

March 22, 2024

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

RE: **Comments of the Minnesota Department of Commerce, Division of Energy Resources
Otter Tail Power Company 2023 Integrated Distribution Plan**
Docket No. E017/M-23-380

Dear Mr. Seuffert:

Attached are the comments of the Minnesota Department of Commerce, Division of Energy Resources (Department) in the following matter:

In the Matter of Otter Tail Power Company's 2023 Integrated Distribution Plan

Otter Tail Power Company's Integrated Distribution Plan (IDP) was filed on November 1, 2023 by Michael Riewer, Manager, System Infrastructure and Reliability for Otter Tail Power Company.

The Department makes recommendations and requests below and is available to answer any questions the Minnesota Public Utilities Commission may have.

Sincerely,

/s/ Louise Miltich
Assistant Commissioner of Energy Regulatory Analysis

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Attachment



Before the Minnesota Public Utilities Commission

Comments of the Minnesota Department of Commerce Division of Energy Resources

Docket No. E017/M-23-380

I. INTRODUCTION

The Department provides the following comments on Otter Tail Power's (OTP) Integrated Distribution Plan (IDP). Through these comments, the Department responds to the Notice of Comment (Notice) issued by the Commission on November 15, 2023.¹

The IDP allows for greater transparency into the distribution system planning process used by utilities. Distribution plans cover utility infrastructure from the substation to the meter, as well as customer offerings in these areas. The need for distribution system planning is enhanced by the increasing complexity of the distribution grid created by smart grid technologies, electric vehicles, and other distributed energy resources (DER). Due to the rise in these technologies, ratepayers will have an increasingly interactive role in distribution grid management, which further establishes the need for greater transparency in the distribution grid planning process. The Commission set forth five planning objectives for IDPs, with additional filing requirements to promote transparency in distribution system planning. The Commission's planning objectives for IDPs are to:

1. Maintain and enhance the safety, security, reliability, and resilience of the electricity grid, at fair and reasonable costs, consistent with the state's energy policies;
2. Enable greater customer engagement, empowerment, and options for energy services;
3. Move toward the creation of efficient, cost-effective, accessible grid platforms for new products, new services, and opportunities for adoption of new distributed technologies;
4. Ensure optimized utilization of electricity grid assets and resources to minimize total system costs; and
5. Provide the Commission with the information necessary to understand the utility's short-term and long-term distribution-system plans, the costs and benefits of specific investments, and a comprehensive analysis of ratepayer cost and value.

While the Department finds that OTP's IDP is largely compliant with filing requirements, the Department also identifies areas in which the IDP could be improved and offers recommendations (in bold, italicized text) for remedying them. The Department will provide a final recommendation regarding whether the Commission should accept OTP's IDP in reply comments once the Department reviews additional information from OTP and has the opportunity to consider stakeholder input.

¹ Notice of Comment – In the Matter of Otter Tail Power Company's 2023 Integrated Distribution Plan, Docket No. E017/M-23-380 (November 15, 2023). (eDocket No. [202311-200509-01](#)). Hereinafter "Notice."

II. PROCEDURAL HISTORY

On December 8, 2022, the Minnesota Public Utilities Commission (Commission) issued its Order in Docket Nos. E002/M-21-694, E999/CI-17-879 (December 8, 2022 Order).² The December 8, 2022 Order revised the filing requirements for electric utility IDPs and Transportation Electrification Plans (TEP) and approved combining IDPs and TEPs. The December 8, 2022 Order also required each investor-owned utility to file its TEP in its next IDP, due November 1, 2023, and biennially thereafter.

In May 2023, the Minnesota Legislature established requirements for utility TEPs in 2023 Minn. Laws. Ch. 60, art. 12, sec. 12, codified at Minn. Stat. § 216B.1615.³ Minn. Stat. § 216B.1615 requires electric utilities to file TEPs, establishes certain content requirements, grants the Commission authority to approve, modify or reject TEPs, and establishes evaluation criteria.

On November 1, 2023, Otter Tail Power Company (OTP, Otter Tail, or the Company) filed its IDP and TEP in Docket No. E017/M-23-380.⁴ This filing is the first time that OTP has filed its TEP as part of its IDP.

On November 15, 2023, the Commission issued its Notice on the issues of whether the Commission should accept or reject Otter Tail Power Company's 2023 IDP and TEP. The Notice included the following topics open for comment:

2023 Otter Tail Power Integrated Distribution System Plan

1. Should the Commission accept or reject Otter Tail Power's IDP?
2. Did Otter Tail Power adequately address the Commission's IDP filing requirements and prior Orders, as outlined in Attachment A to this notice? Is additional information necessary for improved clarity?
3. Feedback, comments, and recommendations on the following areas of Otter Tail Power's IDP:
 - a. Non-wires alternatives analysis and potential pilot project
 - b. Planned grid modernization initiatives
 - c. Forecasted distribution budget
 - d. Distributed Energy Resource (DER) scenarios and forecasts
 - e. The System Infrastructure and Reliability Improvement (SIRI) initiative
 - f. Results from the DER and Electric Vehicle (EV) impact study conducted in Morris, MN
4. In light of Otter Tail Power's pilot project on a utility-scale electrical battery system, is Otter Tail Power conducting its non-wires analyses in a reasonable way?
5. Has Otter Tail Power appropriately discussed its plans to maximize the benefits of the Inflation Reduction Act (IRA) and the IRA's impact on the utility's planning assumptions pursuant to Order Point 1 of the Commission's September 12, 2023 Order in Docket No.

² Order, *In the Matter of a Commission Inquiry into Electric Vehicle Charging and Infrastructure; In the Matter of Xcel Energy's 2021 Integrated Distribution System Plan; In the Matter of Minnesota Power's 2021 Integrated Distribution System Plan; In the Matter of Distribution System Planning for Otter Tail Power Company*, Docket Nos. E-99/CI-17-879, E-002/M-21-694, E-015/M-21-390, E-017/M-21-612 (December 8, 2022). (eDocket No. [202212-191192-03](https://www.revisor.mn.gov/statutes/cite/216B.1615)). Hereinafter December 8, 2022 Order.

³ Minn. Stat. § 216B.1615. <https://www.revisor.mn.gov/statutes/cite/216B.1615>

⁴ 2023 *Integrated Distribution System Plan, Otter Tail Power Company*, Docket No. E017/M-23-380 (November 1, 2023) (eDocket No. [202311-200138-02](https://www.revisor.mn.gov/statutes/cite/216B.1615)). Hereinafter "IDP."

E,G-999/CI-22-624?

6. What should the Commission consider or address related to enhancing the resilience of the distribution system within Otter Tail's IDP?
7. Other areas of Otter Tail Power's IDP not listed above, along with any other issues or concerns related to this matter.

2023 Otter Tail Power Transportation Electrification Plan (TEP)

8. Should the Commission approve, modify, or reject Otter Tail Power's TEP?
9. Did Otter Tail Power adequately address the Commission's TEP filing requirements and prior Orders, as outlined in Attachment A to this notice? Is additional information necessary for improved clarity?
10. How should the Commission consider modifications or supplements to Otter Tail Power's Transportation Electrification Plan?
11. Should the Commission establish any procedural or filing requirements for future TEPs under Minn. Stat. 216B.1615?
12. Are there gaps in Otter Tail Power's transportation electrification programs the Commission should address to ensure equitable customer outcomes?
13. Are there other issues or concerns related to this matter?

III. DEPARTMENT ANALYSIS

The initial comments provided by the Department address OTP's IDP and TEP and the Commission's Notice Topics 1 through 13. Recommendations are offered in the corresponding sections and are summarized at the conclusion of this filing.

For reasons of organization and clarity, these comments do not perfectly follow the sequence of topics in the Notice. The order of these comments is presented below:

- A. *IDP Compliance with Filing Requirements and Recommendations Concerning Acceptance (Notice Topics 1 and 2)*
- B. *Non-Wires Alternatives Analysis and Utility-Scale Electrical Battery System (Notice Topics 3.A and 4)*
- C. *Planned Grid Modernization Initiatives (Notice Topic 3.B)*
- D. *Forecasted Distribution Budget (Notice Topic 3.C)*
- E. *Distributed Energy Resource (DER) Forecasts and Morris, MN Impact Study (Notice Topics 3.D and 3.F)*
- F. *The System Infrastructure and Reliability Improvement (SIRI) Initiative (Notice Topic 3.E)*
- G. *The Inflation Reduction Act and Utility Planning and Benefits (Notice Topic 5)*
- H. *Distribution System Resilience (Notice Topic 6)*
- I. *Other Areas of OTP's IDP (Notice Topic 7)*
- J. *TEP Compliance with Filing Requirements and Recommendations Concerning Acceptance (Notice Topics 8 and 9)*
- K. *Other TEP Topics (Notice Topics 10, 11, 12, and 13)*

A. *IDP COMPLIANCE WITH FILING REQUIREMENTS AND RECOMMENDATIONS CONCERNING ACCEPTANCE*

Notice Topic 1: Should the Commission Accept or Reject Otter Tail Power's IDP?

Notice Topic 2: Did Otter Tail Power Adequately Address the Commission's IDP Filing Requirements and Prior Orders, as Outlined in Attachment A to This Notice? Is Additional Information Necessary for Improved Clarity?

OTP provides a matrix as an attachment to its IDP with the IDP Checklist of Requirements, the requirements imposed on OTP's 2023 IDP by previous Commission Orders and statutes, and the location within the IDP where information related to those requirements can be found.⁵

The Department's review of OTP's IDP begins at a threshold question: did OTP provide information and analyses required by the Commission's IDP filing requirements and previous Commission Orders? The Department reviewed OTP's compliance matrix and determined that the references provided to the contents within the IDP are appropriate. Further, at first pass, it does appear that OTP has mostly addressed each of the IDP filing requirements, Commission Orders, and statutes. The Department provides its assessment of OTP's compliance with filing requirements with these comments as Attachment A.

Moreover, as required by the Notice, where OTP did not include the required information, the Company generally provides an explanation of why that information is not included in the filing. However, in several instances, the information provided by OTP did not fully address the filing requirement or prior Commission Order. Specific examples are indicated throughout the Department's comments.

Throughout these comments the Department identifies topics and Order Points where additional information would improve the ability to meaningfully analyze the IDP.

The Department will provide a final recommendation regarding whether the Commission should accept OTP's 2023 IDP in reply comments after the Department reviews additional information from OTP and has had the opportunity to review stakeholder input.

1. *Compliance with Specific Grid Modernization Filing Requirements*

OTP's IDP is subject to multiple filing requirements concerning grid modernization information. Most substantively, OTP is obligated to provide detail about planned grid modernization investments expected to occur in the next five years in the "5-Year Action Plan" that is a part of the mandated "Long-Term Distribution System Modernization and Infrastructure Investment Plan."

Per the Commission's IDP filing requirements, the 5-Year Action Plan "should include a detailed discussion of the underlying assumptions (including load growth assumptions) and the costs of

⁵ IDP at 68 – 69.

distribution system investments planned for the next 5 years.”⁶ The filing requirements also establish the need for a clear statement of the objectives of individual projects and detailed alternatives analysis. In IDP Filing Requirement 3.D.2.k, the Commission requires that for each grid modernization project included in the 5-Year Action Plan, “Otter Tail Power should provide a cost-benefit analysis based on the best information it has at the time and include a discussion of non-quantifiable benefits. Otter Tail Power shall provide all information to support its analysis.”⁷ Discussion of grid modernization filing requirements is provided in Section 9 of OTP’s IDP.

The Department finds that the Advanced Metering Infrastructure (AMI), Outage Management System (OMS), and Demand Response Management System (DRMS) projects were not compliant with IDP Filing Requirement 3.D.2k. The AMI and OMS projects have already been approved for cost recovery and presented a Cost Benefit Analysis (CBA) in Docket No. E017/M-21-382 before they were approved for cost recovery. These projects fulfilled the filing requirement in another docket, but OTP did not mention this in their IDP. The DRMS Project has not been approved for cost recovery, and has not presented a CBA, which does not meet the filing requirement. The Department discusses each of these projects in greater detail in Section III.C.

B. NON-WIRES ALTERNATIVES ANALYSIS AND UTILITY-SCALE ELECTRICAL BATTERY SYSTEM

Notice Topic 3A: Feedback, Comments, and Recommendations on Non-Wires Alternative Analysis and Potential Pilot Project

Notice Topic 4: In Light of Otter Tail Power’s Pilot Project on a Utility-Scale Electrical Battery System, is Otter Tail Power Conducting its Non-Wires Analyses in a Reasonable Way?

The Department is combining a discussion of Non-Wires Alternatives (NWA) Analysis with the Morris Flow Battery Project, as these projects both relate to the NWA discussion.

1. NWA Analysis

OTP devotes less than a page to its NWA Analysis in Section 10 of its IDP. OTP states that it does not have any distribution projects in its five-year budget that are above \$2 million. OTP mentions that it has a long history of utilizing its Demand Response (DR) and ECO programs, which can be part of an NWA analysis, but the Company does not provide a description of how these programs have been used in an NWA analysis.

The Department reviewed OTP’s five-year budget located in IDP Appendix B, and found two distribution projects over \$2 million. The first project is the “Purchase of DSA Substation” project, with a 2023 budget of \$2,508,982.14. The second project is the “Rush Otter South Feeder Upgrades” project, with a 2023 to 2025 budget of \$2,500,000. Without a description of each of these projects, the Department assumes that both have the potential for NWA analysis, which are not discussed in OTP’s

⁶ IDP Filing Requirement 3.D.2.

⁷ IDP Filing Requirement 3.D.2.k.

IDP. Additionally, OTP does not provide a discussion of how it would conduct an NWA Analysis for projects above the \$2 million threshold.

The Department recommends that OTP outline its process for how NWA analysis will be conducted, and present an analysis, as applicable, for the “Purchase of DSA Substation” and “Rush Otter South Feeder Upgrades” projects.

2. *Morris Flow Battery Project*

OTP provides a brief discussion of its Morris Flow Battery Project, which was developed with the University of Minnesota Morris and Open Access Systems International (OATI). The University of Minnesota Morris applied for two grants totaling \$2.65 million, leaving a balance of \$2.1 million that OTP included in its five-year budget. OTP supplied additional information about the project in response to Department Information Requests 15 and 16.⁸ This project is not an NWA solution because it does not appear to be solving a distribution grid problem. Instead, the battery is an effort to study how to maximize utilization of existing renewable energy generation assets owned by the University of Minnesota Morris, as well as to study grid effects of charging and discharging the battery. To date, OTP has not incurred any expenses for the project. On March 4, 2024, OTP submitted a Request for Proposals (RFP) to hire a consultant for design engineering, vendor selection guidance, and construction management guidance. The RFP for battery installation is scheduled to be released in June 2024, with final completion and interconnection expected in the fall of 2025. OTP states that it has been invited by the US Department of Energy to submit a grant application for Smart Grid funding to further support this project.

OTP does not have the final specifications of the project, as design engineering has yet to take place. OTP states in IR responses that it expects the system size to be between 1 to 2 MW, and for the storage capacity to be between 2 to 8 MWh. OTP and the University of Minnesota Morris will both have access to charging and discharging data, and OTP has agreed to allow the university to test battery discharging during times outside grid stress to better understand how the battery affects the distribution grid.

The Department recommends the Commission direct OTP to include an update of the Morris Flow Battery Project in its 2025 IDP.

C. *PLANNED GRID MODERNIZATION INITIATIVES*

Notice Topic 3B: Feedback, Comments, and Recommendation on Planned Grid Modernization Initiatives

OTP discusses its grid modernization initiatives in Section 9 of its IDP. The initiatives fall under the umbrella of OTP’s Innovation 2030 (I2030) Initiative, with the stated objectives to “1) improve reliability and safety of the Otter Tail system; 2) improve customer engagement; and 3) improve

⁸ The Department has included all OTP responses to Department information requests in Attachment B.

business processes.”⁹ Grid Modernization and Pilot Projects take up an outsized role in the 2023 to 2027 forecasted budget. Between 2023 and 2027, Grid Modernization and Pilot Projects are forecasted to spend \$75.0 million, which is 43.2 percent of the entire budget. In its previous five-year budget from 2018 to 2022, OTP spent \$11.4 million on Grid Modernization and Pilot Projects, which is 13.0 percent of a budget that is less than half the size of the proposed 2023 to 2027 budget. The following sections outline OTPs forecasted spending for its major grid modernization programs.

Finally, while System Infrastructure and Reliability Improvement Initiative (SIRI) is included in the Grid Modernization Section of the IDP, this project is discussed separately in Section F.

1. Advanced Metering Infrastructure

The Advanced Metering Infrastructure (AMI) project is the largest portion of the Grid Modernization and Pilot Projects budget. The AMI Program replaces manually read meters with new smart meters at all of OTP’s locations. The system consists of three main components, which all support each other to enable the full functionality of the system. The first component is the smart meter. OTP plans to install approximately 80,000 smart meters in its Minnesota service area. The second component is a Field Area Network (FAN), which uses wireless radio frequencies to transmit data back to OTP. The third component is a Meter Data Management System (MDMS), which is an OTP data repository and control system, which allows OTP to process and use the data it collects. The deployment of these three components will allow OTP to implement its full AMI rollout.

OTP lists a cost of \$49.4 million for the deployment of the AMI program, which is 65.9 percent of the Grid Modernization and Pilot Projects budget. In 2021, the Commission approved the AMI program and the Outage Management System (OMS) for cost recovery as part of the EUIC rider.¹⁰

There are several benefits that result from the implementation of the AMI Program. The most significant benefit is direct cost savings, which are primarily realized by ending manual meter reading (currently a contracted service), as well as by utilizing OTP staff time more efficiently. OTP modeled a cost savings in excess of \$20 million through 2045 due to avoided manual reading.¹¹ Additional benefits of the AMI Project include the possibility to create new rates, to improve outage reporting, and delivering an enhanced customer experience by providing real time data and more choices.

As this program has already been approved by the Commission with established reporting requirements, it does not warrant additional comments by the Department.

2. Demand Response Management System

The Demand Response Management System (DRMS) is the second largest portion of the Grid Modernization and Pilot Projects budget. The DRMS provides OTP with the ability to administer its Demand Response (DR) program by communicating with a series of Load Management System receivers that tell specific load sources to reduce their electricity consumption. The DRMS allows OTP to dispatch

⁹ IDP at 40.

¹⁰ Docket No. E017/M-21-382

¹¹ Docket No. E017/M-23-131

its DR program during times of grid stress, which increases the resiliency of the OTP power system. OTP states that its current DRMS is no longer supported by the vendor and does not have security updates. Further, the system only allows for one-way communication from the utility, and thus OTP cannot confirm that its signals are received by the Load Management System receivers.

