COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Investigation by the Department of Public Utilities on its own Motion into the Modernization of the Electric Grid – Phase Two	**)** **)** **)** **)**	**D.P.U. 20-69**

COMMENTS OF THE MASSACHUSETTS ENERGY DIRECTORS ASSOCIATION AND THE LOW-INCOME ENERGY AFFORDABILITY NETWORK

INTRODUCTION

On July 2, 2020, the Department issued its Order opening D.P.U. 20-69, an investigation by the Department into grid modernization issues that were originally raised in D.P.U. 15-120/121/122, but were reserved for a second phase of the grid modernization investigation.[1] In its order, the Department listed a number of questions for stakeholders to answer, to determine whether the customer-facing deployment of technologies, including advanced metering infrastructure (AMI), would yield benefits that justify the costs of these technologies. The Department seeks input regarding the use of certain technologies for residential customers, including low-income customers, as well as other parties, to implement electric vehicle (EV) time-varying rates (TVR).

The Low-Income Energy Affordability Network (LEAN) and the Massachusetts Energy Directors Association (MEDA) offer the following comments in response to the Department's request. LEAN is an organization of 23 local agencies that delivers weatherization and energy efficiency services to low-income households across Massachusetts. MEDA is the organization of the directors of offices throughout the Commonwealth that administer fuel assistance and other energy benefits to eligible low-income households. LEAN and MEDA are both interested in ensuring that low-income communities and households affirmatively benefit from transportation electrification, and that these communities are not disproportionately burdened with expenditures related to EV infrastructure. Both organizations also have an interest in ensuring that EV-related rate design proposals, including TVR, serve the public interest, benefit low-income consumers, and do not financially harm low-income customers.

Although very few low-income customers currently own EVs, EV ownership is expected to rise over the coming years. As more affordable used EVs become available to consumers at all income levels, EV adoption among low-income consumers is likely to increase, particularly if state and federal policy improves affordability of these vehicles. While we recognize that few low-income consumers would be affected at this moment, we believe that it is important to lay the groundwork now to encourage an affordable and equitable transition to electrified transportation over the coming years and decades.

---

[1] Hereinafter, "NOI".

Our comments will focus primarily on the needs of residential low-income customers, and we provide comments on the Department's questions that are most directly relevant to these consumers. However, we note that issues related to commercial and industrial customers and EV site hosts may also affect low-income consumers, including those who will not own EVs, and those who may purchase an EV but lack access to charging at home and would rely instead on public charging infrastructure.

Our comments on several of the questions raised by the Department are below:

QUESTIONS PRESENTED BY THE DEPARTMENT

1. *Please discuss all factors the Department should consider when determining whether a targeted deployment of advanced metering functionality to EV customers is appropriate. As part of your response, identify any unique factors that should be considered for particular EV customer segments -- residential customers, low-income customers, C&I customers, EV charging site hosts).*

Affordability of electricity must remain a Department priority. Customers struggled with affordability even before the current pandemic. Now that tens of thousands of Massachusetts utility customers have lost income and are expected to struggle to pay household utility bills,[2] we urge the Department to carefully analyze factors that could raise rates for low-income utility customers, including investments in advanced metering infrastructure (AMI). Targeted investments in AMI to facilitate EV charging may be appropriate, but only if investments can be made without adding to the financial burdens of low-income customers and recognizing that low-income customers may not own EVs in large numbers for years or decades. Further, exploration of less costly means of demand management for EV charging should be part of any determination about even limited AMI deployment. The Department should use the utmost caution in its analysis.

Additionally, equitable access to transportation electrification should be an important consideration for the Department because access to employment and educational opportunities is paramount for low-income consumers, and therefore transportation is vital to expanding economic opportunities for low-income households.[3] EVs represent a technological opportunity for both environmental and economic benefits, if transportation electrification is implemented in a way that prioritized affordability and access for low-income and vulnerable consumers.[4]

The economic vulnerabilities of low-income customers should therefore be considered when designing TVR rates for customers with electric vehicles. For example, an EV-specific TVR

[2] D.P.U. 20-58. Inquiry of the Department of Public Utilities into Establishing Policies and Practices for Electric and Gas Companies Regarding Customer Assistance and Ratemaking Measures in Connection to the State of Emergency Regarding the Novel Coronavirus (COVID-19) Pandemic. (May 11, 2020).

