Application for Supplemental Resource Plan Approval 2023–2037

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OTTER TAIL POWER COMPANY

Table of Contents

1 Summary of Supplemental Filing 1

2 Procedural Background 3

3 Supplemental Preferred Plan 5

4 Recent Developments and Modeling Changes 16
- 4.1 Resilient Generation / Reliability Attributes Analysis 16
- 4.2 MISO Changes 19
- 4.2.1 Seasonal Construct 19
- 4.2.2 MISO Planning Reserve Margin Requirements (PRMR) & Subsequent Accreditation 20
- 4.2.3 MISO Capacity Position & Regional Resource Assessment 22
- 4.2.4 Auction Clearing Mechanism as Established within MISO's Seasonal Construct 23
- 4.2.5 Potential future policy changes (sloped demand curve, D-LOL, etc.) 24
- 4.3 Inflation Reduction Act (IRA) 2022 25
- 4.3.1 IRA & Wind Energy Facility Equipment Upgrades 25
- 4.4 Minnesota Clean Energy Law 26
- 4.5 Natural Gas and Energy Market Volatile Conditions 28
- 4.6 Load Forecast – New Large Loads 30
- 4.7 Plan Development 31
- 4.8 New Resource Alternatives 31
- 4.8.1 Cost Assumptions 32
- 4.8.2 Interconnection queue status and costs 32
- 4.8.3 Long-range transmission plan impacts 32

5 Additional Factors Considered in Our Supplemental Filing Analysis 33
- 5.1 Multi-State Jurisdictional Complexity 33
- 5.2 Multiple ISOs (SPP & MISO) 34
- 5.3 Coyote Station – Price Stability & Cost Effectiveness 36
- 5.4 Coyote Station – Withdrawal Process & Key Considerations 38
- 5.5 Astoria Onsite Fuel Inventory 44

6 Conclusion 45
- 6.1 Supplemental Preferred Plan is in the Public Interest 45
- 6.2 Socio-Economic Impacts of the Supplemental Preferred Plan 46
- 6.3 Five-Year Action Plan 47

List of Appendices

Appendix A: Plan Cross Reference and Checklist – See Initial Filing
Appendix B: Electric Utility Report - See Initial Filing
Appendix C: Existing Resources – **NEW**
Appendix D: Potential Resources - **NEW**
Appendix E: Assessment of Federal and State Environmental Regulation – See Initial Filing
Appendix F: Assumptions for EnCompass Modeling Scenarios - **NEW**
Appendix G: REO/RES Compliance Strategy – See Initial Filing
Appendix H: Brattle Group Study on Demand Response – See Initial Filing
Appendix I: Integrated Resource Plan Sensitivity Summary – **NEW**
Appendix J: Distributed Renewable Generation Evaluation – See Initial Filing
Appendix K: Mine Mouth Plants - **NEW**

List of Tables, Graphs & Figures

Supplemental Table 3-1 – Supplemental Preferred Plan Summary 7
Graph 3-1: Supplemental Preferred Plan Accredited Winter Capacity and -PRMR 8
Graph 3-2: Supplemental Preferred Plan Accredited Spring Capacity and PRMR 8
Graph 3-3: Supplemental Preferred Plan Accredited Summer Capacity and PRMR 9
Graph 3-4: Supplemental Preferred Plan Accredited Fall Capacity and PRMR 9
Graph 3-5: Supplemental Preferred Plan (Coyote 2028) Energy Generation Percentage 10
Graph 3-6: Supplemental Preferred Plan (Coyote 2040) Energy Generation Percentage 10
Table 3-2: Otter Tail 2023-2029 Detailed Action Plan 14
Supplemental Table 4-1: Resilient Generation 17
Figure 4-1: 2023 Forecasted Load Relationship with Resilient Generation 18
Figure 4-2: 2030 Forecasted Load Relationship with Resilient Generation (including Coyote Station) 19
Figure 4-3: 2030 Forecasted Load Relationship with Resilient Generation (Coyote removed) 19
Table 4-2: MISO Seasonal Planning Reserve Margin 20
Graph 4-1 Initial Filing vs. Current Filing PRMR 21
Table 4-3: Wind and Solar Accreditation (Percentage of ICAP) 21
Graph 4-2: LRZ 01 Results – Capacity and Reserves 23
Graph 4-3: Assigned Auction Clearing Prices within Planning Resource Auction 24
Table 4-4: Wind Energy Facility Equipment Upgrade 25
Table 4-5: Minnesota Clean Energy Law Compliance Breakdown (Withdrawal from Coyote pre-2030) 27
Table 4-6: Minnesota Clean Energy Law Compliance Breakdown (Coyote 2040) 28
Graph 4-4 Natural Gas Forecast, Initial Filing vs Supplemental 28
Graph 4-5 Peak Energy Forecast, Initial Filing vs Supplemental 29
Graph 4-6 Off-Peak Energy Forecast, Initial Filing vs Supplemental 29
Figure 4-4: Sales Forecast Comparison 30
Table 4-7: List of Resource Alternatives Included in the EnCompass Model 32
Supplemental Table 5-1: Percentage of Otter Tail operations in each of its three states 33
Table 5-2: Net Cost of Energy Paid by Otter Tail Customers since 2013 37
Figure 5-1: Coyote Revenue and Fuel Cost 37
Supplemental Table 5-3: Coyote Station Estimated Foreseeable Withdrawal Costs 41
Table 6-1 -Five Year Action Plan 47

1 Summary of Supplemental Filing

This filing supplements and updates Otter Tail Power Company's (Otter Tail or Company) Application for Resource Plan Approval for 2022-2036 (Initial Filing) made September 1, 2021.[1] Specifically, this supplemental filing (Supplemental Filing) addresses changes that have occurred since we made our Initial Filing. These changes include the following:

- The Midcontinent Independent System Operator's (MISO) adoption of a seasonal resource adequacy construct and capacity requirements that increased planning reserve margins (PRMs) above the quantities included in our Initial Filing and its modeling;
- The enactment of the federal Inflation Reduction Act, which provides renewed and new incentives for wind, solar, clean energy storage, and clean energy manufacturing projects, such as the extension of wind and solar tax incentives that were set to expire and the creation of other new tax credits for renewable energy projects;
- Changes to Otter Tail's load forecasts; and
- MISO's projection for capacity deficits and recent volatility in energy markets.

More recently, Minnesota Governor Tim Walz signed into law the 100 percent Clean Energy Law (Minnesota Clean Energy Law) on February 6, 2023. The law requires all Minnesota electric utilities to generate or procure sufficient electricity from carbon-free resources to provide retail customers in Minnesota with 100 percent carbon-free electric energy by 2040.

Collectively these developments present a markedly different planning landscape than the one our Initial Filing addressed. Moreover, these developments occurred over a brief 18-month period since our Initial Filing, demonstrating how quickly key planning assumptions can change and the importance of flexibility in any preferred plan.

Based on the foregoing factors and our forecasted needs, we have updated the preferred plan set forth in our Initial Filing (Initial Preferred Plan). Our updated preferred plan (Supplemental Preferred Plan) set forth herein provides both specific actions that Otter Tail

[1] Otter Tail's Initial Filing was filed concurrently with the Minnesota Public Utilities Commission (MPUC), the North Dakota Public Service Commission (ND PSC), and the South Dakota Public Utilities Commission (SD PUC). This Supplemental Filing is also being filed concurrently with MPUC, ND PSC, and SD PUC.

plans to complete during the first five years of the planning period and potential actions that Otter Tail may take during the subsequent ten years. Accordingly, we are requesting authority to carry out the following key aspects of the Supplemental Preferred Plan in the next five years:

- The addition of onsite liquified natural gas (LNG) fuel storage at Astoria Station in 2026.[2]
- Adding approximately 200 MW of solar generation in the 2027-2028 timeframe.
- Taking the initial steps necessary to add approximately 200 MW of wind generation in the 2029 timeframe.
- Withdrawal from our 35 percent ownership interest in Coyote Station in the event Otter Tail is required to make a major, non-routine capital investment in the plant.[3]

In addition to these actions, we intend to repower most of our existing wind facilities in 2024 and 2025.[4] In the aggregate, the repowering of these facilities will be the equivalent of adding 40 MW of wind generation with a 50 percent capacity factor to our portfolio.

Compared to our Initial Preferred Plan, our Supplemental Preferred Plan proposes to add more renewable generation resources to our portfolio. The most significant change between our Initial Preferred Plan and our Supplemental Preferred Plan concerns Coyote Station. As a winter peaking utility we are particularly concerned about MISO's new seasonal reserve margin requirements, open questions concerning MISO accreditation methodologies, and projected capacity deficits within MISO - especially when we consider changes to our load forecasts. These and other factors discussed herein raise significant concerns about our future capacity position and the degree to which MISO capacity and energy markets will be available to support our fundamental obligation to ensure system resource adequacy at a reasonable cost. In this unsettled environment, the value of existing dispatchable capacity offered by

[2] The issue of onsite fuel storage at Astoria Station is addressed more fully in related filings. On November 1, 2022, the MPUC issued a revised Notice of Comment Period separating the issue of fuel storage at Astoria Station from the Comment period applicable to the balance of Otter Tail's IRP. We anticipate that the issue of fuel storage at Astoria Station will come before the MPUC in May 2023. On February 8, 2023, we filed a request for an advance determination of prudence with the ND PSC for the onsite fuel storage at Astoria Station in Case No. PU-23-066.

[3] A large capital investment supporting withdrawal from Coyote Station must be distinguished from routine capital expenditures necessary for the plant to operate safely, reliably, and in compliance with current regulations. This distinction is discussed in Section 5.4 herein.

[4] As noted in Section 4.3.1. herein we intend to repower our Langdon, Ashtabula, Luverne and Ashtabula III wind facilities, all of which are powered by General Electric turbines. Our Merricourt wind facility is not part of this plan. The repowering of existing wind facilities is not part of Supplemental Preferred Plan for which we seek authority; we reference repowering to provide a full picture of our efforts to deliver cost effective energy to our customers.

Coyote Station augers against a premature and irretrievable withdrawal from the plant that may unnecessarily expose our customers to risk.

Therefore, in this Supplemental Filing we support retaining our ownership interest in Coyote Station unless and until there is a need for a large, non-routine capital investment necessary to operate the plant or to comply with a regulatory requirement, such as may be required by the federal Regional Haze Rule. We indicated in our Initial Filing that there was an especially strong case to exit Coyote Station if we are faced with a situation requiring a large, non-routine capital investment in the plant. Our modeling and analysis on this point have not changed and our Supplemental Preferred Plan seeks such authority. What has changed are the uncertainties and risks our customers now face. In this environment we believe it is in the public interest to retain Coyote Station in our generation portfolio pending the need for large, non-routine capital investment in the plant. Our posture with respect to Coyote Station will be subject to additional evaluation in future IRP filings. In the meantime, we support a prudently deliberate approach that preserves flexibility to respond to uncertainties.

Our Supplemental Preferred Plan accomplishes the following:

- Ensures that Otter Tail will have the resources necessary to continue providing reliable, low-cost electricity to meet our customers' needs, while avoiding adverse impacts;
- Complies with the requirements of applicable statutes and rules, including the Minnesota Clean Energy Law;
- Preserves flexibility to respond to risks in an unsettled planning environment; and
- Accounts for differing energy policies in each of the three states we serve while preserving the customer benefits of system-wide planning and networked assets for a small utility.

2 Procedural Background

Minnesota Procedural Background

Otter Tail submitted its Initial Filing on September 1, 2021.[5] The Minnesota Public Utilities Commission (MPUC) extended the initial comment period several times, and on

[5] Docket No. E017/RP-21-339. In Minnesota, this plan is filed to satisfy the requirements of Minnesota Statute § 216B.2422 and Minnesota Rules, Part 7843.

September 14, 2022, the MPUC issued its Fourth Notice of Extended Comment Period, setting November 14, 2022, as the deadline for initial comments and January 17, 2023, for reply comments.

On October 14, 2022, Otter Tail requested that the MPUC bifurcate the docket to (1) maintain the procedural schedule set forth in the MPUC's Fourth Notice of Extended Comment Period for addressing Otter Tail's proposed onsite fuel inventory system at Astoria Station and (2) amend the procedural schedule for the balance of Otter Tail's resource plan to allow Otter Tail time to update its Initial Filing to account for recent material developments, including the MISO's adoption of a seasonal capacity construct with significant winter and spring reserve planning margins and renewable energy incentives provided by the recently enacted Inflation Reduction Act.[6]

On November 1, 2022, the MPUC issued its Notice of Extended Comment Period granting Otter Tail's bifurcation request, with Astoria Station initial comments due December 1, 2022, (later changed to December 31, 2022) and Otter Tail's supplemental filing for the balance of its resource plan due March 31, 2023.

On November 4, 2022, Otter Tail filed Supplemental Comments summarizing our request for authority to develop an onsite fuel storage system at Astoria Station. On December 30, 2022, the following parties filed Initial Comments on Otter Tail's Astoria onsite fuel storage proposal: (1) Minnesota Department of Commerce (2) the Minnesota Office of the Attorney General – Residential Utilities Division (OAG) (3) Laborers' International Union of North America Minnesota and North Dakota and (4) Operating Engineers Local 49 and North Central States Regional Council of Carpenters. On February 10, 2023, Otter Tail, the Clean Energy Organizations, and the OAG filed Reply Comments concerning fuel storage at Astoria Station. On February 16, 2023, Otter Tail filed a Supplemental Letter concerning the impact of the Minnesota Clean Energy Law on the proposal for fuel storage at Astoria Station.