OTP lists a budget of \$23,335,420 in its five-year budget for the DRMS, which is 31.1 percent of the Grid Modernization and Pilot Projects budget. In 2021, OTP requested cost recovery for its DRMS, but withdrew its request at the recommendation of the Department due to a lack of cost estimation and a required cost benefit analysis.¹² OTP states that it has solicited a Request for Proposals (RFP) and received its final offers, with an expected vendor selection at the end of 2023.¹³

Several benefits will result from implementation of the DRMS Program. The most notable benefit is to restore system security, as the current DRMS is no longer supported. Once implemented, the system will allow OTP to begin two-way communication via AMI, which will enhance OTP's capabilities to dynamically manage load. A future system could integrate a Distributed Energy Resource Management System (DERMS), which would allow OTP to temporarily curtail DER generation, such as rooftop solar systems, to avoid overloading a feeder. The DRMS is the final step required to implement programs such as managed EV charging and additional tariff control structures that provide value to the distribution grid in addition to cost savings for customers by shifting load to a cheaper time of day rate. OTP notes that it is already in the 90th percentile or greater for DR amongst investor-owned utilities, and has little economic potential to expand its DR program substantially beyond its existing program.¹⁴

OTP has not fulfilled its Grid Modernization filing requirements. IDP Filing Requirement 3.D.2.k states that "For each grid modernization project in its 5-year Action Plan, Otter Tail Power should provide a cost-benefit analysis based on the best information it has at the time and include a discussion of non-quantifiable benefits. Otter Tail Power shall provide all information to support its analysis."¹⁵ The Department is aware that final selection may have taken place after the submission of OTP's IDP, however the DRMS budget is included in the five-year budget, and therefore OTP is required to provide a discussion of the cost and benefits of the DRMS Project.

The Department requests that OTP discuss in reply comments how OTP selected its DRMS vendor, if applicable, including whether costs and benefits were weighed prior to vendor selection, and that OTP present its cost-benefit analysis for the DRMS project, if available.

3. Outage Management System and Geographic Information System

The Outage Management System (OMS) is a customer-facing software system that allows OTP to formally track customer-reported outages. The system was deployed on December 18, 2022, and allows customers to report outages via an automated phone service, whereas previously phone operators were taking all of these calls. The deployment of the OMS is claimed to have captured 80

¹² Docket No. E017/M-21-382

¹³ IDP at 44.

¹⁴ IDP at 45.

¹⁵ IDP Filing Requirement 3.D.2.k.

percent of outage calls.¹⁶ The OMS is further tied into a Geographic Information System (GIS), which maps out OTP's distribution system infrastructure, and allows the Company to better respond to outages, as well as plan for system upgrades.

OTP has not included a budget for the OMS in its five-year budget. OTP does however present a capital budget of \$509,716 in its 2023 budget to complete the project in Docket No. E017/M-23-131, which appears to be missing in its IDP. Cost recovery has already been approved for the OMS Project, and thus further budget discussion is not warranted in the IDP discussion.

4. *Telecommunication Architecture Plan*

OTP describes a project called the Telecommunication Architecture Plan, which would replace its existing microwave telecommunications backbone with a fiber optic system. This Plan will enable future smart grid upgrades beyond AMI, such as communicating with capacitor banks, reclosers, regulators, and fault detectors. OTP projects this project will cost \$30 - \$50 million in the next 15 years, which is in the range of the budget for the AMI and DRMS programs. The Department requested clarification regarding the project's inclusion in the budget, and OTP responded that the project falls under the "General Plant" budget rather than "Distribution," and therefore was not included in the IDP budget.¹⁷

Based on this information, the Department concludes that the Telecommunication Architecture Plan is not subject to IDP Filing Requirement D.2.k, which requires a cost benefit analysis. The proposed budget for the Telecommunication Architecture Plan is large compared to historical expenditures, and the Department encourages OTP to assess both alternatives to the proposed capital project and the net benefit to ratepayers.

D. *FORECASTED DISTRIBUTION BUDGET*

Notice Topic 3C: Feedback, Comments, and Recommendations on the Forecasted Distribution Budget

OTP's 2021 IDP projects total distribution spending of approximately \$115.98 million between 2021 and 2025.¹⁸ OTP's 2023 IDP increased that projection to \$173.83 million between 2023 and 2027.¹⁹ The table below provides a high-level overview of the projected spending levels OTP provides in its 2021 and 2023 IDPs, organized by the IDP Budget Categories required by IDP Filing Requirement A.29. IDP Filing Requirement A.29 requires OTP to provide information on "[p]lanned distribution capital projects, including drivers for the project, timeline for improvement, summary of anticipated changes in historic spending"²⁰ and contains nine IDP Budget Categories. which are listed in the table below.

¹⁶ IDP at 42.

¹⁷ OTP Response to Department IR 9. See Department Attachment B.

¹⁸ *Integrated Distribution System Plan, In the Matter of the Distribution System Planning for Otter Tail Power Company*, Docket No. E017/M-21-612 (November 1, 2021). (eDocket No. [202111-179391-02](#)). Hereinafter "2021 IDP."

¹⁹ IDP at 38.

²⁰ IDP Filing Requirement 3.A.29.

The Department notes that while the IDP Filing requirements have now incorporated Electric Vehicle Programs as a budget category, OTP has continued to provide spending for EVs separately.

**Table 1. Comparison of OTP Distribution System Spending Projections:
2021 and 2023 IDP**

	<i>Spending (Millions)</i>		
IDP Budget Category	2021 IDP (2021 - 2025)	2023 IDP (2023 - 2027)	Δ
<i>Age-Related Replacements and Asset Renewal</i>	\$ 41.49	\$ 47.50	\$ 6.00
<i>System Expansion or Upgrades for Capacity</i>	\$ 2.53	\$ 3.78	\$ 1.25
<i>System Expansion or Upgrades for Reliability and Power Quality</i>	\$ 1.63	\$ 11.62	\$ 9.99
<i>New Customer Projects and New Revenue</i>	\$ 24.58	\$ 30.44	\$ 5.86
<i>Grid Modernization and Pilot Programs</i>	\$ 40.72	\$ 75.01	\$ 34.30
<i>Projects related to Local (or other) Government Requirements</i>	\$ 0.73	\$ 0.69	\$ (0.04)
<i>Metering</i>	\$ 1.34	\$ 1.81	\$ 0.48
<i>Other</i>	\$ 2.96	\$ 2.97	\$ 0.01
Total Spending	\$ 115.98	\$ 173.83	\$ 57.85

For each IDP Budget Category and overall, this table calculates the difference in projected spending between the 2021 IDP and the 2023 IDP.

These filings were made two years apart from one another (on November 1, 2021 and November 1, 2023), and overall distribution system spending projections increased from approximately \$115.98 million to \$173.83 million, a 50% increase. The IDP Budget Categories of “Age-Related Replacements and Asset Renewal,” “System Expansion or Upgrades for Reliability and Power Quality,” “New Customer Projects and New Revenue,” and “Grid Modernization and Pilot Programs” are the main drivers of the increase, accounting for increases of \$6.0 million (14 percent), \$10.0 million (613 percent), \$5.9 million (24 percent), and \$34.3 million (84 percent), respectively.

While Table 1 shows increases in total projected spending, it is important to note that this is not an apples-to-apples comparison, given the periods analyzed in each filing (e.g., the 2021 IDP period covers years 2021 through 2025, whereas the 2023 IDP period covers years 2023 through 2027).

To obtain a better apples-to-apples comparison between the filings, the Department reviewed the annual spending projections provided in each filing and was able to compare projected spending between the 2023 through 2025 period. Table 2 below provides such a comparison.

Table 2. Comparison of OTP’s Distribution System Spending Projections for the 2023 – 2025 Period: 2021 and 2023 IDP

	<i>Spending (Millions)</i>		
IDP Budget Category	<i>2021 IDP (2023 - 2025)</i>	<i>2023 IDP (2023 - 2025)</i>	Δ
<i>Age-Related Replacements and Asset Renewal</i>	\$ 28.85	\$ 25.54	\$ (3.31)
<i>System Expansion or Upgrades for Capacity</i>	\$ 1.70	\$ 0.57	\$ (1.13)
<i>System Expansion or Upgrades for Reliability and Power Quality</i>	\$ 1.01	\$ 8.75	\$ 7.75
<i>New Customer Projects and New Revenue</i>	\$ 15.41	\$ 18.08	\$ 2.66
<i>Grid Modernization and Pilot Programs</i>	\$ 24.71	\$ 68.48	\$ 43.76
<i>Projects related to Local (or other) Government Requirements</i>	\$ 0.45	\$ 0.40	\$ (0.05)
<i>Metering</i>	\$ 0.63	\$ 0.69	\$ 0.06
<i>Other</i>	\$ 2.40	\$ 1.70	\$ (0.70)
Total Spending	\$ 75.15	\$ 124.20	\$ 49.05

Table 2 calculates the difference in total spending and for each IDP Budget Category reported in the 2021 IDP and the 2023 IDP for the 2023 through 2025 period. OTP’s total planned distribution system spending over these three years increased by \$49.0 million (63 percent). While proposed total spending for this three-year period is relatively similar in most categories, the increase in total spending is primarily driven by the Budget Categories of “Grid Modernization and Pilot Programs” and “System Expansion or Upgrades for Reliability and Power Quality,” with increases of \$43.4 million (177 percent) and \$7.8 million (769 percent), respectively.

Finally, the Department reviewed the 2023 IDP’s provision of information related to OTP’s historical actual distribution system spending from the 2018 to 2022 period and compared it to OTP’s projected distribution system spending from the 2023 to 2027 period. This high-level overview of financial data in OTP’s 2023 IDP is summarized in the table below.

Table 3. Comparison of Distribution System Spending Reported in OTP's 2023 IDP, Historical Actual (2018 – 2022) vs. Budgeted (2023 – 2025)

	Historical Actual (2018 - 2022)		Budgeted (2023 - 2027)		Δ	
IDP Budget Category	Spending (Millions)	% of Total Spend	Spending (Millions)	% of Total Spend	(Millions)	%
<i>Age-Related Replacements and Asset Renewal</i>	\$ 29.14	33.17%	\$ 47.50	27.32%	\$ 18.36	63.01%
<i>System Expansion or Upgrades for Capacity</i>	\$ 2.52	2.87%	\$ 3.78	2.18%	\$ 1.26	49.99%
<i>System Expansion or Upgrades for Reliability and Power Quality</i>	\$ 10.68	12.16%	\$ 11.62	6.68%	\$ 0.94	8.81%
<i>New Customer Projects and New Revenue</i>	\$ 30.03	34.19%	\$ 30.44	17.51%	\$ 0.41	1.36%
<i>Grid Modernization and Pilot Programs</i>	\$ 11.43	13.01%	\$ 75.01	43.15%	\$ 63.59	556.57%
<i>Projects related to Local (or other) Government Requirements</i>	\$ 1.81	2.06%	\$ 0.69	0.40%	\$ (1.12)	-61.79%
<i>Metering</i>	\$ 1.74	1.98%	\$ 1.81	1.04%	\$ 0.07	4.10%
<i>Other</i>	\$ 0.50	0.57%	\$ 2.97	1.71%	\$ 2.47	496.65%
Total Spending	\$ 87.85		\$ 173.83		\$ 85.98	97.88%

OTP's total budgeted distribution system spending is projected to be \$173.8 million for the 2023 through 2027 period compared to the historical actual distribution system spending of \$87.9 million for the 2018 through 2022 period, an increase of 98 percent. OTP has budgeted relatively small increases or decreases in every IDP Budget Category except "Age-Related Replacement and Asset Renewal" and "Grid Modernization and Pilot Programs," with increases of \$18.4 million (63 percent) and \$63.6 million (557 percent), respectively. Together these two categories account for 70.5% of total planned distribution investment over the coming five years. This increase represents a significant re-alignment of priorities from pre-2018 spending patterns primarily towards the Company's I2030 grid modernization initiative, discussed more in Section III.C. The increase in the "Other" IDP Budget Category is largely attributable to investments in telecommunications upgrades, which have been developed and forecasted in the five-year plan.

The "Grid Modernization and Pilot Projects" budget category is planned to see a large increase in spending over the next five years. Section III.C covers a discussion of the AMI and DRMS projects. The Company's 2023 – 2027 project list includes the following initiatives and proposed investment amounts:

Table 4. Grid Modernization Project Costs

Grid Modernization Project Name	Total Investment 2023 – 2027 (millions)
AMI – Innovation 2030	\$49.45
DRMS – Innovation 2030	\$23.37
MN EV DCFC Infrastructure	\$0.7
LED Street & Area Light Conversion	\$1.5

OTP’s “Age-Related Replacement and Asset Renewal” budget comprises the second largest category of spending compared to observed actual spending from 2018 to 2022. Spending in this category is a continuing response to the Company’s SIRI initiative that focuses on addressing aging infrastructure plans and preparing for future system needs and technology on the transmission and distribution systems. The Company’s 2019 IDP described SIRI as an effort to “improve the process of identifying the highest value projects to meet the initiative’s goals of improving reliability, safety, efficiency and customer engagement... [and] to better understand the overall health of our existing assets and the current replacement programs in place for those assets.”²¹ OTP’s 2021 IDP described the drivers of increased need to replace fielded equipment to include the replacement of overhead and underground cable with a large vintage reaching end-of-life, the replacement of Carte transformers that have been failing prematurely, and the installation of new trip savers, electronic reclosers, and line sensors to monitor and operate the distribution system safely.²² OTP’s 2023 IDP continues to reflect these priorities.

E. DISTRIBUTED ENERGY RESOURCE (DER) FORECASTS AND MORRIS, MN IMPACT STUDY

Notice Topic 3D: Feedback, Comments, and Recommendations on Distributed Energy Resource (DER) Scenarios and Forecasts

Notice Topic 3F: Feedback, Comments, and Recommendations on Results From the DER and Electric Vehicle (EV) Impact Study Conducted in Morris, MN

The Department addresses Notice Topics 3D and 3F in the following analysis. OTP does not conduct system-wide DER forecasts for its IDP.²³ Instead, it conducted a study specifically for Morris, Minnesota “in an effort to identify the most common and probable issues we may face with increasing levels of DER and EV adoption across our service territory in the future.”²⁴ As such, the DER forecasts and scenarios which comprise the Morris, Minnesota study provide the basis for evaluating OTP’s planning for increased levels of DER adoption.

²¹ *Integrated Distribution Plan, In the Matter of the Distribution System Planning for Otter Tail Power Company*, Docket No. E017/M-19-693 (November 1, 2019). (eDocket No. [201911-157180-01](#)). 2019 IDP at 37.

²² 2021 IDP at 43.

²³ OTP Response to Department Information Request 4.

²⁴ IDP at 25.

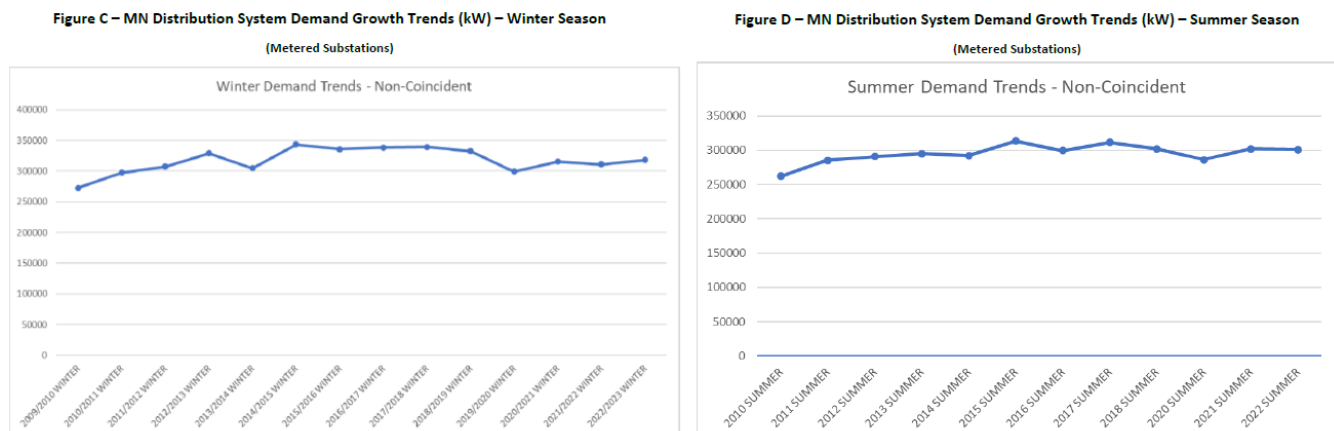
The Commission's Notice Topic 3D states that the comments on OTP's DER scenarios and forecasts are to be made at this time.

OTP's IDP states that:

While Otter Tail has recorded some growth with transmission connected loads, we are still showing a very flat growth profile on the distribution system. This assumption is also the baseline scenario in Otter Tail's latest Integrated Resource Plan (IRP).²⁵

Figures C and D²⁶ of the IDP illustrate very little growth in OTP's distribution system. Based upon analysis of OTP's Integrated Resource Plan (IRP) forecast and historic data presented by OTP, the Department agrees that little change in load is a reasonable base case. The Department provides Figure 1 below depicting OTP's historical demand growth.

Figure 1: OTP IDP Figures C and D Showing Winter (left) and Summer (right) Demand Growth



OTP describes its DER forecasting approach as follows:

Otter Tail has historically averaged around six DER requests and installations on the system annually. As demand growth is monitored and reported, the effects of the request are “netted” into the load from a system perspective. This is due to the behind the meter configuration of these sites. Given the size and the overall number of requests, this approach suits our customers well in comparison to an approach which would exclude these generators from the demand trends and analyze them independently.²⁷

²⁵ IDP at 8.

²⁶ IDP at 9-10.

²⁷ IDP at 24.

The Department agrees that OTP's forecast approach, simply leaving the impact of DER embedded in the forecast data, is reasonable. In general, unless there are strong reasons to do otherwise, the historical data should not be adjusted as such adjustments open the forecast process to several potential issues that could result in a biased forecast.

OTP discusses three DER scenarios: a Base Case, Medium DER Penetration, and High DER Penetration. The latter two scenarios experiment with changes in both DER and electric vehicle (EV) charging at various adoption cases, totaling 45 individual DER adoption cases and 38 individual EV adoption cases.²⁸ The scenarios used OTP's Morris, Minnesota territory as the focus. Morris is OTP's largest adopter of DER with approximately 4 MW.²⁹ For comparison, Morris has an annual coincident peak demand of about 15 MW.³⁰

OTP's base case scenario represents current conditions, with existing levels of DER and EVs. The base case includes 17 EVs, seven Level 2 chargers and one DCFC station.³¹ For the Medium DER Penetration scenario, OTP assumes a slight increase of 320 kW from the base case scenario, to an aggregate total of 4.25 MW. OTP notes that Morris "is already nearing a medium level of DER penetration today."³² OTP also assumed an increase from base EV adoption levels with an additional 23 Level 2 chargers and four DCFC stations, bringing the total number to 30 Level 2 chargers and five DCFC stations in the Medium Penetration scenario.

For the High DER Penetration scenario, OTP assumes an increase of about 2 MW from base case to an aggregate total of 6 MW. In this scenario, the aggregate number and type of chargers increases to a total of 50 Level 2 chargers and 12 DCFC stations. This scenario is designed "to get a better sense of what the common dangers or violations are that Otter Tail could likely anticipate due to increasing levels of penetration across the service area."³³

OTP analyzes 21 different DER cases within the High DER Penetration scenario, 14 of which result in overvoltage violations, 10 in reverse power flow violations, and seven in both violations.³⁴ The most serious violations occur on a long, rural substation feeder serving northeast Morris and the University of Minnesota Morris.³⁵ OTP analyzed 17 high volume EV cases and identified six violations related to undervoltage, thermal overload, or both.³⁶

The Department concludes that OTP analyzed a reasonable range of DER scenarios in its study of Morris, Minnesota. Because Morris has higher rates of adoption for DER and EVs within OTP's service territory, the potential impacts observed in the Medium and High penetration scenarios are unlikely to

²⁸ IDP at 27.

²⁹ IDP at 26.

³⁰ The (non-coincident) annual peak load in Morris is 18 MW.

³¹ IDP at 28.

³² *Ibid.*

³³ IDP at 29.

