BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

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In the Matter of Otter Tail Power Company's 2017–2031 Integrated Resource Plan

ISSUE DATE: April 26, 2017

DOCKET NO. E-017/RP-16-386

ORDER APPROVING PLAN WITH MODIFICATIONS AND SETTING REQUIREMENTS FOR NEXT RESOURCE PLAN

## PROCEDURAL HISTORY

On June 1, 2016, Otter Tail Power Company (Otter Tail or the Company) filed its 2017–2031 resource plan under Minn. Stat. § 216B.2422 and Minn. R. Ch. 7843.

On October 6, 2016, the Division of Energy Resources of the Department of Commerce (the Department), and the Clean Energy Organizations filed comments on Otter Tail's plan.[1]

The Department recommended approval with modifications and requested that Otter Tail file updated planning models and additional forecast data. The Clean Energy Organizations recommended delaying approval of Otter Tail's proposal to construct a 248 MW simple cycle natural gas combustion turbine to replace its retiring Hoot Lake Plant, and recommended requiring Otter Tail to acquire 200 additional megawatts (MW) of wind and to increase its energy efficiency goal.

On December 5, 2016, the Commission received reply comments from Otter Tail, the Midwest Large Energy Consumers, the Clean Energy Organizations, and the Department.

In its reply comments, Otter Tail included modifications to its proposed resource plan in response to the Department's comments and emphasized the need for a dispatchable unit to cost-effectively replace the capacity of the Hoot Lake Plant. The Clean Energy Organizations concurred with the Department's recommended energy efficiency goal of 46.8 gigawatt-hours. The Midwest Large Energy Consumers recommended approval of Otter Tail's proposed resource plan.

On March 16, 2017, the Commission met to consider the resource plan.

[1] The Clean Energy Organizations are Fresh Energy, Minnesota Center for Environmental Advocacy, Sierra Club, and Wind on the Wires.

## FINDINGS AND CONCLUSIONS

## I. Background

### A. The Resource-Planning Process

The resource-planning statute and rules are detailed, but basically they require a utility to file biennial reports on (1) the projected energy needs of its service area over the next 15 years; (2) its plans for meeting projected need; (3) the analytical process it used to develop its plans for meeting projected need; and (4) its reasons for adopting the specific resource mix proposed to meet projected need.[2]

These requirements are designed to strengthen utilities' long-term planning processes by providing input from the public, other regulatory agencies, and the Commission. They are also designed to ensure that utilities give adequate consideration to factors whose public policy importance has grown in recent years, such as the environmental and socioeconomic impact of different resource mixes. For example, the statute requires utilities to develop plans for meeting 50% and 75% of new and refurbished capacity needs with conservation and renewable energy.[3] It also requires them to factor into resource decisions the environmental costs, or externalities, of different generation technologies.[4]

Although the Commission must approve, reject, or modify the resource plans of investor-owned utilities, the resource-planning process is largely collaborative and iterative.

The process is collaborative because there are a wide array wide of facts and considerations that may be relevant to resource choices or deployment timetables. The facts on which resource decisions depend — how quickly an area and its need for electricity will grow, how much electricity will cost over the lifetime of a generating facility or a purchased-power contract, how much conservation potential the service area holds and at what cost — all require the kind of careful judgment that sharpens with exposure to the views of engaged and knowledgeable stakeholders.

The process is iterative because analyzing future energy needs and preparing to meet them is not a static process; strategies for meeting future needs are always evolving in response to changes in actual conditions in the service area. When demographics, economics, technologies, or environmental regulations change, so do a utility's resource needs and its strategies for meeting them.

## II. Otter Tail Power Company

Otter Tail is an investor-owned utility headquartered in Fergus Falls, Minnesota. The Company serves approximately 128,000 retail customers in a 70,000-square-mile rural service area in Minnesota, North Dakota, and South Dakota. About 47 percent of Otter Tail's retail customers are in Minnesota.

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[2] Minn. Stat. §216B.2422; Minn. R. Ch 7843.

