

# Sharing the Good Stuff: Best Practices From Three Minnesota Initiatives

Carl Linvill, Megan Anderson, David Littell, Camille Kadoch and David Farnsworth<sup>1</sup>

## Introduction

New utility commissioners frequently ask RAP for advice as they begin their jobs. The privilege of serving as a commissioner during this exciting period of electric industry transition cannot be overstated, and many public servants are seeking out appointment or election because they want to make a positive impact on the transformation of the electric sector. Many commissioners are thus coming to their new jobs with a passion for a particular aspect of the electric sector in which they plan to engage and in which they hope to see substantial progress during their tenure. Distributed generation, community solar energy, electric vehicles (EVs), distributed storage, carbon policy, and grid-scale solar and other renewable energy are among the many technologies and policies that attract the attention of new commissioners. Although this brief is written for new commissioners thinking about how they might make a difference, we think it will also be appreciated by seasoned commissioners who are always on the lookout for great ideas coming from other commissions. This brief focuses on several recent activities at one public utilities commission (PUC), the Minnesota PUC, with the full understanding that many commissions are breaking new ground. For now, we just want to get the word out: Some good things are happening in Minnesota, and we hope you will take note.

Over the last few years, Minnesota has run some admirable proceedings and implemented approaches that we have come to see as best practice. One area in which notable progress is being made is in laying the groundwork for the beneficial adoption and operation of distributed energy resources (DERs) on the distribution grids in Minnesota. In this brief paper, we want to describe three proceedings that are demonstrating some best practice

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features. These three were not the only ones we could have selected, but we chose them because we are more familiar with them and they demonstrate some practices we wish to emphasize.

The first of the three is the implementation of DER interconnection standard updates in Minnesota. Docket E999/CI-16-521 and follow-on dockets were established to revise interconnection standards that had last been updated in Minnesota in 2004.<sup>2</sup> The PUC convened the proceeding in advance of the formal adoption of the Institute of Electrical and Electronics Engineers (IEEE) standard 1547-2018 and is now developing one of the first statewide interconnection standards that comport with the IEEE language, as well as the related UL 1741 Ed. 2, which sets requirements for equipment such as inverters that is necessary to comply with the IEEE update.

The second area we will emphasize is EV charging infrastructure pilots. Minnesota does not yet have rapid EV adoption, but state policymakers aspire to create fertile ground for EV uptake this decade. As with DER interconnection, the PUC has chosen to act in advance, anticipating a coming trend and identifying programs through pilots that will accelerate uptake in Minnesota as adoption continues. The two pilots we feature here are a residential EV service pilot and a rural EV charging pilot.

The third area involves the Minnesota PUC's consideration of performance-based regulation (PBR). The PUC recognized that the transformation of the electric industry is bringing with it the need for new business models that better align utility, consumer and public interests. The process it launched to evaluate performance-based regulation options demonstrated best practices in several areas: The process had the benefit of a facilitator, the Great Plains Institute (GPI), that began with a careful consideration of goals and outcomes with a large group of stakeholders; the commission launched its regulatory proceeding by encouraging a broad set of stakeholders from the start; the assigned commissioners were actively engaged with the process throughout; and the fruitful engagement produced several areas of focus and metrics that RAP believes were original to this process.

Several themes emerge from these examples that point to some underlying best practices at the Minnesota PUC:

- Willingness to take initiative in forging new pathways to accelerate future adoption of beneficial technologies.
- Commitment to open stakeholder processes to explore change, including being receptive to engaging independent third-party processes (e.g., engaging GPI).
- Relevant stakeholders and willing utilities are invited and engaged in promoting change.
- Promotion of statewide standardization where possible to reduce transaction costs for customers, utilities and third-party providers.

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<sup>2</sup> For more information, see Minnesota Public Utilities Commission. (n.d.). *Interconnection information*. <https://mn.gov/puc/energy/distributed-energy/interconnection/>

- Practical implementation steps (e.g., pilots and interim rule changes) that set the stage for further improvements as technologies, systems and utilities warrant (e.g., setting the stage for hybrid DERs but not holding up more immediate opportunities for storage).
- Innovating with novel approaches as they present themselves from stakeholder and utility interactions.

## Minnesota's Laudable Progress on Distributed Energy Resource Interconnection

The Minnesota PUC has effectively implemented an interconnection standard update with a robust stakeholder process, and its journey toward implementation includes lessons that merit consideration from commissions that have yet to fully update standards. The PUC decided to pursue an update in 2016 that considered impending updates to IEEE standard 1547, as well as the Federal Energy Regulatory Commission's Small Generator Interconnection Protocol. The PUC was further spurred to action by a distribution cooperative, Dakota Electric Association, and a group of distributed generation advocates that came to be referenced as the Joint Movants.<sup>3</sup> The Joint Movants brought lessons learned from states with the highest levels of solar adoption, particularly California and Hawaii, that revised their standards in advance of the IEEE update in an effort to accommodate much higher levels of distributed solar adoption and to proactively address the local reliability issues associated with rapid solar adoption. Minnesota's decision to pursue an update that could be a foundation for a statewide standard applicable to all utilities, and to tailor interconnection improvements to the state's policy goals, is commendable.

