs Deduction on Rate Year 2021 Capital Investments
Electric Transportation Initiative

Line No.			RY3 Rate Years Ending August 31, 2021 (a)	RY4 Rate Years Ending August 31, 2022 (b)
	Capital Repairs Deduction			
1	Plant Additions	Page 11 of 16, Line 5	$966,131	
2	Capital Repairs Deduction Rate	Per Tax Department	0.00%	
3	Capital Repairs Deduction	Line 1 * Line 2	$0	
	Bonus Depreciation			
4	Plant Additions	Line 1	$966,131	
5	Less Capital Repairs Deduction	Line 3	$0	
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5	$966,131	
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department	100.00%	
8	Plant Eligible for Bonus Depreciation	Line 6 * Line 7	$966,131	
9	Bonus Depreciation Rate (April 2021 - December 2021)	0%	0.00%	
10	Bonus Depreciation Rate (January 2022 - Mar 2022)	0%	0.00%	
11	Total Bonus Depreciation Rate	Line 9 + Line 10	0.00%	
12	Bonus Depreciation	Line 8 * Line 11	$0	
	Remaining Tax Depreciation			
13	Plant Additions	Line 1	$966,131	
14	Less Capital Repairs Deduction	Line 3	$0	
15	Less Bonus Depreciation	Line 12	$0	
16	Remaining Plant Additions Subject to 5 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15	$966,131	$966,131
17	5 YR MACRS Tax Depreciation Rates	Per IRS Publication 946	20.000%	32.000%
18	Remaining Tax Depreciation	Line 16 * Line 17	$193,226	$309,162
19	FY22 Loss incurred due to retirements	Per Tax Department	$0	
20	Cost of Removal		$0	
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19, and 20	$193,226	$309,162

The Narragansett Electric Company
d/b/a National Grid
Calculation of Rate Year 2021 Net Deferred Tax Reserve Proration
Electric Transportation Initiative

Line No.			(a)=Sum of (b) through (c) Total	(b) Rate Years Ending August 31, 2021	(c) 2022
	Deferred Tax Subject to Proration				
1	Book Depreciation	Page 11 of 16, Line 27	$66,285	$22,095	$44,190
2	Bonus Depreciation	Page 12 of 16, Line 12	$0	$0	$0
3	Remaining MACRS Tax Depreciation	Page 12 of 16, Line 18	($502,388)	($193,226)	($309,162)
4	FY22 tax (gain)/loss on retirements	Page 12 of 16, Line 19	$0	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($436,103)	($171,131)	($264,972)
6	Effective Tax Rate		21.00%	21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	($91,582)	($35,938)	($55,644)
	Deferred Tax Not Subject to Proration				
8	Capital Repairs Deduction	Page 12 of 16, Line 3	$0	$0	$0
9	Cost of Removal	Page 12 of 16, Line 20	$0	$0	$0
10	Book/Tax Depreciation Timing Difference at 3/31/2022		$0	$0	$0
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	$0	$0	$0
12	Effective Tax Rate		21.00%	21.00%	21.00%
13	Deferred Tax Reserve	Line 11 * Line 12	$0	$0	$0
14	Total Deferred Tax Reserve	Line 7 + Line 13	($91,582)	($35,938)	($55,644)
15	Net Operating Loss		$0	-	-
16	Net Deferred Tax Reserve	Line 14 + Line 15	($91,582)	($35,938)	($55,644)
	Allocation of FY 2022 Estimated Federal NOL				
17	Cumulative Book/Tax Timer Subject to Proration	Col (b) = Line 5	($436,103)	($171,131)	($264,972)
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$0	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($436,103)	($171,131)	($264,972)
20	Total FY 2022 Federal NOL		$0	$0	$0
21	Allocated FY 2022 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	$0	$0	$0
22	Allocated FY 2022 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	$0	$0	$0
23	Effective Tax Rate		21.00%	21.00%	21.00%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	$0	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($91,582)	($35,938)	($55,644)

		(i) Number of Days in Month	(j) Proration Percentage	(k)= Sum of (l) through (n)	(l)	(m)
	Proration Calculation					
26	April 2021	30	91.78%	($7,005)	($2,749)	($4,256)
27	May 2021	31	83.29%	($6,356)	($2,494)	($3,862)
28	June 2021	30	75.07%	($5,729)	($2,248)	($3,481)
29	July 2021	31	66.58%	($5,081)	($1,994)	($3,087)
30	August 2021	31	58.08%	($4,433)	($1,739)	($2,693)
31	September 2021	30	49.86%	($3,805)	($1,493)	($2,312)
32	October 2021	31	41.37%	($3,157)	($1,239)	($1,918)
33	November 2021	30	33.15%	($2,530)	($993)	($1,537)
34	December 2021	31	24.66%	($1,882)	($738)	($1,143)
35	January 2022	31	16.16%	($1,234)	($484)	($750)
36	February 2022	28	8.49%	($648)	($254)	($394)
37	March 2022	31	0.00%	$0	$0	$0
38	Total	365		($41,860)	($16,426)	($25,434)
39	Deferred Tax Without Proration	Line 25		($91,582)	($35,938)	($55,644)
40	Average Deferred Tax without Proration	Line 39 * 50%		($45,791)	($17,969)	($27,822)
41	Proration Adjustment	Line 38 - Line 40		$3,931	$1,543	$2,388