[3] Minn. Stat. § 216B.2422, subd. 2.

[4] *Id.*, subd. 3.

Otter Tail's major generation resources include two jointly owned coal-fired power plants, one solely owned coal-fired power plant, three wind farms, long-term purchased power agreements with two more wind farms, a simple-cycle gas combustion turbine, oil-fired peakers and other purchased-power agreements.

The Company's service territory is within the footprint of the Midcontinent Independent System Operator (MISO), which operates the Midwestern transmission grid. As a MISO member, Otter Tail is able to purchase wholesale energy on MISO's day-ahead market when doing so is more cost-effective than using its own generation.

## III. Otter Tail's Resource Plan – Five-Year Action Plan

Otter Tail projects a growing capacity deficit, beginning in 2017 and increasing over the next fifteen years. The near-term deficit coincides with the 2021 planned retirement of the Company's Hoot Lake Plant located in Fergus Falls — the Company's only coal-fired power plant in Minnesota.

To address future capacity deficits and to replace the capacity and energy components of the Hoot Lake Plant, as well as an expiring 50 MW bilateral capacity purchase, Otter Tail's resource plan included a five-year action plan to construct a 250 MW simple-cycle natural gas combustion turbine, procure 100 MW of wind in 2018, another 100 MW of wind in 2020, and 30 MW of solar by 2020 to comply with Minnesota's Solar Energy Standard.[5] The plan also included a proposal to meet the statutory energy-efficiency goal of 1.5 percent of gross annual retail energy sales.[6]

The Company's current resource plan filing closely coincides with, and furthers the implementation of, its prior resource plan, as approved by the Commission. That plan included retiring and replacing Hoot Lake in 2021, adding 200 MW of intermediate capacity and associated energy, and adding up to 300 MW of wind in the 2017–2021 timeframe, subject to need and cost-effectiveness.[7]

After its initial filing in this docket, the Company revised its load and forecasting data in response to the Department's request that the Company update its weather inputs (how it used sales to create weather station allocation factors), include yearly variables (affecting how sales are accounted for), add a trend line (to show trends in use over the planning period), and account for serial correlation (output patterns often caused by flaws in the model). According to the Company, the updates changed the forecast by less than one-half of one percent in each year of the study period and showed that the forecast remained within the high and low sensitivity bounds included in its original filing.

While the Clean Energy Organizations initially claimed that Otter Tail had overstated its need for additional resources, by the time the Commission met to consider the matter, no party objected to use of Otter Tail's demand and energy forecasts, and the Department recommended that the

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[5] Minn. Stat. § 216B.1692, subd. 2f.

[6] Minn. Stat. § 216B.241, subd. 1c(b).

[7] *In the Matter of Otter Tail Power Company's 2014-2028 Resource Plan*, Docket No. E-017/RP-13-961, Order Approving Plan with Modifications and Setting Requirements for Next Resource Plan (December 5, 2014).

Commission find the forecasts acceptable for planning purposes.[8] The Clean Energy Organizations did, however, challenge Otter Tail's inclusion of a 248 MW simple-cycle natural gas combustion turbine to address capacity needs in lieu of a renewable energy resource.

And the parties ultimately concurred that an annual energy savings goal of 46.8 gigawatt-hours (GWh), or approximately 1.6 percent, during the five-year action plan period was within the Company's reach.[9] The Department acknowledged that the goal is aggressive but explained that this amount of demand-side management reduced Otter Tail's system costs. Higher energy savings scenarios would increase system costs and were less likely to be achieved by the Company.

### A. The Department

The Department recommended that the Commission approve a five-year action plan that includes 200 MW of wind in the 2018–2020 timeframe, 250 MW of peaking capacity, and 30 MW of solar in 2020, consistent with Otter Tail's proposal.

