



12300 Elm Creek Boulevard  
Maple Grove, Minnesota 55369-4718  
763-445-5000  
greatriverenergy.com

July 1, 2024

**VIA EMAIL AND EXPRESS MAIL**

Mr. Steven Kahl  
Executive Secretary  
North Dakota Public Service Commission  
600 E. Boulevard, Dept. 408  
Bismarck, ND 58505-0480

**RE: Great River Energy 10-Year Plan for 2024-2034**

Dear Mr. Kahl:

In accordance with Chapter 69-06-02-02 of the North Dakota Administrative Code, Great River Energy (GRE) hereby gives notice that it has submitted its North Dakota Ten-Year Plan Report, 2024-2034 (Report) to the North Dakota Public Service Commission (Commission) as required under Chapter 49-22-04 of the North Dakota Century Code (NDCC).

The Report details Great River Energy's current electric generation and transmission facilities and future for infrastructure development.

A copy of the Report is available upon request.

Please contact me at (763) 445-6116 or [zruzycki@greenergy.com](mailto:zruzycki@greenergy.com) if you have any questions.

Sincerely,

GREAT RIVER ENERGY

*/s/ Zac Ruzycki*

Zac Ruzycki  
Director, resource planning

Cc: County auditors (4)  
Certificate of Service list

## **Table of Contents**

<b>INTRODUCTION .....</b>	<b>1</b>
<b>SECTION 1: Owned Energy Conversion Facilities.....</b>	<b>1</b>
<b>SECTION 2: Energy Conversion Facilities and Transmission Under Construction .....</b>	<b>3</b>
<b>SECTION 3: Coordinated Regional Plan for Meeting Utility Needs .....</b>	<b>4</b>
<b>SECTION 4: Environmental Protection and Land-Use Planning .....</b>	<b>6</b>
<b>SECTION 5: 10-Year Projected Demand and Assumptions.....</b>	<b>6</b>
<b>SECTION 6: Other Relevant Information.....</b>	<b>8</b>

**Table 1: GRE's Owned Energy Conversion Facilities**

**Table 2: GRE's Existing Electric Transmission Facilities in North Dakota**

**Figure 1: GRE's Owned Energy Conversion Facility Locations**

**Figure 2: GRE's Member Service Territory**

## Table of Exhibits

EXHIBIT 1:	U.S. Department of Energy Form EIA-923.....	10
EXHIBIT 2:	Federal Energy Regulatory Commission Form 714.....	11
EXHIBIT 3:	GRE North Dakota Transmission Map.....	12
EXHIBIT 4:	Projected Load Growth and Forecast Methodology.....	13

## INTRODUCTION

This report was prepared in accordance with the North Dakota Public Service Commission's (Commission) Guidelines (Guidelines) for compliance with the requirements of Chapter 49-22-04 of the North Dakota Century Code. Great River Energy (GRE) offers to provide additional information to the Commission upon request.

### SECTION 1: Owned Energy Conversion Facilities

*A description of the general location, size, and type of all facilities to be owned or operated by the utility during the ensuing 10 years, as well as those facilities to be removed from service during the 10-year period.*

