



**Niagara Mohawk Power Corporation d/b/a National Grid
Residential Electric Vehicle (EV) Managed Charging Proposal**

Submitted in response to the July 16, 2020 Order in Case 18-E-0138

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1. Introduction and background

Niagara Mohawk Power Corporation d/b/a National Grid (“the Company”) submits this proposal for an electric vehicle (“EV”) managed charging program for residential customers in compliance with the New York Public Service Commission’s July 16, 2020 “Order Establishing Electric Vehicle Infrastructure Make-Ready Program and Other Programs” (the “Order”).¹ The Order directs the State’s utilities to file proposals for managed charging programs for mass market customers, in consultation with Department of Public Service Staff (“Staff”).

The Smart Electric Power Association (“SEPA”) defines managed charging as being either active or passive:

Passive managed charging (also known as behavioral load control) relies on customer behavior to affect charging patterns. For example, EV time-of-use rates provide predetermined price signals to customers to influence when they choose to charge their vehicles ... Active managed charging (also known as direct load control) relies on communication (i.e., ‘dispatch’) signals originating from a utility or aggregator to be sent to a vehicle or charger to control charging in a predetermined specific way.²

The Company is proposing an active managed charging program for residential customers, as described in this proposal. The benefits of a managed charging program include lower energy costs, less strain on the delivery network infrastructure, which produces savings over the long run

¹ Case 18-E-0138, *Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure*. Order Establishing Electric Vehicle Infrastructure Make-Ready Program and Other Programs, July 16, 2020.

² SEPA, *A Comprehensive Guide to Electric Vehicle Managed Charging*, page 11.

in potential avoided costs of building out such infrastructure, and the beginning of consumer behavior change to enable those benefits to accrue over the long-term.

In addition to the active managed charging program, following Staff guidance, the Company is including complementary, supportive programs originally proposed in its rate case filing on July 31, 2020.³ In testimony filed in Case 20-E-0380, the Staff Efficiency and Sustainability Panel recommended that the Company include all elements of its Residential EV program from that case in this proposal.⁴ The additional elements reflected in this proposal include: (1) rebates to customers to purchase L2 chargers that can participate in the managed charging program; (2) a “turnkey” installation service; and (3) an expanded online marketplace. To incentivize Company and Customer behavior, the Company is also including its proposal for an earnings adjustment mechanism (“EAM”) that it originally filed in Case 20-E-0380. Finally, the Company will suggest appropriate cost recovery mechanisms for the full suite of residential offerings.

In this proposal, the Company has enhanced the original filing by expanding the managed charging program to include vehicle telematics-based managed charging, which is expected to increase program enrollment and reduce the program cost-per-enrolled customer. In the time since filing the rate case, the Company has learned that vehicle telematics approaches to managed charging have become more market-ready to the point that they can be included in this proposal. Adding support for vehicle telematics increases the share of the EV market eligible (and expected) to participate. From conversations with vendors supporting vehicle telematics approaches to managed charging, BMW, General Motors, Hyundai, Jaguar/Land Rover, Nissan, Tesla, and

³ Case 20-E-0380, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service.

⁴ Cases 20-E-0380 and 20-G-0381, Prepared Testimony of Staff Efficiency and Sustainability Panel, pp. 89-90 (Nov. 25, 2020).

Volkswagen/Audi vehicles currently can be actively managed, with more vehicles expected in the future. The manufacturers listed above are responsible for a majority of battery electric vehicles (“BEVs”) currently in operation.⁵ The program sizes and budgets associated with the turnkey installation and online marketplace have been revised based upon the latest information and implementation plans, however their designs remain essentially the same as reflected in the Company’s filing in Case 20-E-0380.

2. Existing Company programs and offerings

To date, the Company has only done passive managed charging through pricing signals. In New York, the Company offers the SC-1 variable time of use (VTOU) rate that has several hundred known EV drivers enrolled, a relatively small share of the total EVs in the Company’s service area. As discussed in the Order, “the managed charging programs will provide customers with an alternative to the whole home TOU rates already in place.”⁶

Currently, the Company’s affiliates also are running passive managed charging programs in their Massachusetts (SmartCharge Massachusetts) and Rhode Island (SmartCharge Rhode Island) service territories. Those programs provide enrollment incentives and per-kWh rebates to incentivize off-peak charging (for both programs, “off-peak” is defined from 9:00 P.M. to 1:00 P.M.). The Company has received initial evaluation results for SmartCharge Rhode Island, where half of participants received off-peak rebates of \$0.04 (October to May) or \$0.06 (June to September) per kWh. The evaluation results indicated that:

⁵ Only a small share of hybrid electric vehicles (“PHEVs”) are believed to allow for active management via telematics today.

⁶ Order, page 124.

