STATE OF MINNESOTA BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Katie Sieben Joseph Sullivan Valerie Means Matthew Schuerger John Tuma Chair Vice-Chair Commissioner Commissioner Commissioner

2023 OPTIONAL-IRP COMPLIANCE REPORT OF DAIRYLAND POWER COOPERATIVE PURSUANT TO MINN. STAT. § 216B.2422, SUBD. 2b

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A. O-IRP Requirements

For a Generation and Transmission ("G&T") cooperative, like Dairyland, to be eligible to file an O-IRP report pursuant to Minn. Stat. § 216B.2422, Subd. 2b. in lieu of an Integrated Resource Plan ("IRP") pursuant to Minn. Stat. § 216B.2422, Subd. 2, (1) at least 80% of the G&T cooperative's member distribution cooperatives must be located outside of Minnesota, and (2) the G&T cooperative must provide less than four percent of the electricity annually sold at retail in the state of Minnesota. Dairyland clearly meets these criteria.

1. Dairyland's Minnesota member distribution cooperatives:

Freeborn Mower Electric Cooperative	Albert Lea
People's Energy Cooperative	Oronoco
MiEnergy Cooperative (successor to Tri-County Electric Cooperative)	Rushford

Only three of the twenty-four member distribution cooperatives are located in the state of Minnesota. The remaining twenty-one member distribution cooperatives are located outside of Minnesota, which is 87.5% of the member distribution cooperatives. Dairyland meets the first qualification of having more than 80% of its member distribution cooperatives located outside of Minnesota.

2. Minnesota Retail Sales

According to the compliance summary document for the Renewable Energy Standards, 2022 Minnesota Retail Sales totaled 63,789,417 MWh. Of that statewide total, Dairyland provided 883,054 MWh of electricity sold at retail in Minnesota for 2022. Thus, in 2022, Dairyland provided 1.38% of the electricity annually sold at retail in Minnesota.

Based on the information provided in sections 1 and 2 above, Dairyland is eligible to file an O-IRP report pursuant to Minn. Stat. § 216B.2422, Subd. 2b. in lieu of an IRP.

B. Additional Resource Planning Information Submitted by Dairyland

1. Electric Utility Annual Report for Minnesota Department of Commerce – submitted via email to: rule7610.reports@state.mn.us

C. Load Trends

Dairyland updates its long-term load forecasts on a two-year cycle prepared in compliance with Rural Utilities Service (RUS) guidelines as stated in 7 CFR, Part 1710, Subpart E of the Federal Register. The last forecast completed under the two-year cycle was finalized in the fall of 2022 and the next load forecast will be completed in the fall of 2024.

Dairyland's energy and peak demand were forecasted to grow at a 0.7% and 0.3% average annual growth rate respectively over the next 20 years from the 2022 Load Forecast.

Dairyland classifies sales to member cooperatives as Class A. Dairyland's Class A energy sales increased at an average of 2.2% over the last five years, while Dairyland's Class A peak demand increased at an average of 2.8% over the same period. This growth is significantly influenced by the one-time Jo-Carroll Energy load addition that Dairyland began serving in April 2018 (more details below). The residential customers of Dairyland's member cooperatives account for the largest portion of Class A energy sales at 56.2% and 79.1% of total Class A customers.

In addition to providing service to its member distribution cooperatives, Dairyland provides wholesale service to 17 municipal utilities and classifies the sales as Class D: Full Requirements. Four of the seventeen municipal utilities are served by Dairyland indirectly through Class A member distribution cooperatives.

Growth and innovation foster sustainable business and long-term value to Dairyland's member cooperatives. In January 2023, Dairyland began providing power supply to Manitowoc Public Utilities (MPU) and Great Lakes Utilities (GLU) in eastern Wisconsin. The addition of MPU and GLU expands Dairyland's system from 17 to 27 municipals. The MPU and GLC capacity is included each season's Load and Capability – the capacity is added to Class A&D Planning Reserve Margin Requirement Plus Capacity Sales. Figure 1 does not include the energy.

