

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

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In the Matter of a Commission Inquiry into
Electric Vehicle Charging and Infrastructure

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DOCKET NO. E-999/CI-17-879

ORDER MAKING FINDINGS AND
REQUIRING FILINGS

INTRODUCTION

While still a small share of the market, electric vehicle (EV)¹ sales are growing rapidly and show signs of increasing growth. The Legislature has taken steps to facilitate the adoption of EVs in Minnesota. Minn. Stat. § 216B.1614 requires each public utility to have a tariff specifically designed for EV charging that offers time-of-day or off-peak rates to customers who own EVs. Minn. Stat. § 216B.02, subd. 4, exempts entities that sell electricity for EV charging from regulation as a public utility, which allows non-utilities to develop and operate charging infrastructure.

EVs have the potential to benefit Minnesota in numerous ways, but could also adversely impact the electric system if their integration is not planned. In order to facilitate EV integration in a manner consistent with the interests of the public and of ratepayers, the Commission initiated this investigation into EV charging and infrastructure.

PROCEDURAL HISTORY

On December 28, 2017, the Commission opened the present docket by issuing a Notice. The Notice stated,

The purpose of this inquiry is to gather information and gain a better understanding of the following:

1. The possible impacts of EVs on the electric system, utilities, and utility customers, including the potential electric system benefits;

¹ Minn. Stat. § 169.011, subd. 26a, defines “electric vehicle” as “a motor vehicle that is able to be powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and meets or exceeds applicable regulations in Code of Federal Regulations, title 49, part 571, and successor requirements.” The definition includes a neighborhood electric vehicle, a medium-speed electric vehicle, and a plug-in hybrid electric vehicle.

2. The degree to which utilities and utility regulatory policy can impact the extent and pace of EV penetration in Minnesota; and
3. Possible EV tariff options to facilitate wider availability of EV charging infrastructure.

The public interest should benefit from a better understanding of these issues and from more regulatory certainty.

On March 16, 2018, the Commission convened a public workshop featuring national and local EV experts in order to discuss the challenges and opportunities surrounding EV adoption in Minnesota.² The workshop included panels on charging infrastructure, cooperative and municipal utility EV initiatives, and investor-owned utility and stakeholder perspectives.

On May 9, 2018, the Commission issued a Notice of Comment Period, requesting comment on a variety of EV issues including barriers to EV adoption, guiding principles for EV adoption, the possible effects of increased electric retail sales for EVs, cost recovery for EV-related investments, EV pilot programs, and cost-benefit analysis of EVs.

By August 8, 2018, the following parties submitted comments in response to the May 9 Notice:

- Alliance for Transportation Electrification
- Center for Energy and the Environment
- Ceres
- ChargePoint, Inc.
- Citizen's Utility Board of Minnesota
- Dakota Electric Association
- Fresh Energy, Natural Resources Defense Council, Sierra Club, & Minnesota Center for Environmental Advocacy (the Clean Energy Organizations, or CEO)
- Greenlots
- Institute for Local Self-Reliance
- Minnesota Department of Commerce, Division of Energy Resources (Department)
- Minnesota Pollution Control Agency & Minnesota Department of Transportation (MPCA/MDOT)
- Minnesota Power
- Office of the Minnesota Attorney General, Residential Utilities and Antitrust Division (OAG)
- Otter Tail Power Company (Otter Tail Power)
- Siemens
- Tesla, Inc.
- Union of Concerned Scientists
- Xcel Energy

² The Commission issued notices of the workshop on February 1, 2018 and March 5, 2018.

By August 24, 2018, the following parties filed reply comments:

- Center for Energy and the Environment
- CEO
- ChargePoint, Inc.
- Citizen's Utility Board of Minnesota
- The Department
- Greenlots
- MPCA
- Siemens
- Tesla, Inc.
- Union of Concerned Scientists
- Xcel Energy

On December 13, 2018, the Commission met to consider the matter.

