COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

Petition of Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid, for approval of its Phase III Electric Vehicle Market Development Program and Electric Vehicle Demand Charge Alternative Proposal	)	**D.P.U. 21-91**

Direct Testimony of

Melissa Whited

On behalf of

Natural Resources Defense Council, Sierra Club, and Union of Concerned Scientists (Clean Energy Parties)

Regarding Demand Charge Alternative Proposal

May 27, 2022

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1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title and employer.

A. My name is Melissa Whited. I am a Senior Principal at Synapse Energy Economics, located at 485 Massachusetts Avenue, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics is a research and consulting firm specializing in electricity and gas industry regulation, planning and analysis. Our work covers a range of issues, including economic and technical assessments of demand-side and supply-side energy resources; energy efficiency policies and programs; integrated resource planning; electricity market modeling and assessment; renewable resource technologies and policies; and climate change strategies. Synapse works for a wide range of clients, including state attorneys general, offices of consumer advocates, trade associations, public utility commissions, environmental advocates, the U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), U.S. Department of Justice, the Federal Trade Commission and the National Association of Regulatory Utility Commissioners. Synapse has over 35 professional staff with extensive experience in the electricity industry.

Q. Please summarize your professional and educational experience.

A. I have 13 years of experience in economic research and consulting. At Synapse, I have worked extensively on issues related to utility regulatory models and rate design. I have been an invited speaker in numerous industry conferences, including as a panelist for the National Association of Regulatory Utility Commissioners (NARUC) Subcommittee on Rate Design at the 2021 Winter Policy Summit and the 2018 Annual Meeting.

In addition to having previously testified before the Massachusetts Department of Public Utilities, I have sponsored testimony before the Illinois Commerce Commission, the New Hampshire Public Utilities Commission, the Nova Scotia Utility and Review Board, the Newfoundland and Labrador Board of Commissioners of Public Utilities, the Georgia Public Service Commission, the Rhode Island Public Utilities Commission, the Maine Public Utilities Commission, the California Public Utilities Commission, the Hawaii Public Utilities Commission, the Public Service Commission of Utah, the Public Utility Commission of Texas, the Virginia State Corporation Commission, and the Federal Energy Regulatory Commission. I hold a Master of Arts in Agricultural and Applied Economics and a Master of Science in Environment and Resources, both from the University of Wisconsin-Madison. My resume is attached as Exhibit CEP-MW-2.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Natural Resources Defense Council, Union of Concerned Scientists, and Sierra Club (collectively the "Clean Energy Parties").

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address National Grid's (the Company) demand charge alternative proposal, and its implications for the adoption of electric vehicles and charging stations in the Commonwealth, and the ability of the Commonwealth to meet its energy policy goals.

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. What principles should guide the Department's review of the Company's demand charge alternative proposal?

A. EV rates, such as demand charge alternatives, are an efficient means of supporting the Commonwealth's transportation electrification goals. To maximize EV adoption while ensuring that rate design proposals do not shift costs to other customers, the Department should strive to ensure that the approved rates:

1. Provide sufficient incentives to encourage EV adoption that facilitates the Commonwealth's transportation electrification goals,
2. Recover at least the marginal cost of serving the additional load to prevent cross-subsidies, and
3. Promote the efficient use of the grid through meaningful price signals to encourage load shifting to off-peak hours where possible.

Q. Please summarize your conclusions regarding the Company's demand charge alternative proposal.

A. The Company's proposal does not fully adhere to the principles above. In particular:

- The Company proposes that customers be transitioned to traditional demand charge rates after ten years, despite forecasts of continued low average load factors in 2031. The Company provides no process for an interim review and adjustment or extension of its proposal, suggesting instead that such review could occur after Year 10.
- The Company's proposal does not consider marginal costs associated with EV charging load. Without such costs detailed, or a plan to conduct a marginal cost of service study, it is difficult to determine the extent to which the Company's proposal might shift costs to other customers, or to which EV customers are reducing rates for other customers through spreading fixed costs over greater sales.
- The non-coincident peak demand charge in the Company's Rate G-2 sends a poor price signal and may result in inefficient use of the grid and higher emissions.

Q. Please summarize your recommendations.

A. I offer the following recommendations:

1. The Department should require that the demand charge alternatives be evaluated every three years in light of EV adoption metrics. This review should consider whether the Commonwealth is on track to meet its transportation electrification targets, and whether extension or modification of the demand charge alternative rates is needed. Such interim reviews will allow for course corrections early on, as

well as for greater certainty for EV charging station developers in the later years of the rate offering.