Figure 1 shows the breakdown of forecasted energy requirements through 2041 from the 2022 Load Forecast. Historical values are included from 2007 through 2022. Forecast numbers are based on the historical numbers through December 2021.



Figure 1: Dairyland Energy Requirements Composition

In Figure 1, there is an increase in Dairyland's energy sales in 2018. Prior to April 2018, Dairyland served roughly half of the total requirements of Jo Carroll Energy, a Class A Dairyland member cooperative in Illinois. As of April 1, 2018, Dairyland is now serving all the total requirements of Jo Carroll Energy.

The acquisition of a portion of the Alliant Energy territory in southern Minnesota by Freeborn-Mower Electric Cooperative, People's Energy Cooperative and MiEnergy Cooperative will have a similar impact in 2025. Dairyland will begin to serve that acquired load in 2025 and is indicated in Figure 1 and Figure 2 beginning in 2025 and beyond.

D. Current Capacity

Starting in planning year 2023/2024, MISO changed its Resource Adequacy requirements from an annual capacity construct to a seasonal capacity construct. Included in this O-IRP, are four load and capability charts representing Summer, Fall, Winter, and Spring.

Figures 2-5 illustrate Dairyland's forecasted net load and capacity to meet the MISO Resource Adequacy requirements. Off-system capacity sales are added to Dairyland's Class A & D Planning Reserve Margin Requirement in figures 2-5.



Figure 2: Dairyland Load and Capability – Summer Season

Dairyland currently owns or has under contract 1,389.1 MWs of accredited capacity in MISO's summer season. This value is based on the MISO's Seasonal Accredited Capacity (SAC) definition for the rating of schedule 53 resources (generation resources that are not dispatchable intermittent, electric storage, external resources, or use limited resources) and capacity purchases. The SAC ratings of the plants take the last three years' availability over a two-tiered weighting structure. Tier 1 hours are non-tight operating condition hours and Tier 2 are tightest operating conditions (operating margin below 25% threshold) and max generation emergency declarations. Table 1 shows MISO's transition of a two-tiered weighting over the next three planning years.

Table 1: SAC - Tiered Weighting Transition

Planning Year	Tier 1	Tier 2
2023/2024	40%	60%
2024/2025	30%	70%
2025/2026	20%	80%



Figure 3: Dairyland Load and Capability – Fall Season

Dairyland currently owns or has under contract 1,332.4 MWs of accredited capacity in MISO's fall season. This value is based on the MISO's Seasonal Accredited Capacity (SAC) definition for the rating of schedule 53 resources (generation resources that are not dispatchable intermittent, electric storage, external resources, or use limited resources) and capacity purchases. The SAC ratings of the plants take the last three years' availability over a two-tiered weighting structure. Tier 1 hours are non-tight operating condition hours and Tier 2 are tightest operating conditions (operating margin below 25% threshold) and max generation emergency declarations. Refer to Table 1 for MISO's transition of a two-tiered weighting over the next three planning years.



Figure 4: Dairyland Load and Capability – Winter Season

Note: The winter season includes the diversity exchange with Manitoba Hydro in which Dairyland sends capacity to Manitoba Hydro. This obligation is added to Class A & D Planning Reserve Margin Requirement Plus Capacity Sales in the above chart and goes through planning year 2026/2027.

Dairyland currently owns or has under contract 1,387.6 MWs of accredited capacity in MISO's winter season. This value is based on the MISO's Seasonal Accredited Capacity (SAC) definition for the rating of schedule 53 resources (generation resources that are not dispatchable intermittent, electric storage, external resources, or use limited resources) and capacity purchases. The SAC ratings of the plants take the last three years' availability over a two-tiered weighting structure. Tier 1 hours are non-tight operating condition hours and Tier 2 are tightest operating conditions (operating margin below 25% threshold) and max generation emergency declarations. Refer to Table 1 for MISO's transition of a two-tiered weighting over the next three planning years.