FINDINGS AND CONCLUSIONS

I. Summary of Commission Action

In this order, the Commission will make general and specific findings regarding EVs in Minnesota based on the input received in the course of this investigation, and will direct Xcel Energy, Minnesota Power, and Otter Tail Power to submit plans and proposals for EV-related programs and investments.

The Commission received comments and reply comments from many different stakeholders, each with a unique perspective and expertise regarding EVs and the broader electric system. The Commission has reviewed and considered these comments, and this order discusses below the most prominent issues that emerged from these comments.

II. Key Issues

Issues discussed in this section are not necessarily the views of the Commission, but rather a summary of the issues raised in the course of the investigation. The Commission offers this summary to provide context for the Commission's findings and order, which are informed by these views.

A. Potential Benefits of and Barriers to EVs

1. Benefits of EVs

EVs have the potential to deliver a variety of benefits to Minnesota, especially environmental and public health benefits. Replacing fossil fuel powered vehicles with EVs can reduce greenhouse gas and other harmful emissions, especially as the rise of EVs coincides with the rise of renewable energy and the decline in coal-fired electric generation.

Reducing greenhouse gas emissions is key to stopping climate change, and Minnesota has accordingly established greenhouse gas emissions reduction goals.³ But according to MPCA, the transportation sector is a leading source of greenhouse gas emissions in Minnesota and has not significantly reduced emissions levels.⁴ Increasing the adoption of EVs in Minnesota can help the state meet its emissions reduction goals and fight climate change.

Fossil-fuel powered vehicles also emit harmful pollutants that can cause adverse public health effects.⁵ These harmful pollutants tend to disparately impact minority and low-income areas where emissions are higher. Switching to EVs can help reduce emissions of these harmful pollutants and improve health outcomes in these vulnerable communities.

By using more electricity, EVs can benefit all ratepayers. An increase in electricity sales can drive down rates for all ratepayers “by spreading the utilities’ fixed costs over a greater amount of kilowatt-hour sales,”⁶ especially if EV charging occurs during times of low demand when not as much electricity is consumed by customers. It is estimated that an EV driver uses 4,000–5,000 kilowatt hours annually, but the Department concluded that significant growth in EVs is necessary before it would noticeably impact electric consumption.⁷

Utilities can play a role in advancing these wide-ranging potential benefits by helping facilitate the growth of EVs through education of the public and development of EV charging infrastructure.

2. Barriers to EVs

Widespread EV adoption is not a given due to conditions that can hamper the growth of EVs. The two main barriers to EVs that have been identified in this docket are insufficient charging infrastructure and lack of consumer awareness of EVs and their benefits.

These barriers are intertwined, because a great way to remind consumers about EVs and show that EVs are a viable and convenient option is for consumers to encounter charging infrastructure as they go about their day. Potential EV owners have reported concerns about being able to complete their driving trips on a single charge, a phenomenon that has been labeled “range anxiety.” Installing plenty of chargers that potential EV owners encounter regularly can help counteract range anxiety and encourage EV adoption. Developing charging infrastructure is therefore a potential prerequisite to significant growth in EVs. However, third-party charging providers can face difficulties in developing charging infrastructure without robust EV ownership to support it. Utilities can play a role in facilitating and developing charging infrastructure in order to help bridge this gap.

³ Minn. Stat. § 216H.02.

⁴ MPCA/MDOT comments at 1.

⁵ See, e.g., *In the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422, Subdivision 3*, Docket No. E-999/CI-14-643, Order Updating Environmental Cost Values at 32–33 (January 3, 2018) (Updating Environmental Costs Order).

⁶ CEO comments at 5.

⁷ Department comments at 5.

B. Important Components of EV Proposals

1. Designing Efficient and Effective Rates

The electric system is designed to provide safe and reliable service at all times, including times of peak demand, which is the time of day when electricity use by the public is at its highest. In Minnesota, peak demand generally occurs during the evening hours when most people have returned from work, with the lowest demand occurring overnight.⁸ The growth of EVs has the potential to significantly impact the electric grid, because scores of EVs charging during times of peak demand could necessitate large investments in generation and distribution infrastructure to handle this new load. Fortunately, rate design can be an efficient and effective tool for avoiding these costly investments.