- There was a statistically significant increase in off-peak charging between participants that received the off-peak rebates versus those that did not.
- For BEVs and PHEVs, there was a persistent amount of on-peak charging that participants who received the off-peak rebates still did not shift off-peak.

These results suggested, among other things, that for future programs and rate designs, the Company should investigate technologies and incentives to mitigate and manage any timer or rebound peaks induced from time of use (“TOU”) rates (e.g., charging peaks at 9:01 P.M. as the off-peak window begins).

The Company is proposing an active managed charging program to achieve greater benefits than under a passive managed charging framework. Such additional benefits include avoiding timer peaks, shifting an even greater portion of EV charging off-peak, and anticipating other managed charging use cases envisioned to support a clean energy future.

3. Managed charging program design

Summary of the managed charging program design

The Company proposes an active managed charging program (“the program”), where the Company will be able to control directly the timing or power level of EV charging for select charging stations and vehicles. This proposal covers residential customers who take supply service from the Company (per the draft EV Smart Plan tariff filed in Case 20-E-0380 and described later) and have qualifying vehicle or charging equipment, as clarified later. This proposal does not directly address small commercial and industrial (“C&I”) customers; the Company notes, however, it will consider whether and how to expand the managed charging program to other customer classes and charger types.

The program will support both networked Level 2 (“L2”) chargers and vehicle-based telematics. All participating customers will be enrolled in the EV Smart Plan tariff, which provides a flat monthly price for at-home off-peak charging, either \$20 or \$25 per month, for up to 225 or 325 kWh of off-peak charging per month, respectively. The program will provide upfront and ongoing benefits to participating customers. The Company will offer enrollment incentives of either a one-time \$500 equipment rebate for new installations of qualifying L2 chargers or a one-time \$150 incentive for participants not installing a new L2 charger, including those using telematics or who are using an existing networked L2 charger. Participants will only be allowed to claim one enrollment incentive. Participating customers also will experience ongoing benefits from the EV Smart Plan pricing through reduced cost of at-home charging of up to \$160 per year (as compared to the Company’s proposed SC-1 rates as filed in Exhibit___(E-RDP-4CU), Schedule 4 in Case 20-E-0380 (“Proposed SC-1 Rates”)). Further details are described in the EV Smart Pricing section.

The Company intends to manage at-home charging so that it happens in the off-peak hours (currently 11:00 P.M. to 7:00 A.M.) by default, requiring a customer to “override” or opt to charge during on-peak hours at home. If a customer does charge during peak hours at home, they will be charged an “on-peak” rate for that charging based upon the Company’s SC-1 VTOU rate. In the long-term, the Company expects that managed charging and vehicle-to-grid (“V2G”) technologies will be able to be used for additional purposes beyond the avoidance of charging during peak

hours, such as enabling integration of renewable energy. More use cases are described elsewhere in industry literature.⁷

This design addresses and balances a number of key issues, including:

- Shifting a large share of at-home charging to off-peak hours, while avoiding the “timer peaks” that can occur with TOU rates.
- Offering broad coverage of the EV market by including networked L2 chargers and vehicle telematics. These are complementary technologies, as neither has universal market coverage. Telematics provide greater present-day market coverage, however networked L2 chargers provide a pathway for nearly any EV driver to participate.
- Providing upfront and ongoing customer benefits to increase enrollment and continued participation in the program.
- Supporting installation of at-home charging equipment that facilitates active managed charging.
- Mitigating the costs to non-participating customers through collecting a reasonable fee from participating customers to help cover the costs of the program’s administration through the EV Smart Plan design.

⁷ Industry literature describing managed charging use cases includes SEPA, *A Comprehensive Guide to Electric Vehicle Managed Charging*, and the *Final Report of the California Joint Agencies Vehicle-Grid Integration Working Group*, gridworks.org/wp-content/uploads/2020/09/GW_VehicleGrid-Integration-Working-Group.pdf.

Customer eligibility

To be eligible to participate, residential customers must take supply service from the Company and maintain qualifying vehicle or charging equipment, as outlined below.⁸

Eligible managed charging technologies

The program will allow customers to participate via two complementary technologies:

1. Networked (or “smart”) L2 at-home EV chargers relying upon the customer’s local Wi-Fi or wireless network, or
2. The vehicle’s telematics system, which typically use a secure 4G wireless network.

Both technologies allow for measuring vehicle energy usage by time of day and offer direct load control for managing charging. For both technologies, the Company seeks authorization to leverage the embedded metering and connectivity to measure and manage customer EV charging, including an exclusion from typical metering and ANSI standards in order to bill the monthly EV Smart Plan. The EV Smart Plan is a form of “subtractive billing,” described as using charging data from an EVSE or EV submeter to “subtract” it from a customer’s energy usage as measured at the electric meter in order to apply different pricing. The total energy usage at the site is still measured by a Company meter but is then separated into EV charging and non-EV charging portions using the charger’s or vehicle’s energy measurements.