2. The Department should direct the utilities to conduct detailed marginal cost analyses of load on the distribution system. These analyses should be used to inform the setting of EV rates, as well as the cost-effectiveness assessment of other programs, such as load management.

3. The Department should require that the Company convert its non-coincident demand charge in Rate G-2 to a time-varying volumetric charge or a demand charge that only applies to peak hours.

3. OBJECTIVES OF EV RATES IN MASSACHUSETTS

Q. Why has the Company proposed demand charges alternatives for electric vehicle charging?

A. In enacting Section 29 of the Transportation Act,[1] the Legislature recognized that demand charges can pose a barrier to transportation electrification, particularly for public direct current fast charging (DCFC) stations. When EV adoption is in its early phases, public DCFC typically have high demands (measured in kW) relative to energy usage (measured in kWh), which results in high electricity bills but low utilization. To address these

[1] Chapter 383 of the Acts of 2020, An Act Authorizing and Accelerating Transportation Investment, signed into law on January 15, 2021.

issues, the Transportation Act required each electric distribution company to file an alternative rate design to traditional demand charges for commercial EV charging.

Q. Are alternatives to demand charges important for stimulating transportation electrification in Massachusetts?

A. Yes. Massachusetts has committed to rapidly electrifying its transportation sector, and rate design modifications are necessary to achieve those goals as efficiently as possible. Currently, EV adoption rates are not on track to meet the Commonwealth's commitments.

Q. What commitments are relevant to EV rate designs?

A. The Commonwealth has multiple ambitious greenhouse gas and transportation electrification commitments that are relevant to these rate design proposals. Under the Global Warming Solutions Act (GWSA), the Commonwealth must reduce greenhouse gas emissions by at least 50% from 1990 levels by 2030, at least 75% from 1990 levels by 2040, and achieve Net Zero GHG emissions by 2050 with a gross reduction in emissions of 85% from 1990 levels.[2] The full electrification of vehicles in the Commonwealth is a

[2] Global Warming Solutions Act, Mass. Gen. Laws, Chapter 21N; Executive Office of Energy and Environmental Affairs'("EEA") Determination of Statewide Emissions Limit for 2020 April2020, available at https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit; (setting a legally binding statewide limit of net zero greenhouse gas emissions by 2050, defined as 85 percent below 1990 levels); State of the State Address, January 2021, (Governor commits to achieving net-zero greenhouse gas emissions by 2050), available at https://www.mass.gov/news/governor-baker-delivers-2020-state-of-the-commonwealth-address.

necessary step to comply with the GWSA, as identified in the Administration's 2030 Clean Energy and Climate Plan (2030 CECP).[3]

Further, the Commonwealth has made multiple specific commitments regarding the adoption of zero-emissions vehicles:

- 300,000 zero-emission vehicles will be on the road in Massachusetts by 2025 under the Zero Emission Vehicle (ZEV) Memorandum of Understanding (MOU),[4]
- All new light-duty vehicle sales will be 100% zero emissions by 2035 under Massachusetts' adoption of the California Advanced Clean Cars II Standard,[5] and

[3] Executive Office of Energy and Environmental Affairs, Clean Energy and Climate Plan for 2030 ("2030 CECP") at 21, December 2020, available at https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download.

[4] Zero-Emission Vehicle Memorandum of Understanding, October 2013, available at https://www.nescaum.org/documents/zev-mou-8-governors-signed-20131024.pdf and Executive Office of Energy and Environmental Affairs, 2015 Update of the Clean Energy and Climate Plan for 2020 at 27, December 2015, available at https://www.mass.gov/files/documents/2017/12/06/Clean%20Energy%20and%20Climate%20Plan%20for%202020.pdf.

[5] Executive Office of Energy and Environmental Affairs, Clean Energy and Climate Plan for 2030 ("2030 CECP") at 21, December 2020, available at https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download.

- At least 30 percent of new medium- and heavy-duty vehicle sales will be ZEVs by 2030 and 100 percent by 2050 under the Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding.[6]

Q. Why do you claim that Massachusetts is lagging behind its transportation electrification commitments?

A. As of December 2021, there were only approximately 56,000 electric vehicles in the Commonwealth, which is about 27 percent below the level needed to put Massachusetts on track to meeting its 2025 target of 300,000 ZEVs. Adopting the necessary rate design reforms will help encourage the adoption of EVs needed to meet our EV targets and greenhouse gas emissions reduction requirements.