Figure 5: Dairyland Load and Capability – Spring Season

Dairyland currently owns or has under contract 1,391.9 MWs of accredited capacity in MISO's spring season. This value is based on the MISO's Seasonal Accredited Capacity (SAC) definition for the rating of schedule 53 resources (generation resources that are not dispatchable intermittent, electric storage, external resources, or use limited resources) and capacity purchases. The SAC ratings of the plants take the last three years' availability over a two-tiered weighting structure. Tier 1 hours are non-tight operating condition hours and Tier 2 are tightest operating conditions (operating margin below 25% threshold) and max generation emergency declarations. Refer to Table 1 for MISO's transition of a two-tiered weighting over the next three planning years.

Table 2 shows the accredited capacity that is owned and purchased by Dairyland to comply with MISO's Resource Adequacy Requirements for 2023, and the fuel type of each resource.

Table 2: Planning Year 2023/2024 Dairyland Seasonal Accredited Capacity

			Summer Accredited	Fall Accredited	Winter Accredited	Spring Accredited
DPC Generation Facility	Fuel Type	Owned or PPA	Capacity MWs	Capacity MWs	Capacity MWs	Capacity MWs
John P. Madgett	Coal	Owned	354.7	322.8	387.6	361.4
Weston 4***	Coal	Owned	162.5	146.6	165.8	149.8
Elk Mound	Natural Gas	Owned	67.9	78.1	77.5	77.2
RockGen	Natural Gas	Owned	491.2	477.9	435.2	472.7
Flambeau**, Sartell Hydroelectric Station, MHEB Diversity Exchange*	Hydro	Owned and PPA	58.8	11.3	9.7	16.7
Wind Farms	Wind	PPA	26.1	38.9	57.2	40.5
Other Renewables	Renewables	PPA	21.5	14.45	4.8	19.2
Demand Response	Demand Response	PPA	39.6	36.1	47.6	38.5
York JCE Engine	Gas Engine	PPA	1.5	1.5	1.4	1.6
Other Energy	Renewable Technology No RECs	PPA	5.5	1.75	0.4	4.8
Municipals	Diesel	PPA	129.8	128	112.4	134.6
Certified Capacity Purchases	Not Specified	PPA	30	75	88	75
Total Accredited Capacity			1389.1	1332.4	1387.6	1392.0
***DPC owns 30% of Weston 4. DPC's net accredited share is shown above.						
**MHEB Diversity Exchange applies to summer and winter seasons.						
* 15% Capacity Sale off of Flambeau.						

E. Capacity Purchases and Sales

For planning year 2023/2024 only, Dairyland contracted for seasonal capacity purchase agreements presented below.

Table 3: Seasonal Capacity Purchases

Planning Year	Summer	Fall	Winter	Spring
	Capacity	Capacity	Capacity	Capacity
	Purchase	Purchase	Purchase	Purchase
	(MW)	(MW)	(MW)	(MW)
2023/2024	30	75	88	75

The capacity purchases are represented in gray in Figures 2-5: Dairyland Load and Capability.

Total amount of Capacity Sale Agreements for each of the following plan years:

	Summer	Fall	Winter	Spring
	Capacity	Capacity	Capacity	Capacity
	Sale	Sale	Sale	Sale
Planning Year	(MW)	(MW)	(MW)	(MW)
2023/2024	400.9	426.2	380.87	465
2024/2025	350.9	351.2	350.9	352
2025/2026	302.9	303.2	302.9	304
2026/2027	277.9	278.2	277.9	279
2027/2028	227.9	228.2	227.9	229
2028/2029	172.9	173.2	172.9	174
2029/2030	172.9	173.2	172.9	174
2030/2031	172.9	173.2	172.9	174
2031/2032	150.9	151.2	150.9	152
2032/2033	150.9	151.2	150.9	152
2033/2034	0.9	1.2	0.9	2.0
2034/2035	0.9	1.2	0.9	2.0
2035/2036	0.9	1.2	0.9	2.0
2036/2037	0.9	1.2	0.9	2.0
2037/2038	0.9	1.2	0.9	2.0
2038/2039	0.9	1.2	0.9	2.0

Table 4: Seasonal Capacity Sales

The capacity sales are added to the Class A & D total planning reserve margin requirement in Figures 2-5: Dairyland Load and Capability.

