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30 West Superior Street
Duluth, MN 55802-2093
www.mnpower.com



July 6, 2020

VIA ELECTRONIC FILING

Ryan Barlow
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

Re: In the Matter of a Commission Inquiry into Electric Vehicle Charging and Infrastructure
DOCKET NO. E-999/CI-17-879

Dear Mr. Barlow:

In its February 1, 2019 Order Making Findings and Requiring Filings (the "Order"), the Minnesota Public Utilities Commission (or "Commission") established general findings, specific findings, and outlined directives for Minnesota's utilities related to the advancement and adoption of electric vehicle ("EV") integration. This 2020 Transportation Electrification Plan ("TEP") is submitted on behalf of Minnesota Power (or, "the Company") in response to the Commission's findings and actions.

The Company understands the use of trade secret designations in filings to the Commission must be limited. Certain portions of the Plan contain trade secret information and are marked as such, pursuant to the Commission's Revised Procedures for Handling Trade Secret and Privileged Data which further the intent of Minn. Stat. § 13.37 and Minn. Rule 7829.0500. As required by the Commission's Revised Procedures, a statement providing justification for excising the Trade Secret Data is included in the Plan.

The Company appreciates the Commission's attention to this matter and is available to answer any questions. If you have any questions regarding this filing, please contact me at (218) 355-3202 or jjpeterson@mnpower.com.

Respectfully,

Jennifer J. Peterson
Policy Manager
Minnesota Power

JJP:sr
Attach.

STATEMENT REGARDING JUSTIFICATION FOR EXCISING TRADE SECRET INFORMATION

Pursuant to the Commission's revised Procedures for Handling Trade Secret and Privileged Data in furtherance of the intent of Minn. Stat. § 13.37 and Minn. Rule 7829.0500, Minnesota Power has designated portions of its attached Plan as Trade Secret.

Minnesota Power has made certain information in the Plan non-public to prevent compromising the private data of Minnesota Power's customers. Minnesota Power strictly follows its Customer Energy Usage Data ("CEUD") aggregation and release standard as filed in Docket No. E, G-999/CI-12-1344. Minnesota Power respectfully requests the opportunity to provide additional justification in the event of a challenge to the trade secret designation provided herein.



PUBLIC DOCUMENT
TRADE SECRET DATA EXCISED

MINNESOTA POWER'S 2020 TRANSPORTATION ELECTRIFICATION PLAN

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

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

July 6, 2020

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STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

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

Docket No. E-999/CI-17-879
Transportation Electrification Plan

I. Introduction

In its February 1, 2019 Order in Docket No. E-999/CI-17-879, Making Findings and Requiring Filings (the “Order”), the Minnesota Public Utilities Commission (or “Commission”) established general and specific findings for Minnesota’s utilities related to the advancement and adoption of electric vehicle (“EV”) integration. They are as follows:

General Findings:

- Electrification is in the public interest.
- Barriers to increased EV adoption in Minnesota include but are not limited to: (a) inadequate supply of and access to charging infrastructure, and (b) lack of consumer awareness of EV benefits and charging options.
- How EVs are integrated with the electric system will be critical to ensuring that transportation electrification advances the public interest.
- Minnesota’s electric utilities have an important role in facilitating the electrification of Minnesota’s transportation sector and optimizing the cost-effective integration of EVs.

Specific Findings:

- Minnesota’s investor owned utilities should take steps to encourage the cost-effective adoption and integration of EVs.
- The following should be included at a minimum in any EV-related utility proposals:
 - Any EV-related proposals that involve significant investments for which the utility is seeking or will seek cost recovery should include a cost-benefit analysis that shows the expected costs along with the expected ratepayer, system and societal benefits associated with the proposal.
 - In the case of a proposed pilot, the utility filing should include specific evaluation metrics for the pilot and identify what the utility expects to learn from the pilot.
- Utilities should use the Commission’s current environmental externality values for carbon and criteria pollutants in analyzing the societal costs and benefits associated with EV-related proposals. Cost-benefit analyses should consider potential long-term ratepayer and societal benefits, including better grid management, public health, and other social benefits. These analyses should also consider potential long-term costs, including the risk of stranded investment.
- The Office of the Attorney General (“OAG”) suggested a three-step process for evaluating utility investments in public charging infrastructure is reasonable.

-
- Utility investments and arrangements related to charging infrastructure should be designed to ensure interoperability, using standards such as Open Charge Point Protocol and Open Automated Demand Response.
 - No single method of cost recovery should be generally precluded at this time for any EV-related investments.
 - Minn. Stat. § 216B.1614, subd. 2(c)(2), allows utilities the opportunity to recover costs related to educating customers on the benefits of EVs beyond those costs related specifically to the utility's EV tariffs.

Minnesota Power submitted its first Transportation Electrification Plan ("TEP") on June 30, 2019. On December 12, 2019 the Commission released its Order accepting Minnesota Power's 2019 TEP and outlining refined reporting requirements for its 2020 Plan. The requirements are as follows:

In each annual Transportation Electrification Plan, utilities must provide the following information and data to the greatest extent practicable. For any instance in which the utility is not able to provide the information and data, or it is not practicable to do so, the utility must (1) explain why it is unable to provide the information and data; and (2) make a reasonable effort to provide an approximation of the required information and data. If the utility is unable to provide an approximation of the required information and data, the utility must provide the reason or reasons and explain whether it will be possible to provide the required information and data in the future.