### Interconnection Standard Became a Priority in Minnesota

In 2013, Minnesota Gov. Mark Dayton signed legislation that required utilities to file a plan to implement community solar gardens by the following September. By 2014, the Minnesota PUC had approved Xcel Energy's Community Solar Garden Program, which spawned faster growth in these projects than achieved by any other utility or state. A relatively generous compensation mechanism attracted many projects. The legislation enabling the Community Solar Garden Program did not provide for a capacity cap on the number of community solar projects, so growth continued unabated. Although each project was limited to 1 MW, there was initially no limitation on projects being co-located, or built next to each other. However, the commission soon established a 5 MW co-location limit. Over this same time period, customer-sited, smaller DER interconnection also increased dramatically. As interconnection applications flooded utilities in Minnesota, the

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<sup>3</sup> Fresh Energy, the Environmental Law & Policy Center and the Interstate Renewable Energy Council were the Joint Movants in this proceeding.

evaluation of interconnections for some utilities became more complicated as penetration of DERs increased. In short, the interconnection implications of larger DERs on limited feeders with little on-site load (e.g. community solar gardens) are far different than the interconnection of widely dispersed 1 MW projects or customer-sited DERs with associated load.

The commission subsequently limited co-location of projects to 1 MW with an order in September 2016.<sup>4</sup> Interconnection continued to be contentious owing, in part, to the large number of solar projects on a limited number of feeders due to several factors, including a provision in statute that community solar gardens be located in contiguous counties to subscribers. Developers asserted that uncertainty and delays in interconnection approvals were delaying their projects and affecting project cost and financing. Rooftop solar installers were similarly concerned with the effectiveness of Minnesota interconnection standards. In response, the Joint Movants filed an updated interconnection standard for the commission's consideration in May 2016. The interconnection standard in effect at the time had been established in 2004, and the PUC decided that a confluence of changing conditions merited a refresh. To their credit, Minnesota and the commission decided to move forward in anticipation of the new IEEE standard (IEEE 1547-2018) rather than delay.

In addition to enabling the growth of community solar, improving interconnection standards for all distributed solar projects was important for several reasons:

- Reasonable and expedited interconnection timelines have proven achievable, and Minnesota did not have a streamlined interconnection process.
- As distributed solar adoption increases, concurrent consideration of interconnection with a distribution system hosting capacity analysis was needed to guide solar placement and reveal emerging grid reliability needs; this occurred in a concurrent proceeding.
- Advanced inverter capabilities and improved metering and communications allow for voltage ride-through, which can mitigate unnecessary and pervasive solar curtailments.
- The emergence of energy storage systems requires an interconnection policy that contemplates the interconnection of several individual DERs as well as combinations of those DERs.
- Positioning the grid to effectively use emerging capabilities, such as volt/VAR optimization, that benefit all customers will require a foundational standard that contemplates the emergence of those capabilities.

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<sup>4</sup> Minnesota Public Utilities Commission, Docket No. E-002/M-13-867, Order on September 6, 2016. [https://www.edockets.state.mn.us/Efiling/edockets/searchDocuments.do?method=showPoup&documentId=\(01EC193B-0588-4371-B601-F0E0AA9D4D2D\)&documentTitle=20169-124627-01](https://www.edockets.state.mn.us/Efiling/edockets/searchDocuments.do?method=showPoup&documentId=(01EC193B-0588-4371-B601-F0E0AA9D4D2D)&documentTitle=20169-124627-01)

## The Importance of a Statewide Standard

The Minnesota Distributed Energy Resources Interconnection Process (MN DIP) was approved in 2019 after three years of stakeholder process and regulatory implementation. Minnesota was fortunate to be able to observe and learn from the experiences of other states and utilities that advanced interconnection standards as solar adoption accelerated. Minnesota was also fortunate to have advocates and some utilities that recognized the need to update the standard. The enabling legislation required a statewide standard, and the PUC recognized that flexibility in implementing the standard for vastly differently sized utilities would meet the statewide goal and reduce the transaction costs of solar development in Minnesota as much as possible for developers. Establishing a statewide standard in Minnesota was very challenging due to the number and diversity of situation of its many cooperative, municipal and investor-owned utilities. For example, the utilities affected by the regulation range from cooperatives and municipal utilities that typically serve fewer than 10,000 customers each to an investor-owned utility (Northern States Power Co.) with more than 1.3 million customers.

Pressing ahead with the standard for only the very largest utilities that were motivated to address developer concerns and state policy drivers would have been faster and easier but would not have complied with the legislative requirement.<sup>5</sup> The ability to achieve a statewide standard flexible enough to apply to all utilities but standardized as much as possible so that developers have very similar requirements in Minnesota was an important sweet spot. Furthermore, failure to achieve a statewide standard would have presented the Midcontinent Independent System Operator (MISO) with a patchwork of DER interconnection policies, which would have further impeded opportunities for aggregated DERs to provide services to wholesale energy and service markets.

## An Effective Stakeholder Process Produced Significant Improvements

The Minnesota PUC recognized that updating the standard would require robust participation by representatives of all utilities, DER developers, customer advocates, and the staff of MISO and the Department of Commerce. Many utility commissions have provisions in their interconnection rules that require jurisdictional utilities to update their standard as IEEE 1547 is updated. Although the update requirement in many state interconnection regulations is laudable, it is not sufficient, particularly in this instance in which the revisions to the standard, improvements in technologies and changes in customer preferences have been profound. A utility commission that delegates the responsibility without ensuring a participatory, robust process will fail to appreciate how the changes to the standard affect developers, customers, the utilities and the bulk electric system operator.

