



To: Minnesota Public Utilities Commission  
Fr: Rolf Nordstrom, CEO, and Trevor Drake, Program Manager, Great Plains Institute  
RE: **Summary of Stakeholder Meetings In the Matter of Xcel Energy's Petition for Approval of Electric Vehicle Pilot Programs– Docket No. E002/M-18-643**  
Date: January 31<sup>st</sup>, 2019

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Dear Commissioners,

We are pleased to submit the following summary of a stakeholder engagement process to solicit feedback on Xcel Energy's electric vehicle program offerings in Minnesota, which were filed in the instant docket on October 12, 2018.

We were hired by Xcel Energy as an independent, third-party facilitator to engage a diverse group of stakeholders, including consumer advocates, environmental advocates, state agencies, electric vehicle manufacturers, charging equipment vendors, and public and private fleet operators. Additionally, Xcel Energy hired Atlas Public Policy and PlugInConnect to provide educational presentations and third-party perspectives on the national and local context for utility electric vehicle offerings in these meetings. All meetings were facilitated by the Great Plains Institute.

Our process and this summary are intended to complement the formal regulatory process. Importantly, GPI's role in this matter is as an independent facilitator and not as a party.

Key points about the feedback we received:

- Stakeholders generally supported Xcel Energy's draft electric vehicle offerings, based on the details presented. Several participants noted that the suite of offerings seemed comprehensive and thoughtful.
- Stakeholders raised several key questions and suggested improvements for the proposed pilots, which are further detailed in this summary. These were mostly focused on grid and environmental impacts resulting from the EV offerings, consumer impacts for both EV and non-EV owners, and impacts to the EV market and its actors.
- Participants seemed to agree that thorough evaluation of these pilot offerings would be beneficial. To that end, the group suggested a variety of possible metrics for evaluation that are listed at the end of this summary.

We hope you'll find that this stakeholder engagement process provided a complementary benefit to the formal regulatory process and look forward to continued discussions around Xcel Energy's proposed electric vehicle offerings in Minnesota.

/s/

Rolf Nordstrom, President & CEO  
Great Plains Institute

/s/

Trevor Drake, Program Manager  
Great Plains Institute





# Xcel Energy Electric Vehicle Solutions Summary of Stakeholder Meetings

January 31<sup>st</sup>, 2019

This document provides a synthesis of remarks by stakeholders at five meetings between May and August of 2018. The notes do not indicate complete consensus among the group, but rather are meant to capture the collective discussion and key points raised by participants. No view should be attributed to any specific individual or organization. The stakeholder engagement process and this resulting summary are intended to support, but not replace, important discussions within the formal regulatory process.

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## I. Introduction

The Great Plains Institute, in collaboration with Xcel Energy, convened five stakeholder meetings from May to August 2018 to solicit input on Xcel Energy's proposed electric vehicle solutions. The first and fifth meetings were open to all interested stakeholders, while meetings two, three, and four were conducted by invitation only to facilitate a more focused conversation around fleets, fast charging, and home charging, respectively. As the convener, GPI sought to invite a diversity of perspectives important to both the design of Xcel Energy's proposed offerings and to the regulatory process for considering them.

Meetings were held in Minneapolis and St. Paul and drew attendance of 30-60 individuals representing the organizations listed below. This document summarizes feedback received during the five meetings.<sup>1</sup>

## II. Participating Organizations:

GPI and Xcel Energy would like to thank the following organizations for their participation in one or more of the five meetings between May and August 2018. As noted above, comments summarized in this document represent the collective insights of the group and should not be attributed to any specific organization