³⁴ *Ibid.*

³⁵ IDP at 26 and 29.

³⁶ IDP at 30.

occur across its service territory in the near term. However, the study provides valuable insight into potential system impacts using a highly localized test case.

The Department recommends the Commission direct OTP to include in its 2025 IDP an update of the Morris, Minnesota impact study and identify the specific investments included in its budget to mitigate risks identified in the study.

The Department is interested in how OTP can expand its DER forecast capabilities to ensure it can accurately plan for DER and EV adoption across more of its service territory. OTP also notes that additional analyses will be possible with its rollout of AMI, which can inform planning for DER.³⁷ OTP identified other communities in its IDP which, while lagging Morris, are also experiencing increased growth and higher levels of DER adoption,³⁸ warranting additional study. The Department is interested in hearing from stakeholders and OTP regarding refinements to OTP's DER forecasts in its 2025 IDP, to inform distribution system planning and compliance with IDP Filing Requirement 3.C.

The Department requests OTP discuss in reply comments how it can expand its DER forecasting in its 2025 IDP to inform system-wide distribution planning.

F. THE SYSTEM INFRASTRUCTURE AND RELIABILITY IMPROVEMENT (SIRI) INITIATIVE

Notice Topic 3E: Feedback, Comments, and Recommendation on the System Infrastructure and Reliability Improvement (SIRI) Initiative

The Commission's Notice Topic 3E states that the comments on OTP's SIRI initiative are to be made at this time.

Section 9E of the Petition discusses the SIRI program and states that "SIRI focuses on the transmission and distribution system throughout the entire Otter Tail system and addresses aging infrastructure plans, as well as preparing for future system needs and technology."³⁹ Currently, OTP states that SIRI uses data sources including GIS data, breaker reports, reliability metrics, load data, and inspection reports. OTP expects to use additional data sets in the future to improve the SIRI initiative. The goal for the SIRI initiative is to place renewed emphasis on reliability and data analytics within the planning process. OTP uses SIRI to allocate spending to particular transmission and distribution projects.

The Department agrees with OTP that the SIRI approach of using multiple data sources to prioritize and allocate spending is reasonable. The following distribution-related spending programs are informed by the data from SIRI.⁴⁰

- General Distribution Replace—addresses very near term and urgent failing components;

³⁷ IDP at 33.

³⁸ IDP at 24 and 27.

³⁹ IDP at 48.

⁴⁰ The Department's April 26, 2022 reply comments in OTP's 2021 IDP, Docket No. E017/M-21-612 (eDocket No. [20224-185122-01](#)), reported on four of these programs as being informed by SIRI: UG Asset Replacement; Distribution Pole Replacement; S&C Trip Savers; and Electronic Reclosers. The remaining programs are new.

- Underground (UG) Asset Replacement—replace at-risk underground cable by the end of 2035;
- Distribution Substation Replacement—overall condition failures of substations and associated equipment;
- Distribution Overhead (OH) Replacement:
 - Strategic OH to UG projects—replace poor performing and/or hard to access overhead line sections, with new UG cable infrastructure;
 - Porcelain Cut-out Replacement Program—changing out distribution class porcelain cutouts to polymer cutouts and other related items;
 - Distribution Pole Replacement Program—replace distribution poles that do not meet strength tests; and
- Technology Programs:
 - S&C Trip Savers and Siemens Compact Modular Reclosers (CMR)—investigating the placement of single phase electronic reclosers throughout the distribution system;
 - Electronic Reclosers—oil filled mechanical devices replaced with newer vacuum bottle technology devices;
 - Line Sensors—more advanced line sensors (than current LED fault indicators) are being deployed.⁴¹

The Department has no further comment or recommendations on SIRI at this time.

G. THE INFLATION REDUCTION ACT AND UTILITY PLANNING AND BENEFITS

Notice Topic 5: Has Otter Tail Power appropriately discussed its plans to maximize the benefits of the Inflation Reduction Act (IRA) and the IRA's impact on the utility's planning assumptions pursuant to Order Point 1 of the Commission's September 12, 2023 Order in Docket No. E,G-999/CI-22-624?

Order Point 1 of the Commission's September 12, 2023, Order in Docket No. E,G999/CI-22-624 states in part:

The utilities shall maximize the benefits of the Inflation Reduction Act in [...] integrated distribution plans [...]. In such filings, utilities shall discuss how they plan to capture and maximize the benefits from the Act, and how the Act has impacted planning assumptions including (but not limited to) the predicted cost of assets and projects and the adoption rates of electric vehicles, distributed energy resources, and other electrification measures.⁴²

⁴¹ IDP at 48-52.

⁴² *Order Setting Requirements Related to Inflation Reduction Act, In the Matter of a Joint Investigation into the Impacts of the Federal Inflation Reduction Act, Docket No. E,G999/CI-22-624* (September 12, 2023). (eDocket No. [20239-198869-01](#)). Hereinafter September 12, 2023, Order.

1. General IRA Discussion

OTP does not specifically reference the IRA in its IDP but references federal tax incentives in various contexts. First, OTP mentions the impact of incentives related to solar and EV adoption in the context of its DER scenarios presented as part of the Morris, Minnesota impact study,⁴³ discussed above in Section III.E. Second, OTP notes the relevance of federal policy, presumably including tax incentives, in the context of EV forecast scenarios.⁴⁴

The Department notes the short time period from the September 12, 2023 Order to the filing of the IDP on November 1, 2023. The Department assumes that future IDPs, as well as the other filings required to comply with Order Point 1, will likely become more comprehensive in response to the requirements.

OTP's references to the IRA are limited to a discussion of EVs and solar installations and do not fully address how the incentives have impacted OTP's planning assumptions and adoption rates for EVs and DER. In addition, the Department notes that IRA incentives may address other forms of DER and electrification measures, which are included in the requirements in the September 12, 2023 Order. Specifically, incentives for battery storage, heat pump air conditioners/heaters, heat pump water heaters, electric wiring and electric panel upgrades that facilitate electrification, among others, are relevant aspects of the IRA to include in a discussion of planning assumptions and future adoption rates.

The Department requests OTP include in reply comments a description of how its distribution system planning will evolve with the incorporation of additional impacts from the IRA.

2. Beneficial Electrification

The Department found that a discussion about beneficial electrification, specifically various heat pump technologies, is absent in OTP's IDP. Beneficial electrification is consistent with the state's Climate Action Framework,⁴⁵ which sets a goal to reach carbon neutrality by 2050. As OTP is required to supply 100% carbon free electricity by 2040,⁴⁶ beneficial electrification aligns with the state's full decarbonization goal, to the extent that beneficial electrification technologies are able to offset a fossil fuel-based heat source. Further, OTP is positioned in a position of relative advantage compared to other utilities, with its low electricity prices and the high percentage of its service area that appears to rely on expensive heating sources that are not natural gas. Figure 2 shows that a large portion of OTP's service area does not overlap with natural gas utility service areas.

⁴³ IDP at 25-28.

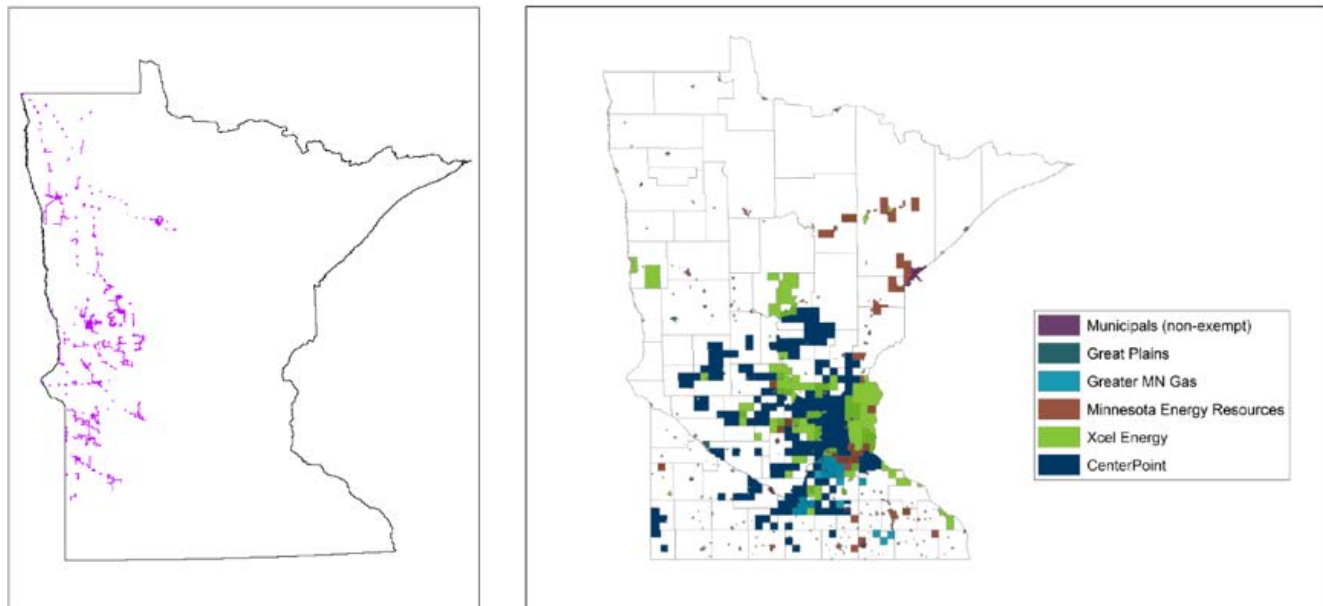
⁴⁴ IDP at 62.

⁴⁵ State of Minnesota. *Minnesota Climate Action Framework Report*. N.D. Accessed at

<https://climate.state.mn.us/sites/climate-action/files/Climate%20Action%20Framework.pdf>

⁴⁶ Minn. Stat. § 216B.1691, subd. 2g. <https://www.revisor.mn.gov/statutes/cite/216B.1691#stat.216B.1691.2g>

Figure 22: Comparison of the OTP Service Area (Left) to Natural Gas Utility Service Areas Throughout Minnesota (Right)



Sources: 2023 IDP at 22 (left) and Minnesota Energy Efficiency Potential Study: 2020-2029 (right).⁴⁷

The Department explores the potential to switch from any heating fuel that is not natural gas to a heat pump using county-level data. After normalizing for the population of each county in OTP’s service area, the Department found that only 35.5 percent of households use natural gas for heating their homes, while 26.7 percent of households use electric heat, and 37.8 percent of households use an alternative fuel source, the majority of which is assumed to be propane.⁴⁸ While the estimated county population is for the entire county, and OTP’s service area is considerably smaller than the areas of the counties it serves, the data is consistent with the Minnesota Energy Efficiency Potential Study. The study found that 28 percent of OTP service area households rely on electric heat. At minimum, the Department expects that heating outside of natural gas or electricity conforms to the state average of 14.9 percent, due to the rurality of the OTP service area,⁴⁹ which includes heating data from the Twin Cities urban area. Heating outside of natural gas totals a minimum of 42.9 percent when combined with electric heating. OTP notes that it serves “...155 communities with an average population of 630,”⁵⁰ which means that many communities are likely too small and spread out to economically install natural gas infrastructure. OTP provides electric service to several communities with relatively larger

⁴⁷ Center for Energy and Environment, et al. (2018). *Minnesota Energy Efficiency Potential Study: 2020 - 2029*. Retrieved from: <https://mn.gov/commerce-stat/pdfs/mn-energy-efficiency-potential-study.pdf>

⁴⁸ State average values for the percent of households that rely on each heating source are: Natural Gas – 66.1%, Electricity – 17.1%, Propane – 10.5%, Wood – 2.4%, Fuel Oil – 2.0%, and Other – 1.9%. For more information, see: Eleff, B. (January 2017). *Residential Space Heating Fuels in Minnesota*. Minnesota House of Representatives – Research Department. Retrieved from: <https://www.house.mn.gov/hrd/pubs/heatfuel.pdf>

⁴⁹ The state average includes the urban area of the Twin Cities that is significantly covered by natural gas service territories and consists of over half of the entire state’s population.

⁵⁰ IDP at 1.

populations, such as Bemidji, Fergus Falls, and Morris,⁵¹ which are served by natural gas utilities. Therefore, the county-level averages may over-estimate the number of non-gas customers across OTP's entire service area, but the general trend should still remain valid,⁵² which is that likely around 50% or more of OTP's service area is heated without natural gas.

The Department requests that OTP provide data on the fraction of its customers that rely on the primary heating sources of natural gas, electric resistance heat, or all other heat sources.

Table 5: OTP Service Area Heating Fuel and Population Normalization Estimates by County

County	% Natural Gas	% Electric	% Other	Total Population	Population Natural Gas	Population Electric	Population Other
Becker	29.0%	27.8%	43.2%	35,183	10,203	9,781	15,199
Beltrami	28.0%	30.1%	41.9%	46,228	12,944	13,915	19,370
Big Stone	31.9%	23.7%	44.4%	5,166	1,648	1,224	2,294
Cass	17.8%	24.6%	57.6%	30,066	5,352	7,396	17,318
Clay	49.0%	35.0%	16.0%	65,318	32,006	22,861	10,451
Clearwater	18.4%	21.6%	60.0%	8,524	1,568	1,841	5,114
Douglas	39.3%	24.8%	35.9%	39,006	15,329	9,673	14,003
Grant	2.1%	26.5%	71.4%	6,074	128	1,610	4,337
Kandiyohi	52.9%	19.7%	27.4%	43,732	23,134	8,615	11,983
Kittson	18.7%	28.2%	53.1%	4,207	787	1,186	2,234
Lac Qui Parle	39.6%	25.7%	34.7%	6,719	2,661	1,727	2,331
Lincoln	29.5%	26.1%	44.4%	5,640	1,664	1,472	2,504
Lyon	38.8%	34.5%	26.7%	25,269	9,804	8,718	6,747
Mahnomen	6.9%	27.2%	65.9%	5,411	373	1,472	3,566
Marshall	24.8%	24.5%	50.7%	9,040	2,242	2,215	4,583
Norman	29.0%	26.7%	44.3%	6,441	1,868	1,720	2,853
Otter Tail	31.4%	27.4%	41.2%	60,081	18,865	16,462	24,753
Pennington	48.8%	23.9%	27.3%	13,992	6,828	3,344	3,820
Polk	41.6%	24.1%	34.3%	31,192	12,976	7,517	10,699
Pope	35.3%	15.6%	49.1%	11,308	3,992	1,764	5,552
Red Lake	12.0%	31.3%	56.7%	3,935	472	1,232	2,231
Redwood	36.9%	21.1%	42.0%	15,425	5,692	3,255	6,479
Roseau	26.6%	25.8%	47.6%	15,331	4,078	3,955	7,298
Stevens	42.7%	24.8%	32.5%	9,671	4,130	2,398	3,143
Swift	38.8%	22.0%	39.2%	9,838	3,817	2,164	3,856

⁵¹ Note that these areas are not fully served by natural gas and electric resistance heat. Populations for each City: Bemidji - 14,574, Fergus Falls - 14,119, Morris - 5,105. Source: <https://data.census.gov/profile?t=Population%20Total>

⁵² OTP states on page 1 of its IDP that it serves an average population of 630 over 155 communities, which totals a population of 97,650. The combined total population of 33,798 between these 3 cities is 34.6% of OTP's total population. This does not mean that 100% of the homes in these cities use either natural gas or electric heat, but the expected share of natural gas is considerably higher than the county average for these communities.

Traverse	1.5%	27.4%	71.1%	3,360	50	921	2,389
Wilkin	36.3%	25.1%	38.6%	6,506	2,362	1,633	2,511
Yellow Medicine	41.1%	22.2%	36.7%	9,528	3,916	2,115	3,497
Total				532,191	188,889	142,187	201,115
Percentage					35.5%	26.7%	37.8%

Sources: US Census Bureau⁵³

The high percentage of homes in OTP's service area that do not use natural gas for heating presents a significant opportunity to add value to OTP's electric ratepayers. Typical fossil-fuel based heating systems are limited to a maximum efficiency that cannot exceed 100 percent, and in practice, most high efficiency models are around 95 percent efficient. Electric resistance heat is 100 percent efficient. Heat pumps, rather than generating heat, instead move heat from one place to another, which allows them to reach efficiencies higher than 100 percent. Heat pump performance is sometimes measured by its Coefficient of Performance (COP), which is measured as the ratio of input electricity to the equivalent output electricity. For example, at a COP of 2.0, this would mean you generate 2 kWh of heat for every 1 kWh that is used by the heat pump, and thus a higher COP means the heat pump is more efficient.

Table 6 below shows a comparison cost table of heating costs by fuel source and by heat pump efficiency. Natural gas costs \$8.84 / MMBtu, while propane costs \$21.64 / MMBtu, fuel oil costs \$21.66 / MMBtu, and electric resistance heat costs \$17.87 / MMBtu. Natural gas is significantly cheaper than propane (59.1 percent), fuel oil (59.2 percent) and electric resistance heat (50.5 percent). Many of the homes in OTP's service area may not have the option to switch to natural gas, which leaves heat pumps as an attractive, if not even cheaper solution than natural gas. Heat pump water heater COPs were found in a real world application to have a COP range of 1.82 – 2.32.⁵⁴ Energy Star requires that certified cold climate heat pumps achieve a COP of at least 1.75 at 5 degrees,⁵⁵ while several models can achieve a COP well above 2.0 at 5 degrees.⁵⁶ While Air Source Heat Pump (ASHP) performance declines with temperature, a COP of 2.0 at 5 degrees is approximately the economic break even point compared to natural gas, which means that cold climate ASHPs will be cheaper to run than natural gas for a significant portion of the heating season. When compared to propane and fuel oil, a heat pump with a COP of 2.0 offers the same level of savings as natural gas, while warmer temperatures offer even higher levels of savings, with COPs reaching as high as 3.5 at 47 degrees.

⁵³ US Census Bureau. (n.d.). Why We Ask Questions About Home Heating Fuel. Retrieved from: <https://www.census.gov/acs/www/about/why-we-ask-each-question/heating/?lv=true> and US Census Bureau. (n.d.). Profiles. Retrieved from: <https://data.census.gov/profile?t=Population%20Total>

⁵⁴ Shapiro and Puttagunta. (February 2016). *Field Performance of Heat Pump Water Heaters in the Northeast*. US Department of Energy. <https://www.nrel.gov/docs/fy16osti/64904.pdf>

⁵⁵ See https://www.energystar.gov/products/heat_pump_water_heaters/key-product-criteria

⁵⁶ See https://ashp.neep.org/#/product_list/

Table 6: Comparison of Heating Cost by Fuel and Heat Pump Coefficient of Performance (COP)

Heat Source	Fuel Cost	Normalized Fuel Cost (\$ / MMBtu)	Heating Cost (\$ / MMBtu)
Natural Gas (95% Efficiency)	\$8.72 / MCF ⁵⁷	\$8.40 / MMBtu	\$8.84 / MMBtu
Propane (95% Efficiency)	\$1.88 / Gallon ⁵⁸	\$20.56 / MMBtu	\$21.64 / MMBtu
Fuel Oil (95% Efficiency)	\$2.85 / Gallon ⁵⁹	\$20.58 / MMBtu	\$21.66 / MMBtu
Electric Resistance - COP 1.0	\$0.061 / kWh ⁶⁰	\$17.87 / MMBtu	\$17.87 / MMBtu
Heat Pump - COP 1.5	\$0.061 / kWh	\$17.87 / MMBtu	\$11.91 / MMBtu
Heat Pump - COP 2.0	\$0.061 / kWh	\$17.87 / MMBtu	\$8.94 / MMBtu
Heat Pump - COP 2.5	\$0.061 / kWh	\$17.87 / MMBtu	\$7.15 / MMBtu
Heat Pump - COP 3.0	\$0.061 / kWh	\$17.87 / MMBtu	\$5.96 / MMBtu
Heat Pump - COP 3.5	\$0.061 / kWh	\$17.87 / MMBtu	\$5.11 / MMBtu

The average Minnesota home uses 59.3 MMBtu for space heating, 15.2 MMBtu for water heating, and 3.5 MMBtu for air conditioning.⁶¹ A fully natural gas heating home is estimated to spend \$659 annually, whereas a fully propane heating home is estimated to spend \$1,532 annually and a fully electric resistance heating home is estimated to spend \$1,331 annually. Compared to a full heat pump home with a heat pump space and water heater that average a COP of 2.0, the average annual cost would be \$666, with a savings potential of \$866 for propane and \$666 for electric resistance heat. Note that most, if not all, cold climate heat pumps currently on the market cannot serve 100% of a Minnesota home's heating load,⁶² and will likely be able to fuel switch economically from natural gas to meet 20 – 80 percent of a home's heating load, based on the Duluth climate.⁶³ Heat pumps will remain economical for electric resistance heat, propane, and fuel oil for the entire load they are able to serve.

