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February 20, 2020

Ms. Debra A. Howland
Executive Director
New Hampshire Public Utilities Commission
21 South Fruit Street, Suite 10
Concord, New Hampshire 03301

Re: Docket No. IR 20-004
Investigation into Rate Design Standards for Electric Vehicle Charging Stations
and Electric Vehicle Time-of-Use Rates

Dear Ms. Howland:

Please treat this letter as the response of the Office of the Consumer Advocate (OCA) to the invitation from the Commission, contained in the Order of Notice issued in the above-referenced docket on January 16, 2020, for written comments on the issues specified in the Order of Notice.

The Commission stated in the Order of Notice that it opened this docket to obtain public comment on (1) the relevant rate design standards regarding electric vehicle charging stations and electric vehicles, (2) whether it is appropriate to implement electric vehicle time of day rates for residential and commercial customers, and (3) any other related issues identified in a memorandum filed by Staff on January 10, 2020. The Order of Notice further listed these issues as germane to this docket:

what rate design standards for electric companies and public service companies, if implemented for electric vehicle charging stations, are consistent with the New Hampshire Energy Policy defined in 378:37, and likely to result in just and reasonable electric rates, as required by RSA 374:2 and RSA 378:5 and :7; whether the implementation of electric vehicle time of day rates for residential and commercial customers would be consistent with the restructuring policy principles defined in RSA 374-F:3, VI, would avoid undue or unreasonable preference as required by RSA 378:10, and would likely result in just and reasonable rates, as required by RSA 374:2 and RSA 378:5 and :7.

Order of Notice at 3.

I. Procedural Matters

Because this docket is neither an adjudicative proceeding nor a rulemaking within the meaning of the Administrative Procedure Act (APA), the Commission may not use this docket to make determinations that are binding on either the state’s electric utilities or their customers. RSA 378:7 requires a hearing before the Commission may determine the “rates, fares or charges” of a utility, which means that such determinations meet the definition of “contested case” in the APA, found at RSA 541-A:1, IV. The PUC must commence an adjudicative proceeding when a matter meets the definition of “contested case” or is a matter “for which a provision of law requires a hearing . . . only upon the request of a party, upon the request of a party.” RSA 541-A:31, I.

RSA 236:5, V – the statute enacted in 2018 that requires the PUC to open this proceeding, directs the agency to “determine whether it is appropriate” to implement certain “rate design standards for electric companies and public service companies [sic]”¹ as well as “electric vehicle time of day rates for residential and commercial customers.” The 2018 statute did not repeal or amend RSA 378:7, nor did it alter any provision of the APA. The need to harmonize RSA 236:5, V with these other statutory requirements leads inexorably to a conclusion that deciding whether it is “appropriate” to endorse certain rate design standards or techniques limits the Commission to making a non-binding policy determination in this docket.

Treating this informal investigative docket as merely advisory in nature is also sensible utility regulation. Rate design and rate design principles are appropriately resolved definitively only in rate cases, when the impact of a particular rate design can be evaluated in the context of its effects on all rates and all rate classes. To cite but one example enumerated in RSA 236:5, V – demand charges – such a rate design technique is completely inappropriate for residential customers but utilities can adopt revenue decoupling as an alternative method for recovering fixed costs. Thus, the propriety of demand charges cannot and should not be considered in isolation.

II. Two Useful Policy Frameworks

Staff notes that RSA 378:10 requires that utility rates avoid “undue or unreasonable preference or advantage to any person or corporation, or to any locality, or to any particular description of service in any respect whatever.” This directive to avoid undue discrimination requires rate treatment of electric vehicle supply equipment that, as a general rule, is consistent with treatment for other end uses within a given rate class under which electric vehicle charging equipment is provided service.” Staff Memorandum at 5. The OCA heartily endorses this framework as the necessary and appropriate one for considering what rates and rate design techniques should be applied to electric vehicles (EVs) and electric vehicle charging stations.

¹ The statute does not explicitly limit the exploration of rate design standards to service related to electric vehicles but, like the Staff, we assume the General Court did not intend to trigger an all-encompassing inquiry into rate design principles.

