STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

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June 17, 2019

In the Matter of Minnesota Power's Petition for Approval of its Electric Vehicle Commercial Charging Rate Pilot **Docket No. E015/M-19-337**

INITIAL COMMENTS OF FRESH ENERGY, MINNESOTA CENTER FOR ENVIRONMENTAL ADVOCACY, NATURAL RESOURCES DEFENSE COUNCIL, SIERRA CLUB, AND UNION OF CONCERNED SCIENTISTS

Fresh Energy, Minnesota Center for Environmental Advocacy, Natural Resources Defense Council, Sierra Club, and Union of Concerned Scientists submit these initial comments in response to the Commission's May 22, 2019 Notice of Comment Period.

Minnesota Power's proposal offers a simple way to provide near-term assistance to electric vehicle (EV) fleet operators and public EV charging operators. The Commission has recognized the tremendous benefits EVs can provide to Minnesotans, and it has specifically directed Minnesota Power to "[d]evelop and file EV-related proposals intended to encourage the adoption of EVs by: […] [f]acilitating the electrification of vehicle fleets."[1] The Commission has also recognized the importance of rate design for EVs and specifically for DC fast charging.[2]

The outdated rate design in the Company's General Service Demand tariff does not reflect underlying system costs and includes inappropriately large non-coincident peak demand charges, which have a chilling effect on fleet electrification and DC fast charging applications. While Minnesota Power's proposal is not perfect, it would provide much-needed temporary support for fleet electrification and public EV charging, and it should be approved. In addition, to develop a more durable solution, the Commission should require Minnesota Power to develop and propose a new rate structure within two years of the approval of the Company's request in this docket, as outlined in Section 2.2., below.

1) The proposed pilot would provide much-needed support for fleet electrification and public charging

1.1 Impact on DC fast charging

Non-coincident demand charges can be devastating for the economics of DC fast charging. DC fast charging is a unique use case[3] that did not exist when most current demand charge structures were

[1] Minnesota Public Utilities Commission, "Order Making Findings And Requiring Filings," filed Feb 1, 2019 in Docket 17-879, at Order Point 5.b.iii., page 10 (link).
[2] *Id*., at Order Point 14.b.iv., page 13.
[3] In the EV marketplace, "use cases" depend on the type of charging need, based on vehicle type, location and charging technology, including rate-of-charge. Examples of "use cases" might include (1) at-home charging of passenger EVs with Level 2 charging stations; (2) public charging of passenger EVs at 50 kW DC Fast Charging stations; (3) charging of medium- and heavy-duty fleets that are publicly or privately owned, with relatively high-power AC charging.

designed. Many utilities around the country have recognized this problem and developed alternative rate designs for commercial EV, including DC fast charging.[4]

DC fast charging is a unique electricity use case, and existing utility rate structures for large customers were not designed with this load profile in mind. At current EV penetrations, DC fast charging has a rare load profile, requiring short bursts of consumption at a relatively high capacity, often followed by long periods with no usage at all. This means DC fast charger operators will have a large peak demand (in kW) every month, but relatively little energy consumption (in kWh). In other words, DC fast chargers have very low load factors.

Utility rate designs that include a demand charge all share a common feature: they favor customers with high load factors, the higher load factor, the less the customer will pay for electricity (per kWh), and the lower the load factor, the more a customer will pay for electricity (per kWh). This is evident in Table 3 (page 13) of Minnesota Power's Initial Filing, which shows DC fast charging customers in their territory can pay as much as *78 cents/kWh*. At those rates, it is impossible to make a business case for DC fast charging.

It is important to note that DC fast charging puts less strain on distribution system equipment relative to more constant loads, making it inappropriate to charge DC fast charger operators the same demand rates as other large customers. The New York State Energy Research and Development Authority explains:

> Transformer life decreases in relation to the length and frequency with which they are overloaded, because of heat buildup from continuous/mostly continuous use. This heat buildup degrades the windings and oil, which leads to a shorter operating life and increased capital expense to replace the transformer (parts and labor) more frequently. So at low utilization (the current case for DCFCs), a 50-kW transformer for a 50-kW DCFC that is used for one 15-minute period per hour does not represent high stress for that transformer.[5]

In other words, DC fast charging's usage pattern puts less stress on distribution system equipment, which should translate into longer equipment life. Since demand charges are based on equipment cost and useful life estimates, it is inappropriate to charge DC fast chargers the same demand charge levels as higher-load factor customers.