Time-of-use rates adjust the price of electricity based on the time that it is consumed, with low prices during low-demand periods and high prices during peak demand. A time-of-use rate could therefore encourage charging during times of low demand and impose higher rates for usage when demand is high to reflect the additional costs this usage imposes on the system. Using rate design to encourage charging during times of low demand can help the electric grid absorb and accommodate the new load created by EVs without the need for new generation or distribution infrastructure, thereby enhancing the efficient use of existing infrastructure and potentially driving down electricity rates.

Rate design mechanisms intended to encourage off-peak charging through lower rates at those times can be particularly effective for persuading public and private fleet managers to switch to EVs. Fleet managers “tend to be very sensitive to operations and maintenance costs, and so are more accustomed to thinking in terms of total cost of ownership” and therefore more likely to consider fuel cost savings in choices about vehicle types.⁹

Another benefit of encouraging charging during times of low demand is that overnight electricity consumption also tends to correlate with high generation of Minnesota’s most abundant renewable resource: wind power. Matching EV charging with wind generation could allow utilities to make better use of the wind resource and potentially support increased wind generation, which can help Minnesota meet its greenhouse gas and harmful emission reduction goals.

Smart or managed charging takes rate design a step further by enabling the utility to actively manage the charging load. Chargers can be equipped with two-way communication capabilities between the utility and the EV, which allows the utility to remotely control the rate of EV charging in order to meet a local or regional system need. For example, the utility could ramp up EV charging during times of high wind generation, and the utility could curtail charging during peak demand in areas with high EV penetration to defer the need for distribution infrastructure upgrades.

⁸ Department comments at 7.

⁹ CEO comments at 21.

2. Educating Ratepayers about EV Options and Benefits

The EV tariff statute allows utilities to recover costs incurred “to inform and educate customers about the financial, energy conservation, and environmental benefits of electric vehicles and to publicly advertise and promote participation in the customer-optional tariff.”¹⁰ A plain reading of this provision authorizes cost recovery for education efforts by a utility that go beyond simply encouraging customers to enroll in the utility’s EV tariff. The statute contemplates that utilities could disseminate information to customers about the overall benefits of EVs, such as the financial benefits to the individual customer in the form of lower fuel costs and broader environmental benefits of widespread EV adoption.

Utilities are uniquely situated to educate the public about the benefits of EVs because of their existing relationships and frequent contact with their customers. Education efforts could even target public and private fleet managers to encourage the transition of vehicle fleets to EVs—a high-impact opportunity for boosting EV adoption. Since lack of awareness about the benefits of EVs is a major barrier to EV adoption, utility efforts to educate ratepayers about benefits of EVs can be an efficient and effective way to encourage EV growth.

3. Investing in EV Charging Infrastructure

Because EV charging infrastructure must connect to the electric grid, utilities inevitably play a role in the development of that infrastructure. At a minimum, the utility will treat a customer hosting charging infrastructure like any new customer by providing a service connection to the customer, including any necessary distribution upgrades, up to and including the meter. The costs of the service connection are then allocated to the customer hosting the charging infrastructure in the same manner as any new customer.

Utilities can take on a larger role in developing EV charging infrastructure by assuming more of the costs and spreading them across all ratepayers. Under the “make-ready” approach, the utility could cover the cost of connecting the charging infrastructure up to the point where the charger connects to the grid. This approach could reduce the cost of building charging infrastructure, which could increase the economic viability of that infrastructure.

Utilities could build and own EV chargers, which would ensure development of charging infrastructure and strongly support the growth of EVs. A less direct approach could involve the utility offering financial incentives to third-party charging providers to build charging infrastructure.

Another factor to consider regarding EV charging infrastructure is the type of infrastructure that will be installed. For example, direct current fast charging (DCFC) infrastructure allows users to recharge in 10–30 minutes, drastically reducing charging time compared with traditional EV chargers and enhancing the potential for combined charging and parking services.