- a. Number of EVs in service territory, by type where possible (e.g. light duty, transit, medium duty, heavy duty).
- b. Number of customers and vehicles on each off peak or managed charging rate, energy consumed, and average hourly load profiles by month.
- c. Level of demand (in kilowatts) resulting from electric vehicles during each hour of the day, or if not yet available, during each time period in a utility's time-differentiated tariff, for each electric vehicle tariff offered by the utility.
- d. Consumption of electricity (in kilowatt-hours) by electric vehicles during each hour of the day, or if not yet available, during each time period in a utility's time-differentiated tariff, for each electric vehicle tariff offered by the utility.
- e. Number and capacity of known Level 2 Charging Stations (public, and any enrolled in a utility program).
- f. Number and capacity of direct current fast charging ("DCFC") stations (including breakout of DCFC installed through a utility program).
- g. Any system upgrades performed to accommodate EV charging, total costs paid by utility and by customer, and average cost per upgrade. Cost should be reported separately for the following customer groups: Residential, Government Fleet, Private Fleet, and Public Charging.
- h. EV adoption forecast scenarios (low, likely, high) by sector (residential, medium duty, and heavy duty).
- i. EV load forecast scenarios (low, likely, high) for capacity and energy, by sector (residential, medium duty, and heavy duty).
- j. A summary of the utility's ongoing transportation electrification efforts, including existing programs and projects in development over at least the next 2 years.

-
- k. How the utility plans to facilitate:
 - i. availability and awareness of public charging infrastructure, including an assessment of the private sector fast charging marketplace for the utility's service territory;
 - ii. availability of residential charging options for both single family and multiple unit dwellings;
 - iii. programs or tariffs in development to address flexible load or reduce metering and data costs; and
 - iv. fleet electrification.
 - l. A summary of customer EV education initiatives. Utilities need not include specific examples of outreach materials.
 - m. How the utility plans to optimize EV benefits, including a discussion of how to align charging with periods of lower customer demand and higher renewable energy production and by improving grid management and overall system utilization/efficiency.
 - n. Summaries of any proposals or pilots, including links to full reports, submitted to other regulatory agencies or jurisdictions (for example, proposals submitted under Conservation Improvement Programs or pilots run in other states).
 - o. Attachments or links to the most recent reports for any ongoing EV pilots or programs.

This 2020 Transportation Electrification Plan ("TEP") is submitted on behalf of Minnesota Power (or, "the Company") in response to the Commission's findings and actions.

II. Background

Minnesota Power's Electrification Guiding Principles

Minnesota Power has dedicated internal resources to focus on electrification efforts through its cross-functional, internal Electrification of Transportation Strategy Group, which works to ensure the Company executes a coordinated and appropriate response to the advancement of transportation electrification. The following guiding principles serve as a tool in developing EV programming and will continue to be utilized in the Company's forthcoming offerings and strategies related to transportation electrification. They are described in more detail below.



Figure 1: Minnesota Power's Electrification Guiding Principles

Education

Provide tools and resources designed to increase awareness of electric transportation, provide information about transportation electrification programs and evolving technology, and empower customers to make informed decisions about electric transportation adoption.

Accessibility

Ensure equitable access to infrastructure for all customers, including in low income, rural and underserved areas, in locations and applications that fit their everyday lives and communities.

Optimization

Design electric transportation programs that promote strategic and efficient use of the electric grid and grid resources, and provide benefits to all customers.

Environment

Create electric transportation programs that promote renewable energy, decrease carbon emissions and improve air quality.

Simplicity

Deliver transparent and straightforward customer-focused offerings, creating a simple and convenient way for customers to adopt electric transportation while ensuring a positive customer experience.

Security

Ensure a sense of security for customers who have adopted or are considering adopting electric transportation through availability, reliability, interoperability and safety of charging equipment.

Current Minnesota Power EV Programming

Minnesota Power currently offers two electric vehicle (“EV”) related programs and is in the midst of a Level 2 charger infrastructure rollout. Details on these programs can be found below.

Residential EV Tariff

Minnesota Power has offered a Residential Off-Peak Electric Vehicle Service tariff¹ (“EV Tariff”) since 2015. The details of the tariff are as follows:

Service Charge \$4.25

Off-Peak Energy Charge

All kWh (per kWh) 1.752¢

On-Peak Energy Charge

All kWh (per kWh) 9.612¢

On-Peak and Off-Peak Energy Defined: The On-Peak Energy shall be defined as energy used from 8:00 a.m. to 10:00 p.m., Monday through Friday, inclusive, excluding holidays. The Off-Peak Energy shall include energy used in all other hours. Holidays shall be those days nationally designated and celebrated as New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas.

Minnesota Power currently has five customers enrolled in the tariff. It is the Company’s belief that the lack of enrolled customers is primarily due to the necessity for customers to install a second service. Installing a second service presents an upfront cost most customers cannot, or are not

¹ Docket No. E-015/M-15-120

willing to, bear. Through an extensive survey and focus group process, customers provided feedback that they would like to see charging options or programs beyond the Residential Rate tariff that requires a second service.²

Commercial EV Tariff

Minnesota Power recently implemented a three year Electric Vehicle Commercial Charging Rate Pilot for Commercial and Industrial Customers. The Commercial Pilot consists of on-off-and-super off peak periods as well as a 30 percent cap on demand charges. The Pilot is designed to address the high demand charges associated with EV charging, particularly in fleet and public charging applications. This Pilot is an initial step towards incentivizing EV charging and will need to be refined as current barriers are overcome and knowledge is gained. Details of the Pilot are as follows:

Service Charge \$12.00

Demand Charge for On-Peak kW \$6.50

Energy Charge for all kWh 5.423¢

On-Peak periods are defined as 3:00 p.m. to 8:00 p.m., Monday through Friday, inclusive, excluding holidays. Super Off-Peak is defined as 11:00 p.m. to 5:00 a.m., Monday through Friday, inclusive, excluding holidays. Off-Peak is all other hours other than On-Peak or Super Off-Peak. There are no Demand Charge applied during Off-Peak or Super Off-Peak hours.