The Company expects the following charger and telematics qualifications to be established following program approval and based on a comprehensive evaluation of technology options,

⁸ Charging rates and other aspects of the program are based on supply service provided by the Company, and therefore eligibility is initially limited to Company supply service customers. As the Company gains experience with the program, it will determine whether and how to extend managed charging to customers on alternative supply service.

including responses to the Company's procurement process for managed charging services. The Company also expects that these qualifications may be modified as the market evolves.

Networked L2 charger qualifications

For an L2 charger to qualify for the smart charging program, the Company currently expects eligibility criteria to include, but not be limited to the following⁹:

- Must be internet-enabled (e.g., Wi-Fi or ethernet) with an active internet service available at the customer site;
- Must meet metering and billing accuracy criteria;
- Must provide sufficiently detailed interval metering (i.e., 15-minute intervals aligned to the hour);
- Must have ability to retrieve interval energy usage data and certain onboard data storage;
- Charging device must be UL Listed, and/or ENERGY STAR certified;
- Must have administrative privileges that enable the Company to access charging data and receive information from the EVSE; and
- Must allow for remote operation consistent with the EV Smart Plan.

Vehicle telemetry qualifications

In order for a customer to participate in the program using their vehicle's telemetry, that vehicle manufacturer's telematics network will need to be integrated into a third-party vendor's managed charging platform. Vehicle telematics-based approaches to managed charging will meet the same data standards networked L2 chargers are required to meet, where applicable. Customers with

⁹ Criteria were originally presented in the Company's 20-E-0380 testimony, page 21.

certain vehicle types may have to purchase an additional connectivity subscription from the manufacturer to enable them to participate (analogous to having a phone plan for your phone).

Rebate and Enrollment Incentives

Participating customers will receive an incentive to enroll in the Program, with the amount varying based upon whether they are installing a new qualifying L2 charger or not. Participants receiving a rebate or enrollment fee will be required to participate in the program for a minimum of three months before being able to withdraw.

\$500 rebate for new networked L2 installations

By offering the program, the Company strives not only to mitigate grid impacts of EV adoption, but also to help spur EV adoption. The proposed charger rebate helps serve those dual purposes. The \$500 rebate towards a networked L2 charger creates a strong financial incentive for people to participate in the program by reducing the installation cost of EVSE, which is a known barrier to EV adoption.¹⁰

Based on customer feedback, the Company believes that robust enrollment in the managed charging program requires offering a rebate to customers. Research with the Company's customers shows that access to rebates/financing for smart chargers is likely to motivate customers to purchase an EV.¹¹ The same research shows EV drivers are likely to participate in a smart charging program, especially if a rebate for the charger is offered as an incentive. Moreover, reducing the installation costs for the customer of EVSE will help EV adoption by addressing concerns of

¹⁰ See Case 20-E-0380, Testimony of the Company's Electric Vehicle Panel (EVP), pp. 29 and 30 (July 31, 2020).

¹¹ National Grid Customer Council Survey, March 2020.

potential EV buyers about the cost of home charging. Installing an L2 charger can be expensive, averaging \$1,400 for single family homes that require a 240-volt outlet upgrade.¹² This expense increases the upfront costs customers face when considering purchasing an EV.

\$150 enrollment incentive for other participating customers

The Company is proposing a one-time \$150 enrollment incentive to customers who enroll in the EV Smart Plan through the telematics option or who participate through a previously installed networked L2 charger. This incentive provides a strong financial motivation to enroll in the program and compensates customers for giving up some control of their at-home charging. A number of other utility managed charging and demand response programs offer rebates and enrollment incentives¹³ to spur participation.¹⁴

EV Smart Plan pricing

All participating customers must enroll in the EV Smart Plan tariff,¹⁵ which offers two pricing tiers to appeal to the diverse driving needs of different customers and vehicle types:

1. A \$20 per month pricing tier for up to 225kWh of off-peak at-home EV charging per month; and
2. A \$25 per month pricing tier for up to 325kWh of off-peak at-home EV charging per month.

¹² Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas, ICCT, August 2019. Available at:

https://theicct.org/sites/default/files/publications/ICCT_EV_Charging_Cost_20190813.pdf.

¹³ E-Source EV Pilots and Programs Tracker, September 2019.

¹⁴ For example, the evaluation of Eversource's Massachusetts program for demand response of EV home chargers showed that 50% of the people that enrolled in the program did so primarily because of the incentives.

¹⁵ Details described in Case 20-E-0380, Testimony of the Company's EVP, pp. 17-28 (July 31, 2020).