F. Capacity Additions

1. Member-Owned Distributed Generation

Dairyland permits its member cooperatives to own or purchase a limited amount of distributed generation to reduce their demand for energy. Currently, there are 11.5 MWs of distributed generation in service that reduce member demand plus an additional 4.25 MWs pending. In addition, Dairyland permits member cooperatives to own or purchase a limited amount of distributed generation within their service territory and sell the energy output to Dairyland. Currently, there are 17 MWs of accredited capacity in service. This is shown in Figure 2: Load and Capability and is represented as Member Owned BTMG.

2. Solar Addition

In 2019, Dairyland signed an agreement for the output of 149 MW of solar from the Badger State Solar project located in Jefferson County, WI. Commercial operation is planned for commencement in 2025. Badger State Solar will power over 20,000 homes. In addition, a pollinator habitat is planned for this site.

3. Prospective Solar and Wind Additions

Dairyland is considering adding 50 MW of wind nameplate capacity and 50 MW of solar nameplate capacity starting in 2026. Combined wind and solar will gradually increase to 580 MW nameplate by 2035. The wind and solar capacity under consideration is indicated in the green striped lines in Figures 2-5: Dairyland Load and Capability. Dairyland will continue to work on these potential additions to diversify its portfolio and reduce carbon emissions. If these additions are not successful by the anticipated start dates, Dairyland expects to have enough capacity, but if it were to be short, it would attempt power purchase agreements (PPA) and if that was not successful, it would rely on the MISO Planning Resource Auction for any remaining shortfall.

4. Nemadji Trail Energy Center (NTEC)

Dairyland, Basin Electric Power Cooperative and ALLETE, Inc. are working together on the development of a natural gas combined cycle facility in Superior Wisconsin. The proposed plant is estimated to have an installed capacity of 550-625 MW. Dairyland owns a 50% share of the project, Basin 30% and ALLETE 20%. The facility is intended to enable further development of intermittent renewable resources on each of the utility systems as well as in the upper Midwest. In January of 2020, the project received a Certificate of Public Convenience and Necessity (CPCN) from the Public Service Commission of Wisconsin (WI). The WI Department of Natural Resources is currently reviewing several permit applications for the project. The permit review process is expected to conclude, with the issuance of needed permits in the second half of 2023. The project entered an application with MISO in June 2017 to include the plant in the August 2017 generator interconnection study group. The Generation Interconnection Agreement was executed by all parties in 2020. The exact in-service date is subject to change until the necessary permits have been granted to the project.

G. Surplus/Deficit

Figures 2-5 show Dairyland's forecasted net load and capability to meet the MISO Resource Adequacy requirements. Dairyland has adequate resources to meet the Class A & D planning forecast requirement for the 2023/2024 planning year. If future planning years included in this report forecasts a deficit, Dairyland anticipates that it will fill projected capacity needs to meet its planning reserve margin requirement through project development, bilateral capacity exchanges, bilateral renewable or conventional power purchase agreements and through purchases from MISO's Planning Resource Auction. The capacity volume filled by each type of resource identified above will be adjusted as load changes and specific resources are added to the portfolio

H. Renewable Generation Summary

Dairyland owns or purchases a variety of renewable generation including hydroelectric, wind, landfill gas, animal waste gas, and solar. Dairyland intends to meet its renewable obligations in all the states where Dairyland provides wholesale service¹. For Minnesota, Dairyland files

renewable compliance documents each year to demonstrate compliance with Minn. Stat. § 216B.1691. In addition, Dairyland files biennial compliance documents in Minnesota detailing Dairyland's renewable compliance efforts. Each of these reports along with this O-IRP Report provides a basis for evaluating Dairyland's renewable compliance position in Minnesota. In addition to the renewable standards, Dairyland has a green energy program (Evergreen Program) that is separate from state requirements.