On March 31, 2023, Otter Tail submitted this Supplemental Filing to address changes outlined in our October 14, 2022, letter filing.

[6] In addition to addressing MISO's seasonal capacity construct and the Inflation Reduction Act we also noted our intent to address changes in MISO Planning Resource Auction (PRA) prices and capacity projections and Otter Tail load forecast changes that have occurred since our Initial Filing.

North Dakota Procedural Background

Otter Tail submitted its Initial Filing on September 1, 2021.[7] On October 14, 2022, Otter Tail filed a supplemental letter to address recent developments that may affect the Initial Filing, including MISO's adoption of a seasonal capacity construct with significant winter and spring reserve planning margins and renewable energy incentives provided by the recently enacted Inflation Reduction Act.[8] Otter Tail requested that the ND PSC delay review of the Initial Filing pending the Company addressing these developments in a supplemental filing on or about March 31, 2023. The Company also indicated its intent to request an Advance Determination of Prudence for that portion of the Initial Filing that sought approval for an onsite fuel storage system at Astoria Station. Otter Tail filed its Application for an Advance Determination of Prudence on February 8, 2023.[9] On March 31, 2023, Otter Tail filed this Supplemental Filing with the ND PSC.

South Dakota Procedural Background

In South Dakota, integrated resource plans are filed to keep the SD PUC apprised of the Company's plans; however, there is not any statute or rule requiring the SD PUC to review or approve resource plans. Otter Tail has filed its Initial Filing and this Supplemental Filing with the SD PUC. While not a resource plan matter, in April 2023 we anticipate filing with the SD PUC a request to modify Otter Tail's Astoria Station site permit to include onsite LNG fuel storage.

3 Supplemental Preferred Plan

The Supplemental Preferred Plan

Our Supplemental Preferred Plan, which replaces our Initial Preferred Plan in its entirety, presents actions that: (a) will ensure that Otter Tail has the resources necessary to continue to provide reliable, low-cost electricity to meet customers' needs, while avoiding adverse impacts; (b) comply with the requirements of applicable statutes and rules, including the Minnesota Clean Energy Law; (c) preserve flexibility to respond to risks in a fluid and uncertain planning environment; and (d) account for differing policies in each

[7] ND PSC Case No. PU-21-380. In North Dakota, the plan is filed pursuant to North Dakota Century Code §§ 49-05-04.4 and 49-05-17.
[8] In addition to addressing MISO's seasonal capacity construct and the Inflation Reduction Act we also noted our intent to address changes in MISO Planning Resource Auction (PRA) prices and capacity projections and Otter Tail load forecast changes that have occurred since our Initial Filing.
[9] *In the Matter of Otter Tail Power Company Advance Prudence Application – Astoria Station Onsite Fuel Inventory System*, ND PSC Case No. PU-23-066.

of the three states we serve while preserving the customer benefits of system-wide planning and networked assets for a small utility.

The Company has determined that it can best satisfy those goals by: (a) modifying Astoria Station to add LNG fuel storage capability; (b) adding solar and wind resources, including approximately 200 MW of solar generation and approximately 200 MW of wind generation (in addition to repowering our existing wind facilities—excluding Merricourt) and (c) retaining Coyote Station in our generation portfolio pending the need for any significant, non-routine capital investment that may be required to continue operating the plant. Our analysis indicates that this combination of actions will provide flexibility, reduce costs, and maintain and enhance the resiliency of our system.

Table 3-1 provides the preferred 15-year resource plan for both the Base Case and our Supplemental Preferred Plan. The Table includes the resource selection and net present value of revenue requirements (NPVRR) both with and without externalities.

Our five-year action plan to add 200 MWs of solar in the 2027/2028 timeframe and to begin activities to add 200 MW of wind in the 2029 timeframe is not altered by any actions we may take concerning Coyote Station. As shown below, if Otter Tail were to withdraw from Coyote Station, in a future resource planning proceeding we would likely request authority to add 100 MW of solar and 150 MW of wind in the 2030/2031 timeframe.

Supplemental Table 3-1 – Supplemental Preferred Plan Summary

	No Externalities		with Externalities	
	Base Case	Preferred Plan*	Base Case	Preferred Plan*
2023	Hoot Lake Solar	Hoot Lake Solar	Hoot Lake Solar	Hoot Lake Solar
2024				
2025	Wind Repowers	Wind Repowers	Wind Repowers 400 MW Sur Solar 100 MW Gen Wind	Wind Repowers
2026	Astoria Onsite Fuel	Astoria Onsite Fuel	ria Onsite Fuel50 MW Gen W	Astoria Onsite Fuel
2027		100 MW Sur Solar		100 MW Sur Solar
2028		100 MW Sur Solar		100 MW Sur Solar
2029	50 MW Sur Solar 250 MW Gen Wind	200 MW Gen Wind	150 MW Gen Wind	200 MW Gen Wind
2030		100 MW Sur Solar		100 MW Sur Solar
2031	25 MW Sur Battery	150 MW Gen Wind	25 MW Sur Battery	150 MW Gen Wind
2032	25 MW Sur Battery 250 MW Sur Solar 100 MW Gen Wind	100 MW Sur Solar 25 MW Sur Battery	25 MW Sur Battery 150 MW Gen Wind	100 MW Sur Solar 25 MW Sur Battery
2033				
2034				
2035				
2036				
2037				
NPVRR	$2,714,497	$2,724,103	$3,152,731	$3,199,210

*Resource additions in 2030 and 2031 are to be determined. 100MW Surplus Solar and 150 MW Generic Wind are needed if Otter Tail withdraws from Coyote at year end 2028.

As provided in the table above, the NPVRR for the Supplemental Preferred Plan is slightly higher than the optimal EnCompass solved Base Case. Our Supplemental Preferred Plan represents a balanced and reasonable approach to addressing the concerns of our regulators and varied stakeholders, which complies with all legal requirements and allows the Company to continue providing reliable, low-cost electricity to meet our customers' needs.

Graphs 3-1 to 3-4 show Otter Tail's position within MISO's current capacity construct for all seasons through 2037 – considering scenarios with Coyote Station included and removed from the resource stack.

Graph 3-1: Supplemental Preferred Plan Accredited Winter Capacity and - PRMR

[PROTECTED DATA BEGINS…

…PROTECTED DATA ENDS]

Graph 3-2: Supplemental Preferred Plan Accredited Spring Capacity and PRMR

[PROTECTED DATA BEGINS…

…PROTECTED DATA ENDS]

Graph 3-3: Supplemental Preferred Plan Accredited Summer Capacity and PRMR

[PROTECTED DATA BEGINS…

…PROTECTED DATA ENDS]

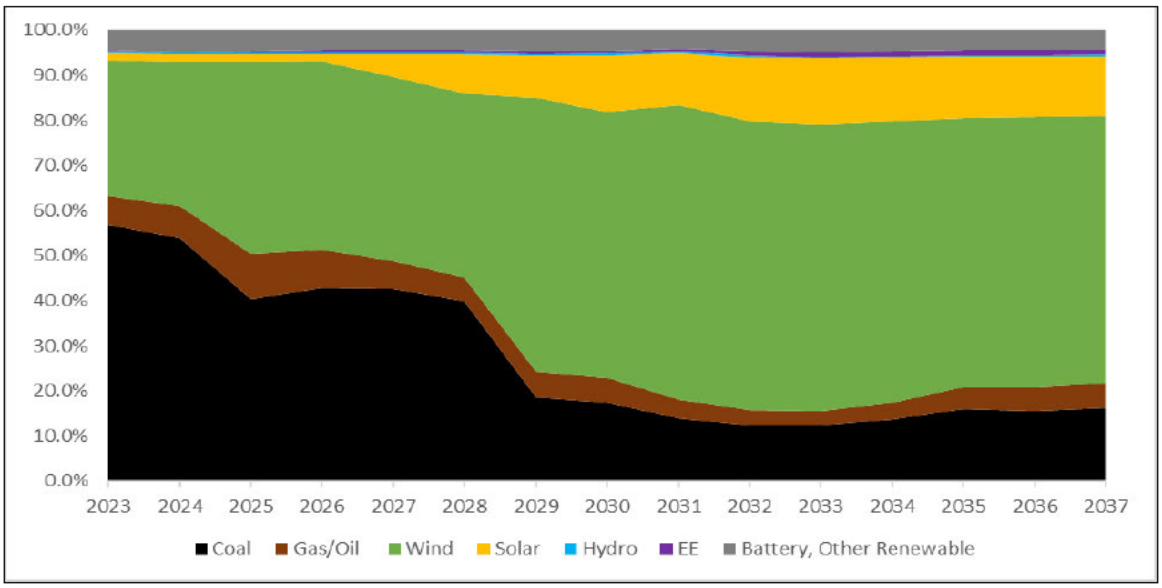
Graph 3-4: Supplemental Preferred Plan Accredited Fall Capacity and PRMR

[PROTECTED DATA BEGINS…

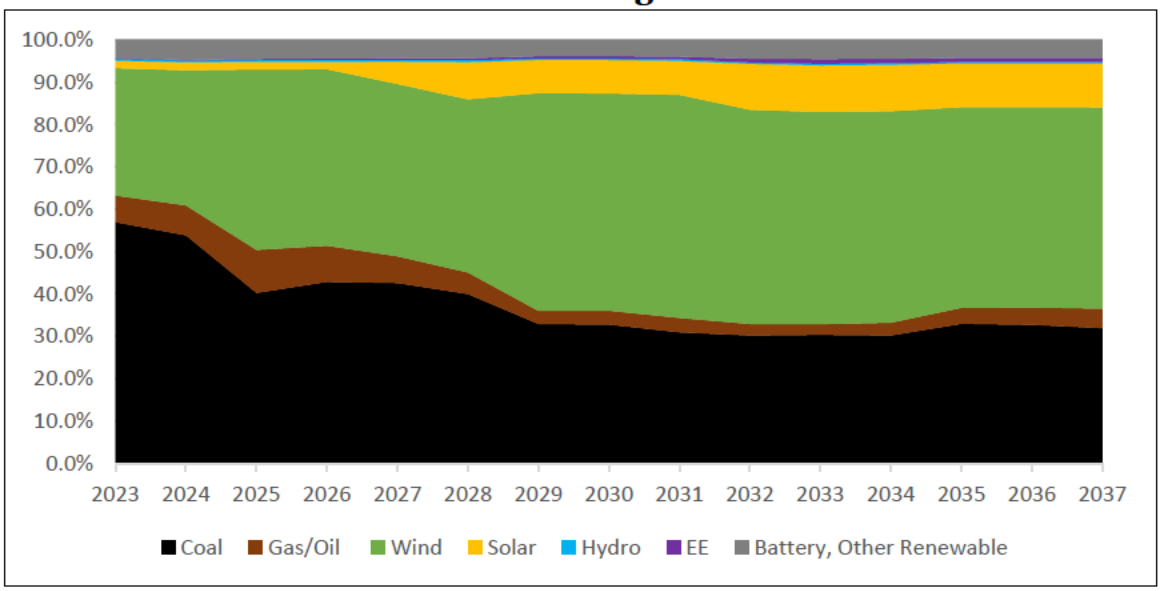
…PROTECTED DATA ENDS]

Graph 3-5 shows the expected energy mix through 2037 for Otter Tail's Supplemental Preferred Plan, considering scenarios with Coyote Station included through 2040 and not included beginning in 2029 (this data is based on Encompass generator output in runs not considering externalities).

Graph 3-5: Supplemental Preferred Plan (Coyote 2028) Energy Generation Percentage



Graph 3-6: Supplemental Preferred Plan (Coyote 2040) Energy Generation Percentage



Otter Tail's approach to planning recognizes that modeling and a corresponding NPVRR analysis, while important, is not the end of the analysis. As noted in our Initial Filing, the Company has historically advocated for what we describe as a "least cost" resource plan. However, the selection of such a plan has always involved more than just selecting the lowest cost option under a single forecasted scenario. Instead, Otter Tail analyzes numerous potential scenarios in a range of possible "futures." By considering a variety of scenarios, the Company's goal has always been to go beyond a single "least cost" consideration to also consider the various *risks* that are inherent in any plan so that we can arrive at a plan that has the greatest likelihood of being "least cost" under the broadest range of possible futures. It might therefore be more accurate to say that Otter Tail's resource planning has been focused on finding the "least cost/least risk" plan. The Supplemental Preferred Plan is such a plan.

Our Supplemental Preferred Plan closely tracks our Initial Preferred Plan. The primary difference concerns Coyote Station. In our Initial Preferred Plan we stated the following:

> In fact, the economic analyses supporting the Preferred Plan is compelling. In almost every scenario and permutation analyzed, the results are clear: It is no longer in customers' best interest for Otter Tail to continue to participate as an owner in Coyote Station. This outcome is true regardless of any future compliance obligation or potential change in law. Should significant investments need to be made at Coyote Station for environmental compliance purposes, the economic analysis is even more compelling.[10]

Based on material changes that have occurred since our Initial Filing we believe our customers are better served by the Company remaining an owner in Coyote Station pending a need for significant investments in the plant, which would most likely be necessary for environmental compliance purposes.[11] Should we determine it necessary to withdraw from Coyote Station, our goal is to do so expeditiously while minimizing potential adverse impacts. Consequently, Otter Tail is seeking authority in its Supplemental Preferred Plan to withdraw from its ownership interest in Coyote Station in the event Otter Tail is required to make a significant, non-routine capital investment in the facility. Pending such a development, Otter Tail believes it prudent not to

[10] Initial Filing at p. 6.
[11] This possibility arises from the EPA's Regional Haze Rule. In its planning, the Company is treating the need for capital investments to comply with that rule as a possibility; however, to be clear, Otter Tail is not taking the position that such capital investments should be required, nor are we providing an estimate of the likelihood of such outcome.

prematurely withdraw from its ownership in Coyote Station, recognizing that our ownership in Coyote Station will be reevaluated in our next resource plan filings.