4. PRINCIPLES FOR EVALUATING EV RATE DESIGN PROPOSALS

Q. How should the Department evaluate EV pricing proposals?

A. Widespread transportation electrification requires rates that enable an electric vehicle market for a broad range of customers and a broad range of use cases. Fleet operators, independent EV charging companies, and other customers across the nation are grappling with the challenge that demand charges on existing commercial and industrial (C&I) rates

[6] Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding, July 2020, available at https://www.nescaum.org/documents/mhdv-zev-mou_12-14-2021.pdf, see also Press Release: Baker-Polito Administration Joins Multi-State Pledge to Increase Market for Electric Vehicles, July 2020, available at https://www.mass.gov/news/baker-polito-administration-joins-multi-state-pledge-to-increase-market-for-electric-vehicles.

pose to widespread transportation electrification. On traditional C&I rates, designed for large buildings and industrial operations that use electricity more constantly, the cost of EV charging often exceeds the cost of filling up with gasoline or diesel. Reformed C&I rates that more accurately reflect the flexible nature of EV charging relative to traditional commercial and industrial loads and provide meaningful reductions in monthly charging costs for drivers and fleet operators could fundamentally change the economics of a decision to invest in EVs in the Company's service territory. This would promote widespread transportation electrification that improves the utilization of the electric grid, puts downward pressure on rates to the benefit of all utility customers, and helps achieve the state's energy policy goals.

Rate design can be an efficient means of supporting the adoption of electric vehicles without requiring incremental ratepayer investments or new programs. As long as new load on the system pays at least the marginal cost of serving that new load, then there would be no new costs allocated to existing ratepayers, while all ratepayers would benefit in the long run as incremental load growth from expanded EV adoption spreads the costs of the electric grid over more sales—promoting downward pressure on rates for all customers. Further, rate designs that drive greater adoption of electric vehicles reduce the need for other forms of EV incentives, thereby lowering the programmatic cost of achieving the cost of compliance with the GWSA and the Commonwealth's transportation electrification goals.

Thus, the Department should ensure that approved EV rates:

1) Provide sufficient incentives to encourage EV adoption that facilitates the Commonwealth's transportation electrification goals,

2) Recover at least the marginal cost of serving the additional load to prevent cross-subsidies, and

3) Promote the efficient use of the grid through meaningful price signals to encourage load shifting to off-peak hours where possible.

Q. Will EV rate discounts result in cross-subsidies from other customers to EV customers?

A. No, not if the rate is designed properly. A cross-subsidy implies that costs *increase* for one customer as a result of discounts provided to another customer. Typically, utility ratemaking apportions the approved revenue requirements across various customer types. In this framework, a decrease in the costs allocated to one customer results in an increase in costs allocated to another customer. In this way, ratemaking is generally a zero-sum game. However, the fact that most EV charging load is *new* load on the system changes this framework.

Q. How does the fact that most EV load is new load on the system alter the standard ratemaking paradigm?

A. There are two important implications of EV load being new load on the system. First, the load from EVs is not guaranteed. Higher electricity rates will result in lower EV adoption, all else equal, thereby requiring other forms of incentives to meet the

Commonwealth's transportation electrification goals, or simply resulting in fewer energy sales over which to spread fixed costs. Neither of these outcomes are desirable.

Second, because EV charging load is primarily *new* load, as long as the price of electricity service for this load is set at marginal cost or above, there will be no cost-shifting to other customers. In fact, if rates are set at any increment above marginal cost, then other customers will benefit from the increase in new load, as the new load is covering its own costs *and* helping to spread the fixed costs of the system over additional sales.