OTP does not provide a forecast for the adoption of heat pumps in its service territory. OTP does, however, present the estimated number of heat pump incentives it expects to deliver in its 2024 to

⁵⁷ 10 year average price of residential natural gas for December – February heating season: 2013 – 2022. Source: <https://www.eia.gov/dnav/ng/hist/n3010mn3m.htm>

⁵⁸ 10 year average price of residential propane for December – February heating season: 2013 – 2022. Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPLLPA_PRS_SMN_DPG&f=W

⁵⁹ 10 year average price of residential propane for December – February heating season: 2013 – 2022. Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPD2F_PRS_SMN_DPG&f=W

⁶⁰ Current OTP residential winter energy use cost. Source: https://www.otpc.com/media/xigneadf/mn_0901.pdf

⁶¹ US Energy Information Administration. Residential Energy Consumption Survey (RECS) Dashboard. Source: <https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253>

⁶² ASHP performance (COP) and output decline with decreasing temperature. Many Energy Star certified cold climate heat pumps have a similar rated output at 47 degrees to their output at 5 degrees, but output declines further at lower temperatures, and likely cannot meet 100% of building heating load without a backup heat source such as fossil fuels or electric resistance heat.

⁶³ A heat pump that can supply 100% of the heating load at 5 degrees will supply approximately 80% of a home's heating load in Duluth, which is a similar climate to the OTP service area. See Minnesota Energy Efficiency Potential Study at 104-105.

2026 ECO filing.⁶⁴ OTP expects to deliver 147 fuel switching heat pump incentives between 2024 and 2027, which translates to 245 new heat pumps installed in the budget forecast period between 2023 and 2027. Further OTP expects to deliver 401 electric resistance heating incentives between 2024 and 2027, which translates to 668 new heat pumps installed in the budget forecast period between 2023 and 2027. In total, OTP expects to install 913 new heat pumps in the 2023 to 2027 budget period. OTP states that it has just over 62,000 customers and 82,241 meters in Minnesota.⁶⁵ Based on 62,000 customers / buildings, the Department estimates there are 17,360 electric resistance heating buildings and 16,926 buildings that heat with fuels other than natural gas or electricity in OTP's service territory.⁶⁶ OTP's planned heat pump incentives corresponds to a heat pump adoption rate of 3.8 percent for electric resistance heating and 0.9 percent for all other fuels between 2023 and 2027. When annualized to 2050, OTP would be on track to install heat pumps at 21.6 percent of homes on electric resistance heat and at 8.1 percent of homes that use other heating sources, which leaves a significant number of high heating cost homes still reliant on expensive heating fuels in 2050.

These projected deployment numbers do not appear to take IRA incentives into consideration. As part of OTP's ECO program, OTP offers up to \$840 per ton for a ductless cold climate ASHP and up to \$1,040 per ton for a ducted cold climate ASHP.⁶⁷ The IRA tax credit offers up to \$2,000 for 30 percent of the cost to install an ASHP.⁶⁸ As an example, a 3 ton ducted ASHP that costs \$7,000 would be eligible for a \$5,120 incentive, which would cover 73 percent of the installation cost. The State of Minnesota has received over \$148 million for home energy efficiency and home electrification⁶⁹ which can fund rebates up to \$8,000 towards the installation of a heat pump for households at or below 80% of the Area Median Income, and \$4,000 for households at or below 150% of the Area Median Income.⁷⁰ Further, the state is planning on offering a program to fund up to \$4,000 for the installation of a heat pump for applicants of these programs.⁷¹ Some of these programs can also potentially fund heat pump water heaters and clothes dryers.

Despite the unprecedented opportunities created by the IRA to install free or heavily discounted heat pumps, OTP has not presented any discussion about the topic. Many of these programs are scheduled for implementation in 2025, which means that OTP will be behind if it does not start planning for these new programs now. The rebate programs will require energy audits to first be performed that establish the need for heat pumps alongside other energy saving measures, such as insulation and air sealing. The implementation of these programs will require coordination with OTP, at minimum, and at best, a proactive attempt by OTP to identify and enroll high heating cost homes into the many programs

⁶⁴ Docket No. E017/CIP-23-094

⁶⁵ IDP at 23.

⁶⁶ This value is based on an average of the statewide average of 16.8% and the county average presented in Table 5 of 37.8%, which totals 27.3%.

⁶⁷ See <https://www.otpc.com/ways-to-save/programs/heat-pump/>

⁶⁸ See <https://www.irs.gov/credits-deductions/energy-efficient-home-improvement-credit>

⁶⁹ See <https://www.energy.gov/sites/default/files/2023-07/IRA%2050121%20%26%2050122%20Home%20Energy%20Rebates%20State%20Allocations.pdf>

⁷⁰ See <https://mn.gov/commerce/energy/consumer/energy-programs/home-energy-rebates.jsp>

⁷¹ See <https://mn.gov/commerce/energy/consumer/energy-programs/heat-pump.jsp>

available for beneficial electrification. Further, while switching from electric resistance heat to heat pumps will reduce electric loads, fuel switching from other fuels will increase loads. These homes are more likely to be located on long rural feeders that do not have access to natural gas, and beneficial electrification will create new stresses on the distribution grid that must be appropriately planned for, especially when combined with electric vehicles.

The Department recommends the Commission order OTP to file a supplemental filing that proposes a plan to accelerate beneficial electrification for its customers and provide forecasts of expected grid impacts of the same.

H. DISTRIBUTION SYSTEM RESILIENCE

Notice Topic 6: What Should the Commission Consider or Address Related to Enhancing the Resilience of the Distribution System Within Otter Tail's IDP?

OTP primarily discusses resilience in its IDP in the context of Planning Objective 1, which establishes that the purpose of the IDP is to “maintain and enhance the safety, security, reliability, and resilience of the electricity grid, at fair and reasonable costs, consistent with the state’s energy policies.”⁷² OTP cites its efforts to improve system resiliency, including its SIRI Initiative, its Outage Management System (OMS) project, and Advanced Metering Infrastructure (AMI).⁷³

While OTP does not provide its definition of resilience, resilience “refers to the ability of the energy system to avoid, withstand, and recover from the impacts of extreme weather and other disruptive events.”⁷⁴ The Department notes the unique challenge of OTP’s large and rural service territory in the context of resilience, as resources devoted to withstanding and recovering from disruptive events must be spread across a 70,000 square mile service territory.⁷⁵ This challenge also necessitates a targeted approach toward resilience in order to ensure it is maintained and enhanced.

It is currently a challenge to fully assess system resilience due to a lack of existing metrics focused on resilience as a distinct concept from reliability. Currently, OTP’s IDP is primarily focused on reliability or discusses reliability and resilience in tandem.⁷⁶ The differentiation of reliability and resilience along the axes of the “probability and impact of the disruptive event under consideration”⁷⁷ would inform Commission and stakeholder understanding of OTP’s system and its compliance with IDP Planning Objective 1.

⁷² IDP Planning Objective 1.

⁷³ IDP at 3.

⁷⁴ National Renewable Energy Laboratory (NREL). *Measuring and Valuing Resilience: A Literature Review for the Power Sector*, August 2023 at 2. Hereinafter “NREL.” Accessed at <https://www.nrel.gov/docs/fy23osti/87053.pdf>

⁷⁵ IDP at 6.

⁷⁶ IDP at 3.

⁷⁷ NREL at 7.

OTP's IDP reports on system reliability using weather normalized metrics, although this is not explicitly noted in its discussion.⁷⁸ The reliability metrics reported in the IDP are pulled from its Minnesota Safety, Reliability, and Service Quality (SRSQ) Annual Report.⁷⁹ The SRSQ Annual Report includes the standardized reporting metrics of System Average Interruption Duration Index (SAIDI), Customer Average Interruption Duration Index (CAIDI), and Momentary Average Interruption Frequency Index (MAIFI),⁸⁰ among others, which are also reported in its IDP. The standardization of reliability reporting using normalized data is appropriate given reliability "typically deals with routine, shorter-time events."⁸¹

In contrast, resilience "typically focuses on low-probability, high-consequence events [...] and affect a significant number of customers, often spanning a wide geographic extent."⁸² Accordingly, the focus for resiliency should be on non-weather-normalized versions of metrics including Major Event Days (MEDs).⁸³ OTP is required to report some non-normalized reliability metrics in its SRSQ Annual Report,⁸⁴ which could provide the basis for resiliency reporting metrics. The Department notes that other jurisdictions track SAIDI and SAIFI with MEDs as measures of resilience.⁸⁵

The Department recommends the Commission direct OTP to develop a suite of metrics to track resiliency, including SAIDI and SAIFI, MEDs, and other metrics to the extent warranted.

For reference for developing this suite of metrics, the Department points to reports published by Pacific Northwest National Laboratory and Sandia National Laboratories^{86,87} on the development of resiliency metrics. The Department encourages OTP to establish metrics and track performance across different customer groups and geographies to the extent practicable with its existing and future technological capabilities.

⁷⁸ IDP at 19.

⁷⁹ *Annual Report, In the Matter of Otter Tail Power Company 2022 Annual Safety, Reliability and Service Quality Report and Proposed SAIFI, SAIDI and CAIDI Reliability Standards for 2023, Otter Tail power Company, Docket No. E017/M-23-76* (April 3, 2023). (eDocket No. [20234-194475-01](#)). Hereinafter "SRSQ Annual Report".

⁸⁰ SRSQ Annual Report, Section II at 5.

⁸¹ NREL at 7.

⁸² *Ibid.*

⁸³ Major Event Days are power outage scenarios often caused by severe weather. The protocol for determining the MED threshold is per IEEE 1366.

⁸⁴ SRSQ Annual Report, Section IV at 12.

⁸⁵ See <https://www.nationalgridus.com/media/pdfs/our-company/massachusetts-grid-modernization/future-grid-full-plan-sept2023.pdf>

⁸⁶ Pacific Northwest National Laboratory and Sandia National Laboratories. *Resilient Electric Grid: Defining, Measuring, and Integrating Resilience into Electricity Sector Policy and Planning*. September 2023. Accessed at <https://www.pnnl.gov/sites/default/files/media/file/MOD-Plan%20Resilience%20Paper%20Final.pdf>

⁸⁷ Sandia National Laboratories. *Performance Metrics to Evaluate Utility Resilience Investments*. May 2021. Accessed at <https://www.osti.gov/servlets/purl/1821803/>

I. *OTHER AREAS OF OTP'S IDP*

Notice Topic 7: Other Areas of Otter Tail Power's IDP Not Listed Above, Along With Any Other Issues or Concerns Related to This Matter

The Department identifies two issues raised in its March 4, 2024 initial comments⁸⁸ filed in the ongoing Xcel Energy IDP proceeding which also pertain to OTP's IDP. First, the Department discusses the alignment of IDP budget categories with other OTP dockets. Second, the Department discusses the timing of IDP filings.

1. *IDP-Specific Budget Categories*

In the Department's initial comments in the Xcel IDP proceeding, the Department responded to Xcel's request to revise IDP filing requirements to removing the requirement that financial information be reported in IDP-specific budget categories.⁸⁹ Xcel's request was prompted by its observation regarding the manual work required to convert its internal budget categories to the IDP-specific budget categories and a desire from stakeholders to facilitate comparison of budget information across utility proceedings.⁹⁰ The Department expressed support for the alignment of the IDP process with other dockets, including cost recovery proceedings, which the removal of IDP-specific budget categories could facilitate. The Department also recommended the Commission consider implementing similar revisions with other utilities' IDP filings.

The Department continues to believe that consistent presentation of budget information across utility proceedings could benefit the regulatory process, particularly with cost recovery proceedings. The Department is interested in hearing from OTP regarding its challenges, if any, with providing its budget information in the IDP-specific budget categories, and what the impacts would be of aligning its IDP budget information with its internal budget categories.

The Department requests feedback from OTP and stakeholders regarding the potential revision of IDP filing requirements to remove the requirement that financial information be presented in IDP-specific budget categories.

2. *On the Timing and Synchronization of IDPs With Other Proceedings*

In Section III.K of the Department's initial comments in the Xcel IDP proceeding discussed the issue of timing misalignment between the IDP and other proceedings. The Department provides its discussion here for clarity:

The Department provides the following observation regarding timing of the IDP and integration with other processes such as rate cases and the

⁸⁸ Department March 4, 2024 comments (eDocket No. [20243-204037-04](#)) in Docket No. E002/M-23-452. Hereinafter "March 4, 2024 Comments."

⁸⁹ March 4, 2024 Comments at 16.

⁹⁰ 2023 *Integrated Distribution System Plan, Northern States Power Company dba Xcel Energy*, Docket No. E002/M-23-452 (November 1, 2023) (eDocket No. [202311-200132-09](#)). Xcel IDP Main Report at 27.

Integrated Resource Plan. The IDP and the IRP are currently separate processes, but are not wholly unrelated. Currently all IDPs, including Xcel's IDP, are filed simultaneously on a schedule that is unrelated to other Commission proceedings. As such, there is no reason to assume that the inputs to Xcel's IDP analysis will be the same or similar to the inputs to Xcel's IRP—the difference in timing alone creates the potential for significant differences. In addition, due to the timing of Xcel's IDP, there is no reason to assume that the outputs from Xcel's IDP could be used as inputs to Xcel's IRP or any other proceeding. In essence, the current filing schedule leaves the IDP process as a standalone proceeding whose inputs and outputs are not easily integrated into any other Commission proceeding.

Finding an approach that integrates these processes and addresses the timing of these filings would be beneficial. For example, one approach would be to have Xcel's IRP and IDP filed on the same schedule so that they share a common set of inputs. Another approach would be to sequence the dockets so that the IDP is completed first and the IDP outputs can then be used as inputs to the IRP. The Department is interested in working with Xcel and other parties to address these concerns.

The Department requests feedback from Xcel and other parties on how to schedule the IDP filing to better integrate the IDP's inputs and outputs with other Commission processes in reply comments.⁹¹

The Department notes that the same concerns apply to OTP's IDP and its other proceedings.

The Department requests feedback from OTP and other parties on how to schedule the IDP filing to better integrate the IDP's inputs and outputs with other Commission proceedings in reply comments.

J. TEP COMPLIANCE WITH FILING REQUIREMENTS AND RECOMMENDATIONS CONCERNING ACCEPTANCE

Notice Topic 8: Should the Commission Approve, Modify, or Reject Otter Tail Power's TEP?

Notice Topic 9: Did Otter Tail Power Adequately Address the Commission's TEP Filing Requirements and Prior Orders, as Outlined in Attachment A to This Notice? Is Additional Information Necessary for Improved Clarity?

The Department analyzes OTP's TEP and offers recommendations both to promote transportation electrification consistent with the public interest and to ensure that the Commission is presented with the resources to make an informed decision. The Department looks to relevant statute and Commission Orders to define the boundaries and parameters of the public interest in this venue. Some

⁹¹ March 4, 2024 Comments at 58.

of those constituent goals of the public interest include expansion of transportation electrification, optimizing EV benefits, overcoming barriers to adoption, and clarifying the role of utilities in transportation electrification.

The Department's review of OTP's TEP begins at a threshold question: does OTP provide information and analyses required by the Commission's TEP filing requirements and previous Commission Orders? The Commission's December 8, 2022 Order approved combining IDPs and TEPs, and the current filing is OTP's first time submitting its TEP as a component of its IDP. The December 8, 2022 Order also incorporated TEP filing requirements into the IDP filing requirements as Section 3.F.⁹² OTP structures its TEP to directly address each of the filing requirements in Section 3.F, as well as the additional transportation electrification related filing requirements incorporated into the IDP filing requirements in Sections 3.A and 3.C.

The Department notes that OTP provided a Checklist of Requirements⁹³ showing where it provided information addressing some of the IDP filing requirements from the Commission's December 8, 2022 Order. However, OTP's Checklist of Requirements simply referred to its TEP in totality and did not specify the location within the TEP for each of the filing requirements within Section 3.F.⁹⁴ The Department includes each of the filing requirements within Section 3.F in its assessment of OTP's compliance with IDP filing requirements included with these comments as Attachment A. The Department reviewed OTP's filing in its entirety and concludes that OTP has sufficiently addressed each of the IDP filing requirements and Commission Orders.

In addition, the Department analyzes OTP's TEP under the relevant statute, Minn. Stat. § 216B.1615.⁹⁵ Subdivision 3 of the relevant statute gives authority to the Commission to approve, modify, or reject a TEP and the rubric under which that decision is to be made.

The Department additionally recognizes the importance of electrifying Minnesota's transportation sector consistent with both the Commission's February 1, 2019 Order in Docket No. E999/CI-17-879 (EV Inquiry Order)⁹⁶ and subsequent Orders in similar proceedings.

⁹² The Department notes that OTP's IDP filing requirements mis-ordered the sub-sections establishing the requirements for Non-Wires (Non-Traditional) Alternatives Analysis and the TEP. As the final sub-section of Section 3 of the IDP filing requirements, the TEP requirements should be labeled Section 3.F, consistent with the location of the TEP filing requirements for the other electric utilities included in the December 8, 2022 Order. The Department will refer to the TEP filing requirements as Section 3.F and discusses correcting this issue in Section K below.

⁹³ IDP at 68-69.

⁹⁴ IDP at 69.

⁹⁵ Minn. Stat. § 216B.1615. <https://www.revisor.mn.gov/statutes/cite/216B.1615>

⁹⁶ *Order Making Findings and Requiring Filings, In the Matter of a Commission Inquiry into Electric Vehicle Charging and Infrastructure*, Docket No. E-999/CI-17-879 (February 1, 2019). (eDocket No. [20192-149933-01](https://www.revisor.mn.gov/statutes/cite/20192-149933-01)). Hereinafter EV Inquiry Order.