1.2 Impact on fleets

The proposed pilot would also benefit electric fleets, especially the Duluth Transit Authority. Transit buses' heavy usage makes them especially well-suited for electrification: the average transit bus in the U.S. drives 34,000 miles per year—three times more than the average light-duty vehicle—and they typically have a lifetime of 12-15 years.[6] In this duty cycle, the fuel and maintenance cost savings from electric buses can result in a lower total cost-of-ownership, paying off the upfront cost premium of an electric bus and creating a virtuous cycle where cost savings can be reinvested to continue to electrify the

[4] *See, e.g.*: Union of Concerned Scientists, "Electric Utility Investment in Truck and Bus Charging," April 2019, pages 5-6, 9 (link)
[5] New York State Energy Research and Development Authority, "Electricity Rate Tariff Options for Minimizing Direct Current Fast Charger Demand Charges," December 2015, at page 13 (link)
[6] U.S. Department of Energy, "Average Annual Vehicle Miles Traveled of Major Vehicle Categories," December 2018 (link)

bus fleet. However, excessive non-coincident demand charges can quickly make electrification uneconomic by undercutting its fuel cost savings.

Transit buses have significant environmental justice benefits as well. The Commission has highlighted the importance of environmental justice, requiring utilities' EV pilots to report on "[e]nvironmental justice, with a focus on communities disproportionately disadvantaged by traditional fossil fuel use" and "low-income access and equitable access to vehicles and charging infrastructure, which can include all-electric public transit and EV ride-sharing options."[7] Transit routes disproportionately serve economically disadvantaged communities and communities of color, making them an ideal market to focus on in the near-term.

2) The proposal provides temporary relief, but a more permanent solution is needed

Throughout its filing, Minnesota Power notes that this pilot is intended to provide temporary relief, not a permanent solution, calling the proposal "an initial step" (page 5), a "short-term solution" (page 9) a "bridging solution" (page 10), and "not a definitive solution" (page 15). However, the Company provides a justification for this approach: it is installing new metering infrastructure and implementing a new meter data management system.[8] We believe this is a reasonable approach, as it will be easier to implement an updated rate design after the metering and billing infrastructure is in place. However, the Commission should take steps to ensure the transition to a more permanent solution, as discussed in Section 2.2, below.

2.1 Minnesota Power's rate design does not accurately reflect underlying system costs and does not send appropriate price signals

While Minnesota Power "recognizes that targeted On-Peak time periods would be ideal for this rate and for these customers," it also argued that its on-peak period is reasonable considering its load profile:

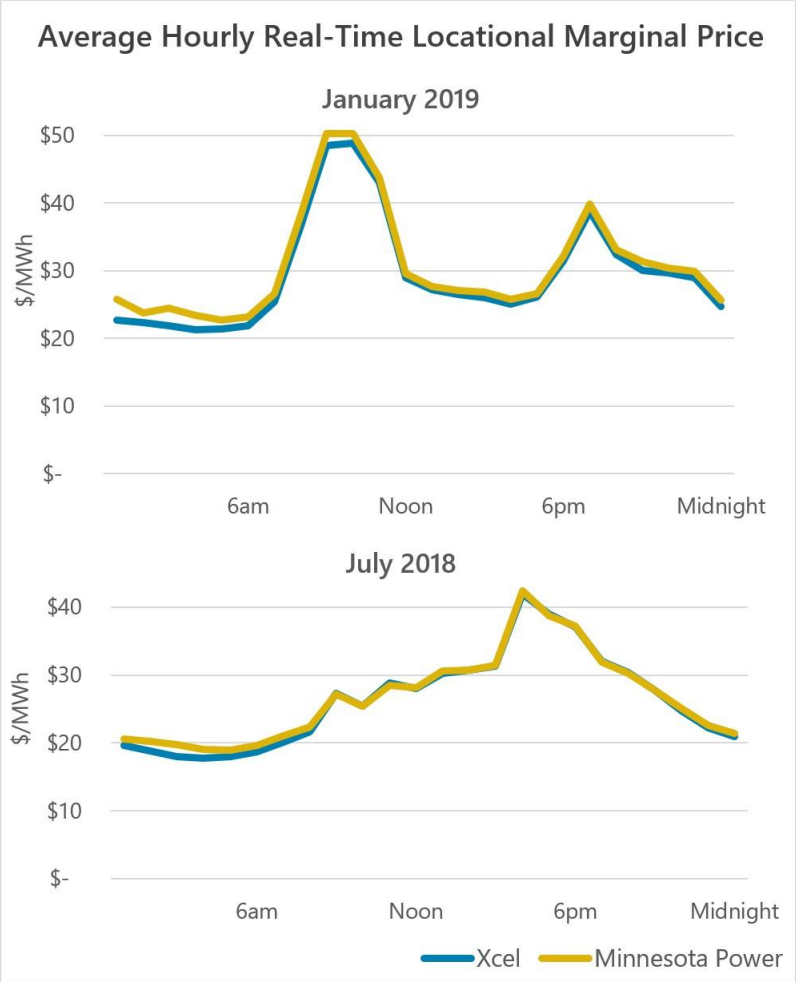
> While the current/proposed On-Peak period covers a broad portion of the day, it does generally align with the Company's system load profile as depicted in Figure 1. Minnesota Power has a high load factor due to the predominance of large industrial customers in its customer mix. This translates to a unique load profile when compared to other utilities across the United States. Minnesota Power's system is winter-peaking, with highest demand typically occurring on a winter evening, either in December or in January. It is also notable that the summer system peak typically occurs earlier in the day, in the afternoon, compared to the evening winter peak.[9]