The risks and uncertainties that inform our view of Coyote Station (discussed in more detail later in this Supplemental Filing) include the following:

- Modeling Changes - In our Initial Filing, there were few scenarios where it was economic to remain in Coyote Station beyond 2028. In nearly every case, even when externalities were not included, the modeling supported withdrawing from Coyote Station. In our updated modeling there are now additional scenarios that support remaining in Coyote Station. These scenarios include a high renewable energy cost scenario and a low renewable accreditation scenario.
- Capacity Accreditation Questions - There remain significant questions about MISO's capacity accreditation for generation resources. MISO is considering several proposals for capacity accreditation and as of the date of this Supplemental Filing it is unclear which standard MISO will adopt.[12]
- Otter Tail's Capacity Position Relative to Load Growth – Otter Tail's updated modeling includes the addition and projected addition of large loads. Some of these loads are agricultural processing facilities similar to what we have seen historically, albeit with different methods, intended to produce carbon neutral products; others are atypical in nature for Otter Tail, such as data processing customers. We expect continued interest from customers in these industries, which could affect our overall capacity position.
- Recent Volatility in MISO Energy Markets and Natural Gas Markets - While we expect these markets to return to more normal conditions in our forecasts, the extreme volatility in these markets that occurred after our Initial Filing demonstrates that forecasting will always have an inherent amount of uncertainty and risk.

[12] Also note that on March 21, 2023, MISO received an order from the Federal Energy Regulatory Commission (FERC) establishing a show cause proceeding in FERC Docket EL23-46-000 regarding Seasonal Accredited Capacity (SAC) ratios for Schedule 53 resources. FERC's order dated March 17, 2023 states that MISO "appears to be violating its Open Access Transmission, Energy and Operating Reserve Markets Tariff (Tariff) by failing to update its system-wide Unforced Capacity (UCAP)/Intermediate Seasonal Accredited Capacity (ISAC) ratio (Ratio) for the 2023/24 Planning Resource Auction despite having updated ISAC values for certain resources." In response to FERC's order, MISO will be recalculating the SAC ratios, which is expected to result in reduced SAC values for individual market participants on an aggregate basis. We do not anticipate this development having a material impact on our Supplemental Fling.

- MISO Capacity Position & Regional Resource Assessment –Since our Initial Filing MISO has shifted from capacity surplus to capacity shortfall, and MISO modeling indicates near term capacity risk. MISO's Local Resource Zone 1 of which Otter Tail has 99 percent of its customers, is not isolated from this risk.

In the current planning environment, having Coyote Station part of the Company's portfolio provides a cost-effective hedge against market volatility, unresolved accreditation questions, forecasting uncertainties and related risk of errors, and unforeseen developments. This is a cautious and measured approach that preserves flexibility and limits risk pending more clarity on several fronts.

There is no doubt there will be differences of opinions among our stakeholders, some of whom may view our Supplemental Preferred Plan as a significant departure from our Initial Preferred Plan on the issue of Coyote Station. We do not think that is the case. Our position with respect to Coyote Station tracks closely to that detailed in our Initial Filing; our Supplemental Preferred Plan should be viewed as a cautious pause pending further developments.

Otter Tail's goal is to keep customers' interests in the forefront of this analysis. We know we share this goal with each of our three Commissions. Our Supplemental Preferred Plan strikes a balance between several planning objectives - including arriving at a diversified mix of generation resources that assures reliability, rate stability, environmental responsibility, and the flexibility to respond to risks and opportunities in this rapidly changing environment.

As we noted in our Initial Filing any withdrawal from Coyote Station is complex and challenging. Coyote Station is a key baseload resource for the plant's co-owners. Additionally, Otter Tail is the current operator of the plant and is relied upon by the co-owners for the plant's safe and efficient operation. Further, Coyote Station is a mine-mouth lignite plant, with the adjacent mine serving the plant. There are significant differences between mine mouth plants such a Coyote Station and delivered fuel plants that affect any withdrawal analysis. Appendix K provides a summary of these differences.

The mine is owned by Coyote Creek Mining Company, LLC, a subsidiary of the North American Coal Corporation, which is not affiliated with any of the Coyote Station co-

owners. Finally, Coyote Station is a key source of jobs and tax base in Mercer County and North Dakota. These challenges will require thoughtful consideration and management should circumstance make it necessary to withdraw from Coyote Station.

Table 3-2 below summarizes the key actions in the Supplemental Preferred Plan. Each of the items listed is discussed in greater detail in subsequent sections of this filing.

Table 3-2: Otter Tail 2023-2029 Detailed Action Plan

Year	Actions
2023	Monitor Possible Withdrawal from Coyote Station: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital investment; withdraw if a large non-routine capital investment is needed. Wind Equipment Upgrades (in service 2024 & 2025)[13]: Secure necessary siting amendments, equipment and contracting for construction. Onsite Fuel at Astoria Station: Development Activities: Engage engineering firm to complete sufficient design to support permitting, regulatory approvals, and Engineering, Procurement, and Construct (EPC) bid packages. Enter into EPC and fuel supply agreements.
2024	Monitor Possible Withdrawal from Coyote Station: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital investment; withdraw if a large non-routine capital investment is needed. 100 MW Solar (in-service 2027): Development Activities: Secure land, MISO interconnection, Preliminary Design Permitting Onsite Fuel at Astoria Station: EPC contractor completes detailed design, manufacturing and

[13] We reference the repowering of our wind facilities in the Supplemental Preferred Plan to provide a full picture of our efforts to develop cost effective generation and the impact of the IRA. Repowering of these facilities is subject to separate regulatory proceedings outside of this Supplemental Preferred Plan.

Year	Actions
	construction begins.
2025	Monitor Possible Withdrawal from Coyote Station: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital investment; withdraw if a large non-routine capital investment is needed. 100 MW Solar (in-service 2028): Development Activities: Secure land, MISO interconnection, Preliminary Design Permitting Onsite Fuel at Astoria Station: Construction
2026	Monitor Possible Withdrawal from Coyote Station: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital investment; withdraw if a large non-routine capital investment is needed. 100 MW Solar (in-service 2027): Final design and contracting 200 MW Wind (in-service 2029): Development Activities: Secure land, MISO interconnection, Preliminary Design, Permitting
2027	Monitor Possible Withdrawal from Coyote Station: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital investment; withdraw if a large non-routine capital investment is needed. 100 MW Solar 2027 Commercial operation 100 MW Solar (in-service 2028): Final design and contracting 200 MW Wind (in-service 2029): Secure necessary equipment and contracting for construction
2028	Monitor Possible Withdrawal from Coyote Sation: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital

Year	Actions
	investment; withdraw if a large non-routine capital investment is needed. 100 MW Solar 2028 Commercial operation 200 MW Wind (in-service 2029): Construction
2029	Monitor Possible Withdrawal from Coyote Station: Fulfill contractual and legal obligations. Prepare for possible withdrawal from plant pending need for a large, non-routine capital investment; withdraw if a large non-routine capital investment is needed. 200 MW Wind: 2029 commercial operation

4 Recent Developments and Modeling Changes

4.1 Resilient Generation / Reliability Attributes Analysis

Historically, resource plans have focused on energy and capacity metrics to assess a utility's ability to produce electricity cost-effectively and reliably for its customers. With changes that have occurred in the marketplace over the past several years, however, the full scope of generation attributes has grown in significance for resource planning, going beyond just the attributes of capacity and energy. A well-crafted resource plan will consider other important attributes like dispatchability, fuel supply and deliverability, price assurance, and other attributes that contribute to the resilience of the resource portfolio. We have undertaken such an analysis in arriving at our Supplemental Preferred Plan.

These concepts were highlighted during events such as the 2014 Polar Vortex, the 2021 Winter Storm Uri and the 2022 Winter Storm Elliot, where renewable generation was at times not available, natural gas availability was at times limited, and electricity market prices and natural gas prices were at times extremely high.

Recent proposals by MISO highlight its increased awareness of planning attributes beyond capacity accreditation. Long-duration energy and fuel assurance are part of

MISO's six proposed reliability attributes. These attributes are at the forefront of MISO's planning and are part of the discussion to address future requirements.[14] Although MISO is just beginning the process of valuing these various attributes, Otter Tail has consistently emphasized our resilient generation capabilities.

In our Initial Filing we noted the three characteristics that define resilient generation resources: (a) dispatchability, (b) reliable fuel supply, and (c) energy price protection. Table 3-8 of our Initial Filing displays the various resources Otter Tail analyzes for resiliency.[15] Similar to Otter Tail's Initial Filing, Supplemental Table 4-1 compares our total current resilient generation in 2023 to our Supplemental Preferred Plan resilient generation in 2030, assuming for analysis that onsite fuel capability is added at Astoria Station. All four seasons have been included to better reflect MISOs seasonal construct.

Supplemental Table 4-1: Resilient Generation

	2023			
	Summer	Fall	Winter	Spring
Big Stone	256	256	256	256
Coyote	149	149	149	149
Astoria	0	0	0	0
Solway	42	44	46	44
Oil Peakers	59	59	59	59
Controllable Load	115	115	210	115
Total	**621**	**623**	**720**	**623**

	2030 (including Coyote)				2030 (excluding Coyote)			
	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring
Big Stone	256	256	256	256	256	256	256	256
Coyote	149	149	149	149	0	0	0	0
Astoria	248	264	280	264	248	264	280	264
Solway	42	44	46	44	42	44	46	44
Oil Peakers	59	59	59	59	59	59	59	59
Controllable Load	115	115	210	115	115	115	210	115
Total	**869**	**887**	**1000**	**887**	**720**	**738**	**851**	**738**

[14] MISO's September 21, 2022, System Attributes Stakeholder Workshop presentation: https://cdn.misoenergy.org/20220921%20System%20Attributes%20Workshop%20Presentation626391.pdf.

[15] Table 3-8 of our Initial Filing was later amended in subsequent filings concerning Astoria Station fuel storage, as Otter Tail continues to survey and analyze various technologies for consideration within our resource mix. See Otter Tail Power Company Supplemental Comments, MPUC Docket No. E017/RP-21-339, November 4, 2022, at p.5; Initial ADP Filing, ND PSC Case No. PU-23-066, February 8, at p. 13.

Figure 4-1 (below) compares Otter Tail's 2023 forecasted hourly load to existing resilient generation capabilities. The grey area in Figure 4-1 depicts Otter Tail's seasonal load duration curves. A load duration curve illustrates the total amount of load in each hour of the season arranged in order of magnitude. From it, we can consider the maximum amount of load we need to be prepared to serve over the course of a year. The blue line in Figure 4-1 is drawn to show the level of our resilient generation resources. The purpose of this figure is to show the relationship between resilient generation capabilities and forecasted hourly load and potential market exposure if variable resources were not generating at the time load exceeded the resilient generation capabilities. As shown in the figure, we project that 12 percent of our overall load will not be backstopped by resilient resources.

Figure 4-1: 2023 Forecasted Load Relationship with Resilient Generation

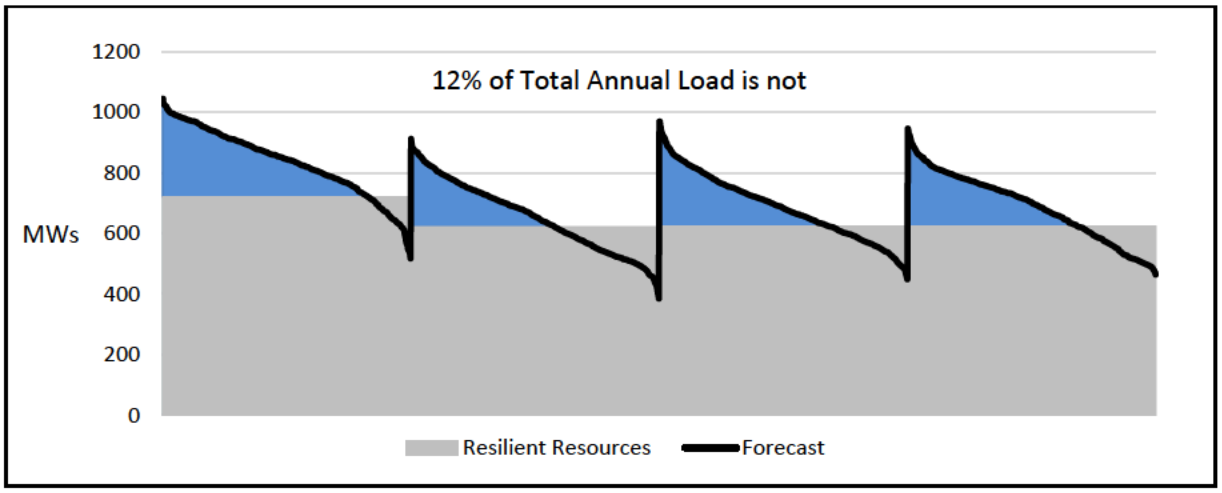


Figure 4-2 similarly compares Otter Tail's 2030 forecasted hourly load with the resilient generation available under the Supplemental Preferred Plan with Coyote Station still in Otter Tail's resource mix. As noted by Figure 3-10 the Supplemental Preferred Plan reduces the amount of load not backed by resilient generation from 12 percent to only 1 percent.