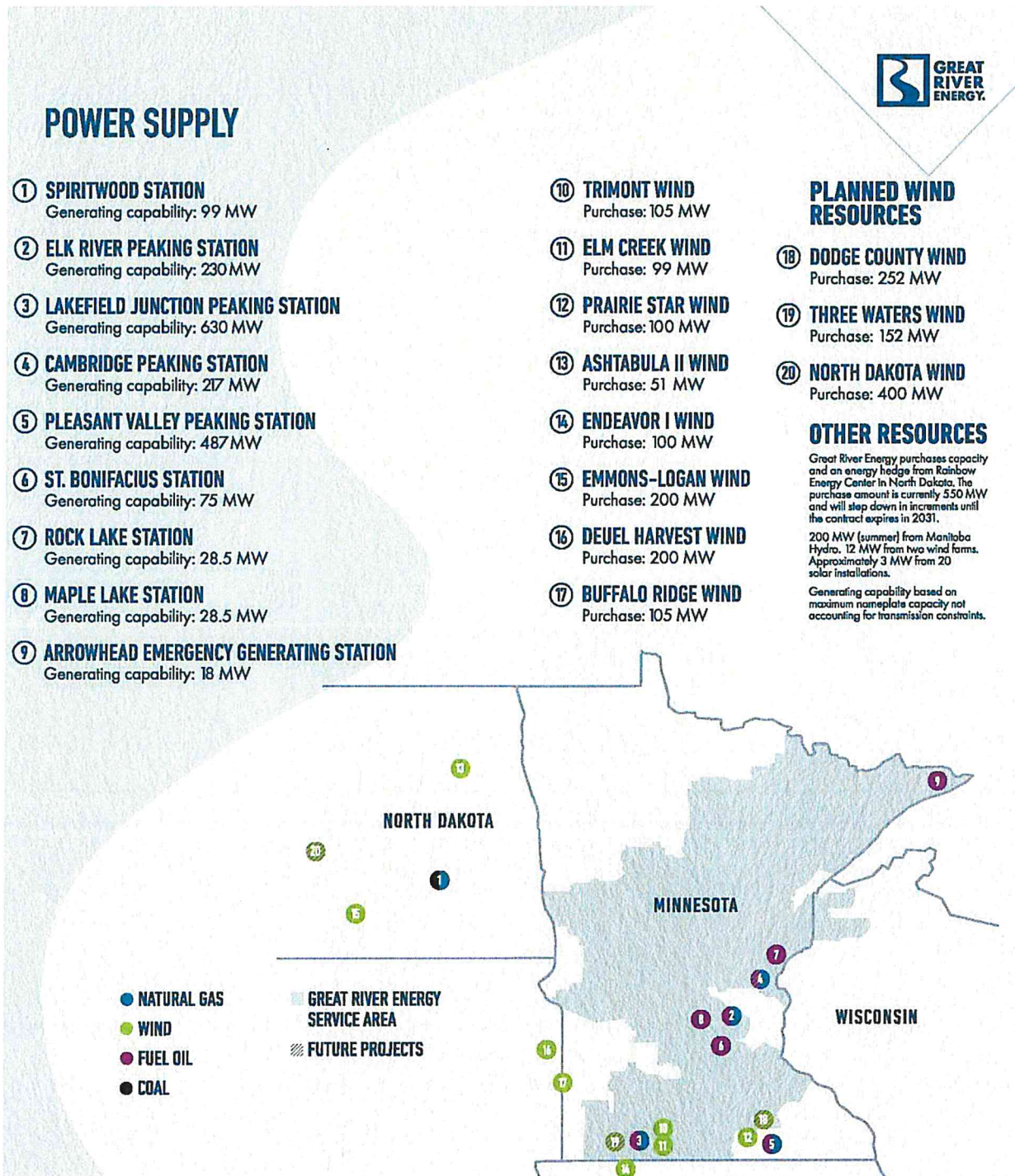
GRE's power supply portfolio is comprised of the following:

- Wind power purchase agreements (PPAs)
- Natural gas (NG) combustion turbines
- Fuel oil (FO) combustion turbines
- Fuel oil emergency reciprocating generators
- Hydroelectric PPAs
- Counterparty energy purchases
- Combined heat and power

**Table 1.** GRE's Owned Energy Conversion Facilities

Generation Facility	Location	Unit	Make	Model(s)	Primary Fuel	Secondary Fuel	Nameplate (MW)
Arrowhead Emergency Station	Colvill, MN	N/A	Cummins	9 reciprocating engine generators	FO	-	18
Cambridge Station	Cambridge, MN	1	GE	MS5001	FO	-	28.5
Cambridge Station	Cambridge, MN	2	Siemens	SGT6-4000F (V84)	NG	FO (2025)	188
Elk River Peaking Station	Elk River, MN	11	Siemens	SGT6-5000F4(A)	NG	FO	230
Lakefield Junction Station	Trimont, MN	1	GE	MS7001EA	NG	FO	105
Lakefield Junction Station	Trimont, MN	2	GE	MS7001EA	NG	FO	105
Lakefield Junction Station	Trimont, MN	3	GE	MS7001EA	NG	FO	105
Lakefield Junction Station	Trimont, MN	4	GE	MS7001EA	NG	FO	105
Lakefield Junction Station	Trimont, MN	5	GE	MS7001EA	NG	FO	105
Lakefield Junction Station	Trimont, MN	6	GE	MS7001EA	NG	FO	105
Lakefield Junction Station	Trimont, MN	D	Caterpillar	Caterpillar	FO	-	2
Maple Lake Station	Maple Lake, MN	1	GE	MS5001	FO	-	28.5
Pleasant Valley Station	Dexter, MN	11	Siemens	SGT6-4000F (V84.3A(2))	NG	FO	188
Pleasant Valley Station	Dexter, MN	12	Siemens	SGT6-4000F (V84.3A(2))	NG	FO	188
Pleasant Valley Station	Dexter, MN	13	Siemens	Westinghouse D501D5A	NG	FO	135
Rock Lake Station	Pine City, MN	1	GE	MS5001	FO	-	28.5
St. Bonifacius Station	Saint Bonifacius, MN	1	P&W	Twin FT4C3	FO	-	75
Spiritwood Station	Spiritwood, ND	1	Siemens	Combined Heat and Power	NG	coal	99