Q. Please explain what you mean by "marginal cost."

A. The short-run marginal cost is the cost of serving an additional increment of load, i.e., an additional kilowatt-hour (kWh) of energy consumption or kilowatt (kW) of demand. In the short-run, the marginal cost of serving new electric vehicle charging load tends to be very low, given that electric distribution utilities tend to have excess capacity in many areas.[7] In the long-run, additional capacity on the system may need to be constructed to serve new load, resulting in higher costs. Thus, in the long-run, electricity service must be

[7] As described by Alfred Kahn, "Any plant and equipment will be designed for some level of production at which total unit costs will be at their lowest point. As output increases to that point, the fixed costs are spread over a larger and large number of units…. In view of the heavy fixed costs of most public utility operations and the tendency for companies to build capacity in advance of demand – partly because of the economies of building in large units and partly because of their obligation to supply a service that cannot in most cases bs stored but can only be produced on demand – excess capacity and short-run decreasing costs and output expands, at least in certain dimensions, are pervasive." Alfred Kahn, *The Economics of Regulation: Principles and Institutions*, vol. I and II (Cambridge, MA: MIT Press, 1988), 124.

priced at or above long-run marginal cost to avoid cross-subsidies. Still, however, these long-run marginal costs tend to be below the average cost in industries where there are economies of scale, such as electric distribution utilities.[8] Thus, pricing new load such as EV charging at or above marginal cost will avoid cross-subsidies.[9]

Q. Should EV rates be set based on marginal costs?

A. For the reasons described above, in the near-term, rates should be set close to marginal cost to drive EV adoption, particularly where EV adoption rates lag policy goals as in Massachusetts today. However, over the long-term EV rates should be increased to gradually reflect embedded costs so that all customers can benefit from the spreading of utility fixed costs over greater electricity sales.

Q. How rapidly should rates be increased from marginal costs to embedded costs?

A. The timetable for increasing EV rates to embedded costs should be informed by EV adoption levels. If transitioning to full embedded cost rates will hinder the achievement of the Commonwealth's transportation electrification goals, it may be appropriate to extend pricing below embedded costs for a longer period.

[8] *Ibid.*
[9] Where there is sufficient capacity on the system, pricing at the short-run marginal cost may be adequate to ensure that EV load is covering its costs. Where capacity is constrained, pricing at long-run marginal cost will ensure that EV load covers its costs.

Q. Is it unfair to set rates for EV customers below the embedded cost?

A. No. As noted above, EV load is primarily *new* load on the system, and the historical investments in the grid (embedded costs) exist regardless of this new load on the system. In other words, EV charging load did not cause the incurrence of those historical costs. Instead, EV charging customers should bear the costs of any additional costs that they impose on the system – i.e., the marginal costs of serving this new load. Doing so will ensure that existing customers bear no additional costs, while also ensuring that EV charging customers are not unfairly saddled with historical costs that they did not cause.

Q. Have any other jurisdictions set EV rates based on marginal cost?

A. Yes. First, economic development rates frequently set rates with a floor based on marginal cost. With respect to EVs, this approach was recently adopted in California. In approving San Diego Gas and Electric's (SDG&E) high-power EV rates (EV-HP) based on marginal costs, the California Public Utilities Commission concluded new EV load should be treated as retained or incremental load, recognizing that the purpose of the rate is "to attract participants who would not have adopted electric vehicles without a discount below standard commercial industrial rates."[10]

Further, the Commission found that "revenues collected under the EV-HP rate will benefit ratepayers as long as the EV-HP rate is set above a price floor of marginal

[10] California Public Utilities Commission, Decision 20-12-023, Decision Authorizing San Diego Gas & Electric Company Rate for Electric Vehicle High Power Charging, A.19-07-006, December 17, 2020, at 28.

costs and non-bypassable charges. . . Ratepayers benefit even if the revenues collected under the EV-HP rate are substantially lower than would have been collected under Schedule AL-TOU [the standard commercial rate]."[11]

Ultimately, the commission directed SDG&E to initially collect only marginal distribution and commodity costs, to linearly phase in non-marginal distribution and commodity costs over ten years, and to hold a stakeholder workshop after two years to evaluate whether any course corrections are needed (continually ensuring the rate results in a positive contribution-to-margin).

5. CONCERNS REGARDING NATIONAL GRID'S RATE DESIGN PROPOSAL

Q. Please describe National Grid's demand charge alternative proposal.

A. National Grid has proposed two rates for EV charging: Rate G-2 and Rate G-3. Both feature a sliding scale for demand charges based on the load factor of the EV charging site. As the site load factor increases, the demand charge increases and the energy charge decreases.[12] The Company proposes for the EV rates to be in effect for ten years from the date of approval. At the conclusion of the tenth year, customers would be returned to the traditional rate structure for Rate G-2 and Rate G-3.[13]

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[11] *Id.* at 29.
[12] Exhibit NG-DCA-1, p.13.
[13] Exhibit NG-DCA-1, pp.14-15.