Dairyland's projected renewable generation and existing renewable requirements are provided in Figure 3. An estimate of Evergreen Program sales is also provided in Figure 3 in addition to the state renewable obligations. The Current Renewable Generation Forecast shown in Figures 2-5 includes an annual estimate of the renewable generation from projects that are currently in Dairyland's renewable generation portfolio, along with prospective renewable projects.

¹ Iowa and Illinois do not have renewable energy requirements applicable to Dairyland.





Dairyland notes that with the resources it has in place now along with the additional planned resources, it will have a renewable certificate surplus in 2023, as well as subsequent planning years. As shown in Figure 3, assuming all other existing renewable projects and contracts continue to be in place and operate along with the prospective solar and wind additions, Dairyland will have enough renewable resources in place to not only meet all its obligations but exceed them in each year of the planning period by a significant margin, resulting in a renewable certificate surplus.

As part of Dairyland's resource planning efforts, Dairyland is continually evaluating and assessing new renewable resources and technologies. Dairyland also continues to evaluate the reliability impacts of adding new intermittent renewable resources in its system and the corresponding cost impacts as seen through the hourly locational marginal prices (LMPs) at each existing renewable facility's commercial pricing node. Dairyland models potential new resource dispatch scenarios (renewable and conventional) against hourly LMP forecasts to assess the full costs and benefits of acquiring new renewable generation. Dairyland will continue to consider self-build projects and work with cooperative members, independent power producers, and others to expand and maintain its robust and diversified renewable generation portfolio in a cost-

efficient manner. Dairyland's efforts have been detailed in numerous annual and biennial docket submittals since the REO and RES became law.

In 2023, the Carbon-free standard (CFS) became law. Dairyland has a diverse energy supply portfolio including solar, wind, and hydro that are eligible carbon-free technologies. Additional renewable projects are continuously being evaluated based on economic and environmental impacts for meeting the RES and CFS, as well as, Dairyland's own carbon reduction goal of 50% by 2030 from 2005 levels. In addition to Dairyland's current renewable energy supply and planned renewable/carbon-free additions, Dairyland has a large Renewable Energy Certificate (REC) inventory to aid in meeting these requirements now and well into the future and still have a surplus.

I. Innovation and New Technologies

Dairyland is exploring new technologies that provide grid reliability and are environmentally responsible. New technologies such as batteries and pumped hydro storage are being evaluated. Dairyland recognizes new technologies and innovation are key to a reliable, clean environmentally responsible future. New opportunities will continue to be examined that show potential to provide cost effective renewable/carbon-free resources.

J. Community Solar

Dairyland's member cooperatives have added community solar projects to their distribution systems. As of May 2023, there are a total of 39 different sites operational with a total nameplate capacity of 29.0 MW AC.

K. Consumer-Owned Distributed Generation (DG)

Dairyland has implemented a small renewable tariff (net metering for projects under 40 kW) that is available to retail members of Dairyland's Minnesota member distribution cooperatives. In the entire Dairyland system there are 3,998 member-owned solar and wind projects having a nameplate capacity size of less than 40 kilowatts each. Through 2022, retail members of Dairyland's member distribution cooperatives installed 47.4 MW of distributed solar projects and 1 MW of wind. Dairyland does not receive the renewable energy certificates from these facilities.

Displayed in Figure 5, the number of member-owned solar DG installations (<40 kW) continues to increase on the Dairyland system with solar representing nearly 98% of all DG installations at the end of 2022.