Figure 1. GRE’s Energy Owned and Power Purchase Energy Conversion Facility Locations



GRE has two combustion turbine peaking facilities located in southern Minnesota (Pleasant Valley and Lakefield Junction), five combustion turbine peaking facilities located in central Minnesota (Cambridge, Rock Lake, Maple Lake, St. Bonifacius, and Elk River), and Arrowhead Emergency Station located near Colvill, Minnesota.

GRE's combined heat and power facility, Spiritwood Station, has been retrofitted to allow for 100% natural gas generation. This natural gas retrofit also provides additional fuel flexibility, including co-generation utilizing coal or potentially biomass, if a fuel source can be identified. This conversion maximizes multi-fuel optionality for the purpose of both economics and reliability.

GRE also works with its member-owner cooperatives to develop local renewable resources as well as deploy energy efficiency and demand response programs that make electricity more sustainable, affordable, and reliable. GRE and its member-owners have installed 20 solar installations across Minnesota, including a 250-kilowatt (kW) installation at GRE's Maple Grove, Minnesota, headquarters. Nineteen more GRE-owned 20-kW arrays were installed at our member-owned locations, and nine of those sites were expanded to include member-owner community solar projects. GRE has approximately 360 megawatts of demand response resources in its member portfolio.

Effective August 1, 2023, Members of GRE now have the right to self-supply up to 10% of their power supply requirements from Member Resources (MR) that are distribution interconnected within a Member's Assigned Service Area. There are two types of MRs, Renewable Member Resources (RMR) and Storage Member Resources (SMR).

GRE has not historically owned or operated any wind generation facilities. All wind has been procured through competitive PPAs with for-profit developers. After passage of the Inflation Reduction Act which made direct pay available, in combination with NewERA (empowering rural America), GRE is considering owning wind. The Empowering Rural America (NewERA) program assists rural Americans transition to clean, affordable, and reliable energy. More information on the Inflation Reduction Act and NewERA can be found at [usda.gov](https://www.usda.gov). GRE is not planning to remove any facilities from service during the 10-year period addressed in this plan.

## **SECTION 2: Energy Conversion Facilities and Transmission Under Construction**

*An identification of the location of the tentative preferred site for all electric energy conversion facilities and the tentative location of all electric transmission facilities on which construction is intended to be commenced within the ensuing five years and such other information as may be required by the commission. The site and corridor identification shall be made in compliance with the criteria published by the commission pursuant to section 49-22-05.1.*

GRE's Energy Owned and Power Purchase Energy Conversion Facility Locations can be viewed in [Section 1](#). No additional energy conversion facilities are currently under construction by GRE. GRE continues to evaluate future needs as part of the resource planning process.

GRE regularly tests technologies and business strategies to improve the way it will serve members in the future. An example of this is the Form Energy Storage Pilot Project under development at GRE's Cambridge Station facility. The project consists of a multi-day storage resource with the potential to turn variable sources of renewable energy into dependable, dispatchable energy resources. A battery that discharges over several days could provide electricity long enough to outlast most periods of extreme

weather, which can pose challenges to the grid. The project is scheduled to be operational by the end of 2025.