Rate G-2 is available to EV charging sites where the average 12-month billing demand is 200 kW or less, and monthly kWh usage is greater than 10,000. The Company expects Rate G-2 will be used primarily by Level 2 charging sites.[14] Billing demand under Rate G-2 is determined based on the greatest 15-minute usage during all hours.[15] The demand charges and volumetric charges at different load factors for Rate G-2 in the Company's exemplar tariff are shown in Table 1.

Table 1. National Grid proposed Rate G-2 for demand of 200 kW or less

Rate G-2		
Load Factor	Demand Charge ($/kW)	Volumetric Charge ($/kWh)
0%-5%	$0.00	$0.03640
5%-10%	$2.80	$0.02784
10%-15%	$5.60	$0.01928
> 15%	$11.21	$0.00213

Source: Exhibit NG-DCA-2, p.1

Rate G-3 is available to EV charging sites where the average 12-month billing demand exceeds 200 kW. The Company expects that Rate G-3 will be used by most DCFC sites due to their larger capacity.[16] Rate G-3 is time-differentiated with on-peak hours from 8:00 a.m. to 9:00 p.m. on non-holiday weekdays, and billing demand is determined based on the greatest 15-minute usage during the on-peak hours.[17] The

[14] Exhibit NG-DCA-1, at 12.
[15] Massachusetts Electric Company, M.D.P.U. No. 1427, Sheet 1, issued October 25, 2019.
[16] Exhibit NG-DCA-1, at 13.
[17] Massachusetts Electric Company, M.D.P.U. No. 1428, Sheet 1, issued October 25, 2019.

demand charges and volumetric charges at different load factors for Rate G-2 in the Company's exemplar tariff are shown in Table 2.

Table 2. National Grid proposed Rate G-3 for demand of more than 200 kW

Rate G-3		
Load Factor	Demand Charge ($/kW)	On-Peak Volumetric Charge ($/kWh)
0%-5%	$0.00	$0.04639
5%-10%	$2.01	$0.03524
10%-15%	$4.02	$0.02410
> 15%	$8.05	$0.00175

Source: Exhibit NG-DCA-2, p.1. Note that there is no distribution charge for off-peak energy consumption.

Q. Do you have any concerns regarding the Company's proposed rate design?

A. Yes. I have three primary concerns with National Grid's proposed EV demand charge alternative:

1) The Company's proposal does not consider the magnitude of marginal costs,

2) The 10-year availability of the rates may be insufficient to support adequate build-out of charging infrastructure; and

3) The demand charge for G-2 customers is a non-coincident peak ("NCP") demand charge, which poorly reflects cost causation for most system costs and could lead to customers flattening their load when it is not beneficial to do so.

<u>Marginal Costs and Rate Design Proposal</u>

Q. Please explain why the Company's proposal does not consider the magnitude of marginal costs imposed by new load.

A. The Company states that its proposal cannot be readily compared to marginal distribution costs, since the Company does not have a marginal cost of service study that has been updated following the outcome of the previous rate case.[18] In addition, it appears that the Company's previous marginal cost of service study evaluated costs associated with high distribution system peak demand, which is not comparable to the price associated with demand measured over a different timeframe.[19]

Q. Is it important to understand the marginal costs associated with EV charging load?

A. Yes. As I discussed in Section 0 above, EV charging rates should recover at least the marginal cost of serving the additional load to prevent cross-subsidies, while providing sufficient incentives to drive EV adoption. A lack of understanding the magnitude of marginal costs hinders the achievement of these objectives.

Further, a detailed understanding of marginal costs on the distribution system can be used to evaluate the cost-effectiveness of various other programs and proposals. Thus,

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[18] Response to IR CEP 3-5.

[19] For example, a non-coincident demand charge is associated with a different measure of demand than the distribution system peak.

a detailed understanding of marginal costs supports setting efficient rates and designing efficient utility programs in multiple contexts.

Q. What do you recommend regarding the use of marginal costs?

A. I recommend that the Department direct the Companies to develop and file detailed distribution marginal cost of service studies that quantify the marginal cost on various components of the distribution system, ranging from the secondary service level to substations. These analyses should be used to inform the setting of EV rates, as well as the cost-effectiveness assessment of other programs, such as load management programs.