The Department evaluated Otter Tail's forecast models and results for reasonableness, explaining that Otter Tail developed both energy-sales and demand forecasts using regression analysis, a statistical technique used to forecast changes in variables. Specifically, the Company developed an energy sales model using data on historical monthly use per customer and a customer count, resulting in customer-class forecasts used to forecast total system energy sales. To forecast system peak demand, the Company used monthly demand proxy variables and weather variables, as well as estimates of pipeline and industrial peak demand, which showed growth in both summer and winter peak demand over the planning period.

Because the Company claimed that its winter peak demand is offset by its winter demand-response resources (load management and load shedding), the Department concurred with the Company's decision to focus on planning for the projected increase of 1.23 percent in summer peak demand.[10] That growth, along with the planned retirement of the Hoot Lake Plant and the Company's MISO reserve obligation, produces a net capacity deficit as shown in the table below.

[8] The Clean Energy Organizations recommended that Otter Tail be required, in its next resource plan filing, to include a transparent methodology to reflect the load associated with pipelines to ensure that load forecasting based on pipeline sales is clearer.

[9] Minn. Stat. § 216B.241, the Conservation Improvement Program statute, sets an annual energy savings goal of 1.5 percent of gross annual retail sales for each utility.

[10] The Department noted that under MISO's reliability framework, the Company's peak demand is discounted, meaning that Otter Tail is allowed to have fewer resources that its own peak demand. But the Company chose to have enough resources to meet its forecasted load rather than the lower amount required by MISO, a reasonable decision considering the Company's explanation that the MISO numbers change every year and that the difference between the MISO peak and the Company's peak is covered by the forecast band.

**Summer 2017-2031 Load and Capability Prior to Preferred Plan (MW)**

| | Obligation | Total | Net |
|---|---|---|---|
| **2017** | 795.1 | 773.2 | (21.9) |
| **2018** | 801.8 | 772.8 | (29.0) |
| **2019** | 833.4 | 761.3 | (72.1) |
| **2020** | 840.7 | 761.3 | (79.4) |
| **2021** | 848.2 | 574.9 | (273.3) |
| **2022** | 855.0 | 575.9 | (279.1) |
| **2023** | 861.8 | 575.9 | (285.9) |
| **2024** | 878.5 | 575.9 | (302.6) |
| **2025** | 895.3 | 576.9 | (318.4) |
| **2026** | 902.4 | 577.9 | (324.5) |
| **2027** | 909.6 | 578.9 | (330.7) |
| **2028** | 916.7 | 578.9 | (337.8) |
| **2029** | 923.9 | 576.3 | (347.6) |
| **2030** | 931.0 | 577.3 | (353.7) |
| **2031** | 938.2 | 578.3 | (359.9) |

The Department stated that based on the Company's projections, the amount of capacity Otter Tail proposes to add is in line with its expected net capacity deficit, considering accredited capacity. The total nameplate capacity (480 MW) comes from 200 MW of wind, 250 MW of natural gas, and 30 MW of solar. But MISO counts *accredited* capacity for planning purposes. For wind, accredited capacity is approximately 16 percent of nameplate, and for solar, it is approximately 50 percent of nameplate. And while the numbers in the table do not account for demand-side management (DSM) programs that would be utilized to achieve energy savings, DSM was subsequently factored into the modeling the Company conducted to address its resource needs.

The Company used a capacity expansion modeling tool, Strategist, to model the least-cost mixture of supply-side and demand-side resources for meeting its resource needs. The Department scrutinized the results of the Strategist modeling by replicating the results, modifying the base case, assessing the results of possible scenarios, and running new scenarios to test the robustness of the preferred case. The Department then analyzed whether the Company's proposed plan is reliable, low-cost and low-impact, and whether modifications to the plan were warranted.

The Department studied the 30 scenarios evaluated by Otter Tail in its Strategist modeling and concurred with the Company that the results support Otter Tail's proposal to replace the capacity and energy components of the Hoot Lake Power Plant with a 248 MW combustion turbine unit and 200 MW of wind — creating a reliable and low-cost resource mix that would help the Company achieve Minnesota's greenhouse gas reduction goals.[11]

[11] Minn. Stat. § 216H.02.