[3] E.g., N.Y. Times, *Transportation Emerges as Crucial to Escaping Poverty* (May 7, 2015); The Atlantic, *The Transportation Barrier* (Aug. 9, 2015).

[4] See, e.g., National Consumer Law Center, *Principles for Fair and Equitable Investment in Electric Vehicles and Transportation Electrification* (Oct. 2018).

would be more protective of low-income ratepayers than a whole-house TVR. There is a lack of data to show that low-income customers could benefit from whole-house TVR rates, and existing research is, at best, inconclusive.[5] Low-income customers are likely to have less discretionary household load to shift for a number of reasons: they may be conserving energy as much as possible already, may be in the home for the entire day, may work irregular schedules which provide less flexibility for shifting load, and may own fewer or no appliances with discretionary load such as dishwashers or air conditioners. Thus, evidence shows that TVR and Smart Meters (or AMI) are not cost-justified for low-income customers because their shiftable LI load in response to demand response (DR) or TVR incentives is insufficient to justify the associated cost of the shift.[6] Since, at least in theory, other customers may be able to shift larger portions of their loads to save costs cost-effectively, the difference in savings will wind up as a net charge to LI bills. Thus, the LI concern with TVR and associated Smart Meters is that they will very likely result in a net increase in most LI bills.

Significantly, the Department found that "our review of the business cases for full deployment of advanced metering functionality showed that the anticipated benefits of these investments did not justify the substantial costs[,]" (NOI at 1-2) and that monetization of TVR is uncertain (NOI at 3), while leaving open the possibility that a narrow application to EVs may be economic (NOI at 3-6, 10 Q2d).

An EV-only TVR rate avoids these pitfalls. However, of course, the Department will still need to determine the utility costs involved in designing and implementing an EV-only TVR, such as information technology upgrades and billing system changes (in addition to the meters themselves) and whether these costs are reasonable, prudent, and cost-effective. An EV-only TVR rate could make EV operation more affordable for low-income customers, and other residential customers who would be likely to charge their EVs most frequently at home.[7]

---

[5] E.g., Cappers, Spurlock, Todd and Ling, Experiences of Vulnerable Residential Customer Subpopulations with Critical Peak Pricing, Lawrence Berkeley National Laboratory (Sept. 2016).

[6] For example, National Grid conceded that the anecdotal evidence of the pilot is that low-income customers are 39% as responsive as others to time-varying rates because their use of electricity is carefully limited to that which is essential. (Tr. in DPU 15-120 from 127, line 10.) TVR proponent Cape Light witness Rabago agrees that not all will benefit from time-of-use pricing, especially low-income and medically dependent customers. [6] (Tr. in DPU 15-122 at 400, line 17 - 401, line 14.) Indeed, Eversource made the case for the minimal benefit of time-of-use pricing for the vast majority of customers:

> Q. One of the conclusions that the company has reached is that most residential customers don't have enough load to shift to benefit from TVR; right?
> A. [MCLEAN-CONNER] That is correct, Mr. Oppenheim. Most customers just do not have the discretionary load to shift. ... time-varying rates are just not something most customers want to participate in. (Tr. in 15-122 from 343, line 14.)
> * * *
> we believe very few residential customers have the discretionary load, and based on our pilots and based on our look across the country, only 5 percent of the customers -- we believe that's a very good number -- really want to be participating. (Tr. in DPU 15-122 at 295, from line 3)

[7] Idaho National Laboratory*, How Do the EV Project Participants Feel about Charging their EV at Home?* The EV Project (Feb.2015); Pepco, *Grid Related Costs Associated with EV Charging,* MD PSC Public Conference – PC-43 (July 14, 2016) (citing data from EPRI, Technical Update, *Pepco Demand Management Pilot for Plug-In Vehicle Charging in Maryland: Final Report – Results, Insights and Customer Metrics* (May 5, 2016).