Minnesota's deliberative and participatory stakeholder process should be emulated by other states, and the adopted standard should be considered a starting point for other states that need to move forward quickly in advance of their stakeholder process. Although

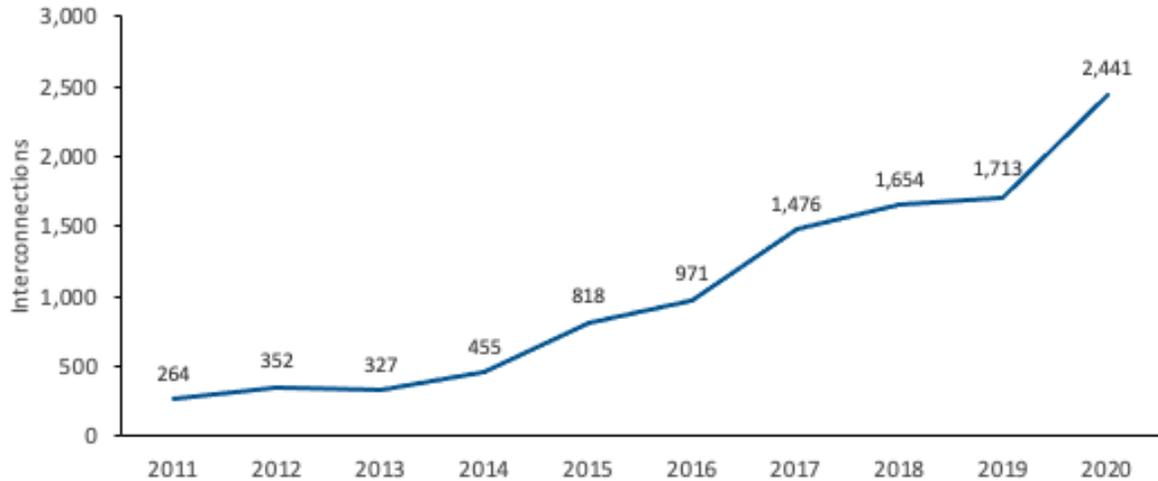
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<sup>5</sup> See Office of the Revisor of Statutes, Minnesota Legislature. (2020). *2020 Minnesota Statutes: §216B.1611 Interconnection of On-Site Distributed Generation*. <https://www.revisor.mn.gov/statutes/cite/216b.1611>

the Minnesota standard did not go far enough in the eyes of some,<sup>6</sup> it improved the process in several tangible ways and advanced the interconnection conversation to a point at which additional improvements to the standard will be a lighter lift.

The interconnection process as it exists is producing positive outcomes, as seen in Figure 1.<sup>7</sup> Table 1 shows how well the interconnection process worked in 2020.<sup>8</sup> With the COVID pandemic in 2020, drawing conclusions from the data is premature. However, it will be useful to observe whether time to process interconnections improves.

**Figure 1. Number of interconnections per year**



Source: Minnesota Public Utilities Commission. (2021, May 11). *MN DIP Temporary Annual Reporting Review*

<sup>6</sup> The interconnection standard represents a significant improvement from the 2004 standard and is better than the standard operative in most other states. However, this does not mean it is without problems. Some developers are filing complaints over interconnections not being as smooth as promised. Some cutting-edge issues, like streamlined interconnection for storage, hybrid storage and solar systems, continue to be a work in process.

<sup>7</sup> Minnesota Public Utilities Commission. (2021, May 11). *MN DIP temporary annual reporting review* [PowerPoint slides]. Docket No. E999/CI-16-521. [https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPop&documentId=\(90A85C79-0000-C638-9974-E47050E668D8\)&documentTitle=20215-174052-03](https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPop&documentId=(90A85C79-0000-C638-9974-E47050E668D8)&documentTitle=20215-174052-03)

<sup>8</sup> Minnesota Public Utilities Commission, 2021.

**Table 1. Minnesota interconnection experience in 2020**

Minnesota Distributed Energy Resources Interconnection Process stats by process track*				
	Simplified	Fast track	Study	Blank
Total	2,832 (21 MW)	549 (272.1 MW)	162 (91.8 MW)	236 (1.2 MW)
Active applications	1,162 (8 MW)	355 (236.2 MW)	113 (80.3 MW)	31 (0 MW)
Interconnections	1,211 (9.4 MW)	81 (7.9 MW)	20 (10 MW)	0
Withdrawn	459 (3.6 MW)	113 (28 MW)	20 (10 MW)	205 (1.2 MW)
Size range	0 to 30 kW	12.3 kW to 1 MW	2.8 kW to 1 MW	0 to 325 kW
Median size	6.96 kW	300 kW	1 MW	0
Initial review pass rate	87%	78%	29%	-
Supplemental review pass rate	96%	92%	25%	-
Application date to permission to operate (median business days)	128 days	204.5 days	186 days	-
Completeness review	31 days	37 days	35.5 days	-
Initial engineering review	14 days	22 days	23.5 days	-
Supplemental engineering review	32 days	32 days	33 days	-
System impact study	-	-	50 days	-
Facilities study	3 days	-	48 days	-
Interconnection agreement sent	2 days	8 days	9 days	-
Time to sign agreement (developer action)	4 days	4 days	2 days	-
Returned agreement to permission to operate (utility/developer action)	60 days	114.5 days	58 days	-

\* Applications with activity in 2020 (Dakota, Minnesota Power, Otter Tail Power, Xcel)

The Distributed Generation Work Group (DGWG) continues to work to improve processes and respond to new challenges. Rapid changes in DER technologies, as well as the electronics available to communicate with and control those technologies, continue to demand further improvements in the standard and the processes implementing the standard in Minnesota and throughout the world. Minnesota is once again setting a good example by offering proactive improvement in consultation with stakeholders.