- AESL Consulting
- American Lung Association
- Atlas Public Policy
- Center for Energy and Environment
- ChargePoint
- Citizens Utility Board of Minnesota
- City of Edina
- City of Minneapolis
- Ecolab
- Electrotech Inc.
- Elk River Municipal Utilities
- eMotorwerks
- Environmental Initiative
- Environmental Quality Board
- Fresh Energy
- GreenLots
- Health Partners
- HOURCAR
- McKnight Foundation
- Metro Transit
- Minnesota Center for Environmental Advocacy
- Minnesota Department of Administration
- Minnesota Department of Commerce
- Minnesota Department of Transportation
- Minnesota Housing Finance Agency
- Minnesota Office of Enterprise Sustainability
- Minnesota Pollution Control Agency
- Minnesota Power
- Minnesota Public Utilities Commission
- MISO
- MN350
- Mortenson Construction
- Natural Resources Defense Council
- New Flyer of America Inc.
- Office of the Minnesota Attorney General
- Otter Tail Power
- PlugInConnect
- Siemens
- Sierra Club
- Tennant Company
- Tesla
- The Mendota Group, LLC
- Twin Cities Clean Cities Coalition
- UMN Center for Sustainable Building Research
- UMN Parking & Transportation Services
- ZEF Energy

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<sup>1</sup> All meeting materials and notes are available online at <https://trello.com/b/rJZjJFGR/xcel-energy-ev-solutions>

### III. Key Terms:

The following terms came up in the group's discussions and are defined here only to provide clarity to the notes.

- **Electric Vehicle Supply Equipment (EVSE):** Delivers electrical energy from an electricity source to charge an EV's battery. It communicates with the EV to ensure that an appropriate and safe flow of electricity is supplied. EVSE units are often referred to as charging stations.<sup>2</sup>
- **Make-Ready:** Refers to the infrastructure needed to connect an electric vehicle charging station to the grid (to make it ready for use), excluding the charger itself.
- **Direct Current Fast Charging (DCFC):** Provides charging through 480 Volt AC input and requires highly specialized, high-powered equipment as well as special equipment in the vehicle itself. (Plug-in hybrid electric vehicles typically do not have fast charging capabilities.) Can deliver 60 to 80 miles of range in 20 minutes of charging. Used most often in public charging stations, especially along heavy traffic corridors.<sup>3</sup>
- **Demand Response (DR):** Reduction in energy use in response to either system reliability concerns or increased prices (where wholesale markets are involved) or generation costs (in the case of vertically integrated utilities). Demand response must generally be measurable and controllable to participate in wholesale markets or be relied upon by system operators.<sup>4</sup>
- **Level 1:** Provides electric vehicle charging through a 120 Volt AC plug and does not require installation of additional charging equipment. Can deliver 2 to 5 miles of range per hour of charging. Most often used in homes, but sometimes used at workplaces.<sup>3</sup>
- **Level 2:** Provides charging through a 240 Volt (for residential) or 208 Volt (for commercial) plug and requires installation of additional charging equipment. Can deliver 10 to 20 miles of range per hour of charging. Used in homes, workplaces, and for public charging.<sup>3</sup>
- **Time-of-Use (TOU):** Rates that vary by time of day and day of the week. TOU rates are intended to reflect differences in the underlying costs incurred to provide service at different times of the day or week.<sup>4</sup>

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<sup>2</sup> Definitions are from the Department of Energy, Office of Energy Efficiency and Renewable Energy, Plug in Electric Vehicle Handbook. August 2013. <https://www.nrel.gov/docs/fy13osti/58494.pdf>

<sup>3</sup> Definitions are from the Department of Energy, Office of Energy Efficiency and Renewable Energy, website on Vehicle Charging: <https://www.energy.gov/eere/electricvehicles/vehicle-charging>

<sup>4</sup> Definitions are from the Second Edition of Electricity Regulation in the US: A Guide, by Jim Lazar and staff at the Regulatory Assistance Project (June 2016).

## IV. Objectives and Guiding Principles

Our stakeholder engagement process was designed and guided by the following objectives:

### PROCESS OBJECTIVES

1. Create a base understanding of transportation electrification and how this topic has been evolving over time
2. Gather feedback and input on concepts in Xcel Energy's Minnesota EV Plan in preparation of one or multiple filings
3. Develop key metrics for pilots that stakeholders and decision-makers can use later to evaluate pilot success and suitability to go to scale
4. Provide a platform to share ideas regarding transportation electrification efforts

Additionally, to guide the development of their electric vehicle solutions, Xcel Energy proposed a set of principles to which we asked stakeholders to respond and offer feedback. After incorporating that feedback (changes emphasized in italics below), Xcel Energy arrived on the following set of guiding principles for the design of their EV solutions. While the group was not driven to total consensus, stakeholders seemed satisfied with this list and occasionally used it as a framework for structuring their feedback during meetings.