According to the Department, Otter Tail experimented with differing levels of energy savings, wind, and solar, and demonstrated that a reasonable combination of these resources does not eliminate the need for a capacity resource, i.e., peaking capacity such as a combustion turbine, in the Company's five-year action plan. And the Department emphasized that the Company obtained approval of an additional resource to meet the capacity need arising from the retiring Hoot Lake Plant in its previous resource plan.

Additionally, the Department did not recommend use of bilateral purchased power agreements as a resource in lieu of the combustion turbine, noting the price risk involved for Otter Tail's customers. Long-term contracts could provide competitive pricing in the near term, but years into the contract market prices could drop, leaving the Company with comparatively higher fixed prices and no option for exiting the contract. The Department also reiterated, however, that the Company bears the burden to ultimately demonstrate, in a subsequent rate case, that its decision to add a combustion turbine was prudent and that cost recovery is warranted.

### B. The Clean Energy Organizations

The Clean Energy Organizations recommended that the Commission reject Otter Tail's proposal to include a 250 MW natural gas combustion turbine as part of its resource plan. They emphasized the need to further explore the use of renewable energy alternatives, consistent with the policy preference for renewable energy unless a utility demonstrates that a renewable energy facility is not in the public interest.[12]

Specifically, the Clean Energy Organizations claimed that Otter Tail did not fully and quantitatively explore options other than a gas plant, such as combinations of wind, solar, energy efficiency, demand response, storage, distributed generation, and bilateral contracts. They also contended that at a minimum, the Company should have explained why bilateral contracts to meet capacity needs would be too expensive or not available, consistent with the Commission's directive in the Company's last resource plan to obtain 200 MW of intermediate capacity through construction of a facility, or through bilateral contracts, whichever is most cost-effective.

The Clean Energy Organizations recognized that bilateral contracts might include coal or gas, but maintained that contracts would be a more favorable outcome than adding new infrastructure such as a 40-year gas plant that would likely be retired before the end of its economic life. And they challenged Otter Tail's claim that short-term contracts could expose their customers to higher costs, stating that the market-exposure argument offered by Otter Tail was unconvincing and did not withstand scrutiny under the renewable energy preference statute.[13] As a result, they opposed Otter Tail's decision to include a natural gas plant, claiming that Otter Tail did not meet its burden to show why a renewable resource is not in the public interest as required by statute. At hearing, however, they acknowledged that the record had been supplemented sufficiently to support a Commission finding that the burden has been met.[14]

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[12] Minn. Stat. § 216B.2422, subd. 4.

[13] *Id.*

[14] *Id.*

### C. Midwest Large Energy Consumers

The Midwest Large Energy Consumers recommended that the Commission approve Otter Tail's resource plan, including the Company's proposed five-year action plan.

They countered the claim by the Clean Energy Organizations that Otter Tail's modeling was flawed and that it does not support the addition of a natural gas plant. They stated that in lieu of a 250 MW gas plant, an additional 500 MW of solar and 1,000 MW of wind (assuming accredited capacity of 50 percent for solar and 25 percent for wind) would be needed. Considering that the Company's peak demand total is 800 MW, the Midwest Large Energy Consumers stated that such a plan is not cost-effective, would put reliability at risk, and would jeopardize the Company's ability to recover the costs of such a plan from its two other jurisdictions (North and South Dakota), which do not allow consideration of environmental externalities.

### D. Commission Action

The Commission is persuaded that the Company's five-year action plan, accompanied by the Department's analysis of that plan, is a thorough consideration of the relevant factors governing the resource planning process and contains a reasonable set of resource options for meeting the Company's projected capacity deficits. And the Commission finds that the Company's demand and net energy forecasts are acceptable for planning purposes.