However, we also note that many low-income households may not be able to take advantage of such a rate because they may lack a parking space or other location at which to charge an EV at home. According to one study, only about 56 percent of residential car owners have an off-street parking space.[8] Low-income households are more likely than others to be renters,[9] so it is likely that the percentage of low-income vehicle owners with dedicated parking space is even lower. Public, workplace, or other charging stations located away from home will be important to address the needs of EV drivers who cannot charge at home.

If the Department ultimately allows targeted investments in AMI to facilitate TVR for customers with electric vehicles, meter costs should be fully allocated to non-low-income EV customers. Utilities in many states have adopted different types of EV TOU rates, including EV-only rates, and rates that require EV owners to bear certain costs for separate meters.[10] The Department to should exempt low-income EV households from meter and other fees in order to expand access for these customers in the future when the transition to electric vehicles makes economic sense for these households.

Finally, low-income consumer protections should be present in any program that uses advanced metering. Any AMI must comply with the Department's rules regarding termination of service, at 220 CMR 25.02, and must not be used for remote termination of service or reduction of electricity as a means of bill collection. The Department should also investigate whether technology that the Companies seek to use has adequate privacy protections for consumers, to avoid breaches of the customer's digital privacy.

Energy efficiency program considerations

While the scope of this docket is limited to time-of use-pricing for EVs, demand management (including time-of-use pricing) is a high priority for general energy efficiency policy attention. From a low-income energy efficiency perspective, it is important to understand that there are very few low-income customers who own EVs at this time, and the rate of EV adoption for these consumers is uncertain and heavily dependent on state and federal programs and policies that are beyond the scope of this docket. In light of the very low levels of current EV ownership among low-income customers, there are shorter-term challenging low-income hi-tech options where current attention and perhaps demand management is more likely to be rewarded relatively quickly, such as building electrification (specifically, air source heat pumps). Whether it is the intent of the Department or not, this docket may be seen as setting priority focus on a specific new electrification or energy efficiency technology (EVs) rather than those

[8] Elizabeth J. Traut et al., *US Residential Charging Potential for Electric Vehicles*, Transportation Research Part D: Transport and Environment (Dec. 2013), at www.researchgate.net/profile/Elizabeth_Traut.

[9] E.g., Renter median income is 54% of owner income; renter income is 63% of median income while owner income is 17% above (2017). National Multifamily Housing Council (NMHC) tabulations of 2018 Current Population Survey, Annual Social and Economic Supplement microdata, US Census Bureau. (Updated 2019), https://www.nmhc.org/research-insight/quick-facts-figures/quick-facts-resident-demographics/household-incomes/ (table at Median Household Income).

[10] For a listing of EV TOU rates, see Smart Electric Power Alliance, *Residential Electric Vehicle Rates That Work*, Appx. A (Nov. 2019).

new technologies at the core of low-income energy efficiency strategy, such as air source heat pumps.

There is no basis for investing low-income energy efficiency funds at this time in EV development. In contemplating any new technology investments or rates, the Department must avoid any measures that will reduce the budgets for current energy efficiency programs that serve low-income customers, which continue to prove their effectiveness in promoting immediate affordability for these customers while advancing the Commonwealth's climate goals. Additionally, we urge the Department to carefully consider whether less expensive options such as simple Demand Response (DR) programs, or options discussed below at question 8, are sufficient to manage EV charging or other customer uses, rather than more costly AMI, as well as the rate impacts of any investments on low-income customers.

Principles established in this docket for EV Demand Response (DR), and possibly time-of-use pricing (TOU, Time Varying Rates or TVR) may be seen as a potential model for energy efficiency measures (NOI at 6) such as with respect to heating. There are many unresolved questions about costs and benefits of energy efficiency demand response, especially with respect to low-income customers and measures. Energy efficiency planning is the superior place for Department determination of such questions; EV demand response should not be considered in isolation from other energy efficiency measures to which demand response may be applied.