The OCA urges the PUC to proceed creatively but carefully as it considers the question of what approaches to rate design will most efficiently and effectively lead to the optimal deployment of electric vehicles among motorists living in or visiting New Hampshire. Two recently published resources have been especially helpful to the OCA and are worthy of careful review by the PUC. The first is “Promoting the Ownership and Use of Electric Vehicles in the State of Vermont,” a report issued by the Vermont Public Utility Commission in June 2019 (“Vermont PUC Report”),² and a supplemental report issued thereto (“Vermont PUC Supplement”)³ in December 2019 dealing specifically with rate design issues. The second is “Taking First Steps: Insights for State Utility Commissions Preparing for Electric Transportation,” issued earlier this month in draft form by the Regulatory Assistance Project (“Draft RAP Report”).⁴

a. Vermont

In particular, New Hampshire should keep in mind two key realities identified by the Vermont PUC. First, that “[t]he present low-cost of electricity relative to gasoline is a benefit, rather than a barrier, to EV charging.” Vermont PUC Report at 11 (noting that “most Vermonters adopting an EV will experience a 50% fuel cost reduction starting on their first day of ownership”). Second,

[b]ecause of demand charges, delivery of a kWh of energy at a public DCFC [direct current fast charging station] is more expensive than buying the same kWh of energy at home. Simply put, fast charging is a convenience service, and that convenience comes at a cost. . . . When DCFC usage is low, as it will be in the early phases of EV adoption, the demand charge can represent up to 90% of a station’s monthly electricity bill, which is a prohibitively high operating cost.

Id. at 10.

The OCA agrees with the Vermont Public Utility Commission: Utilities should “offer alternative rate design options that are conducive to sustainable, long-term growth in the EV and EV charging markets. At the same time, the alternative rate designs must provide enough compensation to the utility for system costs – incremental costs plus contributions to margin to cover joint, common, and embedded components of costs – *without imposing additional costs on non-EV users.*” *Id.* at 10 (emphasis added).

² The referenced document is available at https://puc.vermont.gov/sites/psbnew/files/doc_library/Electric%20vehicles%20report.pdf.

³ The referenced document is available at https://puc.vermont.gov/sites/psbnew/files/doc_library/EV-Supplemental-Report.pdf.

⁴ The referenced document is available at <https://www.raonline.org/wp-content/uploads/2020/02/rap-farnsworth-et-al-EVs-first-steps-working-draft-february-2020.pdf>.

b. The Regulatory Assistance Project

The Regulatory Assistance Project offers four key findings for state regulators to consider with respect to EV rate design:

- Unmanaged EV charging loads could increase the level of stress in the grid unless they are managed effectively,
- Reasonably designed rates are a key to utilities managing EV loads and maximizing public benefits from transportation electrification,
- Utility programs related to EVs “should focus on customers, helping them gain control over their transportation energy bills and empowering them to manage their energy usage,” and
- Pilot programs and other “transitional arrangements” can provide welcome opportunities for learning and gaining experience before adoption of larger and more permanent programs.

RAP Report at 1-2.

The deployment of electric vehicles in New Hampshire remains in a nascent state. In 2018, the Granite State saw the registration of 1,123 new electric vehicles, which accounted for just 1.16 percent of all vehicles sales but was also a 42.5 percent increase over the comparable figure for 2017. Peter O’Connor et al., “Evaluating Electric Vehicle Infrastructure in New Hampshire” (July 2019) at 9.⁵

III. Specific Comments Sought by the PUC Staff in re Rate Design Standards

a. Definitions

The OCA does not have any concerns about the definitions employed by the Staff in its memorandum for most of the topics the General Court has directed the PUC to consider, i.e., cost of service, prohibition of declining block rates, time-of-day rates, seasonal rates, interruptible rates, and load management techniques. With respect to the last item on the list, demand charges, the OCA would urge the PUC to append to Staff’s definition some or all of these understandings from the 2015 RAP Publication “Smart Rate Design for a Smart Future” by Jim Lazar and Wilson Gonzalez:⁶

Because traditional demand charges are measured on the basis of the individual customer’s peak, regardless of whether it coincides with the peaks on any portion of the system, this approach inevitably results in a mismatch between the costs incurred to serve the customer and the prices charged if the customer’s peak is non-coincident with the

⁵ The referenced research report, sponsored by the Department of Business and Economic Affairs, is available at <https://www.nh.gov/osi/resource-library/documents/nh-ev-infrastructure-analysis.pdf>.

