

**STATE OF MINNESOTA  
PUBLIC UTILITIES COMMISSION**

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February 2, 2018

**In the Matter of Xcel Energy's Petition for  
Approval of a Residential EV Service Pilot Program**

**Docket E002/M-17-817**

**INITIAL COMMENTS OF FRESH ENERGY, MINNESOTA CENTER FOR  
ENVIRONMENTAL ADVOCACY, AND THE SIERRA CLUB**

Fresh Energy, Minnesota Center for Environmental Advocacy, and the Sierra Club submit these initial comments in response to the Commission's November 22, 2017 [Notice of Comment Period](#). Xcel's proposed smart charging pilot is a valuable first step toward maximizing the benefits of new electric vehicle (EV) load. Though there are issues that will need to be addressed before the pilot can transition into a permanent tariff offering, we support this pilot and recommend the Commission approve the pilot as proposed.

**Electric vehicle overview**

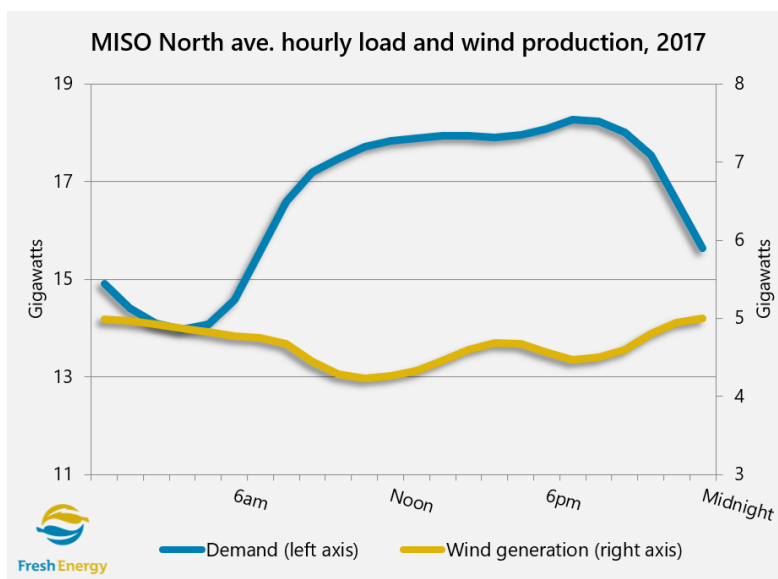
The new electricity demand from EVs could either be a tremendous grid asset or a serious grid liability. For most EV drivers today, the vast majority of charging occurs at the home. This charging behavior is likely to increase as EV driving ranges increase and EVs need to be charged less frequently.

In this context, it is essential to get the rate design right in order to incent beneficial charging behavior. EVs are the ultimate in flexible and manageable load. So long as the car is fully charged by the time an EV driver plans to leave in the morning, that driver couldn't care less whether the car began charging at 5pm or 2am. But without price signals directing EV drivers to charge overnight, most drivers will likely begin charging when they get home from work. This will further increase the residential peak and could necessitate expensive distribution system upgrades where there are clusters of EVs charging during peak times.

If, on the other hand, customers have the incentive to charge overnight, new EV load can improve the efficiency of a utility's system and lower rates for all customers. A series of recent studies by the research firm MJ Bradley & Associates quantified these benefits for eight states:

[Connecticut](#), [Colorado](#), [Illinois](#), [Maryland](#), [Massachusetts](#), [Michigan](#), [New York](#), and [Pennsylvania](#).<sup>1</sup> For each of the eight states, the studies found that adding EVs to the grid and charging them during off-peak hours would deliver electricity system benefits to *all* utility customers, not just those with EVs. This is not surprising: if most EV charging takes place during off-peak hours, utilities will add sales revenue without costly distribution system upgrades or new generation capacity, which puts downward pressure on electric rates for all customers.

Off-peak charging has even greater benefits in Minnesota, as it will allow more cost-effective wind generation to be added to the grid. The Great Plains have some of the best [wind resource](#) in the world, and utilities have been purchasing long-term contracts for new wind farms for [less than 2¢/kWh](#). But, while wind is the lowest-cost generation available in Minnesota, wind speeds are not constant, so wind turbines produce more electricity at some times than at others. In the



upper Midwest, wind production tends to be the highest overnight, when demand is lowest, as shown in the graph to the right.<sup>2</sup> Adding and/or shifting more flexible load to overnight hours will improve the economics of wind development by increasing market prices overnight and reducing curtailments, which would allow more wind to be added to the grid.