Figure 7: Dairyland Cumulative Installations of DG

L. Energy Efficiency

Dairyland will be filing the Energy Conservation and Optimization (formerly Conservation Improvement Program) compliance filing with the Minnesota Division of Energy Resources by July 1, 2023. Compliance is achieved as Dairyland and its member cooperatives encourage energy users in Dairyland's service territory to conserve energy by providing incentives on energy efficient appliances, appliance recycling, heating equipment, lighting, water heating, agricultural, commercial, and industrial equipment. An incentive is also available for homes implementing measures recommended in an audit and for new homes that meet the requirements of the Touchstone Energy Home program. Dairyland's Incentive Program is also encouraging beneficial electrification by incenting EV charging stations providing measures can be taken to keep the charger off-peak. Custom incentives are also available for agricultural, commercial, and industrial equipment not covered under the above listed prescriptive incentives.

M. Load Management

Dairyland's resource portfolio also consists of both registered and unregistered demand-side resources coordinated through its Load Management system to achieve economic, operational, and sustainability benefits for the cooperative membership. Load management puts energy conservation to work through active management of residential, agricultural, commercial, and

industrial loads. This can improve grid sustainability by better aligning electricity needs to the availability of intermittent renewable resources, such as wind and solar. Additionally, energy consumption can be shifted to periods of lower energy pricing, and system-wide peak demands are lowered, which can alleviate capacity constraints and reduce the overall need for generation infrastructure. Dairyland estimates its total Load Management capacity at approximately 80 MW in the summer and 140 MW in the winter – the equivalent size of a small power plant.

N. Consideration of Environmental Costs

Apart from a relatively small amount of Minnesota renewable generation purchased by Dairyland, all Dairyland's owned or purchased generation is located outside of Minnesota. At this time, Dairyland is not planning to build any generation that would require a Minnesota Certificate of Need; therefore, there are no Minnesota resource options for which an evaluation of environmental values would be required. If Dairyland's plans change regarding new Minnesota resources, it will inform the Commission of the change by no later than the next O-IRP report submittal date.

O. Electric Vehicles

Dairyland has one electric vehicle, and five plug-in hybrid vehicles that are part of its 2023 administrative vehicle pool fleet. Along with those existing assets, Dairyland's Powered Printing organization acquired a fully electric Ford e-Transit van in 2022 for their daily use around the community. Dairyland Power Cooperative will continue to consider the needs of its entire enterprise when choosing Fleet asset types such as hybrid vehicles, electric vehicles, or other technologies to meet the needs and requirements for the enterprise.

P. Beneficial Electrification

Dairyland continues to work with all its member cooperatives being served in Minnesota to expand additional public Level 2 electric vehicle charging infrastructure in strategic places to enable EV ownership. Dairyland also continues to assist school districts with evaluating and implementing electric school buses in their fleets. Since 2018, Dairyland has supported the installation of over 150 EV chargers in rural communities in its service territory which includes Minnesota. These efforts align with Dairyland's goal to reduce carbon emissions.

Q. Conclusion

Dairyland is using a balanced and pragmatic approach to add natural gas generation and renewable generation to meet the future load obligations and continue to diversify the Dairyland generation portfolio. Dairyland intends to use short-term capacity contracts to purchase or sell any short-term capacity deficit or surplus while it continues to evaluate its existing plants and new generation. Dairyland is currently meeting the MISO Resource Adequacy requirements and all the renewable energy obligations and plans to do so in the future.

Dairyland requests that the Commission find and conclude that:

- 1. Dairyland is eligible to submit an O-IRP report because it is a Generation and Transmission ("G&T") cooperative that has at least 80 percent of its member distribution cooperatives located outside of Minnesota and provides less than four percent of the electricity annually sold at retail in the State of Minnesota.
- 2. Dairyland's O-IRP report includes projected demand levels for the next 15 years and generation resources to meet any projected generation deficiencies.

Dairyland also requests that the Commission acknowledge receipt of its O-IRP report, find the report complete, and close this matter.

Dairyland appreciates the opportunity to submit an O-IRP report and hopes the Commission will find that the annual O-IRP report provides an informative overview of the Dairyland system and a timely update on Dairyland's load and capability and associated infrastructure changes.