We agree that Minnesota Power has a unique load profile, with a high load factor and a winter system peak that is typically roughly the same as its summer system peak.[10] However, for rate design purposes, the Company's load profile is much less important than its underlying system costs. As a member of the Midwest Independent System Operator (MISO), Minnesota Power pays Locational Marginal Prices (LMPs), which vary throughout the day and across the year depending on electricity demand, the electricity

[7] Minnesota Public Utilities Commission, "Order Making Findings And Requiring Filings," filed Feb 1, 2019 in Docket 17-879, at Order Point 16.a. and b., page 13 (link).
[8] Minnesota Power, "Initial Filing," filed May 16, 2019 in Docket 19-337, at pages 10-11 (link).
[9] *Id.*, at page 14.
[10] *See, e.g.*: Minnesota Power's 2018 "Annual Forecast Report," page 2 (link).

generation mix, and local system constraints (e.g. transmission congestion). These prices are not determined solely by Minnesota Power's load or generation fleet, but by the consumption and constraints of the system as a whole. Case in point: although Xcel Energy and Minnesota Power have very different load profiles, their LMPs tend to be extremely similar in both summer and winter months, as shown in the graph below.

In short, Minnesota Power's unique load profile is not a justification for having a 14-hour "on-peak" period. On page 13 of its initial filing in this docket, Minnesota Power referenced a Regulatory Assistance Project (RAP) report on beneficial electrification. An even more relevant RAP report is the December 2017 "Smart Non-Residential Rate Design" report, which concluded an optimal demand-metered commercial and industrial rate design would include: a much smaller non-coincident demand charge; time-varying energy rates that reflect both short- and long-run marginal generation, transmission, and distribution costs; and a critical peak pricing component to limit consumption during extreme peak hours. This type of rate design would not only be more reflective of underlying cost, it would also make it easier for customers to change their consumption patterns, which will lower costs for all customers in the long run.



2.2 The Commission should take steps now to ensure a timely transition to a permanent solution

We agree with Minnesota Power that it would be inappropriate to redesign its demand-metered rates at this time, given the transition underway with its metering and billing system. We also agree with the Company that this program, while valuable, is not a long-term solution. While it will provide near-term relief for existing EV customers, it will likely do little to encourage new EV adoption, and it does not provide adequate incentives to encourage charging patterns that benefit the system as a whole, which the Commission has recognized as being "critical to ensuring that transportation electrification advances the public interest."[11]

In light of the short-term nature of the proposed pilot, the Commission should take steps now to ensure an improved replacement program is implemented in a timely manner. We therefore recommend that

[11] Minnesota Public Utilities Commission, "Order Making Findings And Requiring Filings," filed Feb 1, 2019 in Docket 17-879, at Order Point 3, page 10 (link).

the Commission approve the pilot with a two-year term rather than a three-year term, and to require a replacement program be filed with the Commission within two years from the approval of the Company's request in this case.

According to the "Technology and Metering Considerations" section of the Company's initial filing, the metering and billing system transition is already well underway: the advanced metering infrastructure deployment is ongoing, a vendor has been selected for its meter data management system, and they are in the process of choosing a system integrator, which they expect to have selected by Q3 2019. Given the progress that has already been made, it seems entirely possible to develop an improved replacement program that could be implemented within two years.

3) Conclusion and recommendations

We appreciate the opportunity to provide comments, and we applaud Minnesota Power for taking steps to limit the chilling effects that excessive demand charges can have on EV adoption. We recommend the Commission approve the pilot as filed and speed the transition to a more beneficial program by making the following modification:

- Limit the term of the pilot to two years and require the Company to file a proposal for a replacement program within two years of the Order approving the pilot.

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