COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Investigation by the Department of Public Utilities on its own Motion into Electric Vehicles and Electric Vehicle Charging	D.P.U. 13-182

COMMENTS OF ENE (ENVIRONMENT NORTHEAST)

ENE (Environment Northeast) appreciates the opportunity to provide comments to the Department of Public Utilities ("Department") in Docket 13-182, Investigation by the Department of Public Utilities upon its own Motion into Electric Vehicles and Electric Vehicle Charging. ENE is a non-profit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economies. These comments address the questions raised in this docket that were not addressed in the comments filed separately as Joint Comments on Scope of Authority, primarily Questions B.1-4, C.1-5, D.1-3, and E.2. The issues and arguments in those comments should be considered a baseline that these comments build upon.

The Order opening this investigation lays out the history leading up to the opening of this docket, particularly the activities that have taken place as a part of Docket 12-76 on Grid Modernization, the Massachusetts Electric Vehicle Initiative Task Force ("MEVI Task Force"), and inter-state discussions on electric vehicles ("EVs") and other zero-emissions vehicles. ENE has participated extensively in the deliberations of the MEVI Task Force as well as the Grid Modernization proceeding. As explained in detail below, we recommend the following:

- In addition to economic and environmental benefits, EVs can provide a wide variety of system benefits due to storage capabilities and voltage regulation services. Net benefits can be maximized with appropriate outreach to vehicle owners and full consideration of storage and grid services from electric vehicles in state and regional planning processes, as well as with time-varying rates for EV charging and proper notifications to utilities (discussed in other sections).
- Unregulated affiliates of electric distribution companies, but not the distribution companies themselves, should be allowed to participate in the EV charging market to the same extent as other private parties. There are a few exceptions to this general rule however. In a narrow set

of circumstances involving underserved areas, it may be warranted to allow the distribution companies themselves to own electric vehicle supply equipment ("EVSE") and recover the capital costs through rates. Similarly, the utilities should be allowed to own charging infrastructure to service their own fleets, to provide charging for employees, and for certain types of pilot programs.

- There are some unique rate issues that present themselves in the context of EVs and charging infrastructure, although the broader issues of rates and metering infrastructure may be addressed in the Grid Modernization docket and the new Time-Varying Rates docket. The Department should explore low-cost submetering options, particularly for residential EV charging, to allow EV-specific time-varying rates. The Department should also ensure that demand charges contained in non-residential rates do not unduly inhibit investment in charging infrastructure. Similarly, system upgrades needed because of incremental load from EVs should be paid for in a manner consistent with load growth from other sources.
- The Department must balance the benefit of notifications with the possibility that overly burdensome requirements on EV purchasers or charging infrastructure installers could slow down the market. A cooperative system should be worked out where the registered address of an EV is provided from the Registry of Motor Vehicles to the relevant distribution utility with appropriate privacy protections. Additionally, tariffs could require notification to the local distribution company whenever the power draw of prospective charging infrastructure crosses a major threshold.

Taken together, these recommendations would provide a framework to speed adoption of EVs and maximize the net benefits that EVs can provide to society and the electric grid.

I. Benefits and Costs of EVs

The Memorandum of Understanding on State Zero-Emissions Vehicles Programs ("ZEV MOU"), signed by Massachusetts and seven other states in October of 2013, correctly identifies that increasing

the percentage of electric vehicles driven in our Commonwealth is "a critical strategy for achieving our goals to reduce transportation-related air pollution, including criteria air pollutants, mobile source air toxics and greenhouse gas emissions (GHGs), enhanc[ing] energy diversity, sav[ing] consumers money, and promot[ing] economic growth." The broader economic benefits of EVs come from local jobs in related industries and the significant fuel savings to consumers who switch from gasoline-based vehicles. Perhaps the most significant aspect of this equation is the significant GHG benefits from EVs. ENE recently released *EnergyVision*,[1] an analysis showing that vehicle electrification, combined with cleaner electricity sources, is a key pathway to achieving our ambitious long-term GHG reduction targets. With the current electricity mix, the per-mile GHG emissions from an EV are 60% lower than the emissions of a comparable medium sedan.[2] Given that our Commonwealth's share of the overall target in the ZEV MOU is approximately 300,000 vehicles, roughly 10% of the current automobile fleet, meeting this target could result in a reduction of 1 million tons of GHGs *even with our current electricity mix*. As the Commonwealth's renewable policies and the increasing competitiveness of renewable technologies continue to clean the sources of energy used on our electric grid, these benefits will only get larger.