The benefits of Minnesota's proactive processes have made it a leader among Midwestern states and beyond. The Minnesota DER Interconnection Process provides other states with a new starting point that will reduce their time to implementation. Further, the deliberate stakeholder process reconciled many points of contention in IEEE 1547-2018 implementation, and the lessons learned offer other states a head start in anticipating where disagreements will arise.

## Good Stuff From the Minnesota Interconnection Process and Outcomes

In summary, several features of the Minnesota process are worth emulating.

- Notable lessons on the process of updating the interconnection standard:
  - Don't delegate interconnection updates to the utility with a light regulatory review; instead, employ a broad stakeholder process.
  - Make progress where you can and set the stage for further progress as experience and technologies advance.
  - Anticipate continuous improvement and an ongoing stakeholder process because DER technologies and electric system digital electronics continue to offer additional capabilities and opportunities.
- Notable areas in which Minnesota improved interconnection outcomes:
  - A statewide standard that establishes common interconnection requirements for all utilities where possible and makes accommodation for smaller utilities where necessary.
  - A simplified interconnection process for projects 20 kW or less that establishes a time limit and thus creates more certainty.
  - A public electronic interconnection queue for utilities with 40 interconnections per year or more.
  - Incorporation of advanced inverter functionality in the process, setting the stage to improve visibility and enable voltage ride-through in certain situations when certified equipment becomes available in late 2021. In the meantime, advanced inverters are allowed by mutual agreement with the utility but are not required.
  - A standard application and technical requirements for battery electric storage systems, setting the stage for expedited interconnections of storage and hybrid systems soon.

# Minnesota PUC Progress on Electric Vehicles

Although EVs are still only a small share<sup>9</sup> of the automobile market in Minnesota, the PUC recognized that EVs could benefit the state but also adversely affect the electric system in the absence of proper planning. The PUC utilized its authority<sup>10</sup> to proactively open an inquiry into EV charging and infrastructure. The commission hosted a public workshop and requested input from utilities, EV charging providers, governmental bodies and other interested stakeholders. Beyond this inquiry, the PUC also utilized public processes and stakeholder engagement to provide input and perspective on pilot programs requested by utilities.

## Understanding Electric Vehicles in the Minnesota Context

Recognizing that EVs and EV charging would affect the electric system, the Minnesota PUC opened a commission inquiry into electric vehicle charging and infrastructure in December 2017. The purpose of the inquiry was 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 potential electric system benefits;
2. The degree to which utilities and utility regulatory policy can affect the extent and pace of EV penetration in Minnesota; and
3. Possible EV tariff options to facilitate wider availability of EV charging infrastructure.”<sup>11</sup>

The method by which the commission opened the inquiry is notable, beginning with a one-day workshop in March 2018 that featured both national and local experts on EV charging and infrastructure. The purpose of the workshop was to inform stakeholders and the commission about current efforts to advance EV infrastructure deployment throughout the country and to shape the course of the inquiry. In the public notice, the commission encouraged people to “reach out to others in their network and have them contact PUC staff to be placed on the official service list for the docket”<sup>12</sup> to engage a broad range of stakeholders. It is important to note that the commission opened the inquiry with a public workshop as opposed to a comment period. Opening proceedings for comment can be intimidating to some stakeholders because that process requires formal comment

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<sup>9</sup> Minnesota Department of Transportation. (2021, February 13). *Electric vehicle dashboard*. <https://www.dot.state.mn.us/sustainability/electric-vehicle-dashboard.html>

<sup>10</sup> Office of the Revisor of Statutes, Minnesota Legislature. (2020). *2020 Minnesota Statutes: §216A.07 Commissioner Powers and Duties*. <https://www.revisor.mn.gov/statutes/cite/216A.07>

<sup>11</sup> Minnesota Public Utilities Commission. (2017, December 28). *Notice of commission inquiry into electric vehicle charging and infrastructure*. Docket E999/CI-17-879, p. 1. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={30389E60-0000-C816-8E64-B6EEF826E52F}&documentTitle=201712-138467-01>

<sup>12</sup> Minnesota Public Utilities Commission, 2017, p. 2

submissions. Starting with a workshop enabled broad participation, conversation and sharing of ideas that might not otherwise have occurred.

After the stakeholder workshop, the commission issued a notice of comment period in May 2018 requesting input on a variety of EV issues, including barriers to adoption, guiding principles for adoption, the possible effects of increased electric retail sales for EVs, cost recovery for EV-related investments, pilot programs and cost-benefit analyses. Eighteen parties submitted comments.

In December 2018, the commission issued a summary of the issues raised during the investigation. The PUC also issued its own findings and an order, which were informed by the most prominent issues that emerged from the stakeholder engagement process.<sup>13</sup> The commission required utilities to provide the following information in 2019:

- Report of planned 2019 EV proposals.
- First annual EV report per state statute, including promotional cost recovery mechanisms.
- A utility transportation electrification plan.
- Upcoming proposals including plans for infrastructure, education and managed charging.