On December 7, 2023, the Minnesota Public Utilities Commission approved a minor alternation to the site permit, allowing for the conversion of GRE's Cambridge Station unit 2 combustion turbine into a dual fuel capable energy conversion facility. Currently, this is GRE's only large frame combustion turbine without the ability to burn both natural gas and fuel oil. The addition of dual fuel at Cambridge Station is scheduled to be completed by the end of 2025 and will increase reliability and resiliency.

Summary information for GRE's North Dakota transmission facilities is provided in Table 2. Certain information concerning GRE's transmission facilities qualifies as Critical Energy Infrastructure Information (CEII). A map of transmission facilities owned and operated by GRE in North Dakota will be made available upon request as noted in Exhibit 1, subject to the requirements applicable to CEII. GRE transferred ownership of CU HVDC system to Nexus Line, LLC, in 2022. As such, those facilities are no longer being reported by GRE in Table 2.

**Table 2.** GRE's Existing Electric Transmission Facilities in North Dakota

Facility	Voltage	AC/DC	Install Year
Stanton – Leland Olds	230	AC	1966
Stanton – McHenry Tap	230	AC	1966
McHenry Tap – McHenry	230	AC	1966
McHenry – Balta	230	AC	1966
Balta – Ramsey	230	AC	1966
Ramsey – Prairie	230	AC	1966
Stanton – Square Butte	230	AC	1966
McHenry Tap – Coal Creek	230	AC	1979
Stanton – Coal Creek	230	AC	1979

As of 2024, GRE has no plans to retire or construct any new transmission facilities in North Dakota within the next 10 years. GRE intends to interconnect its existing Stanton-Square Butte 230-kV transmission line into Minnesota Power's proposed Nelson Lake Substation. GRE and other North Dakota Transmission Owners are actively engaged in the regional grid operator's ongoing Long-Range Transmission Plan which may identify the need for transmission expansion in North Dakota within the next 10 years.

### **SECTION 3: Coordinated Regional Plan for Meeting Utility Needs**

*A description of the efforts by the utility to coordinate the plan with other utilities so as to provide a coordinated regional plan for meeting the utility needs of the region.*

The electric grid is heavily interconnected and must be evaluated, operated, and expanded in a coordinated manner to assure reliability and cost-effectiveness. GRE's generation and transmission planning are closely coordinated with other organizations. GRE is a member of — and directly participates in — several regional generation and transmission planning entities described below.

*Midcontinent Independent System Operator (MISO)*

MISO is an independent, not-for-profit, member-based organization responsible for operating the power grid across 15 U.S. states and the Canadian province of Manitoba. GRE works very closely with MISO, our region's grid operator, to ensure plans for the electric system reliably serve our members in an affordable manner via several ongoing efforts:

*MISO Transmission Expansion Plan*

This MISO plan is developed through an inclusive and transparent stakeholder process in which GRE is a stakeholder. MISO also conducts Sub-regional Planning Meetings to encourage an open and transparent planning process and to provide a forum for coordination and discussion of transmission issues and proposed projects among utilities and other interested stakeholders.

*MISO Long-Range Transmission Plan (LRTP)*

The LRTP enables MISO to address fleet change, extreme weather events, and other challenges facing the region. The LRTP is one of MISO's four elements in its reliability imperative and establishes a roadmap for long-term energy security. More information on MISO and its ongoing reliability initiatives can be found at [misoenergy.org](https://misoenergy.org).

*Minnesota Transmission Owners (MTO)*

A consortium of 16 sponsoring utilities and three participating government agencies, MTO fulfills the utilities' statutory obligations for transmission planning in the state of Minnesota. These obligations include the development of the Minnesota Biennial Transmission Plan as well as studies associated with meeting the Minnesota Renewable Energy Standard requirements. Further information about the MTO group is available at [minnelectrans.com](https://minnelectrans.com).

*Grid North Partners*

Grid North Partners, an evolution of CapX2020, is a broad mix of 10 investor-owned, not-for-profit cooperative, and municipal utilities working together to ensure continued safe, reliable, and affordable electric service. All partners serve customers in the Upper Midwest and own and operate transmission infrastructure throughout their respective service territories. More information on Grid North Partners can be found at [gridnorthpartners.com](https://gridnorthpartners.com).