In addition to these major societal benefits, Question C.1 asks about the short- and long-term benefits and costs of EVs to the electric system. In the short term, increased load from EVs, if properly distributed at times of low impact to the transmission and distribution system with time-varying rates and other policies discussed below, could benefit current ratepayers by spreading the fixed costs of the system over a greater amount of energy, thus cutting the volumetric rates paid by ratepayers to cover those costs. By incorporating appropriate demand response technologies, EVs could serve as an effective mechanism to promote the integration of non-dispatchable renewable resources into the grid, by allowing demand to better match supply on a temporal basis. In the medium- to long-term, EVs will be able to provide major system benefits through a suite of technologies collectively known as vehicle-grid

[1] http://www.env-ne.org/public/resources/ENE_EnergyVision_Framework_FINAL.pdf
[2] *Id.* at 9.

integration ("VGI"). These technologies allow an electric vehicle to act as storage and provide energy back to the grid and to provide other grid services, such as frequency regulation. Although these technologies exist, policymakers across the country have only begun to scratch the surface on the changes needed to implement them effectively. The California ISO recently released a report, in conjunction with the California Energy Commission and California Public Utilities Commission, on this very topic.[3] The potential benefits of implementing these technologies are quite high. Storage capabilities presents the most intuitive categories of benefits, by reducing all costs associated with higher peak loads, such as investments in transmission and little-used peaking generation capacity, and reducing marginal energy prices and congestion costs. Storage also has environmental benefits, because it shifts generation away from dirtier, less-efficient units that only generate at peak times. It should be noted that the benefits of storage can only captured by a consumer to the extent that time-varying rates are available. There are possibilities for EVs to incur costs on the system as well, particularly if not managed properly. These costs would primarily be the ones associated with higher peak load, either locally or regionally, such as increased distribution or transmission investment, higher capacity needs, and higher marginal energy prices. With proper planning for integration, benefits should far outweigh costs, before even accounting for the major economic and environmental benefits outside the strict definition of the electric system.

There are numerous policies that the Department and Commonwealth could follow to maximize the net benefits to the system from EV charging, as asked in Question C.2. This includes time-varying rates (discussed in Section III) and proper notification to utilities of EV purchases and infrastructure installation (Section IV). In addition, utilities can do consumer education and outreach to promote charging at off-peak hours, even without the direct economic incentive of time-varying rates. Lastly, the load and storage capabilities of EVs should be fully included in utility-specific, state, and regional planning processes. At the regional level, EVs, like any other category of storage, should be included in a

[3] http://www.caiso.com/Documents/Vehicle-GridIntegrationRoadmap.pdf

manner similar to energy efficiency and distributed resources forecasts. At the utility level, EVs must be included in order to properly evaluate certain types of distribution investments, such as those being considered in the Grid Modernization docket. For example, enabling two-way power flow is necessary for optimal use of distributed storage and distributed generation resources. Similarly, the benefits of advanced metering infrastructure must include the benefits of managing EV load.

II. Role of Electric Distribution Companies

Questions B.1-4 ask commenters to address the role that electric distribution companies should play in the EV charging market. In general, the electric distribution companies should not be allowed to invest in EV charging infrastructure and recover those costs through distribution rates. The guarantee of cost recovery would provide an unreasonable advantage over other private parties and prevent real competition from emerging in this market. There should be several narrow exceptions to this general rule however. First, the distribution companies should be allowed to own charging infrastructure for their own fleets and to provide charging for their employees while at work. Second, pilot projects may require utility ownership of EVSE. Third, to the extent that the distribution companies already own and operate EVSE, it may be appropriate to allow them to recover the costs of operation and maintenance through distribution rates.