Figure 4-2: 2030 Forecasted Load Relationship with Resilient Generation (including Coyote Station)

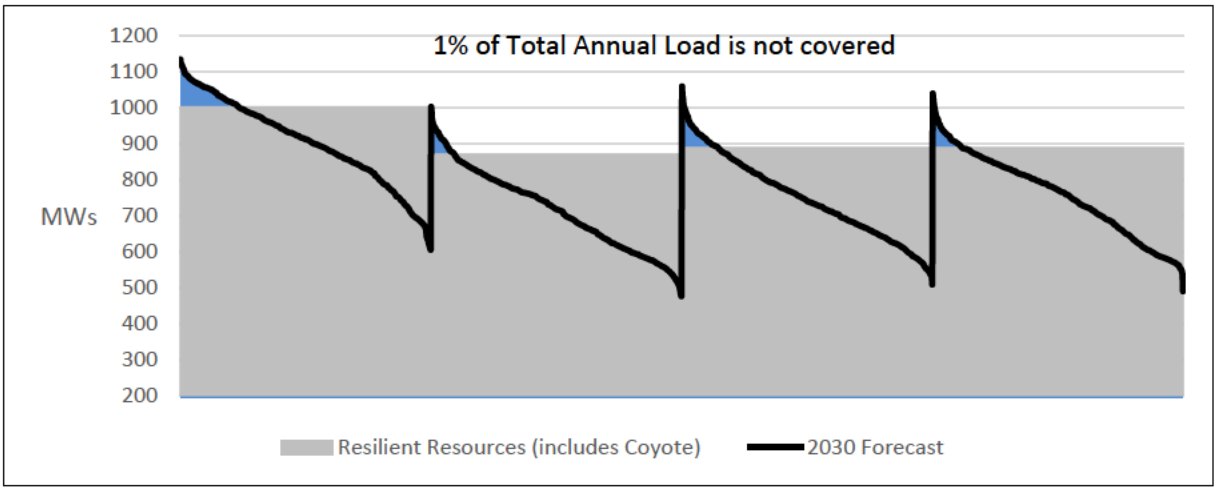
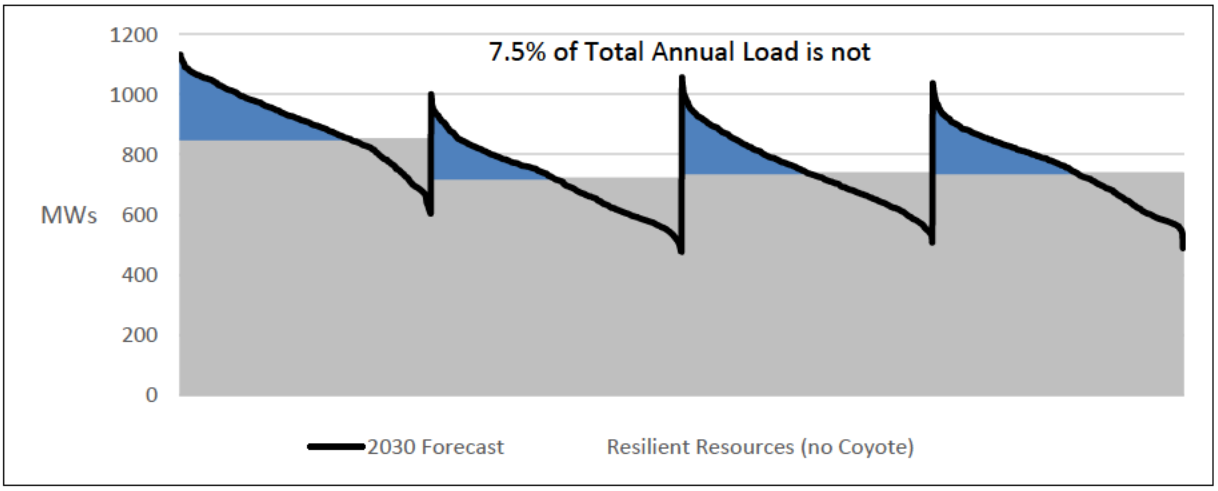


Figure 4-3 is similar to Figure 4-1, with the exception that Coyote Station is removed from Otter Tail's resource mix. In this situation the forecasted 2030 load that is not covered by resilient generation increases from 1 percent when Coyote Station is included to 7.5 percent.

Figure 4-3: 2030 Forecasted Load Relationship with Resilient Generation (Coyote removed)



4.2 MISO Changes

4.2.1 Seasonal Construct

On August 31, 2022, FERC approved MISO Tariff revisions that include the adoption of a seasonal resource adequacy construct and capacity requirements. These changes allow

MISO to move forward with seasonal capacity auctions with each season having its own capacity requirement based on seasonal coincident peak loads and a seasonal reserve margin. The changes also allow MISO to accredit resources based on their historic availability during Resource Adequacy (RA) hours rather than on the forced outage rate methodology where all hours are treated equally. These changes will be implemented in the 2023/2024 planning year.

4.2.2 MISO Planning Reserve Margin Requirements (PRMR) & Subsequent Accreditation

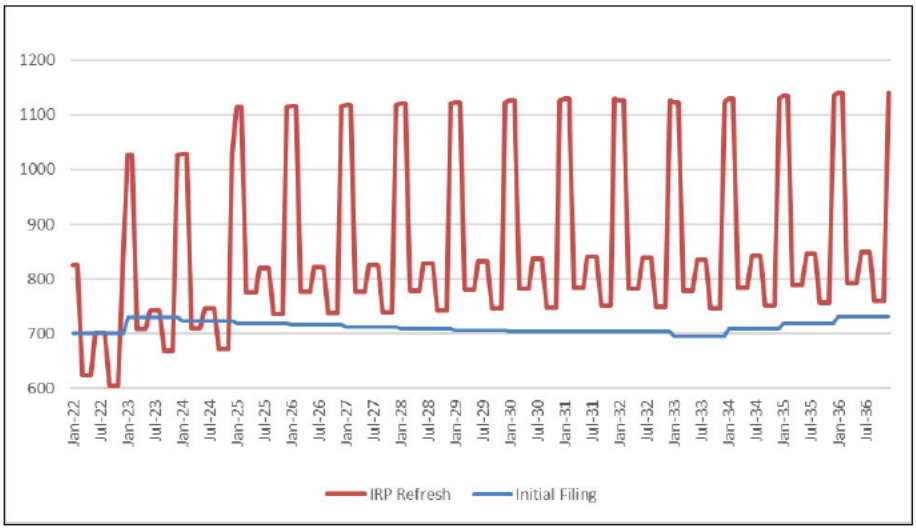
On September 6, 2022, the MISO Loss of Load Expectation Working Group (LOLE Working Group) published draft results for the 2023/2024 Planning Reserve Margin and Local Reliability Requirements. The LOLE Working Group proposed the following planning reserve margins (PRM):

Table 4-2: MISO Seasonal Planning Reserve Margin

Season	PRM Percentage	Otter Tail PRMR
Summer	7.4%	809
Fall	14.9%	729
Winter	25.5%	1,117
Spring	24.5%	775

These reserve margins are significant deviations from MISO's 2022/2023 annual planning reserve margin of 8.7 percent. Of particular consequence for our Company is the PRM percentage of 25.50 percent for the winter season. Otter Tail is a winter peaking utility. Although we have always and continue plan year-round, this magnitude of a reserve margin was not anticipated. Furthermore, at the time we informed our state Commissions of the need to update our Initial Filing, our reserve margins were known but our accreditation values were still unknown. This created concern regarding wintertime exposure risks in MISOs Planning Resource Auction (PRA) that we sought to address in the modeling. The differences between filings are graphically depicted in Graph 4-1 below.

Graph 4-1 Initial Filing vs. Current Filing PRMR[16]



From the same LOLE Working Group presentation wind and solar Effective Load Carrying Capability (ELCC) values were also provided. MISO later established these values as the basis for wind and solar accreditation for the upcoming planning year. Exact accreditation values were unknown at the time of input development for this Supplemental Filing's modeling. Therefore, we used values from MISO's loss of load expectation (LOLE) study for years 2023 through 2030 as well as information from MISO's Regional Resource Assessment (RRA) for years 2031 and beyond. The ELCC of wind and solar are predicted to slowly decrease over time – as is expected with increased penetration of wind and solar. Table 4-3 shows values that were used for wind and solar accreditation within our Supplemental Filing modeling.

Table 4-3: Wind and Solar Accreditation (Percentage of ICAP)

	Summer	Fall	Winter	Spring
Wind (current)	18	23	40	23
Solar (current)	45	25	6	15
Battery* (current)	82	68	82	76
Wind (2031)	18	21	37	12

[16] Otter Tail current customer base includes those that allow for a considerable amount of control for which the load control is registered as a load modifying resource in MISO. Otter Tail's load forecasts in this filing include the net of customer load and the load modifying resources.

	Summer	Fall	Winter	Spring
Solar (2031)	23	18	1	17
Battery (2031) *	82	68	82	76
Wind (2041)	16	21	26	12
Solar (2041)	18	20	11	11
Battery (2041)	100	100	97	64
*Current ELCC not provided by MISO, used RRA 2031 value				

Otter Tail has and will continue to plan for sufficient generation year-round. When we identified the need to update our Initial Filing's modeling the values applicable to our generation fleet's accreditation were unknown. Today, our values for accreditation are known for the upcoming planning year and we have used inputs that are reasonable for this Supplemental Filing. Beyond the upcoming planning year, there are unsettled issues with both the current accreditation methodology and proposed accreditation methodologies. We address these unknowns by running various sensitivities as well as constantly reviewing our generation fleet outside the model (as shown in Section 4.1).

4.2.3 MISO Capacity Position & Regional Resource Assessment

Since our Initial Filing greater uncertainty has developed concerning MISO Planning Resource Auction (PRA)[17] due to a MISO capacity surplus shifting to a capacity shortfall.[18] The Organization of MISO States 2022 survey warns of potential capacity deficits through at least the 2027/2028 planning year depending on the pace of generator retirements and new capacity additions.[19] Furthermore, MISO's 2022 RRA modeling

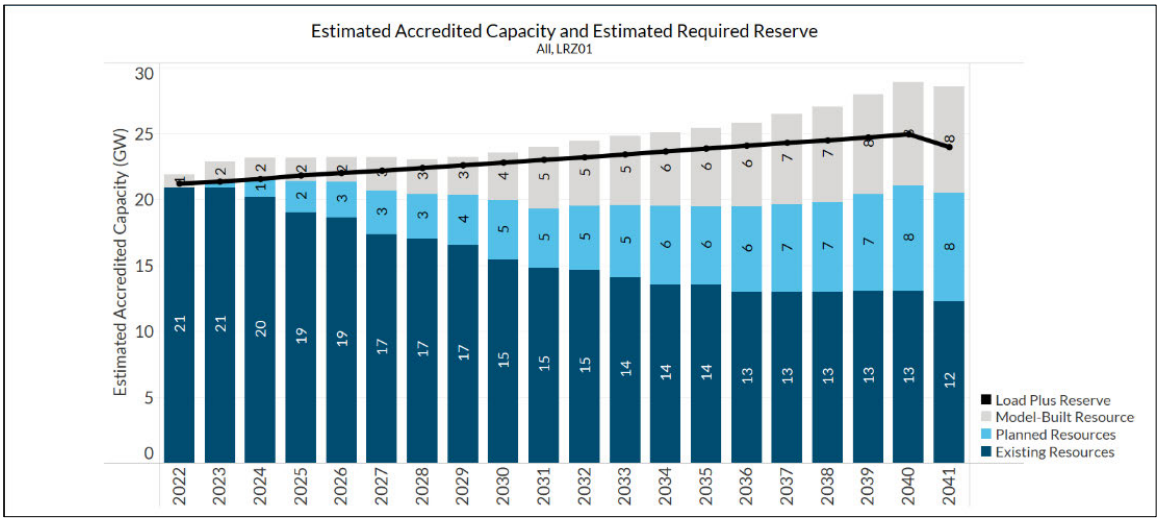
[17] PRA prices for planning year 2022-2023 recently cleared at the cost of new entry (CONE) compared to the much lower historical PRA clearing prices of sub-$5/MW-Day. Clearing prices from MISO's 2022-2023 PRA reflect capacity shortfalls in four zones, exposing nearly 8 GW in MISO North/Central to the Cost of New Entry. For reference, zone 1 auction clearing prices have been no higher than $5.00 per MW-Day since planning year 2017-2018. In 2022 zone 1 auction clearing prices were $236.66 per MW-Day. *MISO Planning Resource Auction (PRA) for Planning Year 2022-2023 Results Posting, May 14, 2022.*

[18] This shift was expressed by MISO in May 2022, when it projected insufficient firm resources to cover peak 2022 summer forecasts under typical demand and generation outages, and that "[e]emergency resources and non-firm energy imports are projected to be needed to maintain system reliability. *MISO Summer Readiness Workshop Summer 2022.*

[19] *2022 OMS-MISO Survey Results Posting June 10, 2022.* These capacity deficits follow a concentrated period of generation plant retirements within MISO. Capacity in the MISO North/Central region fell by 3.2 GW since the last capacity auction. *MISO Planning Resource Auction (PRA) for Planning Year 2022-2023 Results*

"indicates a continued near-term capacity risk, highlighting the immediate importance of coordinated resource planning and additional investment." MISO's Local Resource Zone 1 (LRZ 1), of which Otter Tail has 99 percent of its customers, is not isolated from this risk. Graph 4-2 from the 2022 RRA suggest not only a long-term but also immediate concern regarding capacity and reserves.