With any approach to development of EV charging infrastructure, there will be questions about which costs should be recovered from ratepayers and why. There are a number of mechanisms for cost recovery, as explained further below.

¹⁰ Minn. Stat. § 216B.1614, subd. 2(c)(2).

4. Cost Recovery of EV-Related Investments

Any discussion of utility investments raises the issue of how the utility will recover the cost of those investments from ratepayers. Utilities recover costs from ratepayers through a variety of mechanisms, depending on the type of cost being recovered. Different types of cost recovery can incentivize certain investments and behaviors of the utility.

In the course of this investigation, stakeholders suggested a variety of approaches to cost recovery for EV-related costs. A utility's capital investments in EV infrastructure could be added to rate base through a rate case and earn a rate of return on the investment. The Commission has also authorized cost recovery outside of a rate case through riders. Utilities could be allowed to earn a higher rate of return on EV-related investments as an incentive. Attaching performance metrics to EV-related costs could tie cost recovery to the utility's achievement of certain goals, such as customer participation or satisfaction. Allowing the utility to recover EV-related costs as operating expenses would distribute cost recovery across all ratepayers but without the utility earning a rate of return on those costs. To be clear, the Commission generally decides recovery of a utility's cost of service on a case-by-case basis considering factors such as the purpose, nature, magnitude, and potential benefits of the costs incurred.

For investments serving only one customer, such as home charging equipment, it may be appropriate to recover the cost from that customer. These costs could be recovered over time using on-bill financing, which would recover a portion of the cost through the customer's electric bill each month, thereby easing the burden of the cost to that customer.

5. Promoting Connections Through Interoperability

One concern with the buildout of EV charging infrastructure is "interoperability," which broadly refers to the integration between different charging networks, as well as integration between charging infrastructure and different models of EVs. Interoperability is viewed as an important principle in the development of EV charging infrastructure to ensure a smooth user experience for customers and enable different types of chargers to communicate across networks. The Commission has no authority over third-party charging providers and how they choose to build charging infrastructure in Minnesota, but the Commission can encourage and mandate interoperability in utility proposals for development of charging infrastructure.

One aspect of interoperability is the Open Charge Point Protocol (OCPP), an informal standard that enables communication between a charging station and network management system. Another aspect of interoperability is Open Automated Demand Response (OADR), which enables the two-way communication between the EV and the utility that is necessary for smart charging.

C. Commission Consideration of EV Proposals

1. Weighing Effects Through Cost-Benefit Analysis

The Commission generally evaluates a proposal on its own terms based on the record developed in that docket. This approach promotes consideration of the unique context surrounding the proposal. In addition, the Commission frequently weighs the costs and benefits of a particular proposal in order to determine whether the proposal is in the public interest. Parties can submit a

formal cost-benefit analysis that attempts to quantify various costs and benefits to determine whether the benefits outweigh the costs, or vice versa.

Determining the appropriate level of cost-benefit analysis to inform the Commission's decision can depend on the magnitude of the proposal. For example, a large, expensive project may require a more detailed cost-benefit analysis to persuade the Commission that approval is in the public interest, while a smaller pilot project that is intended to experiment with a new idea in a low-risk manner may not require such extensive analysis.

One challenging aspect of conducting a cost-benefit analysis can be in attempting to quantify the costs and benefits that could result from implementing the proposal. Fortunately, the Commission recently conducted an extensive investigation into the societal costs of fossil fuel emissions and established dollar values attributable to carbon emissions and other harmful emissions.¹¹ These environmental cost values can be used to compare the costs of continued fossil fuel use with the cost of investments in emission-reducing EVs. In addition, MPCA is "beginning to quantify the health and climate costs of vehicle emissions as well as the benefits from policies targeted at reducing these emissions, including the increased adoption of EVs."¹² Some factors that could be considered in a cost-benefit analysis of EVs include better grid management, public health, and other social benefits.