For both pricing tiers, the Company estimates that the monthly fee covers the cost of the supply and delivery for the off-peak kWh charged usage, as well as the incremental costs to cover the third-party vendor that will manage the charging (estimated at \$8.00 per customer per month).

Any residential customer with a qualifying L2 charger or vehicle, who takes electrical supply from the Company may participate.

Given the diversity of travel and driving behaviors (i.e., high-mileage and low-mileage drivers) and the charging needs for EVs (i.e., PHEVs and BEVs) the Company is proposing a two-tier approach to enable the program to provide a savings opportunity to a wide variety of EV drivers while also providing pricing options that reflect the cost of the program. The lower tier of \$20 per month for up to 225 kWh of at-home EV charging per month is designed to cover BEV drivers who travel less than average or have other charging options (e.g., workplaces) and PHEV owners who often do not drive all their miles on electricity. The monthly cap of 225 kWh would allow an EV to travel roughly 700 miles per month, or 8,400 miles per year. Customers who use all 225 kWh each month would reduce their annual charging costs by about \$80 compared to otherwise applicable SC-1 rates, using the Company's Proposed SC-1 Rates. The second, higher tier of \$25 per month for up to 325 kWh per month is intended for EV drivers who drive average or above-average amounts. The monthly cap of 325 kWh would allow an EV to travel roughly 1,000 miles per month, or 12,200 miles per year (the average US light duty vehicle travels around 11,500 miles per year). Customers who use all 325 kWh each month could reduce their annual EV charging costs by about \$165 or about \$14 per month compared to the Proposed SC-1 Rates.

Customers who wish to charge their EVs during on-peak hours will be able to "override" the managed charging system but must pay a higher per-kWh rate for any on-peak charging, in

addition to the fixed monthly subscription cost. The rate for charging outside the off-peak hours is based upon the SC-1 VTOU on-peak delivery rate plus a forecast estimate of the SC1 average on-peak supply rate, which is higher than the standard SC1 (non-VTOU) rate. Please refer to the Appendix – Derivation of EV Smart Charging Plan and example bill under the Plan, for more details.

This pricing design is intended to balance the need to cover the administrative costs and energy costs of the program while demonstrating clear and compelling customer benefits (since this is an opt-in program). The kWh caps for each pricing tier intend to provide the most kWh of charging possible while ensuring that the energy costs and program administrative costs for each customer are covered within their monthly subscription fee. If a customer uses more off-peak charging than their kWh cap for EV charging that month, the program will bill any off-peak kWh beyond-cap at the SC-1 rate, including all applicable surcharges. The off-peak rate used for this program is based on the SC-1 VTOU off-peak delivery rate plus a forecast annual off-peak supply rate and an estimate of the Systems Benefits Charge, Clean Energy Standard Supply surcharge and Merchant Function Charge. The SC-1 VTOU On-peak and Off-peak delivery rates are based on the Company's proposed SC-1 VTOU delivery rates as filed in Exhibit___(E-RDP-4CU), Schedule 4A in Case 20-E-0380.

Participants receiving the \$500 rebate for their L2 charger or the \$150 enrollment fee will be required to participate in the program for a minimum of three months before being able to withdraw.

Required IT and back-office system integrations

Implementing the program involves integrating new types of data and capabilities into the Company's back-office systems. Specifically, the Company requires integrating energy usage data from two new types of technologies (EVSE and EVs) into the Company's Billing and Billing Support systems to bill the EV Smart Plan and for program evaluation. The timeline for these system upgrades is discussed in Section 4 on the program timeline. The costs are included in the budget table in Section 9 on the program budget.

The Company will leverage third-parties to develop and operate the platforms that integrate and provide charging and vehicle data, send "dispatch" signals to the vehicles or chargers to manage their charging, and support the program's marketing and implementation. The Company expects to hire these third-parties through a request for proposal ("RFP") process.

Marketing

Since EVs are a developing market and many consumers are not familiar with the benefits of EVs, a marketing plan is essential to make customers aware of the Company's new programs and the associated benefits. The Company will conduct education and outreach to promote the managed charging program to existing and potential EV drivers throughout its service area. The Company will use traditional forms of marketing such as direct mail, email and social media, and in addition, leverage relationships with industry partners such as charging providers, auto dealers and trade allies. The importance of marketing and education plans for EV programs also has been recognized by stakeholders in the Company's rate case.¹⁶

¹⁶ See Case 20-E-0380, Direct Testimony of the New York Power Authority's Electric Vehicle Panel, pp. 26-33 (Nov. 24, 2020).

4. Program timeline and implementation

The key steps involved in launching the managed charging program as designed include:

- Hiring a program manager.
- Conducting an RFP process for managed charging technology platforms and implementation services, including integration for networked L2 chargers and vehicle telematics.
- Implementing the EV Smart Plan in the Company's billing and back-office systems, including integrating telematics and networked L2 charger data.
- Creating marketing and outreach plans, including updates to the Company's customer-facing websites.
- Developing managed charging accelerator programs (described below).