1. Otter Tail Power's TEP

In response to the various TEP filing requirements of Sections 3.A, 3.C, and 3.F, OTP provides information regarding the current status of transportation electrification in its service territory, its existing initiatives to promote electrification, and planned or possible future initiatives. It is important to note the relatively nascent stage of transportation electrification in OTP's service territory, which differentiates OTP from other utilities filing TEPs. The average size of the communities served by OTP in Minnesota is only 630,⁹⁷ and only two communities have a population exceeding 10,000.⁹⁸ Rural areas generally have lower rates of EV adoption, while drivers in those areas also drive more miles on average.⁹⁹

OTP provides information in its TEP regarding the current levels of EV adoption and availability of charging infrastructure. There are 144 customer-owned EVs are present in its service territory, consisting of 84 battery electric vehicles (BEVs) and 60 plug-in hybrid vehicles (PHEVs).¹⁰⁰ OTP also notes the minimal adoption of EVs in the medium-duty (MD) and heavy-duty (HD) segments, with the current adoption limited to electric school buses (ESBs).¹⁰¹ The state of charging infrastructure in OTP's service territory is similarly limited. OTP identifies 16 publicly available Level 2 charging stations with a total of 28 plugs.¹⁰² Meanwhile, direct current fast charging (DCFC) stations consist of four sites with 20 plugs.¹⁰³

In its TEP, OTP provides a summary of its existing transportation electrification initiatives, which include programs promoting public charging, home charging, and public education and outreach efforts. OTP highlights its ongoing DCFC public charging project, which will result in a total of 11 sites when the remaining sites are completed in 2024.¹⁰⁴ This project also incorporates Level 2 chargers at each DCFC site, while OTP plans to install an additional ten Level 2 chargers in communities not served by the DCFC sites.¹⁰⁵ OTP promotes home charging with \$400 rebates for hardwired Level 2 chargers placed on a load management program.¹⁰⁶ Finally, OTP conducts a number of public education and outreach efforts, including ride and drive events, social media, dealership support, and other forms of public engagement.¹⁰⁷

OTP's TEP identifies several new and future initiatives meant to broaden and deepen its support for transportation electrification. First, its 2024-26 ECO triennial plan features an expansion of its existing

⁹⁷ IDP at 1.

⁹⁸ IDP at 6.

⁹⁹ See <https://www.transportation.gov/rural/ev/toolkit/ev-benefits-and-challenges/individual-benefits> and <https://www.autosinnovate.org/posts/papers-reports/Get%20Connected%20EV%20Quarterly%20Report%202023%20Q3.pdf>

¹⁰⁰ TEP at 61.

¹⁰¹ *Ibid.*

¹⁰² TEP at 64.

¹⁰³ TEP at 65.

¹⁰⁴ TEP at 55.

¹⁰⁵ OTP Response to Department IR 10.b.

¹⁰⁶ TEP at 56.

¹⁰⁷ TEP at 59.

Level 2 charging rebates to \$500,¹⁰⁸ as well as rebates for BEVs, PHEVs, and ESBs.¹⁰⁹ Next, OTP plans to offer new residential rate options to promote EV adoption and off-peak charging. These initiatives include a Level 2 charger demand control rate which would forego the need to install a second meter, lowering customer installation costs.¹¹⁰ In addition, OTP's planned 2025 Residential Time of Day pilot will leverage its AMI rollout to encourage customers to charge during off-peak periods.¹¹¹

Next, OTP discusses providing a Make-Ready offering to facilitate public charging buildout, with OTP "going beyond the typical termination point of the meter and offsetting some of the upfront capital required of a third-party including the transformer, underground line extension, and mounting pad of charging equipment."¹¹² OTP intends to utilize the insight from its remaining buildout of DCFC sites to inform its Make-Ready offering, with an estimated rollout at the end of 2024. The Make-Ready offering would address both DCFC and Level 2 stations.¹¹³ OTP also notes that third parties have expressed interest in utilizing funding from the National Electric Vehicle Infrastructure (NEVI) program¹¹⁴ to provide public charging in its service territory.¹¹⁵ OTP's intent is to utilize the Make-Ready offering to support NEVI projects proposed by third parties if the timing aligns with NEVI installation requirements.¹¹⁶

Finally, OTP notes the potential for a future offering targeted at addressing charging at multi-family dwellings.¹¹⁷ OTP presents limited information regarding this potential offering due to its preliminary status, with the previously noted programs preceding the availability of a multi-family offering. However, OTP notes the evolution of charging technology better equipped to provide affordable solutions specific to the needs of multi-family dwellings, which will inform OTP's future offering.¹¹⁸

2. Statutory Criteria

As noted above, the Department analyzes OTP's TEP using the public interest criteria established in Minn. Stat. § 216B.1615, Subd. 3. Subdivision 3 gives authority to the Commission to approve, modify, or reject a TEP based on an evaluation of whether the TEP's programs, investments, and expenditures "are reasonable and in the public interest, and are reasonably expected to:

- 1) improve the operation of the electric grid;
- 2) increase access to the use of electricity as a transportation fuel for all customers, including those in low- and moderate-income communities, rural communities, and communities most affected by air emissions from the transportation sector;

¹⁰⁸ TEP at 56.

¹⁰⁹ TEP at 55.

¹¹⁰ TEP at 58.

¹¹¹ *Ibid.*

¹¹² TEP at 56.

¹¹³ OTP Response to Department IR 10.c.

¹¹⁴ See <https://www.dot.state.mn.us/nevi/>

¹¹⁵ TEP at 55.

¹¹⁶ OTP Response to Department IR 10.a.

¹¹⁷ TEP at 55.

¹¹⁸ TEP at 56-57.

- 3) increase access to publicly available electric vehicle charging for all types of electric vehicles;
- 4) support the electrification of medium-duty and heavy-duty vehicles and associated charging infrastructure;
- 5) reduce statewide greenhouse gas emissions, as defined in section 216H.01, and emissions of other air pollutants that impair the environment and public health;
- 6) stimulate nonutility investment and the creation of high-quality jobs for local workers;
- 7) educate the public about the benefits of electric vehicles and related infrastructure;
- 8) be transparent and incorporate reasonable public reporting of program activities, consistent with existing technology and data capabilities, to inform program design and commission policy with respect to electric vehicles;
- 9) reasonably balance the benefits of ratepayer funded investments in transportation electrification and impacts on utility rates; and
- 10) appropriately balance the participation of public utilities and private enterprise in the market for transportation electrification and related services.”¹¹⁹

Accordingly, the Department evaluates OTP’s TEP under each of the ten criteria established in Minn. Stat. § 216B.1615, Subd. 3.

- i. Whether the TEP’s programs, investments, and expenditures are reasonably expected to “improve the operation of the electric grid.” Minn. Stat. § 216B.1615, Subd. 3(1).*

The Commission’s EV Inquiry Order established that transportation electrification “can further the public interest in affordable, economic electric utility service by improving utility system utilization/efficiency and placing downward pressure on utility rates through increased utility revenues and better grid utilization.”¹²⁰ The Commission also established that optimized EV integration includes charging during periods of low demand and high renewable energy generation and promoting load management.¹²¹

OTP’s TEP directly addresses improved operation of the electric grid through its current and future residential charging programs. OTP offers rebates for Level 2 chargers installed on an off-peak rate.¹²² OTP’s total number of customers enrolled in off-peak EV rates is limited to just 19 customers,¹²³ however this compares relatively favorably to the total number of EVs in its territory of 144, including just 84 BEVs which would likely comprise the majority of total EV charging. OTP’s TEP addresses the promotion of additional off-peak charging with a future proposal for a residential EV charging demand control rate which will allow customers to forego the installation costs associated with a second meter while providing OTP with additional grid management capabilities.¹²⁴ OTP also plans to use AMI deployment to facilitate its Residential TOD pilot and further promote off-peak EV charging.

¹¹⁹ Minn. Stat. § 216B.1615, Subd. 3. <https://www.revisor.mn.gov/statutes/cite/216B.1615#stat.216B.1615.3>

¹²⁰ EV Inquiry Order at Order Point 1.a.

¹²¹ EV Inquiry Order at Order Point 3.

¹²² TEP at 55.

¹²³ TEP at 66.

¹²⁴ TEP at 57.

OTP has tied its Level 2 charger rebates to off-peak rates, and it is planning additional offerings to provide customers additional incentives for off-peak charging with lower barriers. The Department finds that OTP's TEP can reasonably be expected to continue improving the operation of the electric grid through its promotion of EV adoption and off-peak charging.

- ii. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "increase access to the use of electricity as a transportation fuel for all customers, including those in low- and moderate-income communities, rural communities, and communities most affected by air emissions from the transportation sector." Minn. Stat. § 216B.1615, Subd. 3(2).*

As discussed above, OTP's service territory presents unique challenges for EV adoption. While current levels of EVs remain low, OTP's role in EV adoption in its territory is significant. OTP estimates 144 total EVs in its territory, yet it has provided Level 2 charging rebates to 27 customers,¹²⁵ a significant portion of the total. OTP is also working to lower the barriers to EV adoption by providing access to an off-peak tariff option that will lower customer installation costs for home EV charging by eliminating the need for a second meter.¹²⁶ In addition, the future Residential TOD rate should also offer customers easier access to off-peak charging rates that can help promote EV adoption. Reducing installation costs for home EV chargers and providing reduced rates for EV charging can strengthen the case for customers considering EV adoption.

In addition to the existing and expanded offerings supporting EV charging, OTP has also taken steps to promote EV adoption by addressing the upfront cost of EVs with customer rebates. The upfront cost of an EV remains among the top barriers to EV adoption.¹²⁷ OTP's ECO triennial plan includes rebates for PHEVs and BEVs, with rebate amounts ranging from \$750 to \$3,000.¹²⁸

OTP notes that it does not currently have a specific offering for multi-family dwellings but is considering a future offering.¹²⁹ Such an offering would be an important addition to its portfolio to ensure it is working to increase access to transportation electrification among all customers. The Department encourages OTP to develop such a proposal expeditiously.

The Department also notes the unique role that PHEVs may play in transportation electrification in OTP's service territory. Relative to BEVs, PHEVs comprise a much larger share of the total EV market in rural areas.¹³⁰ Accordingly, OTP's inclusion of PHEV rebates in its ECO triennial plan is well suited for its

¹²⁵ OTP Response to Department IR 11.b.

¹²⁶ TEP at 57.

¹²⁷ See

https://article.images.consumerreports.org/image/upload/v1701451301/prod/content/dam/surveys/Consumer_Reports_B_EV_LCF_National_June_July_2023.pdf and <https://www.spqglobal.com/mobility/en/research-analysis/affordability-tops-charging-and-range-concerns-in-slowing-ev-d.html>

¹²⁸ OTP Response to Department IR 12.g.

¹²⁹ TEP at 56-57.

¹³⁰ See <https://www.autosinnovate.org/posts/papers-reports/Get%20Connected%20EV%20Quarterly%20Report%202023%20Q3.pdf> at 17.

territory. Drivers living in rural areas drive significantly more than residents of more urban areas,¹³¹ suggesting that issues of range anxiety and limited public charging infrastructure may be more salient. Therefore, PHEVs may offer an incremental approach to transportation electrification in these areas. However, the Department also notes that transportation electrification stands to be most beneficial for the rural drivers who drive the most and, accordingly, spend the most on fuel costs.¹³²

Based on the foregoing, the Department concludes that OTP's TEP is consistent with this criterion.

- iii. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "increase access to publicly available electric vehicle charging for all types of electric vehicles." Minn. Stat. § 216B.1615, Subd. 3(3).*

OTP's TEP presents multiple avenues to increase public EV charging. OTP's flagship program is its installation of 11 DCFC sites, which will be completed in 2024. The DCFC sites also include Level 2 chargers, and OTP will install an additional ten Level 2 chargers at other sites. OTP plans to further promote public charging through a Make-Ready program, which it contemplates offering after its DCFC sites are completed. OTP plays a significant role in the availability of public charging in its service territory, as its existing and planned public charging programs represent a significant share of sites.

While OTP's TEP emphasizes the role of DCFC sites for public charging, OTP provides additional valuable discussion of the role of Level 2 chargers in response to Department IRs. In the context of its planned donation of ten Level 2 chargers, OTP notes that the chargers "are part of a plan to not only provide more charging accessibility in our rural service territory, but to also demonstrate the viability of the EV technology."¹³³ OTP also discusses the challenges associated with its Level 2 charger installations. Finally, OTP indicates that Level 2 charging "will most likely be a focus in any Make-Ready offering,"¹³⁴ which was a fact not highlighted in its TEP. The Department appreciates this more robust discussion of Level 2 chargers for promoting public charging access. The Department encourages OTP to ensure that its TEP includes such a discussion so that stakeholders have the necessary information to evaluate its approach to public charging access.

As discussed above, the driving patterns of a rural environment present a particular need for robust public charging infrastructure. OTP's Make-Ready offering may have a particularly important role to play in promoting public charging availability in its service territory, and the Department looks forward to this filing later in 2024. The Department concludes that OTP's TEP is consistent with this criterion.

¹³¹ See <https://www.transportation.gov/rural/ev/toolkit/ev-benefits-and-challenges/individual-benefits>

¹³² *Ibid.*

¹³³ OTP Response to Department IR 10.

¹³⁴ *Ibid.*

- iv. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "support the electrification of medium-duty and heavy-duty vehicles and associated charging infrastructure." Minn. Stat. § 216B.1615, Subd. 3(4).*

OTP's TEP emphasizes the limited adoption of EVs in the MD and HD sectors, with the exception of ESBs.¹³⁵ OTP notes that it excluded MD and HD EVs from its forecast due to limited quantities and anticipated growth.¹³⁶ OTP provides the most extensive discussion related to its role with ESBs in its territory. It notes it facilitates ESB adoption with additional funding for schools who have received grants from the Minnesota Pollution Control Agency.¹³⁷ OTP has also included ESB rebates in its ECO triennial plan in the amount of \$5,000 per recipient.¹³⁸ OTP also notes that ESBs in its service territory rely on Level 2 chargers and were placed on a general service rate, and additional charging options, including for off-peak charging, will be explored once the ESB operators have attained greater experience with the technology.¹³⁹

The Department appreciates OTP's discussion of ESBs in its service territory and its partnerships with school districts to leverage available funding opportunities. With the limited impact its own \$5,000 ESB rebates can offer relative to the full price of an ESB,¹⁴⁰ it is valuable for OTP to promote stacked funding as well as provide support related to charging infrastructure. The Department also encourages OTP to incorporate the newly established Minnesota Electric School Bus Deployment program under Minn. Stat. § 216C.374 into its planning toward ESBs.¹⁴¹ The Department will administer this program and, most pertinent to OTP's service territory, prioritized school districts include rural districts and will be eligible for up to 95% of the costs for the purchase of ESBs and associated infrastructure. The Department encourages OTP to also consider how its future Make-Ready offering can support charging infrastructure for ESBs, and potentially the MD and HD sectors more broadly.

The Department acknowledges the relatively nascent stage of EV adoption in OTP's service territory, particularly for the MD and HD sectors, and appreciates OTP's efforts to support transportation electrification in these sectors to the extent practicable. The Department concludes that OTP's TEP is consistent with this criterion.

¹³⁵ TEP at 61.

¹³⁶ TEP at 62.

¹³⁷ TEP at 57.

¹³⁸ OTP Response to Department IR 12.g.

¹³⁹ TEP at 65.

¹⁴⁰ See <https://www.veic.org/Media/Default/documents/resources/reports/types-of-electric-school-buses.pdf>

¹⁴¹ Minn. Stat. § 216C.374. <https://www.revisor.mn.gov/statutes/cite/216C.374>

- v. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "reduce statewide greenhouse gas emissions, as defined in section 216H.01, and emissions of other air pollutants that impair the environment and public health." Minn. Stat. § 216B.1615, Subd. 3(5).*

The Commission established in its EV Inquiry Order that transportation electrification can further the public interest in renewable energy use by increasing electricity demand during hours when renewable energy is most prevalent and promotes clean energy by reducing statewide greenhouse gas (GHG) and environmentally harmful emissions.¹⁴² OTP's existing and planned transportation electrification offerings promote EV adoption by reducing barriers related to upfront vehicle purchase costs and the costs of charging. In addition, the previous discussion under the criteria established in Subd. 3(1) regarding OTP's encouragement of off-peak charging pertains is relevant to the discussion of GHG impacts. OTP notes that it encourages customers to participate in its subscription based renewable energy program, Tailwinds, and retires Renewable Energy Credits (RECs) for all energy consumption at public EV chargers.¹⁴³ OTP also emphasizes the role that abundant and low cost wind energy generation plays in its territory, enabling all customers to benefit from lower energy costs by shifting load to off-peak periods when wind energy is generally most prevalent.¹⁴⁴ In tandem, OTP's efforts to promote transportation electrification in a manner that optimizes EV integration through off-peak charging and a reliance on renewable generation aligns with the findings of the Commission's EV Inquiry Order.

The Department also notes OTP's programs work to address GHG and air pollutant impacts from other sectors as well, as OTP has included rebates for commercial mowing equipment and forklifts in its ECO filing.¹⁴⁵ While somewhat tangential to the core focus of transportation electrification, the potential GHG and air pollutant benefits of electrification of these sectors is tangible.¹⁴⁶

The Department believes OTP's TEP is consistent with this criterion.

- vi. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "stimulate nonutility investment and the creation of high-quality jobs for local workers." Minn. Stat. § 216B.1615, Subd. 3(6).*

OTP's future Make-Ready offering for public EV charging stands to stimulate nonutility investment from third-party charging providers. As OTP discussed, its Make-Ready offering is intended to stimulate charging investments for both DCFC and Level 2 charging in its service territory. OTP is also working with third-party providers interested in leveraging NEVI funding in OTP's territory, which OTP intends to support through the Make-Ready offering or another funding mechanism. As discussed above for the criterion established under Subd. 3(3), OTP may play an outsize role in stimulating nonutility

¹⁴² EV Inquiry Order at Order Point 1.

¹⁴³ TEP at 58.

¹⁴⁴ *Ibid.*

¹⁴⁵ *Ibid.*

¹⁴⁶ See https://publicinterestnetwork.org/wp-content/uploads/2023/10/Lawn_Care_Goes_Electric_Oct23.pdf and <https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf>

investment related to charging infrastructure in its service territory and, as such, its support for public charging is a critical component of its approach to transportation electrification.

In addition, OTP's support for home charging through its Level 2 charger rebates and its future rate offerings to promote low-cost off-peak charging aligns with this criterion. Home installation of Level 2 chargers requires utilizing the services of qualified electricians for charger installation and home wiring. Further promotion of home charging solutions can be reasonably expected to stimulate additional demand for electrical contractors in OTP's service territory. The Department concludes that OTP's TEP is consistent with this criterion.

vii. Whether the TEP's programs, investments, and expenditures are reasonably expected to "educate the public about the benefits of electric vehicles and related infrastructure." Minn. Stat. § 216B.1615, Subd. 3(7).

OTP's TEP describes its various efforts to educate the public and specific constituencies regarding EVs and charging. OTP's initiatives to educate the general public regarding EVs include ride and drive events, social media, and participation in campaigns such as Drive Electric Minnesota. OTP plans to facilitate three to four ride and drive events annually.¹⁴⁷

OTP also works with dealerships to support their transition to provide EVs to consumers. OTP also notes it plans to work with the Minnesota Automobile Dealers Association (MADA) to educate dealerships on the charging options provided by OTP.¹⁴⁸ OTP plans to increase its outreach and support to dealerships to assist them with planning for and complying with requirements from manufacturers,¹⁴⁹ and OTP plans to engage with 10 to 15 dealerships annually.¹⁵⁰ The general public will benefit from the direct support to dealerships as customers will receive more accurate and updated information regarding EV and charging options.