2. *Please:*

a. describe generally what basic service supply TVR design options each company should make available to the following EV customer segments: (1) residential EV customers; (2) C&I EV customers; and (3) EV charging site hosts. Identify and discuss the basis for any differences between TVR design options for each EV customer segment;

As mentioned above, these comments will focus on low-income residential customers.

Any low-income EV TVR should be subject to the same consumer protections that apply to other residential rates including bill affordability programs. Customers who qualify for the R-2 or R-4 discount rate should receive the same percentage discount on the EV TVR. Protections from termination for customers who suffer a financial hardship and meet the other qualifications set forth at 220 CMR 25.03 should also receive the same protections for the EV TVR. Stable access to electricity, even in difficult economic circumstances, will be an important consumer protection as consumers are encouraged to switch to electric vehicles, and to adopt other beneficial electrification measures.

An important principle to apply with respect to low-income customers is that that costs should follow benefits; for low-income customers, EV benefits are likely to be very small, at least in the short term. However, we support increased access to electric vehicles and transportation electrification options for low-income consumers for various reasons, provided there are net economic benefits to low-income households. EVs generally have lower costs of

operation than gasoline-fueled vehicles, and thus could provide a more affordable and reliable transportation option.

As described below, alternative means may develop at scale for low-income households to participate in transportation electrification. However, the current availability of EV ownership to low-income households is a reminder of how wide the affordability gap is. As noted earlier, EV purchase costs are generally more expensive than for gasoline-powered alternatives, so low-income EV adoption is likely to remain low for some time. The overwhelming reality is that low-income household economics suggest that LI car buyers must buy used cars, if any. We last checked Edmunds.com on August 11, 2020, which reported that the number of used EVs priced at or under $15,000 within 200 miles of zip code 01610 (Worcester) is 0.6% of all locally listed cars for sale -- 253 in an area that covers an area beyond Massachusetts.

Until EV adoption for low-income customers progresses, there must be measures put in place to mitigate any financial impact on low-income customers. For the very few low-income customers who may obtain EV charging stations, there is sound regulatory policy[11] based on the low-income discount rate for holding low-income customers harmless from the cost of any Smart Meter involved.

Low-income access to EVs may gradually increase, but as noted above this is dependent on policies beyond the scope of this docket, or even within this Department's authority. However, we note that some factors may affect the rate of adoption. In California, previously leased EVs have become a source for low-cost used EVs, which may be shipped outside of the state.[12] However, even with purchase or leasing incentives, not all low-income consumers will be able to buy an EV in the near future or would choose to do so. Car ownership, while desirable for many, will not be the best solution for all consumers, and programs that are designed to assist low-income consumers can use other methods to serve their transportation needs. Subsidized EV car sharing programs, and electrification of public transit and school buses, are being piloted in some states to meet the mobility needs of low-income communities.[13] Closer to home, an EV car sharing program for low-income drivers is being developed in Worcester.[14] The Worcester Regional Transit Authority has had electric buses in service for several years.[15] Electric school buses and shuttles have been funded with the Commonwealth's portion of the Volkswagen emissions settlement.[16] Issues that affect C&I customers and site hosts may impact low-income consumers who use these services.