Graph 4-2: LRZ 01 Results – Capacity and Reserves



This Supplemental Filing concerns only our future generation fleet. That being said, MISO's capacity deficit projections inform our view about an unsettled planning environment that may affect our customers.

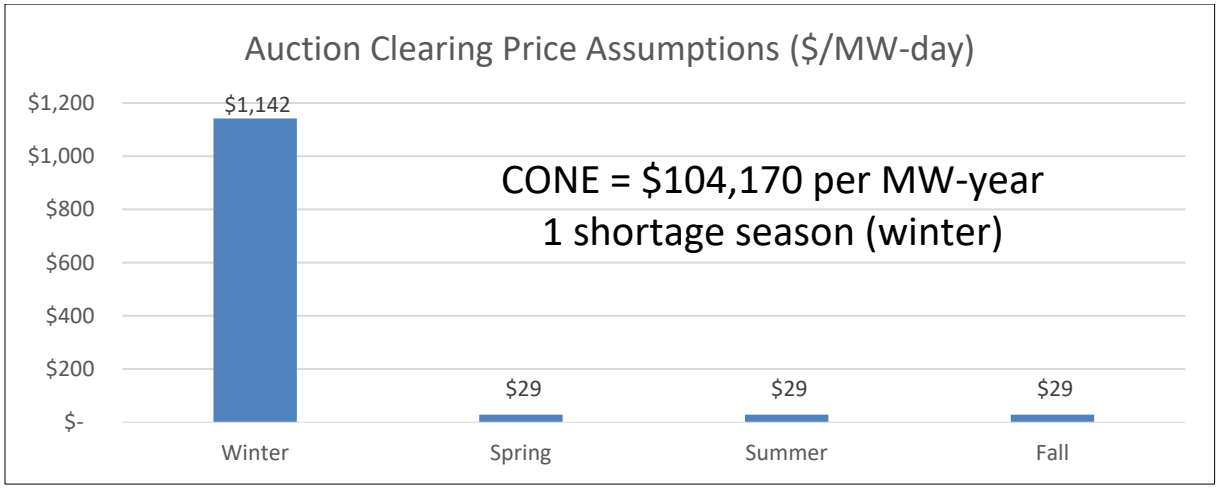
4.2.4 Auction Clearing Mechanism as Established within MISO's Seasonal Construct

Within our modeling we do not allow capacity to be sold to the market to ensure capacity is built only for our customers. This is how we have traditionally modeled excess capacity for resource plans. However, our modeling does put a cost to firm capacity imports when they are necessary to meet our PRMR. The new seasonal construct within MISO comes with nuances regarding the auction clearing prices themselves. One such nuance is the potential for the entirety of Cost of New Entry (CONE) to fall within one season. We determined it was reasonable to assign CONE in its entirety to the winter season given our limited excess capacity for the winter season. Graph 4-3 shows how the inputs were

Posting May 14, 2022. MISO notes that unless more reliable generation is built shortfalls such as this will continue.

established for our Supplemental Filing.

Graph 4-3: Assigned Auction Clearing Prices within Planning Resource Auction



The values shown above are for 2023 and escalate at the inflation rate used throughout Encompass. This cost is a conservative but realistic outcome that could occur within MISO's planning resource auction to disincentivize the model from selecting imports over additional capacity. This change from our Initial Filing was a result of the information described within this section as well as the seasonal nature of the auction as noted above.

4.2.5 Potential future policy changes (sloped demand curve, D-LOL, etc.)

MISO is actively developing a reliability-based demand curve for likely implementation in the 2024/2025 PRA. For modeling purposes, a reliability-based demand curve was not considered for the reasons mentioned in Section 4.2.4 regarding capacity purchases and sales.

We did not use the pending direct loss of load non-thermal accreditation (D-LOL) methodology when determining modeling inputs for this Supplemental Filing. The proposed D-LOL methodology has only been revealed at its highest level. The amount of detail required to model this type of accreditation methodology would require a much more in-depth data release from MISO. We are closely monitoring the proposed accreditation methodology. Because the proposed methodology has not been finalized, we have used accreditation values mentioned in Section 4.2.2.

Furthermore, MISO's states in its presentation entitled *Identification of Sufficient Reliability Attributes* that "[i]n 2023 MISO will explore attributes to define quantitative metrics, enhance visibility and develop a roadmap to assist members in resource planning and prioritization of appropriate market mechanisms."[20] The attributes that MISO is exploring (availability; long duration energy at high output; fuel assurance; rapid start-up; ramp-up capability; and voltage stability) have always been considered within Otter Tail's planning process in a qualitative manner. Otter Tail is generally supportive of MISO's efforts to explore these attributes in a quantitative manner and subsequently applying value to each. Otter Tail will continue to provide feedback and any support necessary to assist MISO in this matter.

4.3 Inflation Reduction Act (IRA) 2022

President Biden signed the IRA into law on August 16, 2022. The IRA provides approximately $369 billion toward wind, solar, clean energy storage, and clean energy manufacturing projects. Notably the IRA extends tax incentives for wind and solar facilities that were set to expire. The impact of this legislation is included throughout this Supplemental Filing and specifically addressed in terms of impacts on resource costs in Appendix F and potential new resources in Appendix D.

4.3.1 IRA & Wind Energy Facility Equipment Upgrades

The IRA provides for full production tax credits for repowered wind facilities. Our Langdon, Luverne, Ashtabula, and Ashtabula III wind energy facilities qualify for repowering. Repowering of these facilities will lead to increased energy output of 167 GWh which is approximately equivalent to the energy output of a 40 MW wind facility with a 50 percent capacity factor. Table 4-4 below provides the expected annual energy increase at the four facilities.

Table 4-4: Wind Energy Facility Equipment Upgrade

Line No.	Wind Energy Facility	Name Plate (MW)	Current NCF	Repower NCF	Current GWh	Repower GWh	Increase GWh
1	Ashtabula	48.0	40%	50%	168	210	42
2	Langdon	40.5	40%	50%	142	178	36
3	Luverne	49.5	42%	50%	182	217	35
4	Ashtabula III	62.4	40%	50%	219	274	55
	Total				**711**	**878**	**167**

[20] *Identification of Sufficient System Reliability Attributes*, Resource Adequacy Subcommittee, January 18, 2023.

Development and siting work continues on these projects that are expected to be in service in 2024 and 2025. These projects are projected to cost **[PROTECTED DATA BEGINS**… **…PROTECTED DATA ENDS]** and generate more than $230 million in production tax credits.

4.4 Minnesota Clean Energy Law

On February 6, 2023, Minnesota Governor Tim Walz signed into law the 100 percent Clean Energy Law (Minnesota Clean Energy Law.) The law requires a transition to 100 percent carbon-free energy for all Minnesota electric customers by 2040.

Minn. Stat. §216B.1691 Subd. 2g (as amended by the Clean Energy Law) reads:

> *Subd. 2g.* ***Carbon-free standard.*** *In addition to the requirements under subdivisions 2a and 2f, each electric utility must generate or procure sufficient electricity generated from a carbon-free energy technology to provide the electric utility's retail customers in Minnesota, or the retail customers of a distribution utility to which the electric utility provides wholesale electric service, so that the electric utility generates or procures an amount of electricity from carbon-free energy technologies that is equivalent to at least the following standard percentages of the electric utility's total retail electric sales to retail customers in Minnesota by the end of the year indicated:*
>
> | | | |
> |---|---|---|
> | *(1)* | *2030* | *80 percent for public utilities; 60 percent for other electric utilities* |
> | *(2)* | *2035* | *90 percent for all electric utilities* |
> | *(3)* | *2040* | *100 percent for all electric utilities.* |

Minn. Stat. §216B.1691, Subd. 4 (as amended by the Minnesota Clean Energy Law) explains that renewable energy credits may be utilized to comply with the carbon-free requirements:

> *. . . (b) In lieu of generating or procuring energy directly to satisfy a standard obligation under subdivision 2a, 2f, or 2g, an electric utility may utilize renewable energy credits allowed under the program to satisfy the standard.*

Otter Tail is uniquely (and well) positioned to comply with the Minnesota Clean Energy Law's 100 percent carbon-free obligation. Compliance can be achieved if the energy delivered to Minnesota customers is accompanied by a corresponding quantity of RECs

that can be retired on their behalf.[21]

We have significant renewable generation already in our fleet relative to the quantity of energy we deliver to our Minnesota customers. Right now, with our current generation fleet, we have enough renewable generation to cover approximately 54 percent of our energy sales to Minnesota customers, which will increase to 57 percent when our Hoot Lake Solar project (now under construction) comes on-line later in 2023. Our Supplemental Preferred Plan builds on this foundation, adding significant renewable generation before 2030.

We forecast that our owned and contracted renewable generation will allow us to comply with this legislation. Table 4-5 and Table 4-6 provide a summary of how we will satisfy the Clean Energy Law's standards in the prescribed timeframe. Table 4-5 assume for analysis that we withdraw from Coyote Station by 2030. Table 4-6 assumes for analysis that we remain in Coyote Station for the balance of its remaining life.

Table 4-5: Minnesota Clean Energy Law Compliance Breakdown (Withdrawal from Coyote pre-2030)

MN REC Forecast	Current No Hoot Lake Solar (HLS) No Wind Repower	2023 w/HLS	2025 w/HLS & Repowers	2030 Preferred Plan*	2035 Preferred Plan*	2040 Preferred Plan*
MN covered by MN RECs	25%	28%	31%	54%	69%	69%
MN covered by MN/ND RECs	50%	53%	59%	106%	137%	137%
MN covered by MN/ND/SD RECs	54%	57%	65%	116%	151%	151%

[21] Otter Tail's 2023 forecasted Minnesota sales are about 2,700 GWh. The Minnesota Clean Energy Law effectively requires retirement of renewable energy credits (REC) for each kWh sold to Otter Tail's Minnesota customers. The new law does mandate any specific disposition of existing fossil fuel generation plants. Importantly the new law does not alter a utility's obligation to reliably deliver electricity to Minnesota customers, and it does not alter the several factors under which integrated resource plans are to be evaluated. The factors of reliability and flexibility are of utmost importance, especially considering the ambition of the new law, the success (or failure) of which will largely depend on whether utilities, the MPUC and other stakeholders are able to achieve compliance without disruptions to reliability.

Table 4-6: Minnesota Clean Energy Law Compliance Breakdown (Coyote 2040)

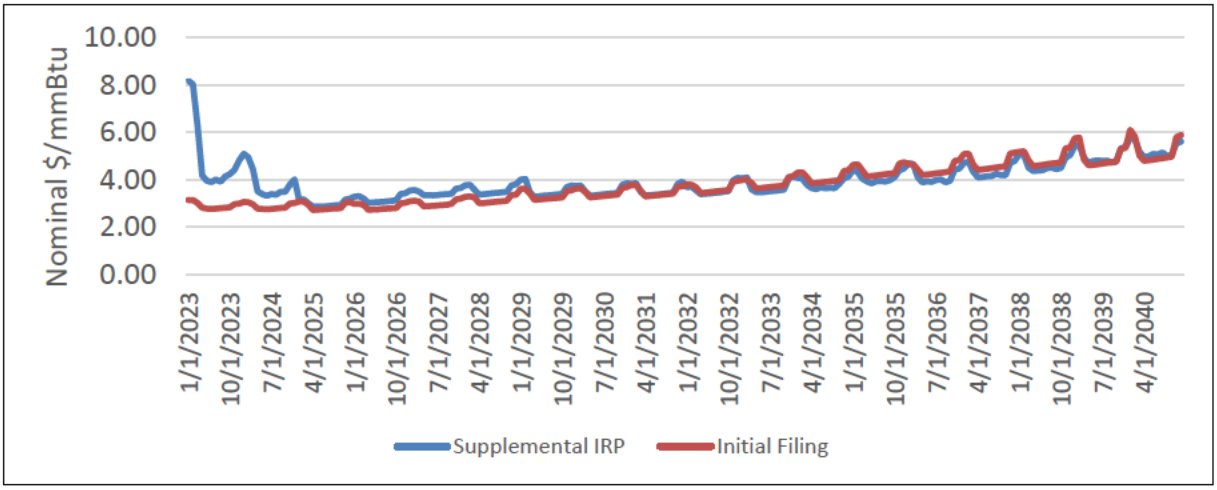
MN REC Forecast	Current No Hoot Lake Solar (HLS) No Wind Repower	2023 w/HLS	2025 w/HLS & Repowers	2030 Preferred Plan	2035 Preferred Plan	2040 Preferred Plan
MN covered by MN RECs	25%	28%	31%	51%	55%	55%
MN covered by MN/ND RECs	50%	53%	59%	100%	109%	109%
MN covered by MN/ND/SD RECs	54%	57%	65%	110%	120%	120%

4.5 Natural Gas and Energy Market Volatile Conditions

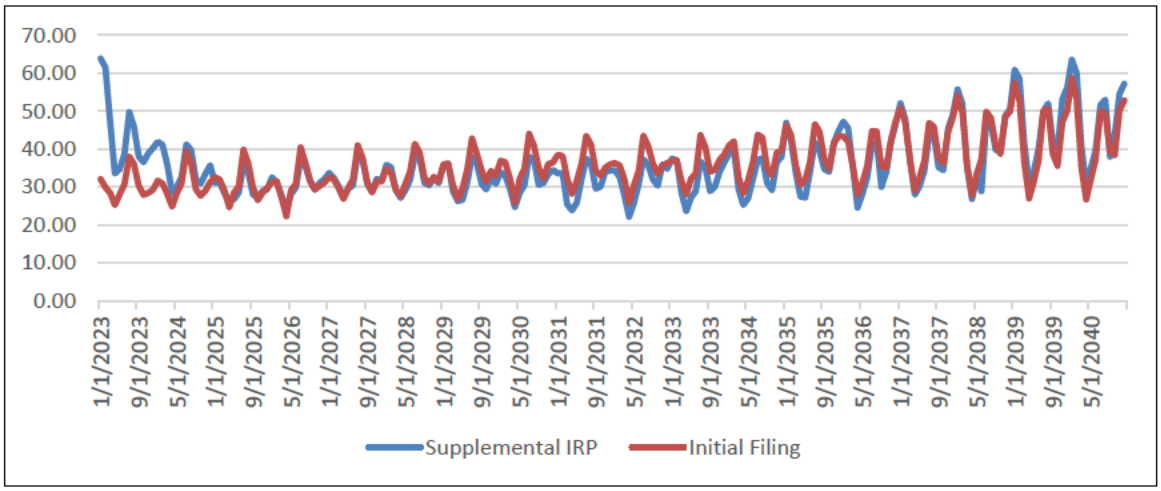
The natural gas transmission lines where the Otter Tail natural gas peakers are located are reliable. Notwithstanding this reliability, the extraordinary pricing variability during Winter Storm Uri in 2021 compelled us to review the intra-day pricing variability exposure of a natural gas generator without a secondary fuel source backup.