## Pilot proposal

Xcel's proposed smart charging pilot is a valuable first step toward maximizing the benefits of new EV load. The pilot will allow the Company, the Commission, and stakeholders to gain familiarity with a new technology while also offering new EV buyers a simple process for installing EV charging infrastructure.

Xcel's proposed pilot offers an attractive new rate option for new EV buyers. Xcel's existing EV tariff has a major barrier to participation: customers must pay to have a second meter installed—which can cost \$1,000-\$2,000 or more up front—and then pay for the second meter itself through an additional monthly fee. This is a significant deterrent to participation, and the new pilot proposal avoids the unnecessary cost of a separate meter. Moreover, the second

<sup>1</sup> M.J. Bradley & Associates, "Plug-in Electric Vehicle Cost-Benefit Analysis," November 2016-September 2017.

<sup>2</sup> Data source: MISO [Market Reports](#), Historical Generation Fuel Mix and Historical Regional Forecast and Actual Load.

meter provides no intrinsic value to a customer; it is simply a means to get lower-cost electricity overnight. With a smart charger, on the other hand, customers get an additional benefit beyond the lower-cost electricity: they will be able to charge their EV much faster and will also get access to [apps and features](#) that improve their EV experience. Many customers may still have to pay for wiring upgrades under the pilot, but they would get more *value* from their investment.

The pilot program will also provide Xcel with valuable experience with a new technology. The Company has already verified that the selected smart chargers are capable of measuring EV load with revenue-grade accuracy, but the pilot will give the company experience in integrating EVSE submeter data into its billing system. The Company will also be able to test the feasibility of customer-owned Wi-Fi for data transmission. This is new territory not just for Xcel, but for all utilities in the state; Xcel's experience will provide a valuable test case for Minnesota's utilities.

In light of these benefits, we support this pilot and recommend approval.

### **Annual reporting**

Ideally, pilot programs would be designed in such a way that they could easily transition into permanent programs if all goes as planned during the pilot stage. However, while we support Xcel's pilot, we do not believe the pilot (in its current form) would be suitable for a permanent rate offering. In the following section, we outline some issues that merit future consideration. While we do **not** recommend any changes to the pilot program prior to approval, the Commission should develop a plan now to address the issues we identify below.

Xcel's annual reports offer a convenient vehicle for this discussion. In its Initial Filing, Xcel outlines topics it plans to address in an annual report, which will be included as a part of the annual report on its existing EV tariff. Xcel also states that it will, "continue to pursue innovations in providing services to meet EV driver needs, even as the pilot is in progress."<sup>3</sup>

As part of its first annual report under the pilot, Xcel should be required to include a plan to transition the pilot to a permanent program. This plan should result in the establishment of a permanent program by, at the latest, its next annual report. Under this timeline, the first annual report under the pilot would be filed in June 2019, and the transition deadline would be June 2020. This should not preclude Xcel from filing a permanent program sooner, if it is able to. In order to maximize the benefits of new EV load, it is important to move swiftly and open this program to greater participation.

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<sup>3</sup> Xcel Initial Filing, at page 17.

## Outstanding issues

While we support the pilot as proposed, there are several issues that would need to be addressed before this program could become a permanent rate offering. This section is intended to identify issues for the benefit future discussions; given the small, targeted nature of Xcel's proposal, we do **not** believe it is necessary to address these issues before approving the pilot program.

### *Customer Choice*

We believe that the turnkey approach proposed by Xcel is a great option for customers who want to avoid the "hassle factor," as Xcel put it. This It will be attractive for many potential EV buyers, who may not be interested in putting in time to review the market for home chargers, select an electrician, etc, and would rather pay a bundled monthly fee for a simple solution.

Other customers, however, will be more cost-conscious. The pilot does not provide these customers with any options to minimize costs: Xcel will own the charger throughout the pilot program, Xcel will choose the electrician, and all customers are required to pay the same installation and maintenance costs. For the pilot period, this is appropriate, as it will provide information on cost savings (relative to the current offering) and maintenance costs for the charger. But, as the pilot transitions to a permanent offering, customers choice should be expanded: customers should have the option to purchase a qualifying charger themselves, use their own electrician, and waive Xcel's maintenance service and avoid the corresponding fees.

For customers who are willing to put in the effort, these changes could provide significant cost savings. Xcel estimates that customers could save up to \$1,800 under the pilot, relative to the current EV tariff. But, with our recommended changes, some customers could save much more. For example, smart chargers come in both "hard-wired" and "plugged" configurations. If a customer already has a 240-volt outlet in her garage, she could purchase a charger with a plug and avoid *all* installation costs; using Xcel's cost estimates,<sup>4</sup> her *total* cost could be as low as \$600, compared to a range of \$1,750-\$3,525 for the current EV rate. She would also pay a lower monthly fee (relative to the current EV rate), as there would not be an additional monthly charge for the second meter. And even if they don't already have adequate wiring to their garage, many customers may already have a trusted electrician, and they may prefer to use their electrician rather than one chosen by Xcel.