EVSE Level 2 Rollout

As mentioned in the Company's last TEP, in 2019 Minnesota Power issued a Request for Information ("RFI") to gather facts and pricing details on Level 2 and DCFC chargers. After a review of available technology and associated pricing at various amounts, the Company released a Request for Proposal ("RFP") and further explored partnering with host sites and/or owning public, workplace, and multi-unit dwelling charging infrastructure to increase availability of Level 2 chargers.

Drawing from the insights gained through the RFI and RFP processes referenced above, in the fourth quarter of 2019, the Company formally began an initiative to deploy a total of 20 Level 2 Electric Vehicle Supply Equipment ("EVSE") chargers across its service territory. The Company is currently collaborating with approximately 20 different commercial site hosts/partners. To date, sixteen locations have been identified and are under development, with six installations nearing completion and one installation complete as of March of this year. The onset of the COVID-19 pandemic and the corresponding community response has slowed down some of the activity in developing partnerships with site hosts for this effort, but the Company is expecting to complete most, if not all, of these site installations in 2020.

² Further details on the Voice of Customer feedback process can be found in the Company's July 6, 2020 EV Portfolio filing, Docket to be assigned.

III. Response to Order Points

Minnesota Power continues to plan for EV adoption expansion and related services in its service territory. The Company has submitted a Commercial EV Charging Rate Pilot Program filing³ and is in the process of finalizing and developing a number of EV-related proposals to address the main barriers to EV adoption as outlined by the Commission. The Company intends to continue examining the EV landscape over the next two years while implementing and assessing current and proposed EV rates, pilots and programming.

In the following sections the Company outlines how its current and planned EV-related initiatives address the specific requirements in the Commission's December 12, 2019 Order in this docket.

Number of EVs in service territory, by type where possible (e.g. light duty, transit, medium duty, heavy duty).

There are currently 180 known electric vehicles in Minnesota Power's service territory⁴. The exact number of each type of EV is unknown at this time but assumed to be mostly made up of light duty vehicles. The Company is aware of the Duluth Transit Authority's seven electric transit buses.

Number of customers and vehicles on each off peak or managed charging rate, energy consumed, and average hourly load profiles by month.

Presently, there are five customers on the Company's residential EV rate; this rate is comprised of on-and-off peak charging times. There are two customers on the Company's commercial EV pilot rate, and these two customers have three distinct service locations. This rate includes a demand component, and on-peak off-peak, and super off-peak rate components. These rates are described in detail in Section II of this Plan.

Minnesota Power does not ask for registration information for customers on its EV specific rates. It is the Company's assumption that each customer account enrolled in the residential EV rate represents one EV on average. As a result of customer survey work, it has been determined that at least two households in Minnesota Power's service territory have more than one EV, but neither households are enrolled in the residential charging rate.

³ Docket No. E015/RP-19-337

⁴ <http://www.dot.state.mn.us/sustainability/electric-vehicle-dashboard.html>

At this time, Minnesota Power does not have the technology in place to gather hourly load profiles for residential customers. The Company will have this ability in the near future once the Meter Data Management (“MDM”) and Advanced Metering Infrastructure (“AMI”) implementation is complete.⁵

Table 1: Total Amount of Electricity Sold by Month on Residential EV Service

Billing Month	Participating Customers	Total Monthly Energy Sold (kWh)
May-19	4	1571
Jun-19	4	1190
Jul-19	4	660
Aug-19	4	652
Sep-19	4	1057
Oct-19	5	869
Nov-19	5	1272
Dec-19	5	1476
Jan-20	5	2405
Feb-20	5	1375
Mar-20	5	1394
Apr-20	5	853
Total		14,774

Table 2: Total Amount of Electricity Sold by Month on Commercial Pilot EV Service

Billing Month	Participating Customers	Total Monthly Energy Sold (kWh)
19-May	0	0
19-Jun	0	0
19-Jul	0	0
19-Aug	0	0
19-Sep	0	0
19-Oct	0	0
19-Nov	0	0
19-Dec	0	0
20-Jan	0	0
20-Feb	0	0
20-Mar	0	0
20-Apr	2	15677
Total		15,677

*The Commercial EV Pilot began in the first quarter of 2020.

⁵ More information on the Company's MDM and AMI expansion can be found in the Company's 2019 Rate Case Docket No. E015/GR-19-442

Level of demand (in kilowatts) resulting from electric vehicles during each hour of the day, or if not yet available, during each time period in a utility's time-differentiated tariff, for each electric vehicle tariff offered by the utility.

Minnesota Power only has the ability to provide this data for commercial service meters at this time. In the future the Company may be able to provide kilowatt demand data for residential service meters.

Table 3: Commercial EV Pilot Demand (kW)⁶

Billing Month	Participating Customers	On-peak Demand (kW)	Off-peak Demand (kW)	Super Off-peak Demand (kW)
19-May	0	0	0	0
19-Jun	0	0	0	0
19-Jul	0	0	0	0
19-Aug	0	0	0	0
19-Sep	0	0	0	0
19-Oct	0	0	0	0
19-Nov	0	0	0	0
19-Dec	0	0	0	0
20-Jan	0	0	0	0
20-Feb	0	0	0	0
20-Mar	0	0	0	0
20-Apr	2	Trade Secret Data Begins		
				Trade Secret Data Ends
	Total			

⁶ The Commercial EV Pilot Rate did not go live for customers until April of 2020.