More significantly, the Department can define a narrow set of criteria for conditions where utility investment, and cost recovery through rates, should be allowed for EVSE accessible to the general public. For example, the Oregon Public Utility Commission, in Order 12-013, determined that the utilities must make a "*compelling* case" (p. 10, italics in original) for a regulated utility to recover the costs of EV infrastructure through rates and identified the following criteria as highly relevant but not necessarily completely determinative: (1) net benefits to ratepayers, (2) infrastructure is essential to EV adoption in the area, (3) 3rd parties or an affiliate of the utility is not likely to provide the service, and (4) the utility has a separate EV rate class. Although the Department need not adopt all of these criteria, the

crucial aspect is that they provide a very strong presumption against utilities undercutting the private market because of their underlying regulatory guarantees.

Because these same issues do not arise without that regulatory guarantee, unregulated utility affiliates, such as a new EVSE corporation wholly owned by the utility or parent company, should be allowed to participate in the market to the same extent as other private parties. Several parts of existing law, notably M.G.L. Ch. 164, § 94B, protect against unreasonable arrangements between the regulated entities and unregulated affiliates. The unregulated affiliates should be subject to the same distribution rates and other policies as other private parties.

III. Rate Issues

The Department asks about rate structure issues in Question D.1-3 and they are also relevant under Question C.2. In particular, time-varying rates have the potential to minimize negative system impacts and maximize positive system impacts. The case for time-varying rates for electric vehicle charging is mostly a specific instance of the general case, where the small costs of advanced metering infrastructure and administration are worth the larger benefits of shifting load, or net load when considering storage, to times when energy costs, as well as impacts on the distribution and transmission system, would be lower. It is possible that consumers would be more accepting of EV-specific time-varying rates since it represents new load and does not risk increasing their electric bills for existing uses. As a result, the Department should explore the relative costs and benefits of both "whole-house" time-varying rates and low-cost submetering options to allow EV-specific time-varying rates. Full dual metering can be investigated but may be too expensive to implement successfully. Time-varying rates, either whole-house or EV-specific, need not be mandatory but should be sufficiently attractive to incentivize their adoption. Predictable time-varying rates would be the most beneficial for EV charging, such as designated on-peak, off-peak, and even "super off-peak" hours.

Two other rate-related issues should be addressed in this docket. The Department should ensure that demand charges contained in non-residential rates do not unduly inhibit investment in charging

infrastructure. Although DC fast chargers have the potential to require additional system upgrades, they will also provide a significant service to EV owners and, sufficiently spread across the Commonwealth, have the potential to end range anxiety issues. In the short term, DC fast chargers may not have high hourly utilization rates so high demand charges would have to be spread over relatively few units of energy, possibly leading to prohibitively high charging costs to the consumer. As the prevalence of EVs increase, utilization rates should rise and these types of issues should become less important. However, the Department should be sensitive to these short-term issues because the very existence of DC fast chargers may be crucial to jump-starting this market. Lastly, as asked about in Question C.5, system upgrades required for EV charging infrastructure should be treated the same as other incremental types of load, such as hot tubs or air conditioners, in terms of cost recovery and any special charges.

IV. Utility Notification of EV Purchase and Infrastructure Installation

Issues of utility notification go to Questions C.2-3 and E.2. The Department must balance the benefit of notifications with the possibility that overly burdensome requirements could hamper the market. To the extent possible, notification should also use existing sources of information. For example, registered addresses of newly purchased EVs should be disclosed, with appropriate privacy protections, to the utilities from the Registry of Motor Vehicles. This type of data can be used for distribution system planning purposes but it would also be useful to promote time-varying rates and other outreach to electric vehicle owners. As a result, this information may also be disclosed to suppliers of generation services in order to promote effective competition in time-varying generation rates. The Department should try to work out a cooperative system with the RMV, although legislation may be required. Although utility tariffs likely already include notification requirements for significant new power demands, it may be worth specifically establishing notification requirements for major charging infrastructure installations, defined appropriately in terms of the size of the circuit in amperes required for the equipment or the peak power draw of the equipment in kW.

V. Conclusion

ENE greatly appreciates the opportunity to submit these comments on the Department's notice of investigation in this docket. We applaud the Department's decision to open this investigation and proper action by the department will speed the adoption of electric vehicles and help the Commonwealth meet its economic and environmental goals.

Thank you for your consideration of these comments.

Respectfully submitted,

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