*Midwest Reliability Organization (MRO)*

The MRO is a nonprofit organization of regional utilities established to develop regional reliability standards and ensure compliance with standards of the North American Electric Reliability Corporation (NERC) as well as its own standards. Further information about MRO is available at [mro.net](https://mro.net). Further information about NERC can be found [nerc.com](https://nerc.com).

*Integrated resource plan (IRP)*

GRE develops and updates an IRP every two- to-three years. This process utilizes GRE's member load forecasts and pairs load with generation capacity needs. While this process incorporates input from various additional stakeholders, the size, type, and timing of generation capacity need reflects the projected load growth of GRE's members. The IRP does not consider regional energy needs outside of GRE's service territory. GRE's latest IRP update was filed on March 31<sup>st</sup>, 2023, and was accepted by the

Public Utilities Commission on March 8<sup>th</sup>, 2024. More information on the IRP can be found at [greatriverenergy.com](http://greatriverenergy.com).

#### *MISO Regional Resource Assessment (RRA)*

MISO is continuing its RRA effort that uses publicly shared IRPs and goals of the region's electric utilities to develop a 20-year view of the evolving resource mix across the MISO region. This collection of data will provide utilities, state regulatory agencies, and MISO with better insight into the expected resource changes over the coming years. This, in turn, will provide stakeholders with the critical information needed to plan the grid of the future and ensure the continued flow of reliable, low-cost electricity. GRE is a participant in MISO's RRA efforts.

#### *Minnesota Resource Planners*

GRE meets quarterly with resource planners from other regional utilities to discuss generation, transmission, planning, and policy.

### **SECTION 4: Environmental Protection and Land-Use Planning**

*A description of the efforts to involve environmental protection and land-use planning agencies in the planning process, as well as other efforts to identify and minimize environmental problems at the earliest possible stage in the planning process.*

GRE employs a robust stakeholder process when planning new energy resources, and engages and complies with all applicable local, state, and federal agencies prior to siting any new resources or facilities. In addition, GRE engages both internal departments and external qualified services from environmental, engineering, land rights, and legal consulting firms.

### **SECTION 5: 10-Year Projected Demand for Service**

*A statement of the projected demand for the service rendered by the utility for the ensuing 10 years and the underlying assumptions for the projection, with that information being as geographically specific as possible, and a description of the manner and extent to which the utility will meet the projected demands.*