## Path From Pilot to Program: Residential Electric Vehicles

During the commission's inquiry into EV charging and infrastructure, and the subsequent requirement that utilities submit proposals on EV charging, Xcel Energy filed an EV pilot proposal that the commission approved in May 2018. The proposal, known as Xcel Energy's residential EV service pilot, was made in response to advocates'<sup>14</sup> concerns that the expense of adding a second meter on Xcel's existing off-peak EV rate was suppressing participation.<sup>15</sup> The new pilot used less expensive, smart EV chargers (i.e., wireless-capable EV supply equipment and a customer's home wireless network) instead of a second meter to monitor and bill off-peak EV consumption. This allowed customers to avoid the need for a second utility-grade meter, reportedly an outlay of over \$2,000. Xcel's report on the status of the pilot indicates that 96% of the related charging has been off-peak, suggesting that the pricing signals are effective.<sup>16</sup>

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<sup>13</sup> Minnesota Public Utilities Commission, Docket E-999/CI-17-879, Order on Feb. 1, 2019, making findings and requiring filings. [https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=\(10BBAA68-0000-C413-9799-DF3ED0978E75\)&documentTitle=20192-149933-01](https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=(10BBAA68-0000-C413-9799-DF3ED0978E75)&documentTitle=20192-149933-01)

<sup>14</sup> Including Fresh Energy, Sierra Club and Minnesota Center for Environmental Advocacy.

<sup>15</sup> Minnesota Public Utilities Commission, Docket No. E-002/M-17-817, Order on May 9, 2018, approving pilot program, granting variance, and requiring annual reports. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7b40004663-0000-C51C-AF02-34594A5E471C%7d&documentTitle=20185-142865-01>

<sup>16</sup> Michigan's Public Service Commission approved a similar change to an Indiana Michigan Power Co. residential charging tariff. Reaching a similar conclusion as the Minnesota PUC in the Xcel case, the Michigan commission approved an arrangement in which the customer is charged for their full residential load as measured by the primary meter and then by separate submeter to reflect the application of the time-differentiated rates under the company's EV charging tariff. Michigan Public Service Commission, Case No. U-20282, Order on November 8, 2018. <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t00000032DjfAAE>

The pilot has been so successful that Xcel filed to make it a permanent offering open to all customers.<sup>17</sup> After two public comment periods, the commission granted this request on October 6, 2020, with modifications.<sup>18</sup> This residential charging pilot example illustrates that through education and cooperation, a pilot can be initiated, improved upon through an open process, and ultimately turned into a permanent utility program that ensures the public good.

## A Minnesota Pilot on Rural Electric Vehicle Charging

Minnesota also recently approved a pilot program with Otter Tail Power Co. that establishes a useful model for rural EV charging. In January 2020, Otter Tail filed a petition requesting PUC approval of an EV direct current fast charging (DCFC) time-of-day pilot tariff, which included the development and ownership of 11 DCFC stations and 10 additional Level 2 charging stations in the company's rural northwestern Minnesota service territory (see Figure 2 on the next page<sup>19</sup>).

In its petition, Otter Tail said it selected 11 areas for placement of DCFCs based on its evaluation of travel corridors, travel destinations and proximity to Otter Tail customers. More than 95% of its customers would be within 30 miles of a DCFC site, the company determined. Charging rates for the DCFCs include a fixed charge of \$6 and variable peak, shoulder and off-peak summer rates per kWh of \$0.13, \$0.049 and \$0.09, respectively, and similar three-period winter rates that range from \$0.07 to \$0.09 per kWh. Charging rates also include the cost of retiring renewable energy certificates in the amount of energy that Otter Tail supplies to EVs through this program.

The PUC's approval of Otter Tail's rural DCFC network is a good example of recognizing the need for and the benefit of utility investment absent a private marketplace to provide necessary service.<sup>20</sup> While Otter Tail's pilot provides a model for utility ownership, it is a limited undertaking designed to meet basic charging needs in a rural part of a largely rural state.<sup>21</sup> The company has indicated its willingness to divest itself of these stations once

<sup>17</sup> See Xcel Energy. (2019, May 31). *Annual report*, p. 5. Compliance filing in Minnesota Public Utilities Commission Docket Nos. E002/M-15-111 and E002/M-17-817. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={B0BF0F6B-0000-CF2D-9F65-F327035855DC}&documentTitle=20195-153306-02>. Although the company and the commission recognized the value of this new pilot, Xcel's original EV subscription pilot is still ongoing and tests a subscription-style rate design.

<sup>18</sup> Minnesota Public Utilities Commission, Docket No. E-002/M-19-559, Order on October 6, 2020, approving electric vehicle home service and voluntary electric vehicle charger service programs as modified. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={20E1FE74-0000-C715-9765-D3D7DC10DE0A}&documentTitle=202010-167089-01>