⁶ The referenced document is available at <https://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-gonzalez-smart-rate-design-july2015.pdf>.

system peak. This means a customer is charged the same rate whether they use power in times of high demand (adding to system peak and utility costs) or low demand (when utility costs are correspondingly lower). Demand charges were implemented for commercial and industrial customers in an era during which sophisticated metering was prohibitively expensive. Today, with smart meters and AMI [advanced metering infrastructure], these metering costs are trivial. Movement away from demand charges, toward more granular time-varying energy rates, is appropriate.

Id. at 9.

b. Current Offerings

Staff requested that the utilities respond to this query with “a detailed summary of each tariff for each of the rate design standards” referenced in SB 575. The OCA looks forward to reviewing and commenting on what the utilities submit.

c. Alignment with Principles

Staff requested comment on the extent to which the rate design standards comport with “the Commission’s rate design principles of efficiency, equity, simplicity, continuity, and revenue sufficiency.” Staff Memorandum at 6. This is a difficult assignment inasmuch as it seeks analysis of how certain generic rate design approaches comport with a series of time-honored (but to some degree contradictory) rate design objectives.

The OCA does not believe that declining block rates are a fruitful rate design technique in light of the need to send appropriate price signals to electric customers of all rate classes. Accordingly, the OCA agrees with the implicit premise of SB 575 that declining block rates are not part of the pathway to optimal implementation of EVs in New Hampshire.

By contrast, as acknowledged in the Vermont and RAP materials previously cited, time-of-use rates have a critical role to play in assuring that users of EV pay for their ‘fuel,’ either directly via home charging or indirectly via public charging stations, in a manner that is faithful to established principles of rate design. The OCA does not support the radical approach to time-of-use rates known as “real-time pricing” inasmuch as such rates expose consumers to the volatility of the wholesale electric market; few if any retail electric customers (and certainly no customer using electricity for transportation-related energy needs) has the requisite appetite for risk or rate arbitrage.

With respect to seasonal rates, interruptible rates, and load-management techniques, the OCA is skeptical but open-minded with respect to whether these approaches to rate design can be squared with the Commission’s rate design principles. Applied to transportation-related electricity consumption, these approaches would be complex, difficult to understand, and potentially disruptive to customers who rely on their vehicles to conduct their day-to-day activities.

The OCA has long been opposed to demand charges for residential electric customers and believes that this would be an ill-advised rate design technique for transportation users. As already noted, time-varying rates do a better job of sending appropriate price signals to consumers and thus aligning costs with prices.

d. Costs and Benefits

On this topic, the Staff requested discussion of “[c]osts and benefits foreseeably associated with adopting any of the above-designed standards.” Staff Memorandum at 6.

A key issue for the Commission to explore is whether to rely on “whole house” time-of-use rates. The Vermont PUC found “little data on how low an EV rate would need to be to affect overall EV adoption by consumers” given that “[t]he top barriers to EV adoption are up-front purchase cost and range anxiety’ and that “no data to support the view that lower-than-retail charging rates will affect adoption of EVs on a meaningful scale, especially when EV drivers already enjoy significant ‘fuel’ cost savings when compared to gasoline. Vermont PUC Supplement at 22. However, the Vermont regulators noted that upgrade costs, associated with the metering and other infrastructure costs associated with EV-specific time-of-use rates (which were estimated at between \$550 and \$1,200 per Vermont household) are a significant deterrent to EV adoption. *Id.* at 23-24.

After a new EV is added to the home, it accounts for about 1/3 of the new total use. Adding two EVs to a household would roughly double that household’s load and be 1/2 of the total load after the EVs are added. This increased demand from EV charging could provide an incentive for customers to choose whole-house time-of-use rates. EV charging is more easily directed to the hours when lower time-of-use rates are available than is other electricity consumption in a household, such as refrigerators or other appliances. Vermont Supp. 24 n.33.