The Company expects to launch the program approximately 20-months from approval. The expected launch date is driven by the timeline required to implement the EV Smart Plan in the Company's back-office systems. At this time, the Company expects the program would launch to customers in late 2022 or early 2023. The program would launch with a focused marketing effort to spur enrollment. The Company plans to accept new customer enrollments at any time but would do focused marketing campaigns annually.

As the program progresses, the Company will track key metrics including enrollment, share enrolled using telematics and networked L2 chargers, retention rate, and others. The Company also plans to have an independent evaluation of the program after at least one full year of program operation, aimed at providing guidance on ways to improve the program. The Company expects the evaluation to begin in late 2023 or early 2024.

Based on these metrics and evaluation, the Company will assess program changes such as:

- Refining or expanding the types of eligible technologies that support managed charging;
- Improving the participant enrollment, marketing, and incentive/rebate processes;
- Modifying the EV Smart Plan pricing; and
- Expanding to different customer classes, including small business customers, customers with EV fleets of light, medium, or heavy-duty vehicles, and charging station site hosts.

In addition, in light of the Commission’s recent approval of the Company’s Advanced Metering Infrastructure (“AMI”) project proposal, the Company plans to look for potential ways during the multi-year roll out of the new metering technology to leverage AMI capability to support EVs and managed charging more effectively in the future.

Finally, this proposal includes program enrollment estimates and costs through fiscal year (“FY”) 2025, ending March 31, 2025; the Company, however, expects the need for managed charging programs to continue beyond this time period as EV penetration increases.

5. Managed charging “program accelerators”

The Company believes that managed charging is a key part of a comprehensive approach to supporting residential EV adoption that includes equipment rebates, customer-friendly online resources for charging education, EVSE and EV-related programs, and simple at-home charging installation services. The turnkey installation service and expanded online marketplace (“program accelerators”) will directly support and accelerate participation in the managed charging program



by providing important guidance, removing barriers to installation of qualifying charging at-home equipment, and offering qualifying charging equipment for sale.

Turnkey installation service

The Company will offer a turnkey installation service to handle all components of a charging station installation at the customer's premise, including the purchase of the station, identification of an installer, and scheduling of that installer. The Company expects to hire a third-party program administrator to manage this offering and develop a network of qualified EVSE installers to provide widespread geographic coverage, affordable pricing, and reliable service to customers. Not only will this provide benefits to the program participants, but it also has the potential to expand the business opportunities for the participating installers. Different customers have different charging installation and vehicle needs; some homes have 240-volt outlets already on hand, while others may require upgrades to install L2 charging equipment. In addition, the technical considerations with EV ownership may appear new and significant for many residential customers, involving different voltage outlets and charging standards terminology (e.g., L1 vs L2 chargers, J1772 plugs and adapters). The turnkey program will ensure each customer goes through a clear and streamlined process to obtain the equipment and services needed to install a managed charging-capable charger at their residence. Participating customers will be responsible for paying for the cost of their charger installation.

Online marketplace

The expanded online marketplace will serve as a key resource for customers to learn about their home charging options and to purchase EVSE and related services. The online marketplace is

intended to address the knowledge gap associated with buying and installing a home charging station during the early stages of EV adoption. For example, research with Company customers shows that more than half of survey respondents are unfamiliar with the difference between using an L1 versus an L2 charger. Customers also tend to be unfamiliar with the costs to install, maintain, and operate a home EV charger. The Company will add L2 chargers and associated products to the marketplace, specifically focusing on networked charging stations that qualify for the smart charging program. The marketplace will also contain a list of qualified electricians to install a home charging station for those who prefer to install their station independently of the Company's turnkey install program.

The costs for these managed charging “program accelerators” (turnkey installation service and the online marketplace) are included and identified in Table 1, as are the program costs that will be recovered from customers participating in the turnkey installation and online marketplace charger sales. The Company proposes the revenue received from the turnkey installation service and expansion of the E-Commerce Marketplace will be treated like the existing electric Platform Service Revenues (“PSR”) sharing mechanisms. As stated in Case 20-E-0380, the Company proposes to continue to retain twenty percent of fees, deferring the remaining eighty percent for the benefit of customers.¹⁷ The dollar figures are reflected in the Table 1 below, line D.