The Department noted that the Company included a mix of both renewable and non-renewable resources to replace the energy and capacity components of its retiring Hoot Lake Plant by proposing 200 MW of wind and 250 MW of natural gas. The Company analyzed the possibility of additional renewable resources and energy savings, but in the modeling replicated by the Department, the natural gas combustion turbine remained in the resource mix as the most cost-effective option relative to the Company's needs. Replacing its only coal-fired plant in Minnesota with a renewable energy component and a natural gas combustion turbine peaking plant reasonably balances renewable energy policy goals, reliability, and cost-effectiveness. In addition, the Company is adding 30 MW of solar (to meet the SES) prior to installation of the gas plant.

With the addition of 200 MW of wind, the Company will be on track to meet the Renewable Energy Standard, which requires a public utility – such as Otter Tail – to generate or procure, by 2025, 25 percent of its total retail electric sales using renewable energy technologies.[15]

And while the Clean Energy Organizations supported use of bilateral contracts in lieu of a new natural gas plant, contracts are likely to include coal or natural gas as the resource supply, not necessarily renewable energy resources. Whether to construct a natural gas plant or use bilateral contracts is relevant to the prudence of Otter Tail's decision and whether the Company can subsequently demonstrate in a future rate case that its decision to construct a natural gas plant was prudent and that cost recovery is warranted.

In this case, the Company explained that it considered the use of bilateral contracts, forecasted energy prices, and determined that bilateral contracts were not more cost-effective than building a power plant. Further, reliance on short-term contracts can subject the long-term planning

[15] Minn. Stat. § 216B.1691, subd. 2a.

process to shorter-term market volatility as contracts expire and market prices and resource availability change. And long-term contracts also carry price risks. Contract prices that are not competitive due to subsequent changes in market prices could result in higher long-term prices for Otter Tail's customers.

Finally, the parties concurred that an annual energy savings goal of 46.8 gigawatt-hours (GWh), or approximately 1.6 percent, during the five-year action plan period was within the Company's reach. The Department stated that 46.8 GWh is the most cost-effective amount in the Strategist analysis (higher energy savings would increase costs) and that Otter Tail has only surpassed the Department's proposed energy savings level of 46.8 GWh once, in 2015.

For all these reasons, the Commission will approve a five-year action plan that includes the addition of the following:

- 200 MW of wind in the 2018–2020 timeframe;
- 30 MW of solar in about 2020;
- Up to 250 MW of peaking capacity; and
- An average annual energy savings of 46.8 GWh (1.6 percent of retail sales).

## IV. Additional Wind

In addition to the amount of wind included in the five-year action plan described above, the parties concurred that authorization for additional wind in the 2022 to 2023 time period is supported by the Company's Strategist modeling, which selected additional wind as a cost-effective tool for mitigating spot-market exposure. According to the Department, the modeling consistently selected an additional 100 MW of wind in 2022 and another 100 MW of wind in 2023. The Company concurred on adding additional wind in this timeframe, if needed and cost-effective.

The Commission concurs with the parties' analyses on this issue and will modify Otter Tail's plan to include an additional 100 MW to 200 MW of wind in the 2022 to 2023 timeframe, if needed and cost-effective.

## V. Environmental Regulations

The Department evaluates utility resource plan filings for compliance with pending state and federal environmental legislation and concluded that Otter Tail is adequately tracking environmental regulations that might impact its operations. These include:

- an Acid Rain Program that aims to reduce emissions of sulfur dioxide and nitrogen oxides;
- National Ambient Air Quality Standards that are applicable to air quality surrounding the Company's facilities;
- Mercury and Air Toxics Standards that are aimed at reducing emissions of mercury and other hazardous air pollutants; and
- the Regional Haze Program that addresses visibility impairment in wilderness areas.

The Department stated that Otter Tail has, where necessary, installed emissions-control equipment and is in compliance with applicable requirements.

Additionally, the Department evaluated Otter Tail's filing to ensure that the Company is monitoring the impact of the Environmental Protection Agency's Clean Power Plan rule on its generation fleet and concluded that with the planned retirement of the Hoot Lake Plant, there are no compliance issues with the Clean Power Plan for the Minnesota portion of Otter Tail's three-state territory.