2. Evaluating Infrastructure Investments

In its comments, OAG proposed an "analytical tool" to assist the Commission in evaluating utility proposals to build EV charging infrastructure.¹³ OAG explained the analytical tool as follows:

Step one involves an analysis of the expected number of EVs expected within a state in a certain time period. This step includes analysis of economics and policy factors such as climate or air quality targets or EV adoption targets. Step two uses the information developed in step one to determine how much public charging infrastructure would be needed to support the projected levels of EV penetration including the type of chargers needed. There are existing resources for this task. For example, NREL has developed a tool to determine the level of infrastructure needs based upon population density, EV ownership rates, traffic patterns, and travel data. Step three is an assessment of the competitive market for charging infrastructure, to determine the ownership model for EV charging stations and the extent of utility involvement in the supporting infrastructure.¹⁴

¹¹ See generally Updating Environmental Costs Order.

¹² MPCA reply comments at 2.

¹³ OAG comments at 13–14.

¹⁴ *Id.*

This approach examines a number of factors to estimate the appropriate amount of infrastructure needed to support EVs, which can help avoid overbuilding infrastructure resulting in stranded assets.

3. Designing Effective Pilot Programs

Utilities occasionally propose pilot programs, which are temporary programs that allow the utility to test new technology or policies on a smaller scale. Pilot programs can be useful in the EV context because they allow utilities to experiment with different approaches to rate design, emerging technologies, infrastructure build-out, and other EV issues.

The purpose of a pilot is to determine whether a proposal is beneficial enough to warrant expansion to a full-scale program. A pilot proposal should articulate clear goals for the pilot and detail the evaluation metrics that will be used to measure and assess whether those goals have been met. Once the pilot has been adequately evaluated, the Commission can turn to the question of whether the approaches that were tested in the pilot should be expanded.

Furthermore, the scope and cost of a pilot will inform the level of scrutiny required before the Commission approves the pilot. For example, a smaller pilot may not require an extensive cost-benefit analysis before approval, because the smaller scale translates into a lower risk of adverse consequences if the expected benefits of the pilot do not materialize.

III. Commission Action

In the ordering paragraphs below, the Commission makes general and specific findings regarding EVs in Minnesota that are intended to shape and guide future EV proposals from utilities. The Commission affirms that EVs hold the potential for significant benefits to all Minnesota ratepayers, and that utilities will play a role in educating ratepayers about the benefits of EVs and helping integrate EVs into the electric system.

The Commission will require Minnesota’s three investor-owned utilities—Minnesota Power, Otter Tail Power, and Xcel Energy—to submit the following filings, which are further described in the ordering paragraphs below:

Filing	Due Date
Report of planned 2019 EV proposals	March 31, 2019
Annual EV Reports required under Minn. Stat. § 216B.1614, subd. 3, including promotional cost recovery mechanisms	June 1, 2019
Transportation Electrification Plan	June 30, 2019
Proposals for infrastructure, education, managed charging, etc.	No later than October 31, 2019

The Commission will also request that MPCA file a supplemental report with the Commission in this Docket after it has completed its work quantifying the benefits of vehicle emission reductions related to EVs.

The Commission outlines in the ordering paragraphs below a number of topics that should be discussed in any future EV pilot proposal submitted by a utility, to the extent relevant.

The Commission will authorize the Executive Secretary to sustain an ongoing stakeholder process in this docket, further described below, which should seek to coordinate as much as practicable with the MPCA Volkswagen stakeholder process.

ORDER

The Commission makes the following general findings:

1. *Electrification Is In Public Interest*: The Commission finds that electrification of Minnesota's transportation sector can further the public interest in:
 - a. *Affordable, economic electric utility service* by improving utility system utilization/efficiency and placing downward pressure on utility rates through increased utility revenues and better grid utilization;
 - b. *Renewable energy use* by increasing electricity demand during hours when renewable energy is most prevalent on the system and developing tariffs that correlate renewable energy resources to electric vehicle charging; and
 - c. *Clean energy* by reducing statewide greenhouse gas and other environmentally harmful emissions.
2. *Barriers to EV Adoption*: The Commission finds that barriers to increased EV adoption in Minnesota include but are not limited to: (a) inadequate supply of and access to charging infrastructure, and (b) lack of consumer awareness of EV benefits and charging options.
3. *Optimizing EV Benefits*: The Commission finds that how EVs are integrated with the electric system will be critical to ensuring that transportation electrification advances the public interest. This may include rate design that pairs charging with periods of low demand and high renewable energy generation, encourages advanced technology for enhanced load management, and provides direct benefits to EV owners through lower fuel costs of electricity.
4. *Utility Role Regarding EVs*: The Commission finds that Minnesota's electric utilities have an important role in:
 - a. *Facilitating the electrification of Minnesota's transportation sector* through policies and investments that educate customers on the benefits of EVs and enhance the availability of charging infrastructure; and

- b. *Optimizing the cost-effective integration of EVs* through appropriate rate designs, policies, and investments that improve system utilization/efficiency and benefit utility ratepayers, including non-EV owners.

The Commission makes the following specific findings:

- 5. *Expectations Regarding Utility Role:* The Commission finds that Minnesota's investor owned utilities should take steps to encourage the cost-effective adoption and integration of EVs. Among these steps, utilities should:
 - a. *Focus specifically on issues related to transportation electrification*, including the cost-effective integration of EVs.
 - b. *Develop and file EV-related proposals* intended to encourage the adoption of EVs by:
 - i. Expanding the availability of charging infrastructure, both home and public;
 - ii. Enhancing consumer awareness of EV benefits and charging options beyond what utilities could otherwise do under Minn. Stat. § 216B.1614, subd. 2(c)(2), without specific Commission approval; and
 - iii. Facilitating the electrification of vehicle fleets.
 - c. *Encourage environmentally and economically optimal EV integration* through, at a minimum, the adoption of appropriate and effective time-of-use and EV-specific rate designs, and reasonable initiatives or investments that encourage and support smart charging.
 - d. *Consider energy bill financing as an option*, at least on a pilot basis, to facilitate the economic availability of residential charging infrastructure.
- 6. *Content of EV-Related Proposals/Investments:* The Commission finds that the following should be included at a minimum in any EV-related utility proposals:
 - a. *Any EV-related proposals that involve significant investments* for which the utility is seeking or will seek cost recovery should include a cost-benefit analysis that shows the expected costs along with the expected ratepayer, system and societal benefits associated with the proposal; and
 - b. *In the case of a proposed pilot*, the utility filing should include specific evaluation metrics for the pilot and identify what the utility expects to learn from the pilot. An extensive cost-benefit analysis may not be needed for a pilot, depending on the scope and cost of the pilot.
- 7. *Cost-Benefit Analysis:* The Commission finds that no specific cost-benefit methodology should be adopted at this time. However, as a starting point, utilities should use the Commission's current environmental externality values for carbon and criteria pollutants in analyzing the societal costs and benefits associated with EV-related proposals. Cost-benefit analyses should consider potential long-term ratepayer and societal benefits,

including better grid management, public health, and other social benefits. These analyses should also consider potential long-term costs, including the risk of stranded investment.

8. *Evaluating Investments in Public Charging Infrastructure:* The Commission finds that the OAG's suggested three-step process for evaluating utility investments in public charging infrastructure is reasonable. This framework should be incorporated into a utility's analysis when seeking Commission approval of any such investments.
9. *Interoperability:* The Commission finds that utility investments and arrangements related to charging infrastructure should be designed to ensure interoperability, using standards such as Open Charge Point Protocol and Open Automated Demand Response.
10. *Utility Cost Recovery:* The Commission finds that no single method of cost recovery should be generally precluded at this time for any EV-related investments. Rather, cost recovery, including the method of recovery, should be determined in each individual case based on factors such as the purpose, nature, magnitude, and potential benefits of the investments.
11. *Promotional Cost Recovery:* The Commission also finds that Minn. Stat. § 216B.1614, subd. 2(c)(2), allows utilities the opportunity to recover costs related to educating customers on the benefits of EVs beyond those costs related specifically to the utility's EV tariffs.