The Department appreciates OTP's discussion of its public education efforts, as the utility plays an important role in EV education efforts in its rural territory. As noted above, EV adoption in rural areas lags more dense environments but the value proposition of EV adoption for rural drivers is strong. In areas with lower rates of EV adoption, public education plays a critical role in bridging the gap. The Department appreciates OTP's discussion of the role of public charging visibility and access to raise consumer awareness of EVs, particularly through its donation of Level 2 chargers.¹⁵¹

OTP notes the prevalence of larger passenger vehicles, such as crossovers, SUVs, and pickups, among customers in its service territory and the future rollout of EV models for these customer segments.¹⁵² OTP suggests that manufacturers will offer EV models in these segments in the future, and OTP

¹⁴⁷ OTP Response to Department IR 12.g.

¹⁴⁸ TEP at 58.

¹⁴⁹ TEP at 59.

¹⁵⁰ OTP Response to Department IR 12.g.

¹⁵¹ TEP at 64-65, OTP Response to Department IR 10.b.

¹⁵² TEP at 62-64.

incorporates the impacts of their availability into its EV forecast in later years.¹⁵³ However, the Department notes that the EV market in the United States is already largely dominated by SUVs and larger vehicles, both in terms of model availability and segment sales.¹⁵⁴ As such, EV models well-suited for OTP's service territory are already available. In addition, the Clean Cars Minnesota rule, establishing manufacturer requirements for zero emission vehicle sales in the state, goes into effect for model year 2025.¹⁵⁵ Compliance requirements for the rule should promote greater EV model availability in Minnesota. Accordingly, the Department encourages OTP to incorporate the current and near-term EV model availability into its dealership engagement efforts, EV forecast modeling, and public education efforts.

The Department concludes that OTP's TEP is consistent with this criterion.

- viii. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "be transparent and incorporate reasonable public reporting of program activities, consistent with existing technology and data capabilities, to inform program design and commission policy with respect to electric vehicles." Minn. Stat. § 216B.1615, Subd. 3(8).*

OTP's TEP provides limited information regarding the public reporting of its program activities, as the corresponding dockets for the specific programs contain the required reporting and program evaluation.¹⁵⁶ Future offerings will proceed in separate dockets in which reporting requirements will be established to ensure transparency. OTP notes the improvement that its planned AMI rollout will offer to its technology and data capabilities, which will present the opportunity for additional offerings for EV charging.¹⁵⁷ Accordingly, the Department concludes that OTP's TEP is consistent with this criterion.

- ix. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "reasonably balance the benefits of ratepayer funded investments in transportation electrification and impacts on utility rates." Minn. Stat. § 216B.1615, Subd. 3(9).*

As discussed above, the relatively nascent stage of EV adoption in OTP's service territory limits both the level of ratepayer funded investments in transportation electrification and the impacts on utility rates. Historically, the DCFC project has comprised the majority of OTP's spending on transportation electrification initiatives.¹⁵⁸ Moving forward, the DCFC project will remain the single largest investment, but OTP's Make-Ready offering, NEVI support, expanded ECO rebates, and additional marketing efforts will increase the overall spending levels on transportation electrification initiatives.¹⁵⁹

¹⁵³ *Ibid.*

¹⁵⁴ See <https://www.iea.org/data-and-statistics/charts/electric-car-model-availability-in-selected-countries-by-size-2018-2022> and <https://www.autosinnovate.org/posts/papers-reports/Get%20Connected%20EV%20Quarterly%20Report%202023%20Q3.pdf> at 3.

¹⁵⁵ See <https://www.pca.state.mn.us/business-with-us/zero-emission-vehicle-credits-for-manufacturers>

¹⁵⁶ TEP at 60.

¹⁵⁷ TEP at 58.

¹⁵⁸ TEP at 60.

¹⁵⁹ TEP at 61, OTP Response to Department IR 12.

The Department notes the large cost ranges for particular components of OTP's forecasted spending, including marketing and communications, NEVI support, O&M charging infrastructure, and ECO rebates.¹⁶⁰ OTP notes that its NEVI support cost range is based on two distinct scenarios, the lower of which, \$50,000, is providing limited make-ready investments while the higher range, \$750,000, would result from upgrading an existing DCFC pilot site into full NEVI compliance.¹⁶¹ The Department encourages OTP to continue to engage with third-parties that have expressed interest in leveraging NEVI funding to develop a better understanding of what level of support will have a positive impact on public charging availability while limiting the impact to ratepayers. OTP also provides a large cost range for O&M costs associated with its DCFC project for sites outside of the service agreement period, with costs ranging from \$50,000 to \$500,000.¹⁶² OTP describes its uncertainty with the required levels of spending for parts replacement and repair for charging infrastructure due to its limited experience and evolving technology landscape.¹⁶³

The Department appreciates the uncertainty surrounding aspects of transportation electrification and the implications for OTP's future spending on its initiatives. However, the broad cost ranges provided, as well as the limited information available regarding the potential impacts of the contemplated investments due to their preliminary nature limits the Department's ability to evaluate the relative balance between ratepayer funded investments and bill impacts. Accordingly, the Department forgoes making a determination regarding OTP's TEP under this criterion.

- x. *Whether the TEP's programs, investments, and expenditures are reasonably expected to "appropriately balance the participation of public utilities and private enterprise in the market for transportation electrification and related services."*
Minn. Stat. § 216B.1615, Subd. 3(10).

This statutory criterion primarily implicates public charging infrastructure, with the risks associated with investor-owned utility investments in this market, up to and including utility ownership of EV charging stations. As discussed above, OTP directly serves the public charging market with its DCFC project. Accordingly, the Commission's IDP filing requirement 3.E.5 requires OTP to discuss divestment strategies for its DCFC sites as the conclusion of the pilot program. In response to this filing requirement, OTP did not provide a discussion of divestment, instead noting the pilot program is in progress and indicating a progress report was filed in the associated docket.¹⁶⁴ The Department acknowledges the ongoing status of the DCFC pilot but encourages OTP to develop a more robust understanding of divestment options once the site installations near completion.

¹⁶⁰ *Ibid.*

¹⁶¹ OTP Response to Department IR 12.f.

¹⁶² TEP at 61.

¹⁶³ OTP Response to Department IR 12.g.

¹⁶⁴ TEP at 59 and *Annual Filing, In the Matter of Otter Tail Power Company's Annual Electric Vehicle Charging and Infrastructure Pilot Programs Report; In the Matter of Otter Tail Power Company's Off-Peak Electric Vehicle Rider Report*, Docket Nos. E017/M-20-181, E017/M-15-112 (June 1, 2023). (eDocket No. [20236-196343-03](#)).

As noted above in the discussion related to public charging infrastructure under the Subd. 3(3) criterion, OTP plays a significant role in supporting public charging in its service territory. As OTP notes, the private sector has shown limited interest in developing public charging infrastructure to date.¹⁶⁵ OTP's Make-Ready offering and NEVI support have the opportunity to provide meaningful utility support for public charging infrastructure in a manner that supports a competitive charging market. The Department looks forward to evaluating these proposals in the future. The Department concludes that OTP's TEP is consistent with the criterion established under Subd. 3(10).

In totality using the criteria established in Minn. Stat. § 216B.1615, Subd. 3, as a preliminary matter the Department finds that OTP's TEP is reasonable and in the public interest. However, the Department will make a final recommendation regarding whether the Commission should approve, modify, or reject OTP's TEP after reviewing party and OTP reply comments.

K. OTHER TEP TOPICS

Notice Topic 10: How Should the Commission Consider Modifications or Supplements to Otter Tail Power's Transportation Electrification Plan?

The Department does not make any recommendations at this time.

Notice Topic 11: Should the Commission Establish any Procedural or Filing Requirements for Future TEPs Under Minn. Stat. 216B.1615?

The Department does not make any recommendations at this time.

Notice Topic 12: Are There Gaps in Otter Tail Power's Transportation Electrification Programs the Commission Should Address to Ensure Equitable Customer Outcomes?

The Department does not make any recommendations at this time.

Notice Topic 13: Are There Other Issues or Concerns Related to This Matter?

The Department notes that OTP's IDP filing requirements mis-ordered the sub-sections establishing the requirements for Non-Wires (Non-Traditional) Alternatives Analysis and the TEP. As the final sub-section of Section 3 of the IDP filing requirements, the TEP requirements should be labeled Section 3.F, consistent with the location of the TEP filing requirements for the other electric utilities included in the December 8, 2022 Order.

The Department recommends the Commission revise the IDP filing requirements to identify the sub-sections establishing the requirements for Non-Wires (Non-Traditional) Alternatives Analysis and the TEP as sections 3.E and 3.F, respectively.

¹⁶⁵ TEP at 55.

IV. RECOMMENDATIONS

The Department appreciates the opportunity to comment on OTP's 2023 IDP and TEP and looks forward to the review of other stakeholder comments. The Department requests that OTP provide the following information in Utility Reply comments:

- *The Department requests that OTP discuss in reply comments how OTP selected its DRMS vendor, if applicable, including whether costs and benefits were weighed prior to vendor selection, and that OTP present its cost-benefit analysis for the DRMS project, if available.*
- *The Department requests OTP discuss in reply comments how it can expand its DER forecasting in its 2025 IDP to inform system-wide distribution planning.*
- *The Department requests OTP include in reply comments a description of how its distribution system planning will evolve with the incorporation of additional impacts from the IRA.*
- *The Department requests that OTP provide data on the fraction of its customers that rely on the primary heating sources of natural gas, electric resistance heat, or all other heat sources.*
- *The Department requests feedback from OTP and stakeholders regarding the potential revision of IDP filing requirements to remove the requirement that financial information be presented in IDP-specific budget categories.*
- *The Department requests feedback from OTP and other parties on how to schedule the IDP filing to better integrate the IDP's inputs and outputs with other Commission proceedings in reply comments.*

The Department makes the following initial recommendations:

- *The Department recommends that OTP outline its process for how NWA analysis will be conducted, and present an analysis, as applicable, for the "Purchase of DSA Substation" and "Rush Otter South Feeder Upgrades" projects.*
- *The Department recommends the Commission direct OTP to include an update of the Morris Flow Battery Project in its 2025 IDP.*
- *The Department recommends the Commission direct OTP to include in its 2025 IDP an update of the Morris, Minnesota impact study and identify the specific investments included in its budget to mitigate risks identified in the study.*
- *The Department recommends the Commission order OTP to file a supplemental filing that proposes a plan to accelerate beneficial electrification for its customers and provide forecasts of expected grid impacts of the same.*

- *The Department recommends the Commission direct OTP to develop a suite of metrics to track resiliency, including SAIDI and SAIFI, MEDs, and other metrics to the extent warranted.*
- *The Department recommends the Commission revise the IDP filing requirements to identify the sub-sections establishing the requirements for Non-Wires (Non-Traditional) Alternatives Analysis and the TEP as sections 3.E and 3.F, respectively.*

V. GLOSSARY

AMI	Advanced Metering Infrastructure	MAIFI	Momentary Average Interruption Frequency Index
ASHP	Air Source Heat Pump	MD	Medium Duty
BEV	Battery Electric Vehicle	MDMS	Meter Data Management System
CAIDI	Customer Average Interruption Duration Index	MED	Major Event Day
CBA	Cost-Benefit Analysis	Minn. Stat.	Minnesota Statute
CMR	Compact Modular Reclosers	MMBtu	Million British Thermal Units
COP	Coefficient of Performance	MW/MWh	Megawatt/Megawatt-Hour
DCFC	Direct Current Fast Charger	NEVI	National Electric Vehicle Infrastructure
DER	Distributed Energy Resources	NWA	Non-Wires Alternative
DERMS	Distributed Energy Resource Management System	O&M	Operations and Maintenance
DM	Demand Management	OATI	Open Access Systems International
DR	Demand Response	OH	Overhead
DRMS	Demand Response Management System	OMS	Outage Management System
ECO/CIP	Energy Conservation and Optimization/Conservation Improvement Program	PHEV	Plug-In Hybrid Vehicle
ESB	Electric School Bus	REC	Renewable Energy Credit
EV	Electric Vehicle	RFP	Request for Proposals
FAN	Field Area Network	SAIDI	System Average Interruption Duration Index
HD	Heavy Duty	SAIFI	System Average Interruption Frequency Index
I2030	Initiative 2030	SIRI	System Infrastructure and Reliability Improvement
IDP	Integrated Distribution Plan	SRSQ	Safety, Reliability, & Service Quality
IRA	Inflation Reduction Act	TEP	Transportation Electrification Plan
IRP	Integrated Resource Plan	TOD	Time of Day
kW/kWh	Kilowatt/Kilowatt-Hour	UG	Underground
MADA	Minnesota Automobile Dealers Association		

Filing Requirement	Description	Report Section	Comments
Planning Objectives	How does OTP's IDP meet the Commission's planning objectives?	3	Addressed
3.A.1	Modeling Software	4	Addressed
3.A.2	Percentage of substations and feeders with monitor & control	6	Addressed
3.A.3	Summary of M&V and planned improvements	6	Addressed
3.A.4	Number of customers with AMI/Smart Meters	6	Addressed
3.A.5	Discussion of IRP and IDP relationship	7	Addressed
3.A.6	Discuss how DER is considered in load forecasting	7	Addressed
3.A.7	IEEE 1547-2018 impacts	4.B	Addressed
3.A.8	Distribution system loss percentages	7.D	Addressed
3.A.9	Coincident load at distribution interface	4	OTP only provided non-coincident load
3.A.10	Substation capacity	6	Addressed
3.A.11	See 3.10 - same answer	6	Addressed
3.A.12	Total Miles OH	6	Addressed
3.A.13	Total miles UG	6	Addressed
3.A.14	Total number of distribution customers	6	Addressed
3.A.15	Costs spent on DER gen installations	4.B	OTP does not keep detailed records to track the cost to review/install DER
3.A.16	Total charges to customers for DER	4.B	Addressed
3.A.17	DER nameplate gen installations	4.B	Addressed
3.A.18	DER count installations	4.B	Addressed
3.A.19	Existing DER	4.B	Addressed
3.A.20	Queued DER	4.B	Addressed

Filing Requirement	Description	Report Section	Comments
3.A.21	EVs in Minnesota	13	Addressed
3.A.22	Number and capacity of EV chargers	13	Addressed
3.A.23	Units of battery storage	10 & 12	Addressed
3.A.24	Savings and demand savings from EE	9.C	Addressed
3.A.25	Amount of Controllable Demand	9.C	Addressed
3.A.26	Historical spends in categories	8/13	Addressed
3.A.27	Investments on the system not by OTP	8	Addressed
3.A.28	Projected spends 5-year into the future	8	Addressed
3.A.29	Projected capital project spends	8/13/Appendix	Addressed
3.A.30	Non-Wires alternatives ben/cost	10	Addressed
3.A.31	Current DER deployment and geographical dispersion	4.B	Addressed
3.A.32	Areas of high DER penetration	4.B	Addressed
3.A.33	Information where advanced inverters are needed	4.B	Addressed
3.A.34	EV rate offering or program during the reporting period	13	Addressed
3.A.35	System upgrades performed to accommodate EV charging	13	Addressed
Prelim Hosting Capacity Data			
3.B.1	Excel spreadsheet of minimum load by feeder	7.D	Addressed
DER Scenario Discussion			
3.C.1	DER scenario recommendations	7, 13	Addressed
3.C.2	Methodology of DER scenario creation	7	Addressed
3.C.3	Tools needed for higher DERs	7	Addressed
3.C.4	Impacts of FERC Order 841	12	Addressed
Long-Term Distribution Grid Mod Plan		9	Addressed
3.D.1	Merged with 3.D.2		
3.D.2	5-Year Action Plan and 10-Year Long-Term Plan	4,7,8,9	Addressed
3.D.3	Distribution grid evolution	4,7,8,9	Addressed
Non-Wire Alternatives			
3.E.1 & 3.E.2	Non-wire alternative screening	10	Addressed

Filing Requirement	Description	Report Section	Comments
Transportation Electrification Plan		13	
3.F.1	Transportation Electrification Programs and Projects	13.1	Addressed
3.F.2.a	Public Charging Infrastructure	13.2.a	Addressed
3.F.2.b	Residential Charging	13.2.b	Addressed
3.F.2.c	Flexible Load or Reduced Metering and Data Costs	13.2.c	Addressed
3.F.2.d	Fleet Electrification	13.2.d	Addressed
3.F.3	Optimizing EV Benefits	13.3	Addressed
3.F.4	Managed Charging	13.4	Addressed
3.F.5	DCFC Divestment	13.5	Pilot ongoing so divestment not yet addressed
3.F.6	Non-Pilot EV Programs	13.6	Addressed
3.F.7	EV Education Initiatives	13.7	Addressed
3.F.8	Other Regulatory Agencies or Jurisdictions	13.8	Addressed
3.F.9	EV Pilots or Programs Reports	13.9	Addressed
3.F.10	Transportation Electrification Historical Spending	13.10	Addressed
3.F.11	Transportation Electrification Future Spending	13.11	Addressed
September 9, 2020 Order (E017/M-19-693)	Order Point 5: Cost-Benefit Analysis	8,9	Addressed
September 9, 2022 Order (E017/M-21-612)	Order Point 2: Innovation 2030 Initiative	9, Appendix B	Addressed
September 12, 2023 Order (E,G999/CI-22-624)	Order Point 1: IRA Impacts		See Department Comments Section III.G

Response to Information Request MN-DOC-001

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 1

Topic: Information Requests

Reference(s): n/a

Request:

Please provide the Department a copy of OTP's past, present, and future responses to other parties' information requests in this proceeding.

Attachments: 1

Attachment 1 to IR MN-DOC-001.pdf

Response:

OTP will provide copies of responses to other parties' information requests in this matter through email at utility.discovery@state.mn.us, daniel.tikk@state.mn.us and peter.teigland@state.mn.us.

As of the date of this response, OTP has responded to one information request from the Minnesota Office of the Attorney General. Otter Tail's response to MN-OAG-001 is attached.

Response to Information Request MN-DOC-002

Page 1 of 3

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 2

Topic: Minnesota DER Interconnections

Reference(s): 2023 IDP Section 4.B

Request:

In section 4.B. of OTP's 2023 IDP, OTP provides information regarding historical DER trends.

- a. On p. 14, OTP identifies ten DER installations in the Bemidji area from 2018-2022. In Table 2 on p. 15, OTP identifies seven interconnections in the Bemidji service area. Please explain the discrepancy and identify whether Table 2 reflects all DER projects during the specified time period.
- b. On p. 16, OTP indicates three interconnection customers have paid for upgrades from 2018-2022. Please provide details for each project regarding the nature of the upgrades and the associated costs.

Attachments: 0

Response:

- a. Table 7 has the correct number of DER installations in the Bemidji area from 2018-2022. Otter Tail had three projects in the Bemidji area in 2022 that did not proceed and these were inadvertently included in the numbers on page 14.

In reviewing this response, OTP realized that two generators, one in the Morris area, D19-08, and one in the Fergus Falls area, D22-04, were inadvertently left out of the table. D19-08 required upgrades that required time to construct and thus did not come online until the very end of 2021. D22-04 came online in 2022 and then requested to expand their system in mid-2023. The expanded system had not yet been installed when this data was compiled. Below is an updated table.