The Commission concurs with the Department and finds that the Company is adequately tracking environmental regulations that might impact its operations. Additionally, the Commission will direct the Company to address the status of the Clean Power Plan in the states included in Otter Tail's service territory in its next resource plan filing.

## VI. Requirements for Next Filing

The Commission will direct Otter Tail to file its next integrated resource plan no later than June 3, 2019.

In its next filing, the Commission will require that the Company address the items described below.

- ***Clean Power Plan.*** The Commission will require Otter Tail to address the status of Clean Power Plan compliance plans in the states included in the Company's service territory.

- ***Forecast of Pipeline Load.*** The Clean Energy Organizations stated that load forecasting based on pipeline sales should be clearer. The Commission agrees and will therefore require Otter Tail to include a transparent methodology to reflect forecasted load associated with pipelines or pipeline replacements.

- ***New Wind.*** The Commission will require Otter Tail to include a discussion of how incremental levels of new wind could be reasonably procured and worked into the system while maintaining reliability of service.

- ***Capacity Savings.*** The Commission will direct Otter Tail to evaluate capacity savings the Company could achieve via demand-response programs, including additional savings from its existing direct load control programs, and will require Otter Tail to study reliability, price, and technology-based demand-response products.

- ***Direct Load Control Programs.*** The Commission will require Otter Tail to include a discussion of how the identified technical and economic potential for direct load control programs can be integrated into its supply-side and demand-side resource mix. The Commission will also require Otter Tail to provide its strategies to improve on its installed kilowatts as a percentage of technical potential and to include a discussion of any overall and specific program benchmarks.

• ***Oil Peaker Plants.*** The Commission will require Otter Tail to analyze the cost-effectiveness of its oil peaker plants at Jamestown, North Dakota, Units 1 and 2, and Lake Preston, South Dakota, relative to other supply-side and demand-side alternatives as it relates to transmission constraints.

## VII. Conclusion

For all the reasons set forth above, the Commission will approve Otter Tail's resource plan, as amended in the ordering paragraphs below.

## ORDER

1. The Commission hereby approves Otter Tail Power Company's 2017–2031 Integrated Resource Plan, as modified below.

2. The Commission finds that the Company's demand and net energy forecasts are acceptable for planning purposes.

3. Otter Tail shall file its next integrated resource plan no later than June 3, 2019.

4. The Commission hereby approves a five-year action plan that includes the addition of:

   a. 200 MW of wind in the 2018 to 2020 timeframe;

   b. 30 MW of solar in about 2020;

   c. Up to 250 MW of peaking capacity in 2021; and

   d. Average annual energy savings of 46.8 GWh (1.6 percent of retail sales).

5. The Commission hereby modifies Otter Tail's integrated resource plan to include 100 MW to 200 MW of wind in the 2022 to 2023 timeframe. This does not preclude additional wind during the five-year action plan period.

6. The Commission hereby finds that Otter Tail is adequately tracking environmental regulations that might impact its operations.

7. Otter Tail must include in its next resource plan filing:

   a. a transparent methodology to reflect forecasted load associated with pipelines or pipeline replacements.

   b. a discussion of how incremental levels of new wind could be reasonably procured and worked into the system while maintaining reliability of service.

   c. an evaluation of capacity savings the Company could achieve via demand- response programs, including more from its existing direct load control programs. The Company must also study reliability, price, and technology-based demand-response products.

d. a detailed discussion of how the identified technical and economic potential for direct load control programs can be integrated into its supply-side and demand-side resource mix. The Company must also provide its strategies to improve on its installed kilowatts as a percentage of technical potential and include any overall and specific program benchmarks.

e. an analysis of the cost-effectiveness of its oil peaker plants (at Jamestown, North Dakota, Units 1 and 2; and Lake Preston, South Dakota) relative to other supply and demand-side alternatives as it relates to transmission constraints.

f. the status of Clean Power Plan compliance plans in the states included in Otter Tail's service territory.

8. This order shall become effective immediately.

BY ORDER OF THE COMMISSION

Daniel P. Wolf
Executive Secretary

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