IV. Specific Comments Sought by the PUC Staff in re Residential and Commercial Time-of-Use Rates for EV Charging

a. Alignment with Principles

Consistent with the comments above, time-of-use rates for EV charging are a key element for successful incorporation of electric vehicles into both the state’s transportation infrastructure and its retail electricity marketplace. Properly designed time-of-use rates provide the price signals that will guide EV users to charging during hours when the cost of energy is essentially zero (given that, at certain hours and in certain conditions, the wholesale spot price of electricity is negative) and will discourage them from charging at times when the cost of the incremental kilowatt-hour can reach into the hundreds of dollars.

The key questions for the PUC to resolve will be (1) whether such time-of-use rates be offered to residential customers with electric vehicles on a whole-house basis, and (2) whether time-of-use rates are preferable to demand charges for public and/or workplace charging stations that will take service from the distribution utility as commercial customers. The hypothesis of the OCA is that demand charges are to be avoided whenever possible, when imposed either directly or

indirectly on residential customers. But, as part of this investigation, the Commission should gather evidence on this question that will be conducive to rate design decisions based in fact rather than aspirations or assumptions.

b. Distribution, Energy, and/or Transmission

On this topic, the Staff Memorandum seeks comment on whether time-of-day rates for EVs should apply to distribution rates, transmission rates, and/or energy rates, and “how benefits would accrue to ratepayers through an electric distribution utility for time-varying transmission and distribution rates.”

In addressing this question, the Commission should review the rate design analysis supporting the time-of-use rates already approved in connection with the Liberty Utilities pilot program involving dispatchable Tesla batteries. *See* Technical Statement Regarding Time-of-Use (TOU) Model (October 22, 2018) in Docket No. DE 17-189;⁷ see also Order No. 26,209 (January 17, 2019) in Docket No. DE 17-189 (approving pilot). As explained in the technical statement, “[a] core principle of any rate design is to ensure the rates being charged to customers reflect cost causation” and, thus, “[e]ach of three main rate components: generation (“G” which is default energy service in this model, although customers may take competitive energy supply of their choice), transmission (“T”), and distribution (“D”) were designed to reflect underlying cost causation allocated among logical break points in time-of-use.” DE 17-189 Technical Statement at 1. In other words, the Commission has already determined that it is consistent with cost-causation principles and the other policy imperatives related to rate design to adopt time-of-use rates for all segments of retail electric bills other than stranded cost charges and the system benefits charge.

As the Commission knows, the Liberty battery storage pilot program is an experiment and, indeed, one that is still just poised for launch. In that context, and certainly in the context of EVs, the Commission should proceed carefully and should reevaluate approved rate designs based on actual experience. But it is appropriate to begin the process of designing time-of-use rates for EV with the expectation that rates will vary not just for energy charges but for transmission and distribution charges as well.

c. Adequacy of Current and Proposed Rate Offerings

For the reasons already stated, currently available rates are not sufficient to encourage the optimal deployment of electric vehicles in New Hampshire and do not adequately take advantage of the capacity EVs have to shift load from times of peak demand to times of low or negative demand, much as batteries do.

⁷ The referenced document is available at https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-189/LETTERS-MEMOS-TARIFFS/17-189_2018-11-19_GSEC_TECH_STATEMENT_TOU.PDF.

d. Metering, Communication, and Billing Costs

The Staff Memorandum seeks comment on whether “implementation of electric vehicle time of day rates for residential and commercial customers requires incremental ratepayer-funded investments in metering, communication, and/or billing systems, and if so, the magnitude of those investments.” Staff Memorandum at 6. To some extent, the question turns on whether time-of-use rates are offered to EV users on a whole-house basis, in which case such new investments would be unnecessary. The Commission should investigate this question thoroughly. The OCA is on high alert when these questions arise, given (1) the chronic tendency of many electric utilities to resist innovation (particularly innovation that threatens the traditional utility business model) by exaggerating costs related to metering and billing, and (2) the history of past resistance to deployment of advanced metering infrastructure (because that, too, threatens the utility business model). The Commission should likewise have its antennae up when reviewing utility assertions on this topic.

e. Potential Load Factor Improvements

The Staff Memorandum requests comment on whether “potential load factor improvements associated with flexible load requirements might offset incremental costs associated with time of day rate offerings for electric vehicle charging and residential and commercial premises.” *Id.* The answer is unquestionably yes.