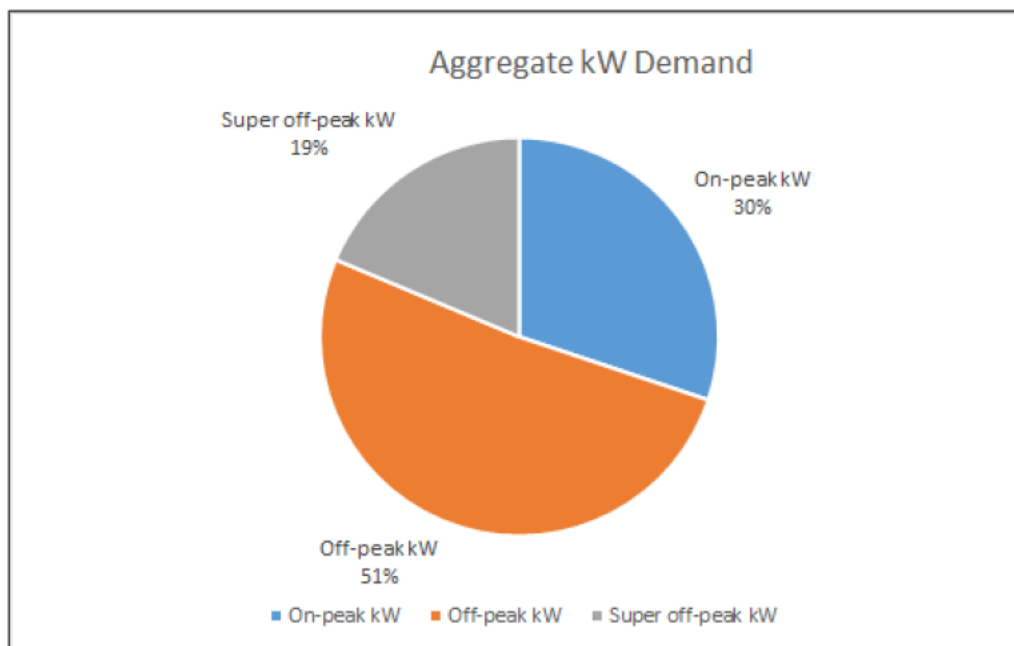


Figure 2: Demand by Time Period in Aggregate for all Commercial EV Pilot Customers

Consumption of electricity (in kilowatt-hours) by electric vehicles during each hour of the day, or if not yet available, during each time period in a utility's time-differentiated tariff, for each electric vehicle tariff offered by the utility.

Minnesota Power is able to report kWh totals by month and time period. The Company does not have the ability to provide hourly at this time, but may be able to do so in the future with the MDM.

Table 4: Total Amount of Electricity Sold by Month for Residential Service

Billing Month	Participating Customers	Total Monthly Energy Sold (kWh)	Off-Peak (kWh)	On-Peak (kWh)
May-19	4	1571	1372	208
Jun-19	4	1190	1076	106
Jul-19	4	660	606	56
Aug-19	4	652	594	57
Sep-19	4	1057	935	123
Oct-19	5	869	780	89
Nov-19	5	1272	864	405
Dec-19	5	1476	1079	398
Jan-20	5	2405	2010	398
Feb-20	5	1375	1080	293
Mar-20	5	1394	1046	348
Apr-20	5	853	629	224
	Total	14,774	12,071	2,705

Table 5: Total amount of Electricity (kWh) sold by Month for Commercial EV Pilot Service

Billing Month	Participating Customers	Total Monthly Energy Sold (kWh)	On-peak (kWh)	Off-peak (kWh)	Super Off-peak (kWh)
19-May	0	0	0	0	0
19-Jun	0	0	0	0	0
19-Jul	0	0	0	0	0
19-Aug	0	0	0	0	0
19-Sep	0	0	0	0	0
19-Oct	0	0	0	0	0
19-Nov	0	0	0	0	0
19-Dec	0	0	0	0	0
20-Jan	0	0	0	0	0
20-Feb	0	0	0	0	0
20-Mar	0	0	0	0	0
20-Apr	2	Trade Secret Data Begins			
					Trade Secret Data Ends
	Total				