Column Notes:

(j) Sum of remaining days in the year (Col (i)) ÷ 365

(l) through (r) = Current Year Line 25 ÷ 12 * Current Month Col (j)

The Narragansett Electric Company
d/b/a National Grid
Revenue Requirement on Estimated Capital Investment 12 months ending August 31, 2022
Electric Transportation Initiative

Line No.				RY4 Rate Year Ending August 31, 2022 (a)
1	EDC Costs (Make-Ready)			$631,873
2	Premise Work Costs (Make-Ready)			$3,585,787
3	EVSE Costs (Utility-Operated Only)			$0
4	Total Capitalized Labor & Tool Costs			$108,918
5	Total Estimated Capital Investment	Sum of Line 1 through Line 4	1/	$4,326,578
	Depreciable Net Capital Included in Rate Base			
6	Total Allowed Capital Included in Rate Base in Current Year	Line 5		$4,326,578
7	Retirements	Line 6 * 0%		$0
8	Net Depreciable Capital Included in Rate Base	Col (a) = Line 6 - Line 7; Col (b) = Prior Year Line 8		$4,326,578
	Change in Net Capital Included in Rate Base			
9	Capital Included in Rate Base	Line 5		$4,326,578
10	Cost of Removal			$0
11	**Total Net Plant in Service Including Cost of Removal**	**Line 9 + Line 10**		**$4,326,578**
	Tax Depreciation			
12	Vintage Year Tax Depreciation:			
13	2022 Spend	Page 15 of 16, Line 21		$865,316
14	Cumulative Tax Depreciation	Previous Year Line 14 + Current Year Line 13		$865,316
	Book Depreciation			
15	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		2.50%
16	Book Depreciation	Col (a) = Line 1* Line 15 * 50%		$7,898
17	Cumulative Book Depreciation	Previous Year Line 17 + Current Year Line 16		$7,898
18	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		5.00%
19	Book Depreciation	Col (a) = Line 2 * Line 18 * 50%		$89,645
20	Cumulative Book Depreciation	Previous Year Line 20 + Current Year Line 19		$89,645
21	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		10.00%
22	Book Depreciation	Col (a) = Line 3 * Line 21 * 50%		$0
23	Cumulative Book Depreciation	Previous Year Line 23 + Current Year Line 22		$0
24	Composite Book Depreciation Rate	As approved per R.I.P.U.C. Docket No. 4770		2.50%
25	Book Depreciation	Col (a) = Line 4 * Line 24 * 50%		$1,361
26	Cumulative Book Depreciation	Previous Year Line 26 + Current Year Line 25		$1,361
27	Total Cumulative Book Depreciation	Line 17 + Line 20 + Line 23 + Line 26		$98,905
	Deferred Tax Calculation:			
28	Cumulative Book / Tax Timer	Line 14 - Line 27		$766,411
29	Effective Tax Rate			21.00%
30	Deferred Tax Reserve	Line 28 * Line 29		$160,946
31	Less: FY 2022 Federal NOL			-
32	Net Deferred Tax Reserve	Sum of Lines 30 through 38		$160,946
	Rate Base Calculation:			
33	Cumulative Incremental Capital Included in Rate Base	Line 11		$4,326,578
34	Accumulated Depreciation	- Line 27		($98,905)
35	Deferred Tax Reserve	- Line 32		($160,946)
36	Year End Rate Base	Sum of Lines 33 through 35		$4,066,727
	Revenue Requirement Calculation:			
37	Average Rate Base	Col (a) = Current Year Line 27 ÷ 2		$2,033,364
38	Less: Proration Adjustment	Page 16 of 16		($6,908)
39	Average Rate Base adjusted for proration	Line 37 + Line 38		$2,026,455
40	Pre-Tax ROR		2/	8.23%
41	Return and Taxes	Line 39 * Line 40		$166,777
42	Book Depreciation	Line 16 + Line 19 + Line 22 + Line 25		$98,905
43	Property Taxes	Yr 1 = 0		$0
44	**Annual Revenue Requirement**	**Line 41 through Line 43**		**$265,682**

1/ Assumes all capital investment associated with RIPTA is placed into service by the end of RY4.