### GUIDING PRINCIPLES

#### A.) Empower customers with information, tools, and options

Stakeholders noted the importance of consumer education and engagement and were particularly interested in learning more about specific tools that would be provided to customers.

#### B.) Increase access to electricity as a transportation fuel *in an equitable manner*

Equity arose as a key item of conversation throughout the five meetings, including consideration of how offerings might enable benefits for all ratepayers.

#### C.) Encourage efficient use of the power grid *and integrate renewable energy*

While "efficient" use of the power grid may imply integrating renewable energy, some stakeholders felt strongly that it should be explicitly stated. There was some discussion about whether the word "encourage" goes far enough. Stakeholders also noted that there may be trade-offs between transportation benefits and grid optimization.

#### D.) Improve air quality and decrease carbon emissions

#### E.) Ensure reliability, interoperability, and safety of equipment

There was clear support among the group for reliability and safety (to the point that some participants questioned including these, as they should be assumed necessary). However, some questions arose around better defining interoperability of equipment. Interoperability was not addressed in-depth in our meetings and may be worth exploring further in the context of specific pilot proposals or offerings.

#### F.) Leverage public and private funding opportunities

**G.) Provide benefits to all customers, both EV drivers and non-EV drivers**

**H.) *Ensure transparency and measure results***

This principle was added to capture stakeholders' interests in being able to evaluate and understand lessons learned from utility EV pilots and offerings.

## **V: Overall Reaction**

Throughout the five meetings, Xcel Energy presented on a suite of draft electric vehicle offerings focused on three areas: fleets, fast charging (including for public use), and home charging. For each of these areas, Xcel Energy staff presented one or multiple pilot project straw proposals that were in development and that the company anticipated refining into filings for the MN PUC. The straw proposals offered key details including the overall rationale, barriers and proposed strategies, who would be responsible for EV infrastructure investment costs, and desired objectives. The presentations did not include estimated costs for pilot projects.

Overall, stakeholders were generally supportive of the straw proposals presented. As noted below, participants in these meetings stated that the suite of offerings seemed comprehensive and thoughtful. Feedback on the proposed pilots, which is further detailed by topic in this summary, was mostly raised in the form of questions, desires for more information, and suggested tweaks rather than major overhauls that would be necessary to win stakeholder support.

The fifth stakeholder meeting was open to all interested parties and offered an opportunity to review all of Xcel Energy's proposed offerings. In this section, we have summarized the feedback received during this final workshop, attempting to identify items that drew positive reactions as well as those that might draw opposition from stakeholders if not addressed.

Things that stakeholders liked and appreciated included the following:

**General approach:** Stakeholders appreciated the breadth and multi-faceted nature of Xcel Energy's proposed EV solutions, with some individuals noting that they would like to see the full package of proposed pilots move forward. Some participants noted that having multiple approaches is beneficial in the context of the evolving EV market. Meeting attendees had these additional comments about Xcel Energy's approach:

- Participants were very interested in the educational component of the proposed pilots and seemed satisfied with Xcel Energy's plans for comprehensive education and advisory services.
- Some participants appreciated Xcel Energy's plans to submit an initial filing covering what is doable now, and then follow-up with an additional filing later. Stakeholders also appreciated Xcel Energy's efforts to build technical and internal capacity on electrified transportation and following good practices demonstrated by other utilities.
- There was significant interest in evaluating the effectiveness of the proposed pilots. As noted later in this summary, stakeholders suggested a wide variety of measures and metrics to support thorough evaluation and learning.