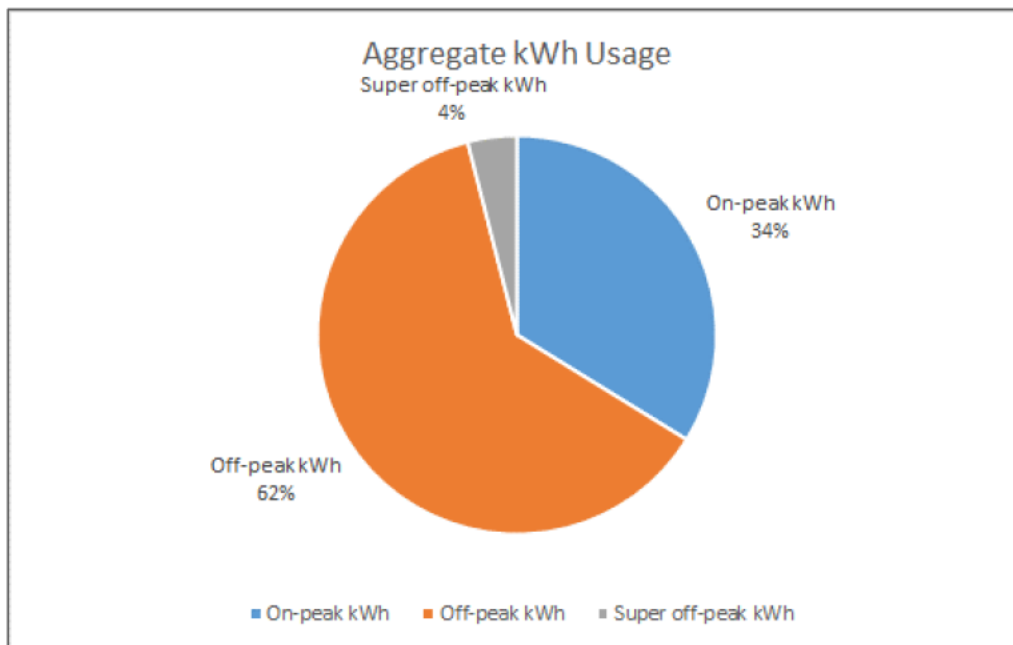


Figure 3: Kilowatt-hours by Time Period in Aggregate for all Commercial EV Pilot Customers

Number and capacity of known Level 2 Charging Stations (public, and any enrolled in a utility program).

According to the Alternative Fuels Data Center (“AFDC”) Station Locator⁷ for the state of Minnesota, and filtered for level two charging location in Minnesota Power’s service area, there are currently 22 level two chargers in operation. The AFDC does not publish capacity information at this time, but a cursory analysis shows that the capacity of these chargers is assumed at 7.7 kW or higher, in aggregate totaling approximately 170 kW, or more.

Number and capacity of direct current fast charging (“DCFC”) stations (including breakout of DCFC installed through a utility program).

According to the AFDC Station Locator for Minnesota, and filtered for Level 3 charging locations in Minnesota Power’s service area, there are currently sixteen level three public DCFC chargers in operation. The AFDC does not publish capacity information at this time, but a cursory analysis shows that the capacity of these chargers have an assumed aggregate totaling approximately 1,100 kW. Twelve of these sixteen chargers are enrolled in Minnesota Power’s Commercial EV Pilot Rate⁸. Additionally, there are eight private DCFC chargers enrolled in the Commercial EV Pilot Rate that are being used for public transportation. With these chargers in mind, there is an aggregate of 1,500 kW in DC fast charging, 1,300 kW of which is enrolled in Commercial EV Pilot Rate.

Any system upgrades performed to accommodate EV charging, total costs paid by utility and by customer, and average cost per upgrade. Cost should be reported separately for the following customer groups: Residential, Government Fleet, Private Fleet, and Public Charging.

Minnesota Power had \$0 of total costs paid by utility or customer for EV charging upgrades in the time period July 1, 2019 – May 31, 2020. EV charging added to the system in 2019 occurred within system capabilities with no required system upgrades.

EV adoption and forecast scenarios (low, likely, high) by sector (residential, medium duty, and heavy duty).

Electric vehicles may present vast potential benefits for most utilities. These potential benefits may differ somewhat for Minnesota Power from other utilities due to the Company’s unique

⁷ <https://afdc.energy.gov/stations/#/find/nearest>

⁸ These chargers are owned by the same customer, and therefore are accounted for as one customer in our reporting under the Commercial EV Tariff.

customer mix.⁹ Nevertheless, if charging infrastructure is unmanaged, it has potential to cause costly impacts to the distribution system. For example, customers installing Level 2 home charging equipment, with about 10 kW of load, can put stress on transformers or cause line voltage issues. This is particularly true if many homes begin installing chargers and charge at the same time. However, if managed through advanced metering infrastructure and/or smart charging EVSE, these loads could be managed effectively. With the current penetration level of EVs in Minnesota Power's service territory, the Company has not experienced any of these issues to-date. It is prudent to consider customer programming that encourages and incentivizes customers to install smart chargers, which can be effectively utilized in conjunction with off-peak EV rate structures. In addition, utilities in general must continue to develop internal expertise, software systems, and protocols for engaging with these new Distributed Energy Resources ("DERs").

There are additional potential benefits related to EVs as they gain the ability not only to charge, but to discharge energy onto the system. This is an emerging area that will require significant investment in regulations, software platforms, charging equipment, and equitable rate structures. Minnesota Power, as highlighted in previous sections, is taking the first steps to provide a base for new rate structures and customer interactions through its internal EV efforts, system integrations and MDM/AMI implementation.

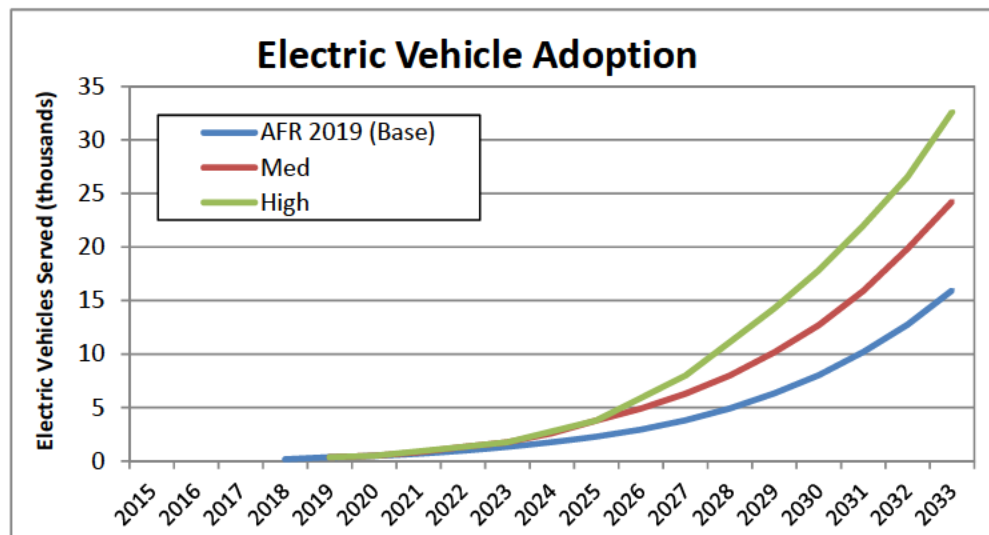


Figure 4: Electric Vehicle Adoption Forecast¹⁰

Currently, the Company estimates there are about 180 light-weight (i.e. non-fleet) EVs registered in Minnesota Power's retail service territory, which equates to an approximate 0.2 percent penetration level among residential customers and an estimated 350-450 MWh of energy