Response to Information Request MN-DOC-002

Page 2 of 3

Queue No.	DER Capacity kW AC	Customer Service Area	DER Type
D18-01	38.7	Bemidji	Solar
D18-02	3.84	Fergus Falls	Solar
D18-03	12.96	Bemidji	Solar
D18-04	38.98	Bemidji	Solar
D19-01	11.31	Fergus Falls	Solar
D19-03	8.03	Morris	Solar
D19-04	15.2	Morris	Solar
D19-06	33.3	Fergus Falls	Solar
D19-07	20	Morris	Solar
D19-08	215	Morris	Solar
D20-01	8.26	Bemidji	Solar
D20-02	33.3	Bemidji	Solar
D20-04	14.45	Fergus Falls	Solar
D20-05	10.41	Fergus Falls	Solar
D20-06	37.5	Crookston	Solar
D21-01	16.4	Morris	Solar
D21-02	36	Crookston	Solar
D21-03	13.6	Fergus Falls	Solar
D21-04	2.03	Bemidji	Solar
D21-05	16	Morris	Solar
D21-07	30.8	Morris	Solar
D21-08	18	Morris	Solar
D21-10	15.2	Fergus Falls	Solar
D21-11	120	Morris	Solar
D21-14	36	Morris	Solar
D21-15	23.1	Morris	Solar
D21-16	39	Morris	Solar
D21-17	25	Morris	Wind
D21-19	4.35	Morris	Solar
D21-20	4.64	Morris	Solar
D21-22	3.84	Morris	Solar
D21-23	7.6	Fergus Falls	Solar
D21-24	10.44	Morris	Solar
D21-25	13.6	Fergus Falls	Solar
D21-26	5.8	Morris	Solar
D21-27	10.6	Fergus Falls	Solar
D22-04	11.4	Fergus Falls	Solar
D22-09	38.5	Fergus Falls	Solar

Response to Information Request MN-DOC-002

Page 3 of 3

D22-12	38.4	Morris	Solar
D22-13	10.4	Fergus Falls	Solar
D22-14	38.4	Morris	Solar
D22-15	9.772	Bemidji	Solar
D22-24	2.61	Morris	Solar
D22-25	11.31	Morris	Solar

- b. Otter Tail has had three types of upgrades due to behind the meter DER interconnections. The first type is for generators under 40 kW needing transformer upgrades. There have been three interconnections of this type, and the cost to change out the transformer in each of these instances has been less than \$2,900. The other type of upgrade is for generators greater than 40 kW needing the transformer upgraded. There was one generator of this type. The cost to change out the transformer for this 120 kW generator was just over \$10,300. The final type of generator requiring upgrades was for other upgrades. One generator required a direct transfer trip scheme at a cost of just over \$171,000.

Response to Information Request MN-DOC-003

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 3

Topic: System Reliability

Reference(s): 2023 IDP Section 5

Request:

On p. 19 of section 5, OTP indicates that it “views MAIFI [Momentary Average interruption Frequency Index] as a leading indicator for future SAIDI [System Average Interruption Duration Index] and tracks and analyzes line sections with excessive momentary interruptions for future capital improvements or possible vegetation management needs.”

- a. Please explain how OTP defines “excessive” for identifying line sections to address.
- b. Identify the number of projects that resulted from this monitoring during the prior five years, including projects which are scheduled for completion in the future.

Attachments: 0

Response:

- a. Although there is no hard rule, Otter Tail typically views “excessive” as a line section that receives an excess of five momentary interruptions in a three-month period. Other aspects that impact investment decisions would be topography (i.e., vegetation/wooded areas), age of the assets, accessibility, etc. This philosophy and worst performing feeders are discussed annually in Otter Tail’s SRSQ filing.
- b. Below is a table summarizing Otter Tail’s large projects resulting from MAIFI monitoring. These include projects completed, in progress, and future projects. These are generally Overhead Line to Underground Line conversion type projects.

Years	Projects	Cost
2020-2023	7	\$15,291,663 ¹
2024-2029	14	\$12,664,941 ¹

¹Project costs represent current forecasts and may or may not match Appendix B forecasts.

Response to Information Request MN-DOC-003

Page 2 of 2

In addition, small maintenance type projects have been completed to also address momentary interruptions, i.e. replacement of: porcelain fused cutouts, insulators, and lightning arresters; wire connections; transformers. In addition, we are using wildlife guards to cover up energized electrical equipment contact points.

Response to Information Request MN-DOC-004

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 4

Topic: DER Forecasts

Reference(s): 2023 IDP Section 7

Request:

Please explain whether OTP has created DER forecasts for each of the scenarios identified in section 7 to generate annual installation forecasts similar to the EV forecasts provided in section 13. For any forecasts that have been developed, please provide the underlying forecast data for each of the scenarios.

Please provide the requested data in a Microsoft Excel executable format with all links and formulae intact. If any of these links target an outside file, please provide all such additional files.

Attachments: 0

Response:

Otter Tail did not create any specific system-wide DER forecasts for the high, medium, and low scenarios discussed in section 7. However, the discussion within those sections is based on results from the Morris, MN study as discussed in section 7.C. This study was used to inform system-wide distribution planning. As such, no system-wide forecast data in Excel file format is available to provide.

Response to Information Request MN-DOC-005

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 5

Topic: Load Forecasting

Reference(s): 2023 IDP Section 7.A.

Request:

On p. 24 of section 7.A., OTP identifies Pelican Rapids and Perham among the areas on its system experiencing the most demand and growth activity. OTP provides a list of communities for which it has completed electrical studies since the 2021 IDP in Table 1 on p. 11, which does not include Pelican Rapids and Perham. Please explain whether OTP previously conducted studies for Pelican Rapids and Perham that are still reliable, whether OTP intends to conduct studies for these areas in the future, and the timing of any planned studies.

Attachments: 0

Response:

Perham was studied in detail in 2014 when a third substation was added in town. The town loading is currently around 70 percent on peak during the summer and is due for a study in 2024.

Pelican Rapids was last studied sometime before 2016 (exact date unknown). Pelican Rapids is currently around 50 percent loaded between two substations. Due to this loading and available capacity, it is less of a concern for a near term study. However, it is scheduled as time permits between now and the next IDP.

Response to Information Request MN-DOC-006

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 6

Topic: DER High Penetration Scenario

Reference(s): 2023 IDP Section 7.B.

Request:

On p. 26, OTP states “system wide impacts of a high penetration scenario are not expected to create issues to the system or the interconnection process.” Please explain this statement, including any evidence, data, or reports relied upon to reach this conclusion, and how the Morris DER and EV Adoption Study informed OTP’s understanding.

Attachments: 0

Response:

The reference to page 26 in the question is in regard to the fact that we are not anticipating impacts beyond local impacts (i.e., sub-feeder, transformer, service, etc). This is based on the results of the Morris, MN study from section 7.C which showed the system performed relatively well with higher DER penetrations (i.e., mainline feeder and substation concerns were not identified).

Additionally and similarly, Otter Tail does not anticipate high levels of DER penetration such as those studied in the Morris study to require changes to the interconnection processes. Our interconnection team will process any interconnection requests in accordance with the state interconnection process. A high penetration scenario would still just represent tens of interconnection requests versus hundreds.

Response to Information Request MN-DOC-007

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions (218) 739-8639

Request Number: 7

Topic: Morris DER and EV Adoption Study

Reference(s): 2023 IDP Section 7.C.

Request:

On p. 32 of its IDP, OTP states that its “smallest default service transformer size of 10 kVA will see continuous rating overloads given the normal customer load plus only a single L2 EV charger.” On p. 34 of its IDP, OTP states that it “has already made an adjustment to not place 10 kVA units, but rather 25 kVA units, at residential locations.” Please identify the extent of the risks associated with 10 kVA transformers and accommodation of customer Level 2 EV chargers, including the total number of 10 kVA transformers in service at residential locations, the proportion of residential locations served by these transformers, and OTP’s plans to mitigate the associated risks.

Attachments: 0

Response:

Otter Tail serves around 140,000 customers across our three states. As of today, around 3,300 of those customers are served from a 10 kVA transformer. This equates to around 2.4 percent of OTP’s customer base.

Through either OTP’s electric vehicle or electric vehicle charging rebate program, the Company is informed of an electric vehicle purchase or subsequent planned connection ahead of the L2 charger installation. During the review process, OTP identifies if a customer has a transformer limitation and will coordinate changing the unit out ahead of the customer connecting their L2 charger.

In addition, through OTP’s AMI roll-out, the Company will have the ability to monitor transformer demand loading. In the event OTP is not notified or able to flag the planned addition of a L2 charger install by the customer, the Company will be able to quickly identify this overload through our AMI system monitoring and proactively change the unit out before it fails due to overloading and creates an interruption in service.

Response to Information Request MN-DOC-008

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 8

Topic: Distribution Spend Forecast

Reference(s): 2023 IDP Section 8.B., Table 11

Request:

OTP provides forecasted distribution spend for 2023 through 2027 in Table 11 on p. 38, as well as a list of corresponding projects in Appendix B. In Table 11, OTP identifies Grid Mod & Pilot Projects spend of \$31,042,326 and \$30,663,947 in 2023 and 2024, respectively. In Appendix B, p. 1, OTP identifies two large Grid Mod & Pilot Projects, AMI - Innovation 2030 and DRMS - Innovation 2030, with forecasted spend in 2024 of \$33,086,524 and \$9,916,775, respectively. The combined spend of these two Grid Mod & Pilot Projects exceeds the total shown in Table 11 in 2024.

- a. Please explain the discrepancy and confirm that the projects listed in Appendix B correspond to the total forecast provided in Table 11.
- b. If the two sets of data do not fully correspond, please explain how the two are related.
- c. Please provide an Excel spreadsheet of the data included in Appendix B. Please provide the requested data in a Microsoft Excel executable format with all links and formulae intact. If any of these links target an outside file, please provide all such additional files.

Attachments: 2

Attachment 1 to IR MN-DOC-008.pdf

Attachment 2 to IR MN-DOC-008.xlsx

Response:

- a. The projects and information in Appendix B correspond to Table 11, but was derived from some forecasting timing differences between our approved five-year plan which was the basis for the data in Table 11. Ideally, Appendix B should have aligned with Table 11. An updated Appendix B is attached that aligns with the data used in Table 11.
- b. The data sets do not fully correspond due to underlying forecasted data being pulled from different points in time. The data in Table 11, is based on our approved capital plan for 2023-2027, and Appendix B is based on a related forecast at a different point in time versus the formal 2023-2027 plan. A corrected Appendix B is attached that aligns with the data used in Table 11.

Response to Information Request MN-DOC-008

Page 2 of 2

- c. An updated pdf of Appendix B is included as Attachment 1 with the source Excel file as Attachment 2.

Response to Information Request MN-DOC-009

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 12, 2024

Responding Witness: Mike Riewer, Manager, System Infrastructure & Reliability 218-739-8565

Request Number: 9

Topic: Telecommunications Architecture Plans

Reference(s): 2023 IDP Section 9.D.

Request:

On p. 47, OTP describes its plan to establish a backbone fiber communications infrastructure and states “early projects have been developed and forecasted in the 5-year plan.” Please provide the annual forecasted cost for these projects. In addition, identify whether these costs are reflected in OTP’s 5-year distribution forecast in Table 11 on p. 38 and Appendix B and identify the corresponding projects and budget categories.

Attachments: 0

Response:

Below are the annually forecasted amounts for the fiber communication projects from our approved 2023-2027 capital plan. The fiber communication project amounts are not included within Table 11. This is due to the fiber projects being classified as general plant rather than distribution.

	2023	2024	2025	2026	2027	Total
Fiber Construction	\$ 305,000	\$ 2,885,000	\$ 550,000	\$ 3,800,000	\$ 605,000	\$ 8,145,000

Response to Information Request MN-DOC-010

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 16, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Request Number: 10

Topic: Public Charging Infrastructure

Reference(s): 2023 IDP Section 13.2.a

Request:

On p. 55-56, OTP discusses its plan to facilitate public charging infrastructure in its service territory.

- a. Please explain whether OTP's consideration of "possibly offering funding" to third-party proposals for the NEVI program refers solely to the potential Make-Ready offering or includes other methods of funding.
- b. OTP's discussion of public charging infrastructure in section 13.2.a solely references DCFC. Please provide a discussion of OTP's plans to facilitate the availability and awareness of public charging infrastructure, including L2 public chargers.
- c. Please explain whether OTP's potential Make-Ready offering intends to facilitate installation of L2 chargers as well as DCFC chargers.

Attachments: 0

Response:

- a. The Make-Ready offering would be OTP's initial method of funding a NEVI project if OTP develops and gains MPUC approval of a Make-Ready offering within the necessary timeline to meet third-party NEVI installation requirements. However, if a Make-Ready offering is not fully developed and approved within the NEVI required timeline then OTP would look to other funding sources. At this time, all potential funding costs or requested amounts are hypothetical and no actual numbers have been discussed or requested by third parties. OTP is supportive of further electric vehicle charging development in communities it serves. OTP plans to review all funding options available at the time, if a request is made, for project development and success.
- b. As part of OTP's DCFC pilot, Docket No. E017/M-20-181, each of the eleven sites is supported with a level 2 charger. In addition, the Company's pilot includes a plan to

Response to Information Request MN-DOC-010

Page 2 of 2

donate ten additional level 2 chargers to communities that do not receive a DCFC site. These additional ten level 2 chargers are part of a plan to not only provide more charging accessibility in our rural service territory, but to also demonstrate the viability of the EV technology. Customers seeing cars charging in their communities will promote further adoption of the EV technology.

Through the process of finding site hosts for the ten level 2 chargers (maximum \$5,000 contribution), the Company has come across two hurdles. The first hurdle includes the limited and high-cost options of “smart” level 2 chargers capable of passing on billing or processing payment to public users. The high upfront cost often exceeds the maximum \$5,000 contribution leading to potential site host having to come up with out-of-pocket funding. There are also options that have ongoing annual fees to keep these billing and processing payment capabilities, leading to a dilemma if not enough usage is occurring, a site host would have ongoing expenses exceeding revenue returned. This has resulted in limited adoption by site hosts that are not able to offer free charging since they do not have other retail products to offer that can offset the cost of electricity usage.

The second hurdle includes the recent changes of more vehicle manufacturers adopting the NACS (North American Charging Standard, also known as Tesla’s plug) protocol in future EV model years. This change and uncertainty lead to a perceived sunset of vehicles with the plug type for a standard J1772 or an adaptor to this standard. Leading to reviewing options to accommodate both standards of J1772 and NACS plug moving forward to set-up installations for long-term success. OTP plans to have a greater focus with EV dealerships once the DCFC network is complete. Engaging with these dealerships to educate perspective EV buyers on public charging options including level 2 public options. The Company has utilized numerous ride and drive events, and ongoing advertising and social media campaigns to educate customers of the latest charging options, charging locations, and tools for locating relevant information.

- c. Yes, the Company plans on including level 2 charging in potential Make-Ready offerings. This type of offering helps support the option for businesses looking to offer employee/customer charging options. Level 2 charging access at these points of interest where faster charging is not required or needed plays a critical role in providing a strong backbone to public charging infrastructure and will most likely be a focus in any Make-Ready offering.

Response to Information Request MN-DOC-011

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 16, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Request Number: 11

Topic: Transportation Electrification Historical Spending

Reference(s): 2023 IDP Section 13.10.

Request:

In Table 13 on p. 60, OTP provides its historical spending for the past 5 years on transportation electrification initiatives.

- a. Please explain the lack of expenses associated with OTP's DCFC Pilot, including how OTP has accounted for costs associated with project planning, site selection and evaluation, and project administration and reporting.
- b. Please identify the costs associated with L2 charger rebates that are reflected in Table 13, including the budget category in which they are included. If L2 charger rebates are not included in Table 13, please explain why they are excluded.
- c. Please identify whether 2023 spending is reflected in Table 13.

Attachments: 0

Response:

- a. The project planning, site selection and evaluation, and project administration are capital expenditures and have been included in the first two rows of Table 13. OTP has included more description in each row to describe its activities. In addition, other promotional expenses associated with OTP's DCFC pilot are included in the "Marketing and Communications" row as they are accounted together in the same accounting project number.

Response to Information Request MN-DOC-011

Page 2 of 2

Table 13

Budget Category (Distribution, IT, Transmission, etc.)	Capital	Expenditure
MN EV DCFC Pilot service extension upgrades, test site installation (2019 - August 2023) Site specific evaluation work conducted by area engineers and service reps once site has been selected.	\$222,395	
MN EV DCFC Pilot, Test Site (2019 – August 2023) Equipment, installation, O&M service agreement for 5-year period as part of manufacture/installer package.	\$784,051	
5-year O&M service as part of MN DCFC pilot project package, Test site service until end of 2024 Once 5-year service agreement ends expense will begin.		\$0
Marketing and Communications (May 2018 – April 2023): Ride & Drive Events, Flyers, Education Outreach, off peak charging (includes rebates), training, level 2 charging donations Overall pilot project planning prior to site being selected and evaluated. Includes project administration and reporting requirements.		\$275,142 \$10,800 in rebates (27 charging stations)
Sub Total:	\$1,006,446	\$285,942
Total Capital and Expense:	\$1,292,389	

- b. Yes, the level 2 charger rebates are reflected in Table 13. The above table has been updated to reflect the \$10,800 of level 2 charger rebates paid towards the installation of 27 customer charging stations.
- c. The first two budget categories reflect the period of 2019 - August 2023. The MN EV DCFC pilot project expenses did not occur until 2021 after approval was received. The Marketing and Communications expenses reflect the period of May 2018 – April 2023.

Response to Information Request MN-DOC-012

Page 1 of 4

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 16, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Request Number: 12

Topic: Transportation Electrification Forecasted Spending

Reference(s): 2023 IDP Section 13.11

Request:

In Table 14 on p. 61, OTP provides its 5-year forecast for spending on all transportation electrification initiatives.

- a. Please identify whether any of the spending included in Table 14 is also included in the distribution forecast in Section 8.B., Table 11, and if so, the corresponding projects, amounts, year, and budget categories.
- b. Please identify whether any of the spending included in Table 14 is also included in Appendix B, and if so, identify the corresponding projects, amounts, year, and budget categories.
- c. On p. 55 of its IDP, OTP states that five DCFC sites will be completed in 2024, and Table 14 identifies capital costs of \$1,311,040 associated with its DCFC pilot. Please confirm the capital costs identified in Table 14 correspond to the five DCFC sites scheduled for completion in 2024.
- d. In Appendix B, p. 1, OTP identifies \$700,000 in 2023 costs for the MN EV DCFC Infrastructure project. Please identify how these costs are accounted for in Tables 13 and 14, if at all.
- e. Please explain whether any costs associated with the DCFC pilot in 2024 are included in Appendix B.
- f. Please identify the costs included in the budget category “NEVI Support”, including whether this solely reflects the potential Make-Ready offering or includes other types of funding.
- g. For each of the following cost ranges provided in Table 14, please provide the underlying assumptions and calculations used to generate the forecast and the number of projects or rebates funded, if applicable:
 - a. Marketing and Communications: \$250,000 - \$750,000 expenditures
 - b. NEVI Support: \$50,000 - \$750,000 capital
 - c. O&M Charging infrastructure: \$50,000 - \$500,000 expenditures
 - d. ECO rebates: \$100,000 - \$500,000 expenditures

Attachments: 0

Response to Information Request MN-DOC-012

Page 2 of 4

Response:

- a. Yes, please reference reply to question b.
- b. Appendix B Fund Project Number D02084.011 “MN EV DCFC Infrastructure” has MN IDP Costs of \$700,000 which is partly included in Table 14, line “MN EV DCFC Pilot – Completed DCFC network installation.” The \$700,000 was budgeted based on eleven DCFC pilot installations with each site estimated to require approximately \$64,000. This dollar amount will continue to be adjusted as more sites are finalized and actual costs are realized. From the six sites completed at end of year 2023, \$381,818 dollars will be removed from the \$700,000 budget amount, and the remaining estimated budgets will move into 2024 budgets and is captured in Table 14 of estimated forecasted spending for the next five years in MN EV DCFC pilot capital that is expected to complete in 2024.
- c. Table 14 and the associated \$1,311,040 is associated with the DCFC pilot. The capital cost amount includes the remaining amount owed to the selected vendor based on a predetermined contracted payment schedule tied to project milestones for all eleven sites and also includes estimated budgeted amounts for line extensions, dedicated transformers, and necessary site upgrades.
- d. The \$700,000 budgeted number would be reflected in actual cost accrued during period in Table 13 MN EV DCFC Pilot service extension upgrades, test site installations. This budgeted number is also reflected in Table 14 MN EV DCFC pilot for estimated amount remaining for 2024 pilot completion.
- e. Yes, please reference replies to questions b and d.
- f. The forecasted estimated budgets are an estimate for what support would be required for a NEVI site based on two scenarios. The first scenario, \$50,000, being a “Make-Ready” type of program that would cover the cost of a dedicated transformer and line extension for this one specific site location. The other scenario being if OTP attempted to upgrade an existing DCFC pilot site and tried to bring the site into NEVI compliance, \$750,000. This capital spend would include upgrading an existing large transformer, upgrading to larger conductor, purchasing larger DCFC units, additional lighting, associated labor, and other possible amenities include security monitoring equipment and waste/recycling services.