- **Consideration of grid and environmental impacts:** Stakeholders felt that the pricing signals offered in these pilots provided a strong incentive to shift charging away from system peaks to off-peak periods. Participants also noted that these pricing signals support increasing infrastructure efficiency, integrating renewable energy, and ensuring that EV owners are paying for costs they might impose on the system. There was also appreciation for Xcel Energy’s attention to environmental impacts like air quality.
- **Consideration of consumer impacts:** Consumer impacts were of significant concern to meeting attendees, who stressed the importance of ensuring the benefits of EV programs outweigh the costs for all Xcel customers, EV drivers and non-drivers alike. Participants seemed satisfied with online tools for customers to determine which rates are best for them (i.e. whole house time of use vs. separate meter for EVs), separate metering for workplace and public charging to avoid impacts on building electric bills, using a marketplace approach to support customer choice, and attention to the EV driver experience.
- **Consideration of market impacts:** There were several discussions within meetings that focused on the market impacts of the proposed offerings. Participants appreciated Xcel Energy’s willingness to assist fleets with the upfront cost of infrastructure, which will help in growing EV adoption, help to create partnerships, and allow new projects to unfold. Attendees noted that the offerings seemed comprehensive while allowing the market to change and grow.

Facilitators also asked participants what might cause them to oppose the package of offerings as a whole. Suggestions received in response to this question included the following:

- Program costs outweighing benefits for ratepayers overall
- Not measuring grid and environmental impacts
- Failing to provide simplicity for customers
- Limiting customer participation by setting costs too high
- Not measuring usage and usability for all types of charging stations being deployed in pilots.

Additional stakeholder feedback has been captured below, specific to each pilot category of fleets, fast charging, and home charging.

## VI: Fleets

The second stakeholder meeting focused on Xcel Energy’s straw proposals for electrifying both light and heavy-duty fleets. The following three components comprised the draft offering for fleets:

- Analytics and advisory services to help customers with understanding fleet electrification opportunities
- Infrastructure services to reduce barriers to installing electric vehicle infrastructure for fleet operators.
- Pricing and smart charging services (over time/as they become available) to reduce charging costs for fleet operators while enabling a more efficient grid with lower carbon emissions

Stakeholders had a generally positive reaction to these straw proposals, though noted some suggestions for improvement or requests for more information. General themes of stakeholder feedback are provided below:

- **Outreach and Education:** Stakeholders wanted more information from Xcel Energy about how the company would conduct outreach to fleets, including which external networks or partners might be engaged.
- **Analytics Technology:** Some stakeholders were interested to learn more about how analytics services and technologies would be deployed and integrated, considering that many fleets already have technology in place to collect and utilize fleet data.
- **Utility Ownership:** There was interest in learning more about utility ownership of charging infrastructure, including what exactly would be owned by the utility versus the customer, and what benefits would result. Some stakeholders suggested that Xcel Energy consider providing cash rebates to site hosts as an alternative to utility ownership, as doing so might simplify the program design and reduce financial expenditure while incenting beneficial load growth.
- **Site Host Considerations:** Stakeholders offered several suggestions for working effectively with site hosts, including differentiating between new and existing construction and streamlining the infrastructure procurement process as much as possible.
- **Grid Benefits:** Stakeholders appreciated Xcel Energy's efforts to design offerings that enable broad grid benefits, including reducing costs and integrating more renewable energy onto the system.
- **Flexibility and Customer Choice:** There was interest among stakeholders to learn more about how programs can be flexible to meet the needs of diverse fleet types, including offering multiple choices among services and programs. It was suggested that there is no "one size fits all" solution for fleets. Some stakeholders pointed out that fleets that are currently leading-by-example, especially public fleet operators, are a good initial starting point for piloting new offerings.

## VII: Fast Charging

The third stakeholder workshop solicited stakeholder feedback on Xcel Energy's straw proposals on fast charging, including the following components:

- Development assistance for fast charging developers that would offer rate options and assistance with navigating the interconnection process.
- Infrastructure services for corridors to support fast charging along key transit routes.
- Infrastructure services for cities and communities to increase access to charging stations for all customers.

In response, stakeholders said they liked the offer of development assistance from Xcel Energy to fast charging developers, the structure for demand charges, the mix of approaches to both corridor and urban fast charging, and the intention to provide benefits to both developers and customers. Stakeholders appreciated overall efforts to encourage fast charging at times that support a more efficient grid, but had conflicting responses about TOU rate requirements, with some positive about sending the right price signal and others concerned with the costs for charging on-peak discouraging fast charging developers and site hosts. Stakeholders also appreciated Xcel Energy's approach in this area as forward-looking and committed.