⁹ Minnesota Power's system is dominated by large industrial customers, with approximately 74 percent of retail kWh energy sales to this customer class in 2018, and only 12 percent and 14 percent of sales to residential and commercial customers. Further information can be found in the Company's 2019 Rate Case Docket No. E015/GR-19-442.

¹⁰ Minnesota Power's 2019 Annual Electric Utility Forecast Report; Docket No.: E-999/PR-19-11

consumption. This level of consumption represents 0.05 percent of all sales to residential customers.

By 2030, EV saturation among Minnesota Power customers is projected to exceed 7 percent, which equates to about 8,000 EVs and 20,000 MWh in additional energy requirements from the residential sector.¹¹ This also equates to increases of about 2.5 MW and 7.2 MW in the 2030 Summer and Winter peaks (respectively). A summary of the utility's ongoing transportation electrification efforts, including existing programs and projects in development over at least the next 2 years.

Figure 5 outlines Minnesota Power's planned timeline for EV related initiatives. The Company has submitted its Commercial EV Charging Rate Pilot Program.¹² The Company will file its SmartCharge Rewards Pilot and Second Service/Smart Charger Rebate Pilot proposal in Q3 2020. The Company is also in the process of exploring other ways of meeting the Commission's electrification objectives, such as investigating Mine Truck Electrification, as highlighted in the Economic Recovery Docket¹³. The Company will continue to work towards the timeline elements as outlined. This list is not final or exclusionary and the Company anticipates there will be modifications to the timeline and proposals as EV growth, programs, and policy advance.

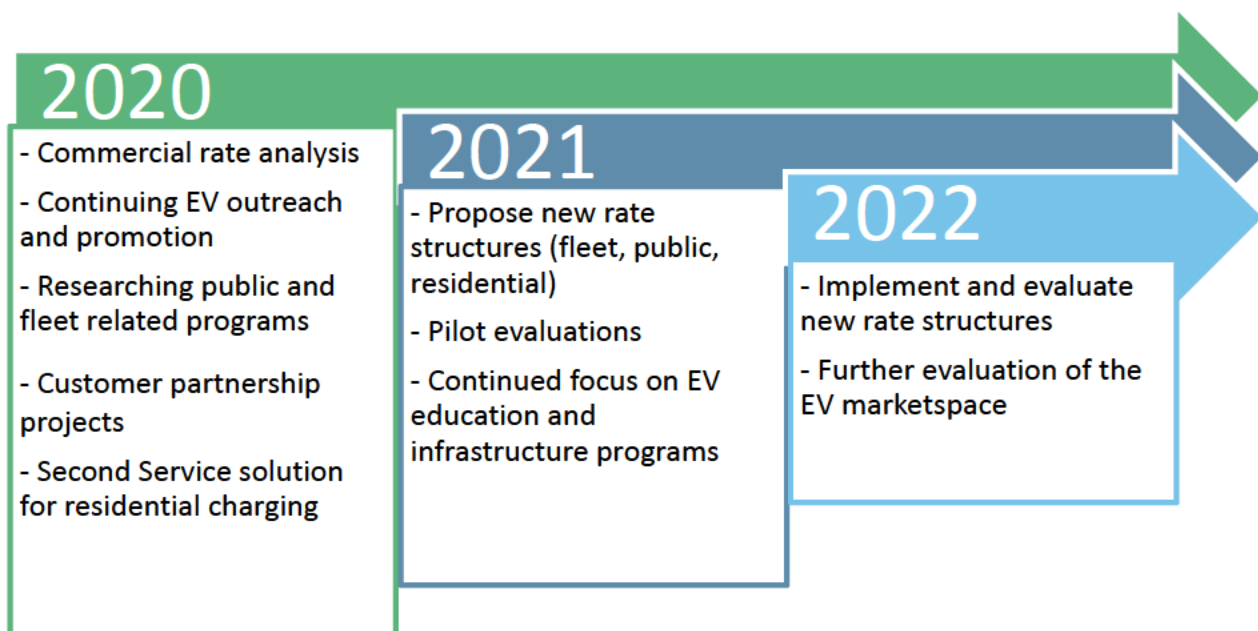


Figure 5: EV Initiatives Implementation Timeline

¹¹ Minnesota Power's 2019 Annual Electric Utility Forecast Report; Docket No.: E-999/PR-19-11

¹² Docket No. E015/RP-19-337

¹³ Docket No. E,G999/CI-20-492

How the utility plans to facilitate: i. availability and awareness of public charging infrastructure, including an assessment of the private sector fast charging marketplace for the utility's service territory; ii. availability of residential charging options for both single family and multiple unit dwellings; iii. programs or tariffs in development to address flexible load or reduce metering and data costs; and iv. fleet electrification.