6. Managed charging EAM

The Company proposed a managed charging EAM in Case 20-E-0380. The Company believes the core outcomes of the Managed Charging EAM include reduced need for future distribution system upgrades/increased utilization of existing grid assets, lower overall energy costs for customers,

¹⁷ See Case 20-E-0380, Testimony of the Company's Electric Vehicle Panel (EVP), pp 33 (July 31, 2020)

and associated environmental benefits. As stated in the DPS Staff EVSE Whitepaper, “increasing EV penetration to meet 2025 ZEV targets could increase average weekday demand for electricity in New York by nearly 6,900 MWh, a nearly two percent increase compared to 2016 levels.”¹⁸ Providing an EAM to support managed charging incentivizes the Company to reduce infrastructure costs, further aligning the Company’s business incentives with the State’s goals. Further, given that EV adoption is still relatively low today (as are the peak reduction impacts), the Company proposed a design aimed at enrolling a large share of the EV-owning market and positively influencing EV driver charging behavior. This design is intended to demonstrate the program’s potential to scale as EV adoption grows exponentially towards the State’s 2025 ZEV goal. While the managed charging programs reduce barriers to customer adoption, the Company believes the Managed Charging EAM is justified by the EV customer behavioral change and the system benefits generated by shifting charging to off-peak hours. The Company supports this EAM as a meaningful and appropriate earnings pathway to help achieve the intended outcomes of this important program.

7. Program cost recovery

The EV Smart Plan pricing design allows the Company to recover some program administration costs from participating customers. To the extent that the Company is unable to recover program costs from program participants, the Company proposes recovering program costs through the Make-Ready Program surcharge until the costs of the program are included in base rates. Table 1 in Section 9 differentiates between costs recovered from program participants and costs expected to be recovered from the Make Ready program.

¹⁸ See Case 18-E-0138, Staff Whitepaper Regarding Electric Vehicle Supply Equipment and Infrastructure Deployment, p. 12 (January 13, 2020).

8. Key areas of discussion regarding program design

The Company looks forward to working with Staff and the Stakeholder working group for managed charging and vehicle-grid integration to produce customer-friendly plans that support timely and cost-effective EV adoption. The Company suggests four key areas for discussion:

- Ensuring **flexible** program designs that evolve with technology, system capabilities, and EV market size.
- Ensuring **appropriate coverage of the EV market**, enrollment targets, and program size, with designs that create effective incentives to spur the EV market.
- The **timing** required to launch the program to customers or revise it over time.
- The **cost-effectiveness** of alternative managed charging solutions. Given the uncertainty around EV adoption trends and technologies, the Company would like to see program designs that are cost-effective across a reasonable range of market outcomes.

The Company has learned a considerable amount since beginning work on managed charging program designs in 2019. The time and cost to implement managed charging can vary significantly depending on the design. In particular, designs that involve on-bill solutions dependent on billing system changes are likely to face more significant costs and time to implement. The Company is interested in exploring alternative, cost-effective methods to price managed charging services that can be implemented in timely fashion, including off-peak rebates paired with an active managed charging platform. The Commission's recent approval of the Company's AMI proposal also changes the options available over the medium to longer-term, emphasizing the need for flexibility in program design.

9. Program budget

Table 1 shows the Company's estimated budget for the proposed managed charging program for the four fiscal years covered. This program is sized to support nearly 20 percent of the EVs on the road under a sales trajectory that meets the Company's portion of the state's ZEV MOU goal of 850,000 EVs by the end of 2025. The primary cost components are:

- Vendor costs, including fixed/annual fees and per-vehicle or per-customer costs, based upon the Company's market research for such services.
- Marketing and customer enrollment incentives and L2 charger rebates. Marketing efforts will be multi-purpose in order to efficiently address the managed charging program, accelerator programs, and other related programs and topics.
- Company staffing for the managed charging program and program accelerators. The managed charging program is estimated at 1 FTE in FY22 of the program, increasing to 2 FTEs in the remaining years.
- IT/billing system integration cost. The IT/billing system integration changes are required to support the EV Smart Plan. The Company is also including costs related to on-bill financing of L2 charger installations supported through the turnkey installation service, as originally proposed in Case 20-E-0380.
- Administration costs for "program accelerators" (online marketplace and turnkey installation program) to help provide a multi-faceted approach to increase EV adoption, enable at-home charging, and support managed charging. These costs include 1 FTE in FY22 and 2 FTEs in the remaining years.

- Program evaluation costs are expected to be incurred primarily during FY24 and FY25.

The evaluation will review the managed charging program and related “accelerator” programs.

Finally, the program will recover some costs directly from participants via the EV Smart Plan, estimated at \$8.00 per customer per month (line C), which is part of the \$20 and \$25 monthly EV Smart Plan. The program accelerators of turnkey installation and the online marketplace are anticipated to recover funds from participants as well (line D).