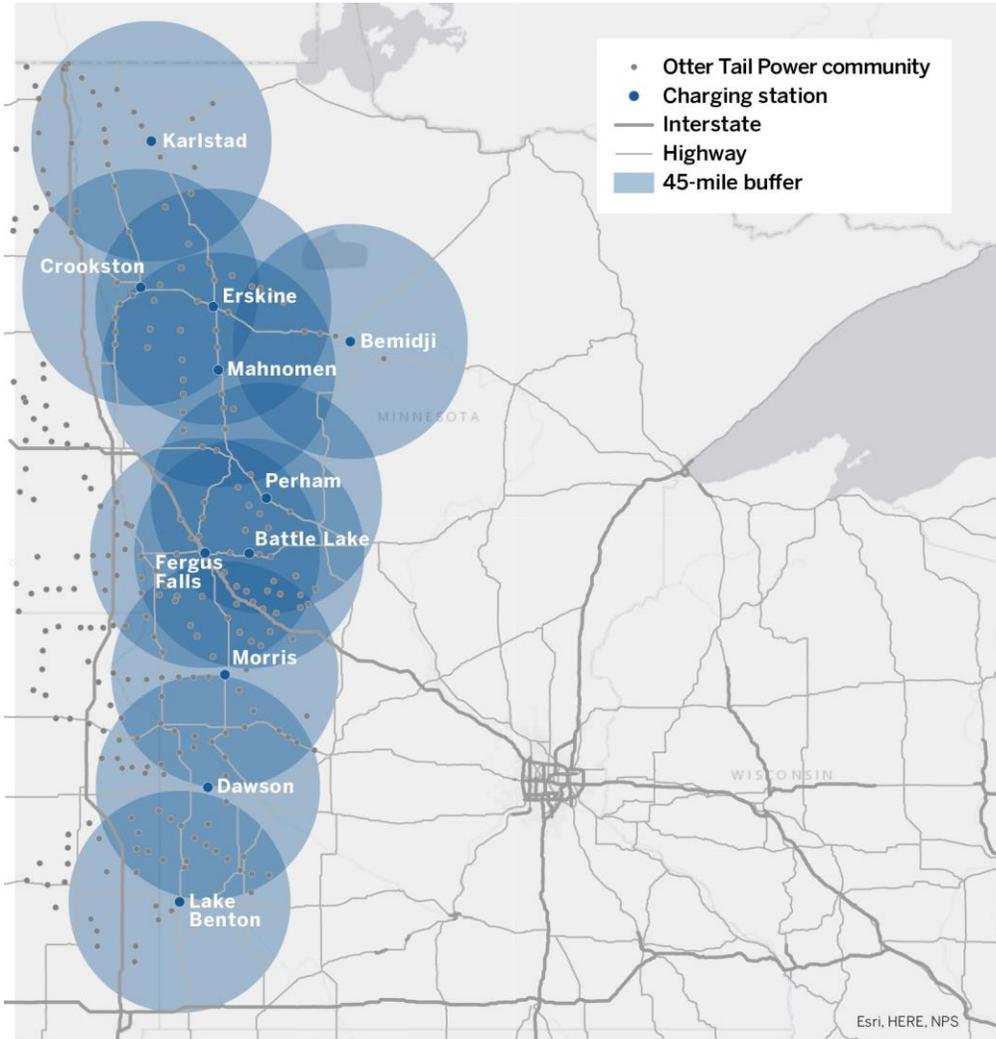
<sup>19</sup> Otter Tail Power Co. (2020, December 28). *Scope of work: Otter Tail Power Company electric vehicle direct current fast charger (DCFC) infrastructure*. Compliance filing in Minnesota Public Utilities Commission Docket No. E017/M-20-181. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={20EEAA76-0000-CE1D-AB1D-613E3EC7BB99}&documentTitle=202012-169380-01>

<sup>20</sup> Minnesota Public Utilities Commission, Docket No. E017/M-20-181, Order on October 27, 2020, approving pilot program, granting deferred accounting, and setting additional requirements. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={50A86B75-0000-C816-B1F8-2B2766A35C71}&documentTitle=202010-167708-01>

<sup>21</sup> Nearly three-quarters of Minnesota's population is in cities. Minnesota State Demographic Center. (2017). *Greater Minnesota: Refined & revisited*, p. 2. Minnesota Department of Administration. <https://mn.gov/admin/demography/reports-resources/greater-mn-refined-and-revisited.jsp>

they are built and to provide interested third parties with charging rates similar to those it will offer under its ownership. For states facing the challenge of developing charging infrastructure in rural areas while trying to preserve the opportunity for a more competitive market to develop where it can, the Otter Tail model is one to consider.

**Figure 2. Potential locations of Otter Tail Power Co. direct current fast charging stations**



Source: Otter Tail Power Co. (2020, December 28). *Scope of Work: Otter Tail Power Company Electric Vehicle Direct Current Fast Charger (DCFC) Infrastructure*

## Good Stuff From the Minnesota PUC Supporting Electric Vehicle Adoption

In most cases, PUC review and approval of utility charging proposals requires commissions to balance two distinct concerns: 1) the desire to either accommodate or promote an EV market and to learn how to improve the delivery of electric transportation services, and 2) the need to make sure that utility investments neither carry too high a price tag nor discourage opportunities for competition among market entrants that could

provide charging services. These two PUC decisions reflect this analytical framework; more specifically, an interest in working with stakeholders and securing economical load management benefits, and meeting the specific needs of charging submarkets, all useful lessons from pilot programs that can translate into permanent utility programs.

## Minnesota Progress on Performance-Based Regulation

Minnesota's performance-based regulation process presents an example worthy of consideration for other states considering how to approach PBR development.

Minnesota's process is noteworthy because it was extensive, it looked at a broad swath of innovative metrics, and it incorporated a range of perspectives in a broad, public process. First, the PUC took a complete look at existing, potential and future metrics. Second, it included consideration of new and innovative metrics and developed those metrics throughout the process. Third, the PUC process not only included stakeholders but ensured a back-and-forth exchange of information and ideas. Minnesota is continuing to finalize the outcomes in its PBR docket and has adopted an extensive set of reporting metrics for its largest utility, Xcel Energy (see the appendix to this paper). The process itself already serves as a model.