A likely benefit for low-income customers of widespread use of EVs is the projection that low-income EV demand management will put downward pressure on rates, if charging is

[11] E.g., G.L. c. 164, sec. 141 (re: solar).
[12] See, e.g., Consumer Reports, "It's a Great Time to Buy a Used Electric Vehicle" (Aug. 31, 2018), at consumerreports.org; Edmunds.com.
[13] E.g., California Public Utility Commission, *Decision on the Transportation Electrification Standard Review Projects*, No. A.17-01-020 (May 31, 2018).
[14] Good2Go Program, at communitycleanenergyproject.org/electric-car-sharing/
[15] Worcester Telegram, "Worcester Regional Transit Authority Puts Fifth Electric Bus on the Road" (July 18, 2014).
[16] See, e.g., Massachusetts DEP, Volkswagen Settlement Open Solicitation Grant Recipients, December 2019.

managed in a way to reduce load factor and the bulk of charging happens at off-peak times.[17] To achieve this outcome, TVRs and other incentives will be needed to encourage drivers to charge their vehicles at times when there is excess generation on the grid.[18] Any financial impacts of these investments must be mitigated for low-income customers, so that the costs thereof do not exceed the rate benefit to low-income customers. The General Court established a principle appropriate to apply here: where a policy of utility ratemaking is adopted for its general social benefit, but the resulting subsidy has adverse impacts on low-income ratepayers, rates paid by LI households should be adjusted to offset the adverse impacts.[19] Accordingly, the Department must carefully analyze any potential rate impacts on low-income customers, and shield low-income customers from bearing a disproportionate cost burden.

. . . .

d. for each identified TVR design option in (a) through (c), discuss whether the TVR should apply only to the EV-charging portion of the customer's load or to the customer's entire load;

As noted above, an EV-only TVR would be preferable for residential customers and essential for low-income customers, since a whole-house TVR could result in higher electric bills for many low-income families. An EV-only TVR avoids this problem for low-income customers by focusing load shifting on the vehicle, not on household uses where a family may have few options. An EV-only TVR would be targeted toward the goal of directing EV charging to off-peak times and would thus provide more clear information to customers about preferred times for EV charging.

Applying TVR pricing to all usage of EV customers would be a disincentive to home EV charging for many, including LI customers whose usage is so small and not shiftable that home TVR would result in a net bill increase. For this reason, there should be a separate EV rate class so the immediate beneficiaries of EV charging and DR should alone pay the costs thereof. This rate classification can be revisited periodically when and if general projected overall net benefits are realized. The point is not to prevent technological improvements of general benefit, but rather to mitigate any adverse impact on LI households that occurs despite beneficial impacts in general.

e. for each identified TVR design option in (a) through (c), discuss how it is designed to provide effective price signals to EV customers so that they can take actions that will contribute to reducing system peak demand; and

---

[17] See, e.g., Synapse Energy, Electric Vehicles are Diving Electric Rates Down (June 2020), at https://www.synapse-energy.com/sites/default/files/EV_Impacts_June_2020_18-122.pdf.

[18] See, e.g., Danielle Goldberg et al., Synapse Energy Economics Inc., *New England Electrification Load Forecast* (May 12, 2020).

[19] G.L. c. 164, §141, re: solar.

In addition to the points raised above, we note the following rate design concerns:

Staggered or ramped start times for off-peak rates may be needed to avoid creating a second peak. Tiered off-peak rates may also be an option (e.g., reduced rates from 9-11pm, and a larger discount from 11pm-6am). Longer off-peak windows may also encourage drivers to charge at times of low demand -- research in California regions with large numbers of EVs indicates that longer off-peak periods may encourage drivers to charge at more varied times and help avoid a second peak.[20]

We also note that the presence of competitive electric suppliers in this market may complicate these efforts. As the Department has indicated, this proceeding will address rates for basic service customers (NOI at 7). Basing a TVR rate on both the supply and distribution rates may result in a stronger price signal to affect charging behavior. We also note that there is precedent in Maryland for limiting participation to basic service customers.[21] As the Department is aware, there is mounting evidence that individual retail sales of competitive electric supply increase the electric costs for residential customers, with a particular burden on low-income customers.[22] In considering a rate structure that incentivizes EV charging with price signals, we submit that any rates that are higher than basic service rates would likely distort the price signals of a TVR. Since a TVR based on arguably inflated supplier rates would likely dilute the effectiveness of the TVR and interfere with Commonwealth's climate and transportation electrification goals, the Department should require that customers must remain on basic service to be enrolled in any TVR rate.

f. where applicable, provide citations to jurisdictions where the identified TVR design options have been applied.