Table 1 Estimated Residential Managed Charging Program Budget (\$M)¹⁹

	FY22 <i>(ends 3/31/22)</i>	FY23 <i>(ends 3/31/23)</i>	FY24 <i>(ends 3/31/24)</i>	FY25 <i>(ends 3/31/25)</i>	Term FY22-FY25
Vendor operating costs-Telematics	\$0	\$0.277	\$1.161	\$1.692	\$3.129
Enrollment incentives-Telematics (\$150-per)	\$0	\$1.344	\$0.769	\$0.958	\$3.071
Vendor-Networked L2	\$0	\$0.154	\$0.488	\$0.666	\$1.308
Enrollment incentives-Networked L2 (\$150-per)	\$0	\$0.185	\$0.093	\$0.110	\$0.388
Networked L2 equip. rebates (\$500-per)	\$0	\$1.143	\$0.575	\$0.682	\$2.399
IT/Billing integration costs	\$1.886	\$1.721	\$0.100	\$0.100	\$3.806
Company staffing for managed charging	\$0.151	\$0.307	\$0.312	\$0.319	\$1.089
Marketing	\$0.066	\$0.291	\$0.438	\$0.338	\$1.133
Evaluation Costs	\$0	\$0.046	\$0.260	\$0.269	\$0.574
A. Total/Gross managed charging program costs	\$2.102	\$5.466	\$4.195	\$5.134	\$16.897
B. Total/Gross program accelerator costs*	\$0.231	\$0.586	\$0.532	\$0.538	\$1.886
C. Costs recovered from EV Smart Plan participants for program admin.	\$0	\$0.299	\$1.599	\$2.355	\$4.253
D. Costs recovered from program accelerators*	\$0	\$0.201	\$0.120	\$0.129	\$0.450
Net Program Costs (= A + B - C - D)**	\$2.333	\$5.552	\$3.008	\$3.187	\$14.080
EVs at end of year	49,805	81,612	117,607	157,791	
EVs enrolled Telematics	-	8,961	14,087	20,474	n/a
EVs enrolled Networked L2	-	3,515	5,283	7,381	
Total EVs enrolled	-	12,476	19,370	27,855	n/a
% of EV drivers enrolled	0.0%	15.3%	16.5%	17.7%	n/a

* As described in the proposal, the managed charging “program accelerators” are the Company’s expanded online marketplace and turnkey installation service for at-home chargers.

** Net program costs will depend upon program enrollment. An enrollment estimate is provided based upon a forecast of EV adoption that meets the State’s 2025 ZEV MOU goal of 850,000 light-duty EVs and the Company’s portion of that statewide goal.

¹⁹ The budget provided in Table 1 is \$4.1 million less than the costs included in the Company’s proposal to date in Case 20-E-0380. The Company will be addressing the budget differences in its rebuttal testimony to be filed with the Commission by December 16, 2020.

10. Appendix – Derivation of EV Smart Charging Plan and example bill under the Plan

Originally filed as Exhibit ___(E-RDP-11) (CU) in Case 20-E-0380.

Development of Residential EV Smart Charging Plan Rates

Rates for Rate Year 1 - July 1, 2021 to June 30, 2022

Calculation of EV On-peak and Off-peak Charging Rates

Line	EV Delivery Rates	On-peak Rate	Off-peak Rate¹
1	Delivery Rate (SC1VTOU)	\$0.07888	\$0.01047
2	Systems Benefits Charge (SBC)	\$0.00520	\$0.00520
3=1+2	Sum Delivery	\$0.08408	\$0.01567
	EV Supply Rates	On-peak	Off-peak
4	Supply Rate (Forecasted)	\$0.04606	\$0.02630
5	Clean Energy Standard Supply	\$0.00556	\$0.00556
6	Merchant Function Charge	\$0.00157	\$0.00104
7=4+5+6	Sum Supply	\$0.05320	\$0.03290
8=3+7	Residential EV Smart Managed Charging Rates	\$0.13728	\$0.04857

Calculation of EV Fixed Monthly Charge (for Off-peak Charging)

EV Fixed Monthly Charge Rate Tier 1			
	Rate	Quantity	Charge
9	Incremental Customer Charge	\$8.00	\$8.00
10=3 (Off-peak)	EV Off-peak Delivery Rate	\$0.01567	225
11=7 (Off-peak)	EV Off-peak Supply Rate	\$0.03290	225
12=9+10+11	Sum		\$18.93
13=Roundup 12	EV Monthly Charge - Tier 1		\$20.00
14=13/10 (Quantity)	Effective price per kwh		\$0.08889
EV Fixed Monthly Charge - Tier 1			
	Rate	Quantity	Charge
15=9	Incremental Customer Charge	\$8.00	\$8.00
16=10 (Off-peak)	EV Off-peak Delivery Rate	\$0.01567	325
17=7 (Off-peak)	EV Off-peak Supply Rate	\$0.03290	325
18=15+16+17	Sum		\$23.78
19=Roundup 18	EV Fixed Monthly Charge - Tier 2		\$25.00
20=19/16 (Quantity)	Effective price per kwh		\$0.07692

Note 1 - The EV Off-peak charging rate is only used in the development of the EV Monthly Charge and is not billed separately.