We appreciate Xcel's efforts to allow customer choice in the pilot. Choice gives customers more freedom and control, allowing them to select the options that best fit their needs, which will maximize customer satisfaction. The proposed pilot takes steps toward improving customer choice; as the pilot transitions into a permanent program, further expanding customer choice should be a high priority.

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<sup>4</sup> See: Xcel Initial Filing, Figure 1, page 12.

### *Monthly Fees*

While appropriate for the pilot, the size of the monthly fees may be cost-prohibitive for some customers. Lowering the monthly fee as much as possible should also be a long-term priority.

Xcel's response to PUC Information Request #1 lists five components to the \$27.45 monthly fee:

- 1) EVSE with embedded load monitoring
- 2) EVSE Installation
- 3) Load Monitoring and Data Management
- 4) Maintenance Service
- 5) Customer Accounting and Information

Customers already have the option to avoid the EVSE cost, and our recommendation of increased customer choice would give customers the ability to avoid the “EVSE installation” and “maintenance service” components. We also believe it is appropriate for all customers to pay the “Customer Accounting and Information” costs, and the corresponding monthly amount seems reasonable and non-burdensome.

That leaves “Load Monitoring and Data Management” costs. As detailed in Xcel's response to PUC Information Request #1, there is considerable variability in the fees charged by the three vendors. We believe minimizing these costs as much as possible will be essential to maximizing customer participation in the program in the long run.

Moreover, in the mid- to long-term, increased EV adoption will increase the value of actively managing EV load. The ultimate goal of EV tariffs is to integrate new load in the way that maximizes its value to the grid. Smart chargers allow a utility to actively direct charging to follow wind production and/or to avoid overloading distribution systems where there are clusters of EVs. As more EVs are added in Xcel's system, the value of managed charging will increase. Eventually, Xcel may be able to use smart chargers to offer a “managed charging” tariff, wherein customers agree to allow Xcel to control when their EV is charged (within a defined period). This additional benefit to Xcel—and to non-participating customers—could justify recovering “Load Monitoring and Data Management” costs from all customers, minimizing the monthly fee and making the managed charging offering more attractive to customers.

### *Renewable energy option*

As noted in the Clean Energy Organizations' [March 12, 2015 comments](#) in Docket 15-111, Xcel's all-renewable tariff should be the default option for EV tariff customers, rather than a premium opt-in product. This modification would increase participation in the all-renewable tariff, making it easier for customers to maximize the environmental benefits of EVs.

### *Multifamily housing*

The proposed pilot excludes customers who live in apartments or condominiums. As Xcel explained, “the complexities associated with multifamily billing and parking (for example, ensuring that we can identify who is using the EVSE to charge their vehicle) present an entirely different set of issues that we believe would have significantly delayed our proposal.”<sup>5</sup> We agree that charging in multifamily housing introduces additional complexity,<sup>6</sup> and we believe it is reasonable to limit the scope of the current pilot to addressing challenges in the single-family residential context.

However, the infrastructure challenges associated with multi-family housing present an opportunity for Xcel. Utilities are uniquely situated to leverage existing customer relationships, knowledge of the electric grid, and economies of scale to deploy charging stations in this critical but underserved market. Moreover, smart charging offers potential solutions for charging in multifamily housing. For example, for units that have assigned parking spaces, smart charging offers a way for residents to charge their EVs without the homeowners’ association worrying about the cost of electricity being passed on to other residents. We urge Xcel to continue working on multifamily charging, and we believe multifamily housing should be included in any future iterations of this program.

### **Recommendations**

Fresh Energy, Minnesota Center for Environmental Advocacy, and the Sierra Club recommend approval of the smart charging pilot as proposed. In addition, Xcel should be required to include in its 2019 annual compliance filing a plan to transition this pilot into a permanent program, including modifications to address the issues raised in these comments, by no later than June 2020.

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<sup>5</sup> Xcel, Initial Filing, at page 6.

<sup>6</sup> For several reasons, prospective EV owners who live in multifamily housing face unique challenges to access vehicle charging: parking lots are often common or shared spaces; the costs of installing infrastructure at a distance from the building is more expensive; and, in the case of renters, investments in charging infrastructure may not be recoverable within their expected tenure. For background information on EV charging in multifamily housing, see: [www.multihousingcharging.com](http://www.multihousingcharging.com)