See above, including footnotes.

. . . .

8. Please discuss whether the Department should require all new service meters to be capable of providing advanced metering functionality when installed to replace an existing meter that reaches the end of its useful life or otherwise needs to be replaced.

---

[20] Synapse Energy, Electric Vehicles are Driving Electric Rates Down (June 2020), at https://www.synapse-energy.com/sites/default/files/EV_Impacts_June_2020_18-122.pdf.

[21] For an example of another jurisdiction with a deregulated market that limits participation in TOU rates to customers on basic service, see Baltimore Gas and Electric Company, Residential Electric Vehicle Time of Use – Electric, Schedule EV, P.S.C. Md. – E-6 (Supl. 637) (Dec. 17, 2019) (customers must be signed up for "Standard Offer Service").

[22] Office of Attorney General Maura Healey, *Are Customers Benefitting from Competition? An Analysis of the Individual Residential Electric Supply Market in Massachusetts* (Aug. 2019 Update); Energy Choice Matters, "Massachusetts Utilities Report Low-Income Customers Paid Over $30 Million More ON Competitive Supply Versus Basic Service During Past ~2.5 Years" (July 20, 2020).

Without a careful analysis of which types of advanced meters or advanced functions would be used by the Companies, how these advancements would benefit customers, and a cost-benefit analysis of replacing existing types of service meters with AMI, the same financial concerns and cost-benefit analysis that led to the Department's decision in D.P.U. 15-120/15-121/15-122 would continue to apply. A blanket policy to replace all meters with AMI remains not warranted at this time and could lead to increased utility stranded costs.

Further, it is possible that in the near future, AMI would not be needed to achieve the ends that the Companies and Department seek. EVs and L2 charging stations are already equipped with technology to track details about vehicle charging. It may be possible to forgo AMI entirely at some point and rely on the technology already embedded in these vehicles to implement TVR or other incentives to charge off-peak, or in the home EV chargers that customers may choose to install.[23]

CONCLUSION

For all these reasons, the Massachusetts Energy Directors Association and The Low-Income Energy Affordability Network urge the Department to:

- Determine the least-cost means of EV charging demand management,
- Protect low-income customers from rate and bill increases due to EV charging investment and demand management,
- Avoid unintended adverse impacts on ratepayer-funded energy efficiency programs, particularly low-income programs.

Respectfully submitted,

The Low-Income Energy Affordability Network and
The Massachusetts Energy Directors Association

By their attorneys,

/S/

Jenifer Bosco
Staff Attorney
National Consumer Law Center

[23] The Department approved National Grid's off-peak charging rebate, using data from EV chargers, in D.P.U. 18-150. D.P.U. 18-150, Order, at 387-392 (Sept. 30, 2019). In Maryland, the Public Service Commission found that in some instances, smart EV chargers could be used as "submeters" to implement an EV-only time of use rate without socializing the costs of additional meters. See, Maryland PSC, Order No. 88997, Case No. 9478, EV Portfolio Order, at 51-52 (Jan. 14, 2019).

7 Winthrop Square, 4th floor
Boston, MA 02110
617-542-8010
jbosco@nclc.org

/S/

Jerrold Oppenheim, Esq.
57 Middle Street
Gloucester, Mass. 01930
JerroldOpp@DemocracyAndRegulation.com
978-283-0897

Dated: August 13, 2020

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Investigation by the Department of Public Utilities on its own Motion into the Modernization of the Electric Grid – Phase Two	**)** **)** **)** **)**	**D.P.U. 20-69**

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all parties of record in this proceeding in accordance with the requirements of 220 C.M.R. 1.05(1) (Department's Rules of Practice and Procedure). Dated this 13th day of August, 2020.

/S/

Jenifer Bosco
Staff Attorney
National Consumer Law Center
7 Winthrop Square, 4th floor
Boston, MA 02110
617-542-8010
jbosco@nclc.org