Since our Initial Filing, a combination of factors including extreme weather events and geopolitical instability (such as Ukraine war) have caused volatility in the gas markets, causing gas prices to more than double, on average, in the near term compared to those forecasted in our Initial Filing. Graphs 4-4 – 4-6 show the differences in natural gas and energy market pricing used in our Initial Filing compared to our Supplemental Filing.

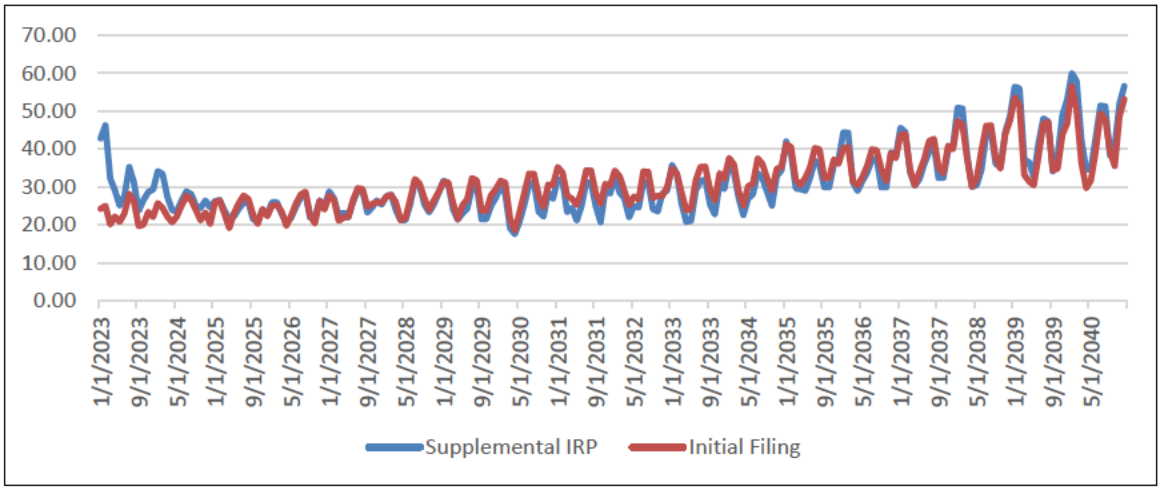
Graph 4-4 Natural Gas Forecast, Initial Filing vs Supplemental



Graph 4-5 Peak Energy Forecast, Initial Filing vs Supplemental



Graph 4-6 Off-Peak Energy Forecast, Initial Filing vs Supplemental



In addition to these events we recently experienced Winter Storm Elliot in December 2022.[22] This event was marked by significant volatility in natural gas markets including a period of time in which natural gas was not available at any price because of increased demand and production facility freeze offs.[23] It is noteworthy that two extreme weather events causing market disruptions and volatility (Winter Storms Uri and Elliot) occurred within a 22-month period. This is consistent with The North American Electric

[22] Winter Storm Elliot Winter was deemed a bomb cyclone, bringing extreme cold temperatures to the eastern two-thirds of the Lower 48, with blizzard conditions occurring in several states. See https://www.wunderground.com/article/storms/winter/news/2022-12-23-winter-storm-elliott-bomb-cyclone-midwest-northeast-winds-snow.

[23] Otter Tail's experience with Winter Storm Elliot is detailed in the Company's February 1, 2023 Reply Comments concerning onsite fuel storage at Astoria Station in MPUC Docket No. E017/RP-21-339 and in our February 8, 2023 Application to the ND PSC for an advance determination of prudence in Case No. PU-23-066.

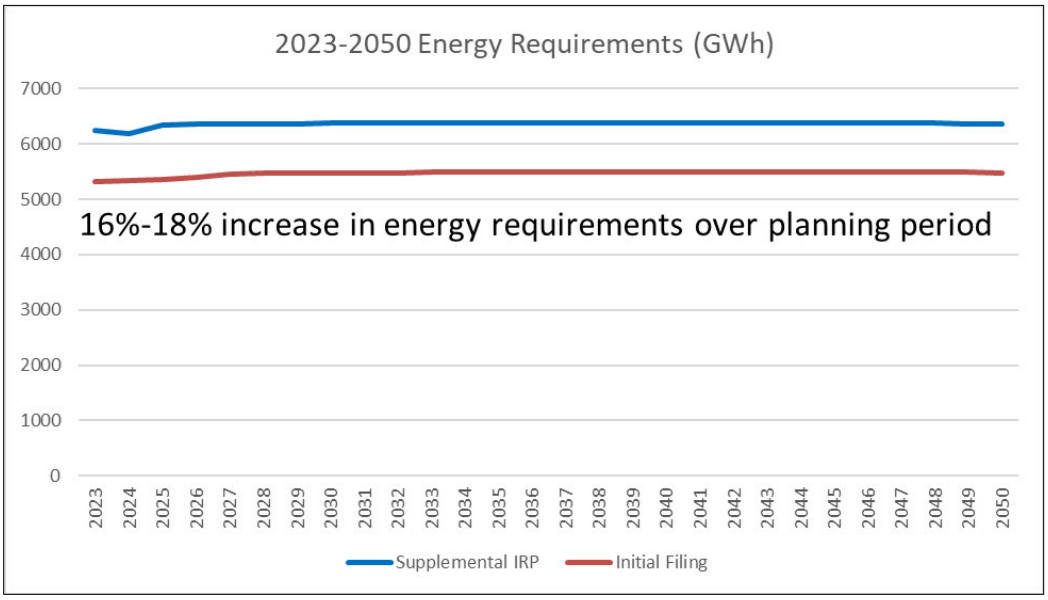
Reliability Corporation's (NERC) 2022-2023 Winter Reliability Assessment, which highlights the increased risks of extreme events.[24]

Given this history, we applied greater scrutiny to the sensitivities regarding natural gas and energy markets in developing our Supplemental Preferred Plan. Although we have the most confidence in our base case scenario, the adjusted natural gas and energy market sensitivities inform our Supplemental Preferred Plan.

4.6 Load Forecast – New Large Loads

As detailed in Otter Tail's August 2, 2021, Prefiling, the Initial Filing sales and demand forecasts were completed in early 2021 using actual sales data through December 2020. Since then, we have added new large load customers with the addition of other large load customers expected within the next 24 months. These new large loads are included in the sales and demand forecast inputs to our EnCompass expansion capacity modeling and were considered in developing the Supplemental Preferred Plan. From an energy perspective, the impact of new customers on the sales forecast is a 16 percent to 18 percent increase in energy requirements over the planning period as compared to the Initial Filing. This increase to forecasted energy sales is depicted in Figure 4-4 below.

Figure 4-4: Sales Forecast Comparison



[24] https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_WRA_2022.pdf.

As noted above, the new loads and expected new loads are in some respects atypical for Otter Tail, both in size and the nature of the loads. While unusual, we are seeing increased interest from customers for such loads.

4.7 Plan Development

The software model we use for resource plan modeling is EnCompass, which replaced the Strategist model used for our 2016 Plan.[25] Otter Tail's long-range peak demand and energy forecasts were incorporated into the EnCompass database, along with the supply-side and demand-side resources available to the Company over the course of the study period. EnCompass was then used to develop a series of least-cost resource plans. We defined the objective function as minimizing total utility costs (i.e., a zero-externality scenario) and, for Minnesota, minimizing total societal costs (i.e., an externality value scenario).

The EnCompass software develops an optimized resource plan for each scenario for the time period 2022 through 2036. Scenarios were developed, including evaluation of sensitivities that varied load growth, altered natural gas and energy market prices, adjusted MISO accreditation percentages, and applied externalities.[26]

4.8 New Resource Alternatives

Otter Tail considers both demand-side and supply-side resources in long-term planning analysis. Appendix D to this filing provides a more detailed discussion of the new resources we evaluated. Table 4-7 provides a list of the alternatives evaluated within the EnCompass model:

[25] Otter Tail first used the EnCompass software in previous Minnesota proceedings that were approved by the MPUC including its forecasted 2021 Energy Adjustment Rider rates in Docket No. E017/AA-20-462.

[26] The externality values reflected in our Supplemental Filing are the most recent figures available from the MPUC. These values were established pursuant Minn. Stat. § 216H.06 in the MPUC's September 30, 2020 Order in Dockets E-999/CI-07-1199 and E-999/DI-19-406. These values may change in the future; the Minnesota Clean Energy Law directs the Commission "to provisionally adopt and apply the draft cost of greenhouse gas emissions valuations presented in the United States Environmental Protection Agency's EPA External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances, released in September 2022, including the time horizon, global estimates of damages, and the full range of discount rates from 2.5 to 1.5 percent, with two percent as the central estimate. The commission shall adopt the estimates contained in the final version of the external review draft report when it becomes available."

Table 4-7: List of Resource Alternatives Included in the EnCompass Model

Resource Alternative Model	Description
49 MW Firm Dispatchable Unit	Generic 49 MW nameplate capacity, closely resemble aeroderivative type simple cycle
248 MW Firm Dispatchable Unit	Generic 248 MW nameplate capacity, closely resemble CT within model
Wind	50 MW nameplate capacity utility scale wind resource. Generic, surplus and replacement options all available to the model.
Solar	25 MW nameplate capacity utility-scale solar resource. Generic, surplus and replacement options all available to the model
Standalone Battery	25 MW nameplate capacity utility-scale battery resource. Generic, surplus, and replacement options all available to the model.

4.8.1 Cost Assumptions

Otter Tail used a blend of the 2022 National Renewable Energy Laboratory Annual Technology Baseline and Level 10 cost data as the main source for new resource cost assumptions. Adjustments were made to account for investment and production tax credits, interconnection costs, and congestion when appropriate. Detailed resource costs can be found in Appendix D.

4.8.2 Interconnection queue status and costs

Due to the large number of requests and recent generator interconnections, transmission interconnection costs for new resources are very high and impact the economic feasibility of adding new generation units of all types. Some of the challenges include additional uncertainties, large queue cycles, delayed studies, and very high interconnection costs. Surplus interconnection and replacement interconnection prevent having to go through the traditional MISO interconnection queue process.

Replacement interconnection resources reuse the existing interconnection rights of an existing resource that is retiring. Surplus interconnection resources are built alongside an existing resource and share the interconnection rights while not exceeding the total output of the existing interconnection. Both interconnection methods are studied to confirm that there are no reliability impacts to the transmission system, and if issues are identified, the request goes to the standard queue.

4.8.3 Long-range transmission plan impacts

In the recent years, an unprecedented amount of renewable generation has been requested to be added to the MISO system. The increase in requests and generators interconnecting to the MISO system has caused congestion that has been reflected in the

MISO interconnection queue. The inclusion of long-range transmission plan (LRTP) projects in the MISO interconnection study process will likely impact the total number of requests in the queue and real-time congestion experienced by existing generators, but the total impact is unknown. For this reason, the LRTP projects did not impact our modeling assumptions. Our Supplemental Preferred Plan, however, accounts for LRTP projects by deferring some wind projects until LTRP projects are complete.

5 Additional Factors Considered in Our Supplemental Filing Analysis

5.1 Multi-State Jurisdictional Complexity

As we indicated in our Initial Filing, Otter Tail faces unique challenges given its small size and multi-jurisdictional service area. Otter Tail is very small, serving just 137,000 customers in its three states. The percentage of Otter Tail's utility service delivered to each state varies depending on whether demand, energy or the number of customers is measured. Overall our service is approximately 50 percent Minnesota, 40 percent North Dakota and 10 percent South Dakota. Supplemental Table 5-1 (updated from our Initial Filing) provides approximate 2022 figures for of demand, energy, and customer count in each state.