Response to Information Request MN-DOC-012

Page 3 of 4

g.

	Assumptions & Calculation Notes
Marketing and Communication Expense: \$250,000 - \$750,000	This estimated amount is based on remaining budgets as part of MN DCFC Pilot to support community outreach and awareness (Ride and Drive events, dealership education and support, etc.) and Pilot level 2 charger donations. Assumed continued need and support of EVs and outreach communication as part of Make-Ready program with very loose idea of budget range. Dealership outreach/support (10-15 annually) - \$15,000-\$25,000 Ride and Drive Events (3-4 annually)- \$15,000/per event Pilot Level 2 charger donations (\$5,000/each) - \$40,000 Other community events and promotion - \$15,000 Make-Ready Program Estimate \$410,000-500,000*
NEVI Support Capital: \$250,000 - \$750,000	Please reference reply to question f.
O&M Charging Infrastructure Expense: \$50,000 - \$500,000	Pilot network comes with manufacturer and vendor warranties for standard equipment operation. Range is based on potential replacement of “consumable” parts. Consumable parts include charging cables, bollards, signs, and parking lot restriping. The extent of these costs and the frequency is an unknown as OTP does not have installed charging stations that have reached this equipment age requiring preventative maintenance or experienced damage requiring repair outside warranty. This estimate is a large unknown as prices fluctuate and continued replacement part support of older equipment is up in the air in this rapidly advancing segment.
ECO rebates Expense: \$100,000 - \$500,000	Assumed participation is 61 customers participating in electric vehicle or electric school bus rebate programs on an annual basis. Rebate amounts range from \$750 up to \$3,000 for electric vehicles and \$5,000 for electric school buses. This is a high target and is determined by forecasted growth year over year from data supplied by the MN Department of Transportation and the number of new electric vehicles registered and served by OTP. 2022 registrations had OTP serving 144 total electric vehicles with 40 added since 2021 reported data. The Company anticipates a slower growth as new vehicle models are not set to be released and produced in major quantities

Response to Information Request MN-DOC-012

Page 4 of 4

	until later into 2027-2028. Most current electric vehicle options in the market are in the car vehicle type segment. The Alliance for Automotive Innovation's 2021 Driving Force Annual Report, indicates the car segment makes up only 13.74 percent of the market in Minnesota, limiting adoption in the short term. As for Level 2 off-peak charging OTP has spent \$10,800 over the last five years to rebate 27 charger installations. The rebate amount in the past has been \$400/charger and has moved up to \$500/charger, but is expected to remain a low overall expense.
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*The Make-Ready program estimate is currently under the expenditures/expenses category. While this estimate is identified as an expense, it likely contains future expenditures that will be capitalized. Infrastructure work supporting the Make-Ready program such as transformers, line extensions, service upgrades, etc. will be capital expenditures. However, the Make-Ready program is still in early development stages and no capital has been budgeted at this time. The Company estimates half of this budgeted amount to be capitalized and half to be O&M expense for ongoing activities supporting the Make-Ready program.

Response to Information Request MN-DOC-013

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 16, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Request Number: 13

Topic: EV Forecast Scenarios

Reference(s): 2023 IDP Section 13.C.1

Request:

Please provide the underlying forecast data for each of the EV forecast scenarios discussed in Section 13.C.1. on p. 62-63.

Please provide the requested data in a Microsoft Excel executable format with all links and formulae intact. If any of these links target an outside file, please provide all such additional files.

Attachments: 3

Attachment 1 EV Forecast 2023 _ IR Request.xlsx

Attachment 2 Driving_Force_Annual_Report_V_3_PREP.pdf

Attachment 3 Get Connected EV Quarterly Report 2023 Q1.pdf

Response:

OTP has included Attachment 1 EV Forecast 2023 – IR Request.xlsx. Within the “OTP Forecast 2023” tab, the associated charts are included in rows 121:142. All associated data is within this same tab. OTP has also included Attachment 2 Driving-Force-Annual-Report_V-3_PREP and Attachment 3 Get Connected EV Quarterly Report 2023 Q1 which are annual and quarterly reports from Alliance for Automotive Innovation. Data from these reports was used to build OTP’s assumptions in Attachment 1.

Response to Information Request MN-DOC-014

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Peter Teigland

Date Received: February 01, 2024

Date Due: February 12, 2024

Date of Response: February 16, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Request Number: 14

Topic: EV Charging System Upgrades

Reference(s): 2023 IDP Section 13.35

Request:

On p. 67, OTP identifies a cost range for system upgrades required for its pilot charging infrastructure of \$15,951.79 - \$56,751.80. For each project that required upgrades, please provide details regarding the scope of the upgrades required, the site characteristics that created the need for upgrades, and the corresponding costs. In addition, please explain how the projects identified can inform OTP's future EV charger siting and installations and program offerings, including the potential Make-Ready offering.

Attachments: 0

Response:

The system upgrade cost required for the pilot charging infrastructure to date is mostly tied to the need for dedicated transformers to serve the 480-volt 3-phase load requirements of the charger equipment. The transformers for the Company chargers have ranged in size from 75 kVA – 500 kVA. The largest cost, outside dedicated transformers, have been underground work for line extensions to the transformer location. The furthest line extension to date has stayed within 100 feet and remained minimal. The Company has worked diligently in site selection locations to limit need for extensive underground distances and has remained in cost estimates budgeted. The below table is a breakdown of these corresponding cost allocations at the sites with work completed.

Response to Information Request MN-DOC-014

Page 2 of 2

Site Location	DCFC Size (Qty)	Level 2 Size	Dedicated Transformer Size	Cost (in progress)
Dawson	120 kW (1)	7.2 kW	150 kVA – pole mount	\$15,952
Morris	180 kW (2)	16.8 kW	500 kVA – ground mount	\$22,877
Fergus Falls	180 kW (2)	16.8 kW	500 kVA – ground mount (1,500 kVA shared with 3 rd party)	\$56,751
Perham	180 kW (2)	16.8 kW	500 kVA – ground mount	\$21,646
Mahnomen	50 kW (1)	7.2 kW	75 kVA – ground mount	\$27,325
Hallock	120 kW (1)	7.2 kW	150 kVA – ground mount	\$24,642
Lake Benton	120 kW (1)	7.2 kW	75 kVA – pole mount – 2024	(\$6,712)*
Battle Lake	50 kW (1)	16.8 kW	150 kVA – TBD – 2024	-
Crookston	120 kW (1)	7.2 kW	150 kVA – TBD – 2024	-
Ersine	120 kW (1)	7.2 kW	150 kVA – TBD – 2024	-
Bemidji	180 kW (2)	16.8 kW	500 kVA – TBD - 2024	-

**In progress – site selected, transformer location in review as location is undergoing recent upgrades with additional underground and pole location movement*

The project cost incurred is valuable information as the Company considers proposing a Make-Ready type of program. This information and experience with installing charging infrastructure allows for the Company to develop appropriate guardrails, such as possibly limiting the length of the included line extension, to ensure cost-effective Make-Ready program offerings in the future.

Response to Information Request MN-DOC-015

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Ari Zwick - Peter Teigland

Date Received: March 05, 2024

Date Due: March 15, 2024

Date of Response: March 15, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Information Request:

Request Number: 15

Topic: UMN Morris Battery Project

Reference(s): 2023 IDP, Section 10, Non-Wires Alternatives Discussion

Request:

On p. 53, OTP describes a battery project conducted in partnership with the University of Minnesota (UMN) Morris. The IDP states that not all technical and operational details are known, however the UMN Morris has recently reported publicly regarding the installation of a 90 kWh lithium ferrous phosphate (LFP) battery.

- a. Please confirm OTP's involvement, if any, with the completed LFP battery installation on the UMN Morris campus and its relation to the UMN Morris project discussed in the IDP.
- b. Please provide a description of the current or planned technical specifications of the entire project, including battery specifications, the microgrid controller, and the nameplate capacity for each connected distributed energy resource.
- c. Please provide a description of any known or anticipated charging and discharging schedules and how these are anticipated to affect the OTP distribution grid.

Attachments: 0

Response:

- a. Otter Tail does not have any involvement in the LFP battery project. The LFP battery project is not related to the UMN Morris battery project discussed in the IDP.
- b. On Monday March 4, 2024, Otter Tail released a request for proposals (RFP) to hire a consulting service to provide design engineering, battery vendor selection guidance, and construction management guidance for the UMN Morris – OTP battery project. This will be Otter Tail's first battery project and having a consultant with prior battery experience will be valuable to ensure the battery project is engineered appropriately from an electrical, environmental, material procurement, and construction standpoint. Otter Tail's

Response to Information Request MN-DOC-015

Page 2 of 2

Renewables, Distribution Engineering, and System Operations teams will gain vital experiences from this project which will be very valuable for any future battery projects.

For this project, the battery is expected to be between 1-2 MW and 2-8 MWh in size. This will be finalized after advisement from our engineering consultant and after review of battery vendor proposals. Otter Tail considers this a pilot project to demonstrate the benefits and identify any issues with operating a battery.

Otter Tail plans to utilize project partner OATI's, GrindMind, controller for this project. OATI has experience with battery installations and the Company has appreciated their additional guidance on the project.

All distributed energy resources are on the University's side of their meter. The battery will be connected to Otter Tail's distribution system on Otter Tail's side of the customer's meter but located on campus. At times, as they currently do, the University will produce more energy than they consume. The University's energy will either charge the battery or flow to Otter Tail's distribution system for other customer needs. This will be dependent on system needs, the battery state of charge, or testing scenarios.

- c. At this time, charging and discharging schedules have not been determined. Since this is a pilot demonstration project that both Otter Tail and the University will be learning from, it will be important to test many different scenarios over the first several years of the project. The University has significant renewable generation on campus. One scenario of project partners is to capture this renewable energy at low-cost times and discharge it at higher priced times. Both the University and Otter Tail will have access to all charging and discharging data for analysis. The Company has also agreed to allow the University to send testing scenarios to the Company so scenarios can be scheduled and tested during non-emergency, and non-high-cost energy or capacity periods.

Response to Information Request MN-DOC-016

Page 1 of 2

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Ari Zwick - Peter Teigland

Date Received: March 05, 2024

Date Due: March 15, 2024

Date of Response: March 15, 2024

Responding Witness: Jason A. Grenier, Manager Retail Energy Solutions - (218) 739-8639

Information Request:

Request Number: 16

Topic: UMN Morris Battery Project

Reference(s): 2023 IDP Appendix B

Request:

On p. 1 and p. 2 of Appendix B, OTP lists budget line item #7383, entitled “UM-Morris Flow Battery Project” with costs of \$2,016,666.63, \$50,000, and \$50,000 in 2023, 2024, and 2025, respectively. Please provide a detailed itemization of the project costs and a narrative description that explains the following:

- a. Distribution system upgrade costs and any equipment upgrades needed,
- b. Battery installation costs,
- c. All other project cost categories,
- d. Total costs incurred to date,
- e. The timing of any intended cost recovery proposals.

Attachments: 0

Response:

- a. The UM-Morris Flow Battery project has not progressed as quickly as project partners initially believed. Project partners are still in the initial RFP stage, with the majority of the engineering work planned for 2024, and construction and interconnection work planned for 2025.
- b. No battery installation costs to date.
- c. No other project costs to date.
- d. No costs incurred to date.
- e. The capital funding budgeted in the IDP has been delayed about one year. Otter Tail is scheduled to release the RFP to battery vendors near the middle of June 2024. Final

Response to Information Request MN-DOC-016

Page 2 of 2

battery selection and contract negotiations are scheduled to occur in September 2024. Delivery and installation of battery to the site is likely fall of 2025 since battery vendors state that procurement takes approximately one year. In early Q4 of 2024, project costs will be further understood allowing Otter Tail to submit a filing to the Minnesota Public Utilities Commission, requesting project cost recovery. In addition to other project details, Otter Tail's filing will include all cost information items requested in this information request.

Otter Tail submitted a second concept paper, which included the UMN-Morris – Otter Tail battery project, on January 10, 2024, for the U.S. Department of Energy's Topic Area 2 - 40107 Smart Grid funding. Otter Tail was notified on February 29, 2024, by the DOE that they are encouraged to move to the full-application stage. Otter Tail plans to submit a full application to the DOE with the hopes of gaining a significant portion of project funding from the DOE.

Response to Information Request MN-DOC-017

Page 1 of 1

OTTER TAIL POWER COMPANY

Docket No: E017-M-23-380

Response to: MN Department of Commerce

Analyst: Daniel Tikk - Ari Zwick - Peter Teigland

Date Received: March 05, 2024

Date Due: March 15, 2024

Date of Response: March 15, 2024

Responding Witness: Mike Riewer, Manager System Infrastructure & Reliability (218) 739-8565

Information Request:

Request Number: 17

Topic: Transformer Overloading

Reference(s): 2023 IDP, Section 7.C.

Request:

On p. 32 of the IDP, OTP states that it "...does allow short duration overloads of residential service transformers, therefore Otter Tail may allow more residential L2 EV chargers per transformer size than what is listed above in Table 9 on a situational, case-by-case basis." Given that EV chargers may be active for 10 hours or more, please define approximately how many hours of overloading OTP considers short duration.

Attachments: 0

Response:

The overloading of distribution transformers is a complex subject requiring knowledge of load characteristics, transformer design ratings, and environmental conditions. Otter Tail's distribution transformer overcurrent protection fuse is sized to protect the transformer from overload and fault current events, which can cause loss of life and ultimately failure to the transformer. A "short duration overload" is determined by the above factors, coupled with the time-current characteristic curve of the applied transformer overcurrent protection fuse. If the magnitude and duration of the overload exceed the fuse rating, the fuse will operate and result in an outage. When there is an outage, Otter Tail field crews will determine if an overload was the cause and upgrade the transformer to the appropriate size. Customers proactively informing Otter Tail of added load at their service helps prevent overload caused outages.

CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

Minnesota Department of Commerce
Comments

Docket No. E017/M-23-380

Dated this **22nd** day of **March 2024**

/s/Sharon Ferguson

[illegible]

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Jon	Brekke	jbrekke@grenergy.com	Great River Energy	12300 Elm Creek Boulevard Maple Grove, MN 553694718	Electronic Service	No	OFF_SL_23-380_M-23-380
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Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_23-380_M-23-380

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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Matthew	Olsen	molsen@otpc.com	Otter Tail Power Company	215 South Cascade Street Fergus Falls, MN 56537	Electronic Service	No	OFF_SL_23-380_M-23-380
Russell	Olson	rolson@hcpd.com	Heartland Consumers Power District	PO Box 248 Madison, SD 570420248	Electronic Service	No	OFF_SL_23-380_M-23-380
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Generic Notice	Regulatory	regulatory_filing_coordinators@otpco.com	Otter Tail Power Company	215 S. Cascade Street Fergus Falls, MN 56537	Electronic Service	No	OFF_SL_23-380_M-23-380
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John C.	Reinhardt	N/A	Laura A. Reinhardt	3552 26th Ave S Minneapolis, MN 55406	Paper Service	No	OFF_SL_23-380_M-23-380
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_23-380_M-23-380
Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_23-380_M-23-380
Michael	Riewer	MRiewer@otpco.com	Otter Tail Power Company	PO Box 4496 Fergus Falls, MN 56538-0496	Electronic Service	No	OFF_SL_23-380_M-23-380
Noah	Roberts	nroberts@cleanpower.org	Energy Storage Association	1155 15th St NW, Ste 500 Washington, DC 20005	Electronic Service	No	OFF_SL_23-380_M-23-380
Robert K.	Sahr	bsahr@eastriver.coop	East River Electric Power Cooperative	P.O. Box 227 Madison, SD 57042	Electronic Service	No	OFF_SL_23-380_M-23-380
Kay	Schraeder	kschraeder@minnkota.com	Minnkota Power	5301 32nd Ave S Grand Forks, ND 58201	Electronic Service	No	OFF_SL_23-380_M-23-380

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Joshua	Smith	joshua.smith@sierraclub.org		85 Second St FL 2 San Francisco, CA 94105	Electronic Service	No	OFF_SL_23-380_M-23-380

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Sky	Stanfield	stanfield@smwlaw.com	Shute, Mihaly & Weinberger	396 Hayes Street San Francisco, CA 94102	Electronic Service	No	OFF_SL_23-380_M-23-380
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Cary	Stephenson	cStephenson@otpc.com	Otter Tail Power Company	215 South Cascade Street Fergus Falls, MN 56537	Electronic Service	No	OFF_SL_23-380_M-23-380
James M	Strommen	jstrommen@kennedy-graven.com	Kennedy & Graven, Chartered	150 S 5th St Ste 700 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_23-380_M-23-380
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_23-380_M-23-380
Dean	Taylor	dtaylor@pluginamerica.org	Plug In America	6380 Wilshire Blvd, Suite 1000 Los Angeles, CA 90048	Electronic Service	No	OFF_SL_23-380_M-23-380
Stuart	Tommerdahl	stommerdahl@otpc.com	Otter Tail Power Company	215 S Cascade St PO Box 496 Fergus Falls, MN 56537	Electronic Service	No	OFF_SL_23-380_M-23-380
Jason	Topp	jason.topp@lumen.com	CenturyLink Communications, LLC	200 S 5th St Ste 2200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_23-380_M-23-380

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Roger	Warehime	roger.warehime@owatonnautilities.com	Owatonna Municipal Public Utilities	208 S Walnut Ave PO BOX 800 Owatonna, MN 55060	Electronic Service	No	OFF_SL_23-380_M-23-380
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Robyn	Woeste	robynwoeste@alliantenergy.com	Interstate Power and Light Company	200 First St SE Cedar Rapids, IA 52401	Electronic Service	No	OFF_SL_23-380_M-23-380
Christopher	Zibart	czibart@atcllc.com	American Transmission Company LLC	W234 N2000 Ridgeview Pkw Court Waukesha, WI 53188-1022	Electronic Service	No	OFF_SL_23-380_M-23-380
Kurt	Zimmerman	kwz@ibew160.org	Local Union #160, IBEW	2909 Anthony Ln St Anthony Village, MN 55418-3238	Electronic Service	No	OFF_SL_23-380_M-23-380