While discussing the fast charging proposals, workshop participants raised the following considerations and suggested improvements:

- **High charging costs:** Some stakeholders saw the high cost of charging at a DCFC station as a potential barrier. Xcel Energy's demand charge structure would help to reduce DCFC charging costs for users to some degree, but would not reduce costs DCFC might impose on Xcel's system as a whole. Specifically, they were concerned that a TOU rate (which would be offered for sites receiving Make-Ready assistance) may not work for site hosts if the rate increases daytime charging rates, which are already quite expensive compared to home charging rates. However, other members of the group noted that this might encourage home charging, which would be easier to manage in support of a more efficient grid.
- **Equity:** Stakeholders wanted more information about how Xcel Energy's fast charging offerings would address equity. There was concern that the high cost of fast charging would make it inaccessible to some community members, though it was noted that fast charging infrastructure could also enable electric shared mobility services, which might spread costs across a larger number of customers.
- **Maximizing usage:** Stakeholders suggested that Xcel Energy could maximize charger usage by identifying DCFC locations to serve the needs of both corridors and local communities (for example, in rural communities located on highway corridors) and those that might be used by both individual drivers and transportation companies (such as shared mobility and app-based ride-hailing services).
- **Holistic site considerations:** It was suggested that Xcel Energy's checklist for fast charging site hosts should include considerations beyond charging infrastructure, including safety lighting and amenities to make sites more attractive and friendly to drivers, thereby increasing utilization.
- **DCFC network characteristics:** Several stakeholders engaged in discussing the necessary and ideal characteristics of the fast charging network, including how many chargers are needed to affect the EV market, whether the perception of charging availability matters more than actual availability, to what extent drivers need fast chargers versus Level 2 chargers, and what the overall experience feels like compared to gas-fueled vehicles. Other stakeholders raised the question of whether utility ownership and operation of charging stations might increase DCFC deployment and utilization. While the group didn't reach a point of consensus, Xcel Energy's pilots may help inform the characteristics of an effective fast charging network.

## VIII: Home Charging

The fourth stakeholder workshop focused on Xcel Energy's offerings to support home charging, including the following components:

- Advisory services to help customers make informed decisions when deciding to purchase an electric vehicle or signing up for utility EV offerings.
- Infrastructure services to help reduce the costs of charging equipment.
- Pricing and smart charging to reduce charging costs for customers and incentivize charging behaviors that optimize grid benefits and minimize adverse impacts.

As with the previous meetings, stakeholders had an overall positive reaction to Xcel Energy's proposal. In particular, participants at this workshop said they liked the emphasis on the customer experience, providing simplicity and options for customers, the intention to keep costs low, and support for charging management to benefit customers and the grid. Stakeholders also appreciated that Xcel Energy is focusing on single family homes initially while beginning to think about more complex multifamily charging offerings.

While discussing Xcel Energy's home charging proposals, stakeholders offered the following suggestions and considerations:

- **Access for all Customers:** Stakeholders expressed support for focusing efforts both in and outside of the metro area, to ensure all customers can access the benefits of these programs.
- **Coverage for wiring to charger:** Xcel Energy did not propose to offer financial assistance for the wiring needed to support home charging, as the costs can vary widely depending on a customer's individual circumstances. Some stakeholders thought it worthwhile to consider a program design that would help with this, as it may pose a large barrier for some customers. As a potential solution, workshop participants suggested exploring an upfront rebate that could be applied to wiring or to a home charger, at the customer's discretion.
- **Customer education, outreach, and recruitment:** Stakeholders raised several suggestions and considerations around understanding customers, communicating with them, and recruiting them into programs. These comments, which are captured in the detailed notes, were generally focused on ensuring Xcel Energy is understanding and meeting customer and grid needs, while acknowledging that those needs may change as electric vehicles become more widely adopted.
- **Increasing adoption of TOU and smart charging:** Some stakeholders would eventually like to see the percentage of electric vehicle drivers that opt into an EV time-of-use and/or smart charging program increase dramatically (during the workshop, one stakeholder said ideally 50% to 75% would participate, since most charging takes place at home).