Minnesota's PBR examination docket began in 2017. Informed and well-written comments by the Office of the Attorney General (OAG) helped frame the process. The OAG noted the need to first consider threshold questions to inform regulators' decisions regarding the PBR process, including consideration of the existing regulatory structure, available policy tools and the desired outcomes of the proceeding. The OAG also proffered a performance incentive mechanism design process, which the PUC adopted as a framework for the docket. The approach and threshold questions set a phased examination of high-level goals, which were then further refined to targets and measures to attain those goals.

### Minnesota Focused First on Goals and Outcomes

Minnesota took care to consider, identify and set forth goals and preferred outcomes.<sup>22</sup> The commission also established five outcome areas and seven metric design principles to help guide the creation of metrics.<sup>23</sup> The stakeholders considered hundreds of new and existing metrics to objectively consider baselines and progress toward the outcomes. The process looked at whether metrics and data sets already existed and could be implemented in the near term. For those that could not be implemented soon, a longer-term viability assessment was performed before a metric or data set was deemed nonviable. By taking a comprehensive approach to the development of metrics, the PUC ensured the process was both rooted in the current regulatory framework when possible and had room to grow into a more comprehensive PBR framework. Minnesota's process continues with reporting the

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<sup>22</sup> The goals were "to promote the public interest by ensuring environmental protection; adequate, efficient, and reasonable service; reasonable rates; and the opportunity for regulated entities to receive a fair and reasonable return on their investments." Minnesota Public Utilities Commission, Docket No. E-002/CI-17-401, Order on January 8, 2019, establishing performance-incentive mechanism process, pp. 11-12. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPopup&documentId=%7BF0E82E68-0000-CF1F-93DB-4CE874187020%7D&documentTitle=20191-148970-01>

<sup>23</sup> Minnesota Public Utilities Commission, January 2019, p. 12.

established metrics, the refinement of those metrics and the development of future metrics and potential performance incentive mechanisms.

## Minnesota PUC Was Focused and Engaged Throughout

The PUC staff and commissioners were highly engaged in understanding the goals and more detailed criteria and metrics. As a result, they understood and analyzed the strengths and weaknesses of proposed metrics and incorporated forward-thinking and innovative outcomes and supporting metrics into the process. Parties also provided expertise and a thorough review in their recommendations that helped shape the metrics.

Xcel Energy proposed a set of metrics relying on existing data sets and a few that would require new data sets. Although there is much to admire about the Xcel proposal, the commission was actively engaged in amending it. Staff expertise, stakeholder input, focused commissioner attention and a two-year process produced modifications to address concerns within the metrics (see the text box).

### PUC Employed a Commendable Stakeholder Process

Minnesota's process is commendable because it included stakeholders and stakeholder input. The PUC's first action in the proceeding was a notice requesting stakeholder comments. In its request, the PUC provided stakeholders with the background of the proceeding, an overview of the process (including the anticipated stages of the proceeding) and topics for initial comments. Opportunity for comment continued throughout the process. Staff briefing papers summarized the issues and comments not only for the PUC but

#### Modifications in PBR metrics<sup>24</sup>

- Include MWh per year in addition to MWh for the demand response capacity available submetric and MW as well as MWh for the "amount called" submetric.
- Change the "Calculation Proposed: Load factor or load net of variable renewable generation" to "Calculation Proposed: Load factor for load net of variable renewable generation."
- Provide data and examples of the shape and shift metrics to all interested parties, along with a timeline for implementing these future metrics.
- Include a discussion of fugitive emissions of methane in the first annual report, including a proposed methodology for reporting fugitive emissions for methane in the "Carbon dioxide emissions avoided by electrification of buildings, agriculture, and other sectors" metric under environmental performance.
- In direct consultation with interested stakeholders, explore and develop options to employ an online utility performance dashboard and present those options to the commission in the first annual report, including a fair discussion of the costs involved.
- In consultation with the Department of Commerce and interested stakeholders, develop and file a demand response financial incentive for commission consideration by the end of the first quarter of 2021.

<sup>24</sup> Minnesota Public Utilities Commission, Docket No. E-002/CI-17-401, Order on April 16, 2020, establishing methodologies and reporting schedules. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={003B8471-0000-C210-BAEF-1348A8CCCEF3}&documentTitle=20204-162148-01>

as publicly filed documents for stakeholders that provided concise ongoing analysis of comments and the proceeding. The PUC also hosted workshops with the help of an outside facilitator, the Great Plains Institute, to provide baseline information on data available, the PBR process itself, and opportunity for stakeholder input and discussion regarding possible goals, outcomes and metrics. Finally, the PUC held hearings on the metrics that included opportunities for stakeholders to answer commissioner questions regarding their comments and recommendations. The exchange of information and the time for facilitated discussion and clarification allowed for a robust and honest exchange of ideas that informed and advanced the development of PBR in Minnesota.

## Good Stuff From the Minnesota Performance-Based Regulation Process

- Minnesota took a comprehensive approach to its consideration of PBR.
  - The PUC examined its existing regulatory landscape to determine where performance criteria and metrics already exist to incentivize utility behavior.
  - The commission then took a broad look at what performance criteria and metrics it might want to employ.
  - The PUC considered future performance criteria, recognizing that it might not have sufficient information to implement all metrics currently but anticipating the steps required to acquire additional data to put those metrics in place.
- Minnesota considered and implemented new and innovative performance criteria and metrics.
- Minnesota included stakeholders throughout its process in a manner that ensured that stakeholder input informed and added to the development of performance metrics.