Supplemental Table 5-1: Percentage of Otter Tail operations in each of its three states

	Minnesota	North Dakota	South Dakota
Demand	51%	39%	10%
Energy	50%	41%	9%
Customer count	47%	44%	9%

In all three states Otter Tail serves very small rural towns—the average population of our communities in the three-state region is approximately 400 people. Continuing to operate as a single, cost-effective multi-state utility is important for our customers and these small communities. Otter Tail is already one of the smallest vertically integrated utilities in the country. To give some perspective, Xcel Energy's NSP Minnesota subsidiary, through which Xcel serves Minnesota, North Dakota, and South Dakota, is approximately 10 times the size of Otter Tail. Because of this already very small size,

splitting Otter Tail into separate and even smaller utility systems would result in harmful inefficiencies and an increased cost of service.

The Supplemental Preferred Plan presented in this filing meets resource planning objectives in each of our jurisdictions, and we feel it can be supported in all the states we serve, and it has the additional benefit of providing a path for Otter Tail to continue operating with a single integrated system.

5.2 Multiple ISOs (SPP & MISO)

As noted in our Initial Filing Otter Tail faces challenges stemming from the fact that Big Stone Plant and Coyote Station are both co-owned and they each operate in two Independent System Operators (ISOs): Southwest Power Pool and MISO. The challenges we face with respect to these issues remains the same as detailed in our Initial Filing. The following is a brief recap of each co-owned facility as referenced in our Initial Filing:

Coyote Station

Coyote Station is 427 MW lignite-mine mouth facility located near Beulah, North Dakota that is co-owned by Otter Tail (35 percent), Northern Minnesota Municipal Power Agency (represented by Minnkota Power Cooperative) (30 percent), Montana-Dakota Utilities Co. (MDU) (25 percent), and Northwestern Energy (10 percent). Coyote Station commenced service in 1981 and it had a depreciable life that assumed retirement in 2016.[27] The depreciable life was extended at various times during the life of the plant, the last time being in 2013, when the depreciable life was extended by nine years, from 2032 to 2041.[28]

Otter Tail, Minnkota, and MDU operate within the MISO market; Northwestern Energy operates within the SPP market. The SPP and MISO markets do not have mechanisms for inter-ISO coordination of commitment status of jointly owned units that partially operate in each ISO. Furthermore, both markets model partial shares of jointly owned units as individual, separate, and distinct generators. If each partner share of the unit were to be offered on an economic commitment basis, in many hours only a portion of the entire unit would be dispatched. From a practical standpoint, however, since the plant is one physical generator, dispatch of a single owner's share of the plant will result in the dispatch of all

[27] *See* MPUC MN Docket E017/D-83-2.
[28] *In the Matter of Otter Tail Power Company's Request for Approval of its Five Year Depreciation Study*, MPUC Docket No. E017/D-13-795, Order (Apr. 7, 2014).

owners' shares of the plant. Furthermore, from a co-owner contractual standpoint, if one owner calls on its share of the plant, all owners are required to take their share of the total minimum output.

Big Stone Plant

Big Stone is co-owned by Otter Tail (53.9 percent), Montana Dakota Utilities Co. (22.7 percent), and Northwestern Energy (23.4 percent). Big Stone Plant, located near Milbank, South Dakota, is a 475 MW coal plant burning sub-bituminous coal from the Powder River Basin. It was retrofitted with an Air Quality Control System (AQCS) in 2015. The AQCS is comprised of state-of-the-art controls for SO2, NOx, and mercury. Big Stone has similar market operating complexities as Coyote. Big Stone straddles both the MISO and SPP wholesale energy markets and can be dispatched by either ISO. Big Stone contractual obligations require partners to take their minimum share of the plant whenever another owner calls for dispatch.

Both Big Stone and Coyote Station are currently capable of being placed on economic commitment. The Big Stone and Coyote co-owners meet periodically to determine if Big Stone or Coyote should be placed into economic commitment or must-run status based on market conditions. Our intention is to continue to evaluate the market conditions and forecasts to evaluate the economic commitment (or not) in the future. The EnCompass sensitivities included in this IRP generally have the Big Stone capacity factor from around 20 percent to 60 percent depending on the sensitivity. This range is far below the 85-90 percent capacity factor of traditional baseload coal plants.

There are several differences between Coyote Station and Big Stone Plant. Big Stone is a delivered fuel plant where we only pay for coal that we take—as contrasted with Coyote where we have a fixed component in the fuel cost. Big Stone's AQCS, with capital intensive state-of-the-art SO2 and NOx controls, is already in place. While the Company would have sufficient capacity resources after withdrawal from Coyote Station, replacing Otter Tail's interest in Big Stone would require the addition of another large dispatchable resource (likely a gas Combustion Turbine). Also, Big Stone has recently been operated more frequently on economic dispatch, which reduces the hours it operates in a market below its production costs.

5.3 Coyote Station – Price Stability & Cost Effectiveness

In addition to being a resilient resource Coyote Station has provided Otter Tail customers with price stability and a cost-effective hedge against market volatility. These features of Coyote Station should not be undervalued in the current planning environment where uncertainty is prevalent. Various stakeholders have in other dockets argued that Coyote Station is not cost effective based on a production cost analysis which compares Coyote's production costs against market revenues. As we have noted in other proceedings this production-cost comparison to market-price is useful in assessing the flexibility of a plant, but it is not a measure of cost effectiveness. [29] There are many cost-effective plants that have limited operational flexibility and would show "production cost losses" including most non-dispatchable renewable resources and many base load generators.

The goal of a utility's resource planning is to manage a portfolio of resources in a way that meets cost, risk, and other objectives. If we were to focus on cost alone as a resource planning objective, we would focus on the performance of the portfolio of resources under a variety of circumstances over time. Table 5-2 below reflects the actual cost of energy paid by Otter Tail's customers since 2013. It shows that Otter Tail's customers have benefitted from Otter Tail's consistent and cost-effective portfolio of resources over that period.

[29] See *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesot*a, E-017/GR-20-719, Gerhardson Rebuttal at 16-22; *In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities,* Docket No. E999/CI-19-704, Otter Tail Power Company Response Comments, June 15, 2021.

Table 5-2: Net Cost of Energy Paid by Otter Tail Customers since 2013

Calendar Year	Net System Cost of Energy ($/MWh)
2013	23.48
2014	25.15
2015	24.73
2016	23.06
2017	23.78
2018	24.14
2019	23.93
2020	20.30
2021	21.68
2022	25.89[30]

Coyote Station's costs have remained stable over time even as markets have fluctuated. Figure 5-1 provides a year-over-year comparison for Coyote revenues and total costs (fixed and variable) from 2017-2022.

Figure 5-1: Coyote Revenue and Fuel Cost

[PROTECTED DATA BEGINS…

…PROTECTED DATA ENDS]

[30] Calculation includes proposed return of Planning Resource Auction revenues from 2022, as proposed in Otter Tail's FCA true-up filing being submitted March 1, 2023, in MPUC Docket No. E017/AA-21-311.

Figure 5-1 shows that Coyote's costs of operations have remained stable over the period and that markets have turned higher following lows in 2020. Figure 5-1 demonstrates that the perceived "net benefit/costs" of Coyote Station have largely been driven by the prices available in the energy markets (which have been highly variable) not by the production costs of the plant (which have been very stable). These characteristics of Coyote Station combined with the risks outlined in this Supplemental Filing inform our views about remaining in Coyote Station until and unless there is a need for a large, non-routine capital investment necessary to comply with regulatory mandates or to keep the plant operational.

5.4 Coyote Station – Withdrawal Process & Key Considerations

Otter Tail is requesting authority to withdraw from its ownership interest in Coyote Station when a large, non-routine capital investment is required. As noted above, this type of capital investment should be distinguished from routine capital investments necessary for the plant to operate safely, reliably, and in compliance with current regulations. In basic terms, a large capital investment that could cause us to withdraw from Coyote Station would differ qualitatively and quantitively from routine capital investments the co-owners have made in Coyote Station in the past and which are projected to be made in the future to operate the plant safely, reliably and in compliance with current law. Each year the Coyote Station co-owners develop a ten-year routine capital plan with contingencies that would serve as a baseline in our analysis. These type of routine capital investments would need to be made even if Coyote Station's operating life were significantly reduced to maintain the plant's safety, reliability, and compliance up to the final day of operations. [31]

We cannot predict when (and if) a capital investment that may compel us to withdraw from Coyote Station will arise. That being said, in this Supplemental Filing and our Initial Filing we have discussed developments in the implementation of the Regional Haze Rule, which has an anticipated compliance deadline of 2028 (year end).

By withdrawal of its ownership interest, the Company means that it is seeking to end its

[31] In Otter Tail's most recent Minnesota rate case we drew distinctions between (a) routine capital investments necessary to maintain safety, reliability, and compliance with current regulations and (b) major, non-routine capital investments, such as may be required to comply with Regional Haze regulations. Those distinctions remain valid. See *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, E-017/GR-20-719, Gerhardson Rebuttal at 13-15.

ownership and role in operating the facility in a manner that is both least-cost to Otter Tail's customers and least-impactful to other plant stakeholders, including the co-owners. As noted in our Initial Filing withdrawing from Coyote Station will be complex.

The process for withdrawal from Coyote Station and key considerations remain largely unchanged from our Initial Filing. As noted in the Initial Filing, to withdraw from our ownership interest in the plant we must either (1) divest its ownership shares in the plant to another co-owner or third-party who will take on Otter Tail's current obligations, and secure releases from those obligations as necessary in favor of the acquiring party; or (2) terminate the co-tenancy in the plant under the ownership agreement and any contractual obligations that survive the termination of that co-tenancy. Neither option is without risk or potential cost to Otter Tail and its customers. In addition to these options there is the possibility of the co-owners mutually agreeing to terminate the Plant Ownership Agreement and provide for an orderly wind-down of plant operations and disposition of plant if a large capital investment is required for regulatory compliance or operational purposes.

Should a major, non-routine capital investment in Coyote Station be necessary, Otter Tail will assess whether a consensus exists among the co-owners to terminate the Plant Ownership Agreement. Absent a consensus, Otter Tail would seek divestment through the sale or transfer of its ownership interest. If there were no qualified buyers for Otter Tail's ownership interest, we could unilaterally initiate termination of the Plant Ownership Agreement upon five years advance notice. The timing and sequencing of our engagement with our co-owners on an exit from Coyote Station would depend on many factors. These discussions are likely to be complex and fluid. Our intent would be to secure an exit from Coyote Station in the least disruptive and most expeditious manner as is reasonably possible.

Otter Tail's termination of the Plant Ownership Agreement would depend on several factors the status of which is subject to future developments. Such unilateral termination could impact the other co-owners, given post closure obligations of the parties to each other, the community, and the state of North Dakota along with the potential that the co-owners may choose to continue to rely on the plant for their own load serving needs. It is important to underscore the irrevocable nature of unilateral termination of the Plant Ownership Agreement. There is no mechanism for a provisional notice of termination

that can later be withdrawn. Once given, notice of termination sets in motion events intended to lead to closure of Coyote Station. These matters are fraught with commercial and political matters beyond Otter Tail's control or ability to unilaterally influence. Without an orderly process for implementing termination of Otter Tail's participation in the plant, there is some potential for disputes amongst the co-owners to arise. Otter Tail is hopeful that a mutually agreeable path can be found, but if it is not, Otter Tail would need sufficient assurances that it could recover any prudently incurred costs of terminating the Plant Ownership Agreement.

As we noted in our Initial Filing, termination of the Plant Ownership Agreement does not cause the automatic termination of the Lignite Sales Agreement (LSA). The LSA and applicable law contain provisions allowing for early termination under certain conditions. If the LSA is terminated early, the agreement provides for the co-owners to buy the membership interests in the mine entity (Coyote Creek Mining Company, L.L.C.) and thereby assume certain of its obligations. Otter Tail projected that in the event of a 2028 buy-out, it would be obligated to pay approximately **$**21.7 million. That figure was used in the Company's modeling, and is a forecast based on current assumptions. That figure remains unchanged in this Supplemental Filing; it was used in the Company's modeling. Any actual buy-out amount would be calculated in the future based on the actual termination date of the LSA and would depend on conditions at the time. As with any contractual termination, there is always the potential for disputes.[32] These costs would need to be recoverable should Otter Tail move forward with a withdrawal.

Cost Impacts of Withdrawal from Coyote Station

The economic analysis that we developed in our Initial Filing provided a conservative estimate of the reasonably foreseeable costs of withdrawing from Coyote Station at the end of 2028 of $68.5 million. That figure remains largely the same, estimated as follows:

[32] As is the case in any situation involving the early termination of a contract there is a risk of litigation. Otter Tail has not included the costs of potential litigation in its modeling.