## IX: Measuring Success

At each workshop, facilitators asked participants to brainstorm measures of success for Xcel Energy's electric vehicle offerings in response to two questions:

1. What would you want to see the utility achieving if a particular pilot concept was brought to full scale (in other words, if fast charging was fully deployed, what evidence would indicate success on behalf of the utility)?
2. What would tell us whether a particular pilot is ready to advance to a full roll-out (in other words, at the end of a pilot, what information would help us evaluate how to move forward)?

The full list of measures and metrics that participants brainstormed in response to these questions are included as an attachment to this summary. Importantly, there was not enough time during meetings to refine and consolidate this list, so it should be taken as a starting point from which a final set of metrics could be developed.

Below, we have summarized the general categories of metrics and measures suggested. While we have broken these into categories to make them easier to digest, they may be combined across multiple categories to comprehensively assess pilots and programs. Throughout these discussions about measuring success, there was clear interest in the evaluation of these pilot projects to inform utility electrification transportation efforts in Minnesota.

- **Customer satisfaction and experience:** These metrics focus both qualitatively on whether customers and developers are satisfied with pilot or program designs, and quantitatively on indicators that would likely influence customer satisfaction, such as the length of time in the interconnection process or reliability of charging stations along key corridors.
- **Program participation and customer behavior change:** This category covers measures that are heavily quantitative, looking at the number of customers, developers, fleets, or dealerships that are participating in programs or utilizing specific program features. This category also includes metrics that combine multiple measures (e.g., ratio of EV drivers participating compared to total EVs in service territory).
- **Technology deployment and utilization:** Where the program participation category looks at measures and metrics related to customers, this looks at technology, including quantitative measurement of the number of vehicles and charging stations deployed and metrics related to utilization of these technologies.
- **Equity:** Suggested measures and metrics around equity were limited and could likely be improved upon with a more focused conversation. These suggestions looked at the location or geographic dispersion of pilot and program impacts to identify whether specific communities (e.g., historically marginalized or rural communities) are benefitting equitably.
- **Grid and environmental impacts:** These measures and metrics are aimed at identifying the grid, air quality, and GHG emissions impacts of EV pilots and programs (including system load shaping), whether additional loads from EV's facilitate better integration of renewables into the electric system, and emissions and air quality impacts resulting from both fuel switching from petroleum vehicles and electric system emissions from vehicle charging.
- **Costs and Economic impacts:** This category looks at spending on pilots and programs, including public and private funds leveraged, as well as economic impacts for both participating and non-participating ratepayers.

## X: Conclusion

Stakeholders who participated in these meetings generally supported Xcel Energy's proposed electric vehicle solutions, noting that the offerings, taken as a package, seemed comprehensive and thoughtful. Stakeholders also had many questions for Xcel Energy and desired more detail on each proposed pilot than was shared at the workshops. Key questions and suggested improvements were focused on the themes of grid and environmental impacts, consumer impacts for both EV and non-EV owners, and impacts to the EV market and its actors. On the whole, there was widespread interest in these offerings and general appreciation for Xcel Energy's leadership in advancing these electric vehicle offerings.

BEFORE THE MINNESOTA DEPARTMENT OF COMMERCE  
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**AFFIDAVIT OF SERVICE**

**Docket No. E002/M-18-643**

I, Trevor Drake, hereby certify that on this 31<sup>st</sup> day of January 2019, I served the *Summary of Stakeholder Meetings In the Matter of Xcel Energy's Petition for Approval of Electric Vehicle Pilot Programs* to all persons on the attached Service Lists by electronic filing, electronic mail, courier, interoffice mail or by placing such filing in envelopes, properly addressed, and depositing the same in the Post Office at the City of Minneapolis, for delivery by the United States Post Office as directed by said envelopes.

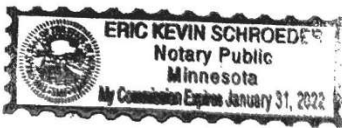


Trevor Drake

Subscribed and sworn to before me  
this 31<sup>st</sup> day of January 2019



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