2/ Weighted Average Cost of Capital as file in R.I.P.U.C. Docket No. 4770, Schedule MAL-1-ELEC

	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	48.35%	4.62%	2.23%	0.00%	2.23%
Short Term Debt	0.60%	1.76%	0.01%	0.00%	0.01%
Preferred Stock	0.10%	4.50%	0.00%	0.00%	0.00%
Common Equity	50.95%	9.28%	4.73%	1.26%	5.99%
	100.00%		6.97%	1.26%	8.23%

The Narragansett Electric Company
d/b/a National Grid
Calculation of Tax Depreciation and Repairs Deduction on Rate Year 2022 Capital Investments
Electric Transportation Initiative

Line No.			RY4 Rate Year Ending August 31, 2022 (a)
	Capital Repairs Deduction		
1	Plant Additions	Page 14 of 16	$4,326,578
2	Capital Repairs Deduction Rate	Per Tax Department	0.00%
3	Capital Repairs Deduction	Line 1 * Line 2	$0
	Bonus Depreciation		
4	Plant Additions	Line 1	$4,326,578
5	Less Capital Repairs Deduction	Line 3	$0
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5	$4,326,578
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department	100.00%
8	Plant Eligible for Bonus Depreciation	Line 6 * Line 7	$4,326,578
9	Bonus Depreciation Rate (April 2021 - December 2021)	0%	0.00%
10	Bonus Depreciation Rate (January 2022 - Mar 2022)	0%	0.00%
11	Total Bonus Depreciation Rate	Line 9 + Line 10	0.00%
12	Bonus Depreciation	Line 8 * Line 11	$0
	Remaining Tax Depreciation		
13	Plant Additions	Line 1	$4,326,578
14	Less Capital Repairs Deduction	Line 3	$0
15	Less Bonus Depreciation	Line 12	$0
16	Remaining Plant Additions Subject to 5 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15	$4,326,578
17	5 YR MACRS Tax Depreciation Rates	Per IRS Publication 946	20.000%
18	Remaining Tax Depreciation	Line 16 * Line 17	$865,316
19	FY22 Loss incurred due to retirements	Per Tax Department	$0
20	Cost of Removal		$0
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19, and 20	$865,316

The Narragansett Electric Company
d/b/a National Grid
Calculation of Rate Year 2022 Net Deferred Tax Reserve Proration
Electric Transportation Initiative

Line No.			(a)=Sum of (b) Total	(b) Rate Year Ending August 31, 2022
	Deferred Tax Subject to Proration			
1	Book Depreciation	Page 14 of 16, Line 27	$98,905	$98,905
2	Bonus Depreciation	Page 15 of 16, Line 12	$0	$0
3	Remaining MACRS Tax Depreciation	Page 15 of 16, Line 18	($865,316)	($865,316)
4	FY22 tax (gain)/loss on retirements	Page 15 of 16, Line 19	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($766,411)	($766,411)
6	Effective Tax Rate		21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	($160,946)	($160,946)
	Deferred Tax Not Subject to Proration			
8	Capital Repairs Deduction	Page 15 of 16, Line 3	$0	$0
9	Cost of Removal	Page 15 of 16, Line 20	$0	$0
10	Book/Tax Depreciation Timing Difference at 3/31/2022		$0	$0
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	$0	$0
12	Effective Tax Rate		21.00%	21.00%
13	Deferred Tax Reserve	Line 11 * Line 12	$0	$0
14	Total Deferred Tax Reserve	Line 7 + Line 13	($160,946)	($160,946)
15	Net Operating Loss		$0	-
16	Net Deferred Tax Reserve	Line 14 + Line 15	($160,946)	($160,946)
	Allocation of FY 2022 Estimated Federal NOL			
17	Cumulative Book/Tax Timer Subject to Proration	Col (b) = Line 5	($766,411)	($766,411)
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($766,411)	($766,411)
20	Total FY 2022 Federal NOL		$0	$0
21	Allocated FY 2022 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	$0	$0
22	Allocated FY 2022 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	$0	$0
23	Effective Tax Rate		21.00%	21.00%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($160,946)	($160,946)

		(i) Number of Days in Month	(j) Proration Percentage	(k)= Sum of (l) through (n)	(l)
	Proration Calculation				
26	April 2021	30	91.78%	($12,310)	($12,310)
27	May 2021	31	83.29%	($11,171)	($11,171)
28	June 2021	30	75.07%	($10,068)	($10,068)
29	July 2021	31	66.58%	($8,929)	($8,929)
30	August 2021	31	58.08%	($7,790)	($7,790)
31	September 2021	30	49.86%	($6,688)	($6,688)
32	October 2021	31	41.37%	($5,549)	($5,549)
33	November 2021	30	33.15%	($4,446)	($4,446)
34	December 2021	31	24.66%	($3,307)	($3,307)
35	January 2022	31	16.16%	($2,168)	($2,168)
36	February 2022	28	8.49%	($1,139)	($1,139)
37	March 2022	31	0.00%	$0	$0
38	Total	365		($73,565)	($73,565)
39	Deferred Tax Without Proration	Line 25		($160,946)	($160,946)
40	Average Deferred Tax without Proration	Line 39 * 50%		($80,473)	($80,473)
41	Proration Adjustment	Line 38 - Line 40		$6,908	$6,908

Column Notes:

(j) Sum of remaining days in the year (Col (i)) ÷ 365

(l) through (r) = Current Year Line 25 ÷ 12 * Current Month Col (j)