The Commission takes the following actions:

12. Minnesota Power, Otter Tail Power, and Xcel Energy shall file EV promotional cost recovery mechanisms consistent with Minn. Stat. § 216B.1614, subd. 2(c)(2), and the Commission's above Findings in this docket, as part of their annual EV reports filed June 1, 2019.
13. The Commission requests that the MPCA file a supplemental report with the Commission in this Docket after it has completed its work quantifying the benefits of vehicle emission reductions related to EVs.
14. The Commission directs Minnesota Power, Otter Tail Power, and Xcel Energy to file:
 - a. By March 31, 2019, a report that identifies and discusses the EV-related proposals the utility plans to file in 2019, including the approximate date the utility anticipates filing those proposals; and
 - b. By June 30, 2019, a Transportation Electrification Plan identifying what EV-related initiatives the utility is contemplating over the next two years, including next steps as specific programs to scale up current or currently proposed EV pilots or tariffs. The plan should identify the extent to which the utility's planned or contemplated initiatives would:

- i. Facilitate availability and awareness of public charging infrastructure and residential charging options for both single family and multiple unit dwellings, including programs or tariffs in development to address flexible load or reduce metering and data costs;
 - ii. Educate customers on the benefits of EVs;
 - iii. Assist in the electrification of vehicle fleets with a focus on medium and heavy duty trucks and buses;
 - iv. Offer DCFC specific tariffs and which tariffs are currently in use;
 - v. Optimize EV benefits by, for example, aligning charging with periods of lower customer demand and higher renewable energy production and by improving grid management and overall system utilization/efficiency; and
 - vi. A discussion of current and planned charging practices/tariffs for public charging stations along with a discussion of any concerns related to those charging practices.
15. Minnesota Power, Otter Tail Power, and Xcel Energy shall file proposals, which can be pilots, intended to enhance the availability of or access to charging infrastructure, increase consumer awareness of EV benefits, and/or facilitate managed charging or other mechanisms that optimize the incorporation of EVs into the electric system. The utilities should consult with stakeholders, including but not limited to the Department, OAG and Fresh Energy, to help with the development of their proposals. The Executive Secretary is authorized to work with the utilities in identifying specific due dates for each filing, which should be sequenced to accommodate workload issues of Commission staff, Department of Commerce and other stakeholders. These proposals must be filed no later than October 31, 2019.
16. In any future pilot proposal, utilities should include a discussion of the following topics to the extent relevant:
 - a. Environmental justice, with a focus on communities disproportionately disadvantaged by traditional fossil fuel use;
 - b. Low-income access and equitable access to vehicles and charging infrastructure, which can include all-electric public transit and EV ride-sharing options;
 - c. Environmental benefits, including but not limited to carbon and other emission reductions;
 - d. Potential economic development and employment benefits in Minnesota;

- e. Interoperability and open charging standards;
 - f. Load management capabilities, including the use of demand response in charging equipment or vehicles;
 - g. Energy and capacity requirements;
 - h. Pilot expansion and/or transition to permanent status at a greater scale;
 - i. Education and outreach;
 - j. Market competitiveness/ownership structures;
 - k. Distribution system impacts;
 - l. Cost and benefits of the proposal;
 - m. Customer data privacy and security; and
 - n. Evaluation metrics and reporting schedule.
17. The Commission authorizes the Executive Secretary to sustain an ongoing stakeholder process in this Docket, led by Commission staff, that involves a broad and diverse range of participants. The Commission specifically authorizes the Executive Secretary, when necessary and at the appropriate time, to solicit written comments and/or establish stakeholder workshops to examine any of the issues raised in this Docket. The Executive Secretary is also authorized to establish a notice and comment process for stakeholder input in response to each utility Transportation Electrification Plan. This stakeholder process should seek to coordinate as much as practicable with the MPCA Volkswagen stakeholder process and their grant program.
18. This order shall become effective immediately.

BY ORDER OF THE COMMISSION



Daniel P. Wolf
Executive Secretary

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