Residential EV Smart Charging Plan Monthly Bill Illustration

Usages (kWh/month)

	Tier 1	Tier 2
EV kWh Max usage under program by Tier	225	325
EV On-peak kWh	0	0
EV Off-peak kWh	225	325
EV Over Tier kWh	0	0
Non EV kWh	600	600
Total Billed kWh (at house meter)	825	925

EV Program Charges

	Rate	Quantity	Charges	Rate	Quantity	Charges
One Time Rebate (Separate from Bill)	\$500.00					
EV Subscription Charge	\$20.00	1	\$20.00	\$25.00	1	\$25.00
EV On-peak Charge	\$0.13728	0	\$0.00	\$0.13728	0	\$0.00
Total EV Program Charges			\$20.00			\$25.00

SC1 Charges - Delivery

	Rate	Quantity	Charges	Rate	Quantity	Charges
Customer Charge (SC1)	\$17.33	1	\$17.33	\$17.33	1	\$17.33
Delivery Charge	\$0.06689	600	\$40.13	\$0.06689	600	\$40.13
SBC	\$0.00520	600	\$3.12	\$0.00520	600	\$3.12
TRAC	\$0.00000	600	\$0.00	\$0.00000	600	\$0.00
RDM	\$0.00000	600	\$0.00	\$0.00000	600	\$0.00
DLM	\$0.00015	600	\$0.09	\$0.00015	600	\$0.09
EAM	\$0.00048	600	\$0.29	\$0.00048	600	\$0.29
VDER	\$0.00000	600	\$0.00	\$0.00000	600	\$0.00
LTC	\$0.00230	600	\$1.38	\$0.00230	600	\$1.38
Other Surcharges	\$0.00000	600	\$0.00	\$0.00000	600	\$0.00
Total SC1 Delivery			\$62.34			\$62.34

SC1 Charges - Supply

	Rate	Quantity	Charges	Rate	Quantity	Charges
SC1 Supply Cost	\$0.03558	600	\$21.35	\$0.03558	600	\$21.35
SC1 ESRM (NHA) Cost	\$0.00173	600	\$1.04	\$0.00173	600	\$1.04
SC1 CESS	\$0.00556	600	\$3.34	\$0.00556	600	\$3.34
SC1 MFC	\$0.00134	600	\$0.80	\$0.00134	600	\$0.80
Total SC1 Supply			\$26.53			\$26.53

Total Home Bill

	\$108.87	\$113.87
Average Rate (\$/kWh)	\$0.13196	\$0.12310
Monthly Savings vs Standard Rates	\$6.83	\$13.75
Annual Savings vs Standard Rates	\$81.91	\$164.99
<i>Not including taxes</i>		

Standard Tariff Bill - Tier 1

Scenario 1 - No EV Subscription Charging; Standard Rates
For 825 kwh scenario (225kwh of EV off-peak charging)

SC1 Delivery - Total Bill

Rate	Quantity	Charges
\$17.33	1	\$17.33
\$0.06689	825	\$55.18
\$0.00520	825	\$4.29
\$0.00000	825	\$0.00
\$0.00000	825	\$0.00
\$0.00015	825	\$0.13
\$0.00048	825	\$0.40
\$0.00000	825	\$0.00
\$0.00230	825	\$1.89
\$0.00000	825	\$0.00
		\$79.22

SC1 Supply - Total Bill

Rate	Quantity	Charges
\$0.03558	825	\$29.35
\$0.00173	825	\$1.43
\$0.00556	825	\$4.59
\$0.00134	825	\$1.10
		\$36.47

Total Home Bill **\$115.69**
Average Rate (\$/kWh) **\$0.14023**

Standard Tariff Bill - Tier 2

Scenario 2 - No EV Subscription Charging; Standard Rates
For 925 kwh scenario (325kwh of EV off-peak charging)

SC1 Delivery - Total Bill

Rate	Quantity	Charges
\$17.33	1	\$17.33
\$0.06689	925	\$61.87
\$0.00520	925	\$4.81
\$0.00000	925	\$0.00
\$0.00000	925	\$0.00
\$0.00015	925	\$0.14
\$0.00048	925	\$0.44
\$0.00000	925	\$0.00
\$0.00230	925	\$2.12
\$0.00000	925	\$0.00
		\$86.72

SC1 Supply - Total Bill

Rate	Quantity	Charges
\$0.03558	925	\$32.91
\$0.00173	925	\$1.60
\$0.00556	925	\$5.14
\$0.00134	925	\$1.24
		\$40.89

Total Home Bill **\$127.62**
Average Rate (\$/kWh) **\$0.13796**