As mentioned in Minnesota Power's last TEP, public charging availability (or lack thereof) continues to be a strong concern amongst customers, especially in the more rural areas of Greater Minnesota. The majority of charging will happen at home, however in numerous conversations with customers and the general public during education and outreach efforts, one of the main customer concerns is where potential EV owners will be able to charge when travelling away from home. The resounding message from customers is that regardless of home charging patterns, publicly available chargers are key to widespread acceptance of EVs as a viable transportation option. Deployment of EV charging will be a foundational component of the TEP plan over the coming years. Minnesota Power has been involved in EVSE development across its service territory over the past few years. These efforts are highlighted in the sections outlined below.

As a trusted energy advisor for its customers, it is imperative that Minnesota Power continues to lead by example. As such, Minnesota Power intends to expand on current efforts for EVSE deployment. This includes identifying willing partners in communities across its service territory to install more chargers for public, work place, and multi-unit dwellings. Potential programs may include other options for trial use by customers and employees. Minnesota Power will continue to explore best practice options for alleviating customer barriers and encouraging responsible growth of the EV market from a power supply perspective.

EVSE Level 2 Infrastructure

Minnesota Power has been tracking and participating in the Minnesota Pollution Control Agency's ("MPCA") efforts to manage and spend the Volkswagen ("VW") Consent Decree settlement funds. While Minnesota Power has not received any funds directly, the Company has been working with regional partners who are utilizing MPCA VW funds to install EVSE equipment within or near its service areas. In addition, Minnesota Power will continue to participate and track efforts like the MPCA Clean Cars initiative, and the School Bus Pilot program. The Company is also mid-process in the implementation out of its commercial Level 2 Pilot Project where 20, 9.6 kW Level 2 chargers are being strategically placed across the Company's service territory in partnership with key municipalities and small businesses.

EVSE DCFC Infrastructure

Minnesota Power is exploring options for an EVSE DCFC expansion pilot. The Company intends to partner with state/local agencies and other hosts to install DC fast chargers throughout its service territory and has been in discussions with multiple state and local agencies who could host potential sites. Minnesota Power plans to own the DC chargers as capital assets and will support the operations and maintenance of each installed charging station. As the Company further explores these partnerships, additional work will also be done to understand the associated costs and customer impacts as well as how best to design and make use of the pilot for the purposes of addressing the key questions and barriers surrounding EV adoption that have been identified by the Company and the State. The Company intends to submit the EVSE DCFC expansion pilot as more of these details are refined.

Electric School Bus

The Company sees a great opportunity for partnership with regional fleet transportation services on both transportation electrification and off-peak use of these resources for storage and peaking resources. While adoption is still relatively low, Minnesota Power believes that now is the time to make intentional and thoughtful efforts to collect data, identify barriers and opportunities, and design pilots, programs and services that meet customer needs and Company objectives and optimize the benefits associated with EV charging.

MPCA Electric school bus pilot stakeholder meetings:

Minnesota Power representatives attended a series of recent informational online meetings (on April 28, and May 14, 2020) hosted by the MPCA. At these meetings stakeholders discussed the opportunities for school bus pilot programs. The meetings provided valuable insight into the current manufacturer offerings, and the potential pilot program parameters. The MPCA has yet to announce the final RFP process. An announcement is expected before the end of summer 2020.

Minnesota Power has also actively engaged with a large provider of school bus operations in the Duluth area and an electric bus manufacturer to explore options for applying to a planned pilot project request for proposals to bring an electric school bus to the region. Minnesota Power and partners have identified significant barriers and apprehension on the part of the operators to enter the market for an electric bus. There is, however, a willingness to engage and apply for a project if the parameters offered by the MPCA's school bus pilot provide a viable path for the operator to take the risks associated with this new technology. Minnesota Power's role would be as a partner in support of a customer proposal. Specifically, the operator and manufacturer have asked Minnesota Power to potentially assist the addition of necessary infrastructure, via financial and/or technical means, to support charging of an electric school bus. Minnesota Power's commercial EV rate also plays a role in enticing customers to take action.

Electrification of Mining Equipment

As Minnesota Power serves some of the nation's largest industrial customers, electrification within the industrial sector presents a unique opportunity for the Company. Transitioning haul trucks at Minnesota's iron mines from diesel mechanical to electric drive would be an effective means of reducing fossil fuel consumption, carbon emissions, and criteria pollutants while advancing the electrification of the transportation sector at an industrial scale. Further, mine truck electrification would enable more interruptible load which helps integrate additional variable renewable energy and keep costs down for customers.

In addition to focusing on residential and commercial transportation electrification efforts, Minnesota Power is also evaluating the potential for a Mine Truck Electrification Pilot Project that would facilitate fuel switching from fossil fuels to electric service. The pilot could possibly include financial support for: a site specific analysis; replacement or retrofitting of a portion of an existing haul truck fleet; engineering and installation of the catenary system & substations; and service extension to the trolley line. Various factors, including many which are site specific, play into the economic feasibility of electric trolley implementation. These factors include the cost of electricity, price of diesel, slope, length and life of haul road, and productivity gains.

This pilot project would also include recommendations for rate structure and energy products which support industrial scale transportation electrification.

Service Extension

Minnesota Power has determined a relatively simple and effective way to incent EV expansion through its service extension regulations. The Company is examining the ways in which it can revise and utilize its current Guaranteed Annual Revenue ("GAR") regulations to support new EV infrastructure.

The GAR is the minimum annual amount of revenue from billings under the applicable rate schedule that a customer who enters into an Electric Service Agreement ("ESA") commits to pay to Minnesota Power to support extension costs for installing a three phase line extension. Utilizing the GAR in EV applications would help offset costs to the customer while upgrading the existing system to serve new EV load at a previously served premise.