Supplemental Table 5-3: Coyote Station Estimated Foreseeable Withdrawal Costs

OTP Share	**Forecast (in millions)**	
Coyote Station [33]	**YE 2040**	**YE 2028**
Book Value (non-land accts 311-316)	(13.4)	$33.4
2041 Decommissioning/Salvage*	$13.4	$13.4
LSA Early Termination Costs	$0	$21.7
Total For Withdrawal	**$0.0**	**$68.5**
*This is the Coyote End of Life book value collected and accumulated in our current depreciation rates for the decommissioning of the plant. Note: Does not include any: (1) ancillary costs of withdrawal such as loss of plant-related transmission rights or other operational matters; (2) any potential costs of disputes; (3) any unforeseen liabilities.		
Project Book Balances in 2023: March 31, 2023: $58.31M YE 2023: $55.21M		

The $68.5 million figure does not consider: (1) ancillary impacts to Otter Tail's costs due to withdrawal; (2) any costs related to disputes between the co-owners and Otter Tail or between North American Coal or Otter Tail; and (3) any unforeseen or retained liabilities other than undepreciated net book value of the plant. If Otter Tail commences the process of withdrawing from Coyote Station, we expect to obtain more clarity on these costs and refine our economic assessment as part of the process of withdrawal. There are two general cost categories to Otter Tail's withdrawal: (1) undepreciated net book value, and (2) early termination costs under the LSA. The undepreciated net book value is based on Coyote Station's remaining depreciable life which currently extends to 2041.[34]

As noted above, Otter Tail's remaining net plant balance of approximately $55 million is being depreciated over the current remaining life of the plant. Any withdrawal from Coyote Station requires consideration of how (and when) to recover the undepreciated balance. In addition to the undepreciated plant balance there are LSA early termination costs to consider. As noted in our Initial Filing, Otter Tail proposes that LSA termination costs and the undepreciated plant balance be placed within a regulatory asset account,

[33] The year 2028 is provided for the purpose of analysis. It reflects the anticipated deadline for Reginal Haze Rule compliance.
[34] As noted earlier, the original depreciable life of Coyote Station assumed retirement in 2016. The depreciable life was extended at various times during the life of the plant, the last time being in 2013, when the depreciable life was extended by nine years, from 2032 to 2041.

which can serve as a vehicle for recovery. The cost impact to customers would then depend on the amortization schedule by which these expenses are recovered over time. One option is a schedule that aligns with Coyote Station's current retirement date of 2041. This option would have the least impact on ratepayers and would be the Company's preferred option. A similar mechanism was used by the MPUC for the abandonment of Xcel Energy's Prairie Island nuclear facility EPU project. The second option would be to accelerate recovery of the regulatory asset account balance to match the early exit date, which would have greater customer impacts. Additional options would fall on a date between these bookends. The paramount issue is that our Commissions authorize recovery, including a return on the undepreciated regulatory asset.

Other Factors that Could Impact Withdrawal

In addition to the contractual issues discussed above, there are additional factors that could influence the ultimate process and form of any withdrawal from Coyote Station. These variables are dynamic and difficult to predict, especially in combination and we cannot rule out the possibility that some combination of factors, including developments that are not currently contemplated, could produce different results in the future. As we noted in our Initial Filing, regulatory approvals will be a precondition to Otter Tail's withdrawal from Coyote Station. Additionally, the ancillary impacts of withdrawal on Otter Tail's transmission rights will need to be further studied.[35]

Regulatory Approvals

Otter Tail's plan to withdraw from Coyote Station should a large capital investment become necessary is premised and conditioned on the support of the Company's regulators, particularly the state commissions regulating Otter Tail's rates. Regardless of whether a formal framework for review and approval of an IRP exists, it is essential that the Commissions in Minnesota, North Dakota, and South Dakota each support withdrawal and allow Otter Tail to recover the resulting costs in rates. Each state has a different regulatory construct and Otter Tail will work to obtain appropriate guidance from each Commission at the appropriate time.

Environmental Compliance

In 1999, the U.S. Environmental Protection Agency (EPA) published regulations

[35] Upon withdrawal, Otter Tail may need to have alternative transmission arrangements in place, the cost of which are difficult to predict. Our resource planning model does not account for these costs.

implementing Section 169A of the Clean Air Act (CCA) establishing the Regional Haze Rule as the comprehensive visibility protection program for Federal Class I areas.[36] States are required to submit Regional Haze Rule state implementation plans (SIPs) that evaluate reasonable progress in approximately 10-year increments. The first Regional Haze planning period covered the years 2008-2018, while the second planning period covers the timeframe ending in 2028. The EPA has designated five Regional Planning Organizations (RPOs) to assist with the coordination and cooperation needed to address visibility. North Dakota is a member of the Western Regional Air Partnership, which serves as the RPO in 15 western states.[37]

The North Dakota Department of Environmental Quality (North Dakota DEQ) submitted a proposed Regional Haze SIP to EPA on August 10, 2022. Within the SIP, the North Dakota DEQ determined that additional emissions reductions measures are not reasonable to apply at Coyote Station for the second planning period. On August 23, 2022, EPA determined that North Dakota's SIP revision was complete; however, this completeness determination does not constitute a finding on the merits of the submission.

The base assumption in Otter Tail's IRP modeling analysis reflects the fact that North Dakota DEQ does not propose a SIP requiring additional controls on Coyote Station. However, Otter Tail recognizes there is a risk that the EPA may not accept that approach;[38] therefore, Otter Tail also included sensitivities in its modeling for the possibility that the Coyote Station owners will be required to make significant upgrades. If significant upgrades are required, the work of making those upgrades will likely need to begin well before 2028 so that they can be operational by the time of the anticipated compliance deadline of December 2028.

[36] These areas include national parks, memorial parks, and wilderness areas over a certain size. The Regional Haze Rule did not mandate specific milestones or rates of progress, but instead called for states to establish goals that provide for reasonable progress towards achieving natural visibility conditions by the year 2064.
[37] Minnesota is a member of the Central Regional Air Planning Association.
[38] In May 2022 public comments on the North Dakota SIP the EPA stated that North Dakota should reassess the determination that additional controls are not necessary. Otter Tail is not quantifying the risk the EPA will not accept North Dakota's approach, nor is it taking a position in this filing as to what action the EPA should or should not take.

Otter Tail Capacity Needs
The future is uncertain and changes to Otter Tail's capacity needs could require adjustments to its Supplemental Preferred Plan. Otter Tail will continue to monitor its needs to ensure it has sufficient generation to meet its obligation of reliable service to its customers.

Operational Matters
As we noted in our Initial Filing if Coyote Station is closed, there are other potential uses for the site. Solar or natural gas generation (two natural gas pipelines are in the vicinity) are two possibilities given the existing transmission interconnection. However, while Otter Tail is open to the concept, there is no agreement among the Coyote Station owners regarding re-use of the site, and such consensus would be necessary for any such development. In addition, state and local preferences and policies would need to be considered. Accordingly, our Supplemental Preferred Plan does not incorporate any predictions or assumptions regarding re-development, and the Company is simply noting the possibility here as it may be relevant to stakeholders and Commissions.

Mitigation of Impacts on the Community
The Company understands the importance of Coyote Station and the adjacent mine to the local community. If there is a withdrawal, we will endeavor to mitigate its impacts. We anticipate that any plans for mitigation will be determined through consultation with community members and elected officials. Included in these impacts will be Otter Tail's need to appropriately transition our workforce currently operating the plant. The transition will depend on the path for withdrawal that would ultimately be chosen. Consequently, we are not able to present any concrete plans in this regard currently.

5.5 Astoria Onsite Fuel Inventory

As noted above in Section 2 "Procedural Background" that portion of our Initial Filing addressing onsite fuel inventory at Astoria Station is more fully addressed in filings made apart from this Supplemental Filing. In Minnesota, Astoria Station onsite fuel storage has been addressed in the current IRP docket with a comment period separate from this Supplemental Filing.[39] In North Dakota, Otter Tail has applied for an Advance

[39] We explained the basis for this bifurcation in an October 4, MPUC 2023 letter filing stating that "[w]e believe it is appropriate to address dual fuel at Astoria Station without delay to strengthen the resilience and availability of the unit during extreme conditions. We believe this is necessary to protect our customers from extreme events and related market volatility. Our preferred plan anticipates 2026 commercial

Determination of Prudence from the ND PSC for an onsite fuel inventory system at Astoria Station. As noted in those filings Astoria Station was constructed to replace the capacity and dispatchable attributes of Otter Tail's Hoot Lake coal-fired generating plant, retired in 2021. Astoria Station functions very well to replace the capacity lost at Hoot Lake, but its dependency on just-in-time delivered fuel limits its ability to serve as a dispatchable hedge against energy market disruptions. Adding the capability for onsite fuel inventory at Astoria Station will provide an important dispatchable-market-hedge attribute that was lost when Hoot Lake was retired.

6 Conclusion

6.1 Supplemental Preferred Plan is in the Public Interest

The Company remains committed to operating its generation facilities as efficiently as practicable while minimizing adverse effects on the environment. The new resources identified in our Supplemental Preferred Plan will meet the Company's needs while maintaining flexibility and limiting the risk of exposure to changes in financial, social and technological factors beyond its control. The Supplemental Preferred Plan maintains flexibility during a period of much uncertainty.

The Supplemental Preferred Plan maintains and enhances system resiliency and corresponding reliability, the importance of which has been demonstrated by events such as the recent Winter Storm Uri and Winter Storm Elliot.

The Supplemental Preferred Plan satisfies the legal and regulatory requirements in the multi-state service territory and allows Otter Tail and its customers to realize the benefits of operating as a single system while recognizing the differing state requirements. The Supplemental Preferred Plan, which includes (a) average annual energy savings of 1.86 percent, (b) 100 MW of surplus interconnection solar in 2027 and 2028, (c) 200 MW of surplus interconnection wind in 2029 time frame, and (d) the authority to withdrawal from Coyote Station if a large capital investment in the plant becomes necessary, satisfies all rules and requirements of each our state jurisdictions and provides a clear concise report to interested parties of what Otter Tail intends to do to satisfy customer needs in

operation of dual fuel at Astoria Station and we are currently engaged in development activities with that target date in mind. Current supply chain issues and inflationary pressures are sufficiently complex that delays on this particular element of our IRP filing would expose our customers to cost increases and would not be in the public interest."

the near term, and identifies the resources the Company is considering for viable options for the long term.

6.2 Socio-Economic Impacts of the Supplemental Preferred Plan

The Supplemental Preferred Plan is a least cost/least-risk plan that meets all statutory and regulatory requirements while providing reliable and affordable electricity to customers. The Supplemental Preferred Plan provides for resilient generation and protects customers from market volatility. The Supplemental Preferred Plan is a reasonable and prudent approach in an increasingly uncertain planning environment.

The Supplemental Preferred Plan supports economic development in the states we do business by keeping costs low and reliability high for commercial and industrial customers so that those customers can invest in greater productivity and growth. Likewise, Otter Tail keeps costs low and reliability high for the residential consumer, recognizing that electricity is a fundamental input to the overall health, welfare, and productivity of society.

The resource additions in the Supplemental Preferred Plan will create construction jobs. We acknowledge that should we withdrawal from ownership in Coyote Station as outlined in this Supplemental Filing there is potential for adverse socio-economic impacts for employees working at Coyote Station, the adjacent mine, and the community in and around Beulah, North Dakota. As the future of the plant becomes clearer, we anticipate that any plans for mitigation will be determined through consultation with community members and elected officials and labor representatives. Included in these impacts will be Otter Tail's need to appropriately transition our workforce currently operating the plant. The transition will depend on the path for withdrawal that will ultimately be chosen.

The Supplemental Preferred Plan will allow us to continue fostering greater awareness and participation in energy efficiency in the homes and businesses the Company serves, helping to meet future energy needs, and avoiding the addition of more expensive generation alternatives. Under this plan the Company will continue to develop an effective demand-side management portfolio, a successful collaboration among Otter Tail and residential, commercial, and industrial customers. These programs provide customers

with economic rates that allow them to be more productive and invest in the regional economy while providing load shifting or shedding capability in times of emergency.

In summary, in terms of socio-economic impact the Supplemental Preferred Plan provides cost-effective, reliable electricity to all classes of customers, preserves and creates jobs in the utility industry, and reduces emissions, all while being responsive to the varied concerns of our stakeholders. Greater detail regarding impacts of specific projects within the plan will be addressed as those projects are developed.

6.3 Five-Year Action Plan

The Supplemental Preferred Plan will require considerable activity within the next five years to bring about the resources previously approved and those selected in the plan. Table 6-1 identifies some of the more major activities and the approximate timelines for those activities. Some of these activities are already underway. There are many other related activities that will be taking place to support the major items identified in the table that will involve many stakeholders, regulatory agencies, and interested parties.

Table 6-1 -Five Year Action Plan

Year	Activity
2023	Commercial operation of Hoot Lake Solar
2024	Continue to monitor need for large capital investment in Coyote Station and commence withdrawal if such investment becomes necessary
2025	- MISO interconnection process for first 100 MW solar project. Engineering and procurement for Astoria onsite fuel project. - Continue to monitor need for large capital investment in Coyote Station and commence withdrawal if such investment becomes necessary
2026	- Engineering and procurement for first 100 MW solar project. - MISO interconnection process for second 100 MW solar project. - Construction and commercial operation of Astoria onsite fuel project - Continue to monitor need for large capital investment in Coyote Station and commence withdrawal if such investment becomes necessary
2027	- Construction and commercial operation of first 100 MW solar project. - Engineering and procurement for second 100 MW solar project. - MISO interconnection process for 200 MW wind project. - Continue to monitor need for large capital investment in Coyote Station and commence process of withdrawal if such investment becomes necessary
2028	- Construction and commercial operation of second 100 MW solar project. - Engineering and procurement for 200 MW wind project. - Continue to monitor need for large capital investment in Coyote Station and commence process of withdrawal if such investment becomes necessary