As the Regulatory Assistance Project has observed, “[b]ecause EVs can charge efficiently over short periods of time and then sit idle for the majority of the day, they are both geographically and temporally flexible load. This charging flexibility is the central reason EV load can be utilized as a resource that can provide potential benefits to the power grid.” RAP Draft Report at 9.

f. Customer Engagement Strategies

The Office of the Consumer Advocate is profoundly skeptical when it comes to spending ratepayer money to rely on public utilities to promote or to guide EV usage in New Hampshire. As the Vermont PUC pointed out, electricity is already a low-cost transportation fuel when compared to gasoline and, thus, the barriers to consumer adoption are range limitations and the limited availability of charging opportunities. Vermont PUC Report at 5, 11. As providers of a monopoly service, electric distribution companies are not naturally suited to dynamic and creative customer engagement. Further, as the state’s electric utilities have amply and repeatedly demonstrated in the context of their work as the administrators of the state’s ratepayer-funded energy efficiency programs, they are unable to resist the temptation to build utility brand goodwill (shareholder value) by using ratepayer money. Customer engagement strategies should be left to companies that sell electric vehicles, to competitive energy services, and to policymakers.

g. Venue

For the reasons already stated, it is necessary for the Commission to conduct adjudicative proceedings, and base any decisions on an evidentiary record developed after notice and opportunity to be heard, before making decisions about rate design issues specific to EVs. Also for the reasons already stated, these decisions should not be made in isolation; specific EV rates and rate designs must be determined in the context of each utility's overall revenue requirement and the effect of EV rates on other rates and charges. The OCA believes the instant proceeding can be useful in building consensus and a shared knowledge base.

h. Role of the Utility

The Staff Memorandum seeks comment on “[t]he role of the utility in deployment of electric vehicle supply equipment, including, but not limited to identification of locations which might host electric charging stations without requiring distribution system upgrades and the utilities [sic] role in the ownership of and payment for the equipment associated with electric charging stations.” Staff Memorandum at 7.

The Commission should require the electric utilities to determine and thereafter to publicize the locations amenable to hosting electric charging stations without requiring upgrades to the distribution system. The public benefit of such disclosures vastly outweighs any cybersecurity concerns that might arise.

In light of the hundreds of millions of dollars in stranded costs incurred by New Hampshire electric customers for the right to participate in a competitive electric industry, the Commission should not walk back electric industry restructuring by allowing electric distribution utilities to own charging stations and thus serve as retail suppliers of transportation fuel. This is simply not a natural monopoly and electric distribution companies, as sellers of a monopoly product, are not suited to providing EV charging stations.

In the pending Eversource rate case, Eversource witness William J. Quinlan stated in his prefiled written testimony of May 28, 2019 that the state's largest electric utility “is exploring options for a public-private partnership to develop an electric vehicle . . . fast charging corridor for New Hampshire” which would involve the investment of approximately \$2 million “to construct distribution facilities, primarily service drops, to energize a series of EV fast chargers.” Testimony of William J. Quinlan in Docket No. DE 19-057 at Bates page 53.⁸ According to the Eversource witness, such a “fast charging corridor . . . would provide multiple charging sites along New Hampshire's most thoroughly traveled roadways and thereby advance in-state economic development, promote tourism and support EV drivers who live and work in New Hampshire.” *Id.* “[F]unding for the chargers (approximately \$50,000 each) is envisioned to

⁸ The Quinlan testimony is available at https://www.puc.nh.gov/Regulatory/Docketbk/2019/19-057/INITIAL%20FILING%20-%20PETITION/19-057_2019-05-28_EVERSOURCE_DTESTIMONY_QUINLAN.PDF. Mr. Quinlan subsequently left his post as president and chief operating officer of Eversource subsidiary Public Service Company of New Hampshire (PSNH) but his testimony has been adopted by his successor at the helm of PSHH, Joseph A. Purington.