<u>Timeframe for Rate Applicability</u>

Q. What is your concern regarding the Company's proposal to terminate the EV demand charge alternative rates after 10 years?

A. I have two concerns regarding the Company's proposal to return customers to standard demand charge rates after 10 years. First, the EV forecast data from Bloomberg New Energy Finance in the Company's Exhibit NG-DCA-3 indicates that average site load factors will be only 8% by 2031. This is far below the 15% load factor threshold used by the for the demand charge discount, implying that many sites will still require demand charge relief to be economic. Removing the demand charge discount when average load factors are only 8% would result in an average increase in bills by 23% - 34%.[20]

Second, if EV charging site load factors remain low at the end of Year 10, the Company proposes that it review the availability of the rate offering with the Department to determine the need for the continuation of the rate offering to support public policy objectives. However, waiting until the end of Year 10 to conduct such a review is far too late and would cause uncertainty for developers who are considering EV charging investments in the latter years of the offering. Instead, an assessment of the continued need for a demand charge alternative should be conducted multiple years in advance—sites that expect to have a low load factor initially would be unwilling to absorb the high up-front costs of construction if the demand charge alternative will be phased out within a short amount of time.

Q. What do you recommend with respect to the timeframe of the demand charge alternative rates?

A. I recommend that the rates be evaluated every three years to determine the extent to which EV adoption is progressing and the need for revisions or extensions to the offering. This review should consider whether the Commonwealth is on track to meet its transportation electrification targets, and whether extension or modification of the

[20] Based on the percentage savings at 8% load factor on the demand charge alternative rate, as shown in NG-DCA-3, pages 1-2.

demand charge alternative rates is needed. Such interim reviews will allow for course corrections early on, as well as for greater certainty for EV charging station developers in the later years of the rate offering.

NCP Demand Charge

Q. Please explain your concerns regarding the Company's NCP demand charge.

A. An NCP demand charge sends a poor price signal to customers. Most demand-related distribution and transmission costs are primarily driven by the combined peak demand of many customers, for example the hundreds or thousands of customers who may be served by a single feeder or substation. It is the timing of these peaks at the substation or feeder level that drive major distribution system investments, not an individual's non-coincident peak demand.

A demand charge based on an individual customer's peak demand may be very poorly aligned with the timing of the peak demand at the substation or feeder level. Further, an NCP demand charge may even discourage a customer from increasing his or her consumption during hours in which it would be beneficial to do so. The potential for NCP demand charges to provide inefficient price signals has been recognized by the California Public Utilities Commission, which wrote:

> Noncoincident demand charges incentivize customers to flatten their load, but given high penetration of solar resources, solar-following loads are becoming more desirable to avoid curtailing renewable resources and may be less costly to serve than customers with flat loads. Noncoincident

demand charges can discourage beneficial energy use, such as electric vehicle fleet charging (overnight or during hours with high solar generation), or Reverse Demand Response to encourage customers to use renewable energy that might otherwise be curtailed due to over-generation conditions.[21]

For these reasons, it is more reasonable to recover most distribution costs through a time-varying volumetric rate, or through demand charges that apply to on-peak periods only.

Q. What do you recommend regarding the design of Rate G-2?

A. I recommend that the Company convert its non-coincident demand charge to a time-varying volumetric charge or a demand charge that only applies to peak hours.

6. RECOMMENDATIONS

Q. Please summarize your recommendations.

A. I offer the following recommendations:

- The Department should require that the demand charge alternatives be evaluated every three years in light of EV adoption metrics. This review should consider whether the Commonwealth is on track to meet its transportation electrification targets, and whether extension or modification of the demand charge alternative

[21] Cal. Pub. Util. Comm'n, D.17-08-030, at 46 (Aug. 25, 2017), https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M194/K599/194599448.PDF.

rates is needed. Such interim reviews will allow for course corrections early on, as well as for greater certainty for EV charging station developers in the later years of the rate offering.

- The Department should direct the utilities to conduct detailed marginal cost analyses of load on the distribution system. These analyses should be used to inform the setting of EV rates, as well as the cost-effectiveness assessment of other programs, such as load management.
- The Department should require that the Company convert its non-coincident demand charge in Rate G-2 to a time-varying volumetric charge or a demand charge that only applies to peak hours.

Q. Does this conclude your direct testimony?

A. Yes, it does.