A summary of customer EV education initiatives. Utilities need not include specific examples of outreach materials.

Minnesota Power has invested resources, primarily in the form time, talent, and partnerships (such as the EVSE Level 2 initiative outlined on Page 15 of the Plan) in the development and promotion of EVs across its service territory and statewide over the past year. Below is an overview of the various methods and channels the Company has been using to educate

customers on the benefits of electric vehicles and to inform them of the Company's EV Tariffs. For its 2019 Annual Report Minnesota Power tracked direct costs related to promotional activities at \$5,142 (this does not include labor, materials or advertisements that the Company designed and printed in-house). The largest investment Minnesota Power made in EV promotional activities was for a video web series called "What Fuels You? An EV Road Trip", which can be viewed online¹⁴. The video series was also used during the Minnesota Power-hosted Energy Design Conference¹⁵ as an attraction at the expanded EV showroom.

Community Events

As Minnesota's plug-in electric vehicle market continues to develop, the Company believes education and outreach are foundational to customer understanding and adoption of EV technology. As shown in Table 6, the Company has continued to invest time and resources in direct in-person community engagements, which have proven valuable in understanding customers' desires and concerns surrounding electric transportation.

Table 6: Outreach and Education Expenditures

Date	Event	Description	Estimated Attendance
5/3/2019	Itasca Community Advisory Panel ("ItasCAP")	EV presentation	25
8/20/2019	Farmers Market "Kick the Tires"	EV available for inspection and questions in Duluth Downtown farmers market	10
8/22/2019	Internal Departmental All Staff Meeting	Presentation and kick the tires for internal staff meeting	100
09/10/2019	"Kick the Tires" at the Duluth Harvest Festival.	EV display with three Minnesota Power customers who volunteered their vehicles and answered questions. The Company had a representative displaying Minnesota Power's Leased Chevy Bolt present to offer information and answer questions regarding EVs and the Company's EV tariff.	1000

¹⁴ https://www.youtube.com/channel/UCgOjNEdhr7Nj7b_Ur_6zjcQ

¹⁵ www.duluthenergydesign.com

9/16/2019	GRE- EV Show and Tell	General Public EV informational sessions in Canal Park	150
9/17/2019	Farmers Market "kick the tires"	EV available for inspection and questions in Duluth Downtown farmers market	10
October 2019	What Fuels You? An EV Roadtrip	Filmed short educational video clips for web series, launched after the new year	1000s
10/10/2019	East Range CAP	EV presentation	25
11/20/2019	Izaak Walton League	EV presentation	30
12/3/2019	Motley DCFC Ribbon Cutting	Cut the ribbon for new DCFC in Motley- Media coverage	100s
12/19/2019	Drive Electric Minnesota- member meeting	Presented MP efforts for interested stakeholders	30
2/22-2/24/2020	Energy Design Conference	EV showroom: in 2020 included cars from dealers, GRE and MP. 6 vehicles in total were displayed	600

How the utility plans to optimize EV benefits, including a discussion of how to align charging with periods of lower customer demand and higher renewable energy production and by improving grid management and overall system utilization/efficiency.

The Company has started exploring ways in which it can align charging periods for EV rates and rewards with periods of lower electric system demand and higher renewable energy production. Minnesota Power's Residential EV Tariff, Commercial EV Tariff Pilot, and its newly submitted SmartCharge Rewards pilot (submitted in a new docket in conjunction with the 2020 TEP) utilize time of use periods. These pilot programs will prepare customers for anticipated time varying and dynamic pricing based rates and will allow the Company to collect the data and perform the analytics necessary to create effective programming in the future.

Summaries of any proposals or pilots, including links to full reports, submitted to other regulatory agencies or jurisdictions (for example, proposals submitted under Conservation Improvement Programs or pilots run in other states).

Minnesota Power submitted no other proposal or pilots to other agencies or jurisdictions.

Attachments or links to the most recent reports for any ongoing EV pilots or programs.

Minnesota Power has submitted no current reports for its EV pilots. Stakeholders' can find information regarding the residential EV charging rate in Docket No. E015/M-15-120.

IV. Conclusion

Minnesota Power is pleased to continue to communicate its plans and implementation timeframe concerning its transportation electrification initiatives. These programs will reduce barriers and range anxiety for customers and visitors to the Company's service territory. Addressing these barriers is a priority as electric transportation continues to gain popularity and momentum in Northeastern Minnesota. With its current and proposed programs and pilots, Minnesota Power is making intentional and thoughtful efforts to collect data and identify barriers and opportunities that meet customer needs and optimize the benefits associated with EV charging. This TEP outlines the Company's efforts towards the design and implementation of these appropriate programs and services.

Dated: July 6, 2020

Respectfully submitted,



Jennifer J. Peterson
Manager – Regulatory Strategy & Policy
Minnesota Power
30 West Superior Street
Duluth, MN 55802
(218) 355-3202
jjpeterson@mnpower.com

STATE OF MINNESOTA)
) ss
COUNTY OF ST. LOUIS)

AFFIDAVIT OF SERVICE VIA
ELECTRONIC FILING

Susan Romans, of the City of Duluth, County of St. Louis, State of Minnesota, says that on the **6th** day of **July, 2020** she served Minnesota Power's 2020 Transportation Electrification Plan ("TEP") in **Docket No. E999/CI-17-879** to the Minnesota Public Utilities Commission and the Energy Resources Division of the Minnesota Department of Commerce via electronic filing. The persons on E-Docket's Official Service List for this Docket were served as requested.



Susan Romans