come from the 2016 Volkswagen settlement trust” with the chargers owned by third party charging vendors selected through a competitive bid process.” *Id.* Eversource envisions up to 48 fast-charging stations at 12 sites in its service territory, with future expansion of up to an additional 40 fast chargers. *Id.*

The OCA concurred in Staff’s recommendation to avoid addressing these issues in the rate case and, instead, to take them up here. This is appropriate in light of Eversource’s forthright disclosure that the proposal was still in the exploratory phase, thus making it inappropriate for inclusion in rates.

In March of 2019, Eversource stated that its proposed contribution to the EV Fast Charging Corridor proposal “more than pays for itself for all customers over its life and does not constitute a subsidy” of EV users by other electric customers. Eversource, “New Hampshire EV Fast Charging Corridor Proposal” (March 2019) at 14.⁹ The Commission should take this opportunity to investigate and test the veracity of this proposition. Assuming it holds up, a reasonable hypothesis is that Eversource has drawn the line in the right place – i.e., that Eversource (and likely the state’s other electric utilities as well) should be allowed to invest in and rate-base cost-effective and suitably located service drops while leaving to unregulated firms the task of deploying and operating fast chargers themselves. In order to assure that the public interest is adequately protected, the task of selecting such unregulated firms via competitive bidding should not be entrusted to utilities but, rather, to the Department of Business and Economic Affairs or the Department of Environmental Services.

In a July 2019 report completed for the Department of Business and Economic Affairs, funded by the U.S. Department of Energy, five transportation consultants (Peter O’Connor of Plug In America, Ben Mandel and Dan Welch of CALSTART, April Bolduc of S Curve Strategies and Paul Stith of Black & Veatch) proposed, *inter alia*, that the Commission “identify any justifiable use cases where full utility ownership and responsibility of all capital costs [i.e., not just those associated with service drops] may be warranted (such as environmental justice, low- and moderate-income communities, or rural high value but low traffic stations.” O’Connor et al., *supra* note 5, at 3. Although the consultants did not elaborate, the Commission should take this suggestion seriously and include it among the topics to be investigated here. Such use cases are the only circumstances in which the OCA could envision supporting direct investment in fast chargers themselves.

i. Other Issues

Given the nascent state of electric vehicle deployment in New Hampshire, the flexibility inherent in the Granite State’s reliance on a restructured electric industry, and the thirst for innovation that is sometimes apparent in both the state’s regulated and unregulated energy sectors, the Commission should seize this opportunity to explore new approaches to beneficial electrification and the reduction of greenhouse gas emissions.

⁹ The referenced Eversource presentation can be found at <https://www.des.nh.gov/organization/divisions/air/tsb/tps/msp/documents/20190322-eversource-presentation.pdf>.

For example, as recently noted by the Vermont PUC,

some utilities may be able to remotely control when vehicles are charging by using wireless broadband connectivity at the customer's location and utility control software platforms. Direct utility control is likely the most effective method for ensuring least-cost charging and maximizing the potential grid benefits of electric vehicles, including the integration of renewable generation. Unlike time-of-use rates that have set hours that are difficult to change, controlled charging can evolve easily on a given day to minimize costs within customer-imposed parameters (e.g., set a vehicle to be fully charged before a long trip).

Vermont PUC Supplement at 24.

There are likely other examples of innovative approaches to the EV challenge that various stakeholders could bring to the attention of the Commission in this investigative proceeding. The OCA hopes for a robust discussion of all such possibilities.

V. Conclusion

The Office of the Consumer Advocate thanks the Commission and its Staff for this opportunity to tender these preliminary comments about electric vehicles and rate design. Please treat these comments as tentative inasmuch as, in the immortal words of former Commissioner Bruce Ellsworth, we “reserve the right to get smarter as we get older” particularly as new evidence and insights emerge. We look forward to participating actively in this docket. Thank you for considering our views.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. Maurice Kreis', written in a cursive style.

D. Maurice Kreis
Consumer Advocate