## Conclusion: Lessons From Minnesota

The Minnesota commissioners would be the first to say they continue to seek to improve in each of the three areas highlighted in this brief and that they are eager to further improve their processes across the board. Nevertheless, the three highlighted areas of progress illustrate strengths in the Minnesota PUC regulatory process and the positive lessons to be drawn.

The Minnesota PUC demonstrated in these three examples that it will venture into regulatory questions that are not settled and seek to make progress. For example, utilities anticipated IEEE 1547-2018 for years before it was finalized, and most states decided to wait until it was finally approved. Minnesota, partly prompted by tensions arising from rapid community solar garden uptake, decided to get started on implementing the standard in 2016, two full years before its final approval. Minnesota used the time leading up to the formal adoption of the IEEE update in 2018 to accept expert opinions from utilities and advocates and work toward resolution of as many issues as possible. In so

doing, the PUC was able to implement a compliant update ahead of almost all other states, and it produced information that is proving valuable to those states that chose to wait.

Minnesota consistently seeks out stakeholder processes convened internally by the commission or externally by organizations like GPI when facing a new and complex issue. The deliberate attention to diverse stakeholders led to the identification of several useful metrics that other states are picking up. The effectiveness of the stakeholder interaction and processes is demonstrated by the fact that original, innovative approaches are emerging in Minnesota that advance the state of play for all states.

Minnesota's regulators and staff are willing to take on issues associated with new technologies, like the expansion of EV charging, and learn their way forward. Although many utilities and states use pilot projects to explore new opportunities, most have difficulty producing results that translate into programs. Utility investment in EV charging infrastructure is controversial, but many states wonder if there is a public benefit created by targeted utility investment in certain charging applications. Minnesota chose to examine the proposition by offering the utility an opportunity to invest in a narrow segment of the infrastructure for a specific application, municipal fleet charging. The commission is documenting the benefits the pilot and will be in a position upon pilot completion to more completely assess whether the public benefits merit the application of ratepayer funds.

## Appendix: Xcel Energy Performance-Based Regulation Goals and Outcomes<sup>25</sup>

OUTCOME	METRIC CALCULATION
Affordability	<ul style="list-style-type: none"> <li>• Rates per kWh based on total revenue, reported (1) by customer class and (2) with all classes aggregated</li> <li>• Average monthly bills for residential customers</li> <li>• Total arrearages for residential customers</li> <li>• Total disconnections for nonpayment for residential customers</li> </ul>
Reliability	<ul style="list-style-type: none"> <li>• System Average Interruption Duration Index (SAIDI)</li> <li>• System Average Interruption Frequency Index (SAIFI)</li> <li>• Customer Average Interruption Duration Index (CAIDI)</li> <li>• Customers Experiencing Long Interruption Duration (CELID)</li> <li>• Customers Experiencing Multiple Interruptions (CEMI)</li> <li>• Average Service Availability Index (ASAI)</li> <li>• Momentary Average Interruption Frequency Index (MAIFI)</li> <li>• Locational reliability</li> <li>• Power quality</li> <li>• Equity — reliability by geography, income, or other relevant benchmarks</li> </ul>
Customer service quality	<ul style="list-style-type: none"> <li>• Existing multi-sector metrics, including ACSI [American Customer Satisfaction Index] and J.D. Power</li> <li>• Commission-approved utility-specific survey</li> <li>• Subscription to third-party customer satisfaction metrics</li> <li>• Call center response time</li> <li>• Billing invoice accuracy</li> <li>• Number of customer complaints</li> <li>• Equity metric — customer service quality by geography, income, or other relevant benchmarks</li> </ul>
Environmental performance	<ul style="list-style-type: none"> <li>• Total carbon emissions by (1) utility-owned facilities and PPAs [power purchase agreements] and (2) all sources</li> <li>• Carbon intensity (emissions per MWh) by (1) utility-owned facilities and PPAs and (2) all sources</li> <li>• Total criteria pollutant emissions</li> <li>• Criteria pollutant emission intensity (criteria pollutant emissions per MWh)</li> <li>• CO<sub>2</sub> emissions avoided by electrification of transportation</li> <li>• CO<sub>2</sub> emissions avoided by electrification of buildings, agriculture, and other sectors</li> </ul>

<sup>25</sup> Minnesota Public Utilities Commission, Docket No. E-002/CI-17-401, Order on September 18, 2019, establishing performance metrics. <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7B0082456D-0000-CA1F-9241-23A4FFF7C2FB%7D&documentTitle=20199-155917-01>

Cost-effective alignment of generation and load	<ul style="list-style-type: none"><li>• Demand response, including (1) capacity available (MWh) and (2) amount called (MW, MWh per year)</li><li>• Integration of customer loads with utility supply, including:<ol style="list-style-type: none"><li>1. Amount of demand response that shapes customer load profiles through price response, time varying rates, or behavior campaigns</li><li>2. Amount of demand response that shifts energy consumption from times of high demand to times when there is a surplus of renewable generation</li><li>3. Amount of demand response that sheds loads that can be curtailed to provide peak capacity and supports the system in contingency events</li><li>4. Metrics that measure the effectiveness and success of items 1 to 3, individually and in aggregate</li></ol></li></ul>
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50 State Street, Suite 3  
Montpelier, Vermont 05602  
USA

---

+1 802-223-8199  
info@raponline.org  
**raponline.org**

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