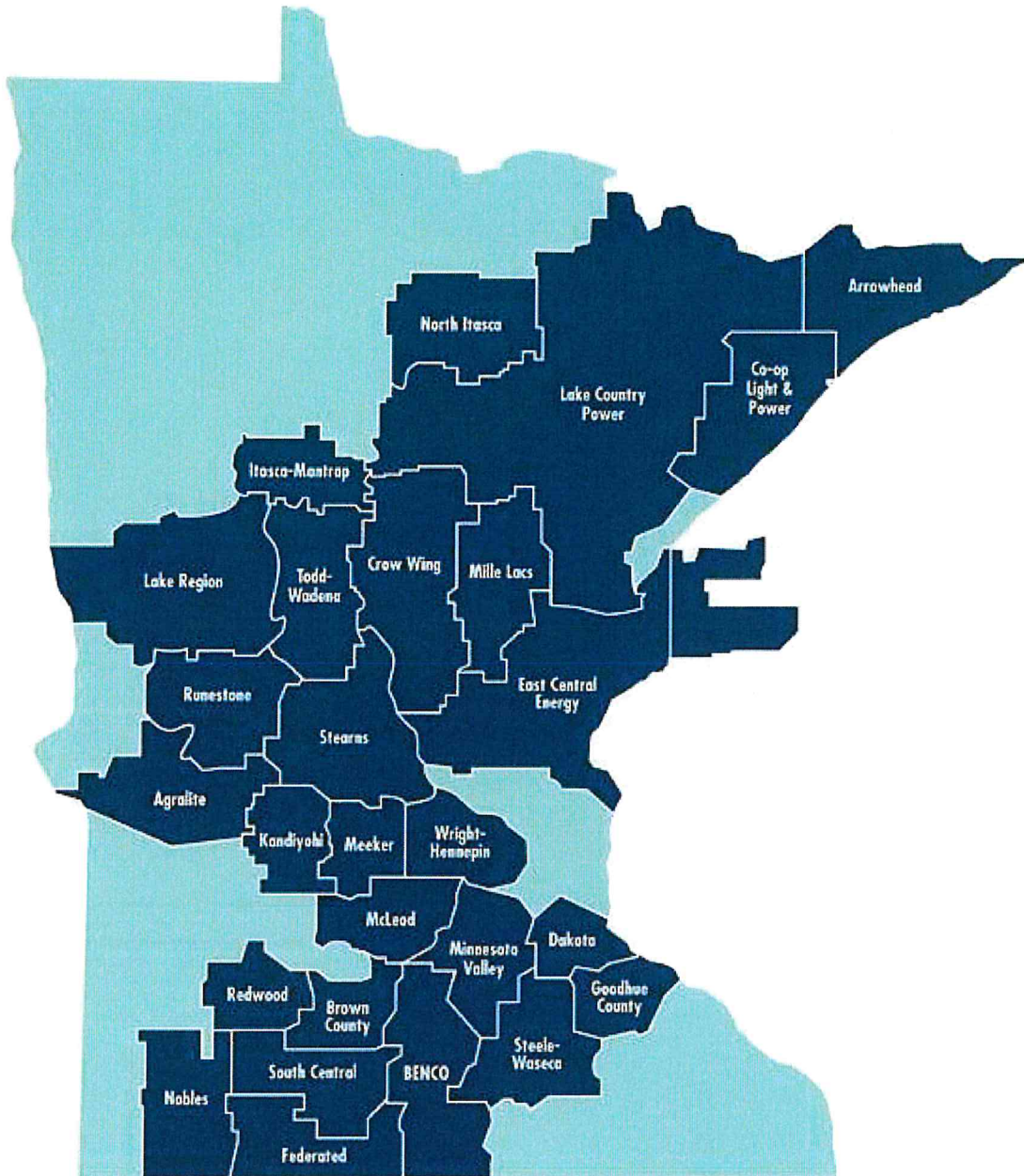
#### *Projected demand*

GRE's forecasted peak demands and energy requirements are provided in Exhibit 4.

#### *Load centers*

The service areas of GRE's 27 member-owners, shown in Figure 2, are located mainly in Minnesota with a small portion in Wisconsin. Nineteen cooperatives are all-requirements (AR) member-owners that purchase all their power from GRE, subject to limited exceptions. Eight cooperatives are fixed requirements member-owners that purchase a fixed amount of power from GRE and purchase all additional requirements from other power suppliers.

**Figure 2** GRE’s Member Service Territory



As part of GRE’s capacity expansion modeling, load forecasts are developed and the need for future generation is assessed.

*Manner and extent of meeting projected demand*

In addition to GRE’s current generation capacity, GRE has entered into bilateral transactions of various types and durations with other utilities. GRE is a transmission owner and market participant in MISO. MISO operates the short-term energy and ancillary services markets that provide economic dispatch of generation and transmission congestion management over a broad region. GRE arranges for its load service through the MISO markets and complies with the MISO resource adequacy requirements, which

are designed to ensure there is sufficient capacity available to meet expected demand requirements within its footprint.

GRE continues to evaluate capital improvements to existing generation facilities, other non-wind renewables, bilateral market purchases, demand response resources, and energy storage (both utility-side and customer-side). Evaluation is performed via capacity expansion modeling. GRE utilizes EnCompass power planning software to determine least-cost generation resource additions for future planning consideration.

GRE's most current Integrated Resource Plan can be found at [greatriverenergy.com](http://greatriverenergy.com)

**SECTION 6: Other Relevant Information**

*Any other relevant information as may be requested by the commission. Upon receipt of the 10-year plans the commission shall proceed to assess the impact of the development proposed within the state to ensure that energy conversion facilities and transmission facilities will be sited in an orderly manner compatible with environmental preservation and efficient use of resources.*

Provided upon request.

July 1, 2024

9

**Exhibit 1**

**U.S. Department of Energy Form EIA-923**

(Forms supplied upon request.)

July 1, 2024

10

**Exhibit 2**

**Federal Energy Regulatory Commission Form FERC-714**

(Forms supplied on request.)

July 1, 2024

11

**Exhibit 3**

**GRE North Dakota Transmission Map**

(Map supplied upon request.)

**Exhibit 4**

**Projected Load Growth and Forecast Methodology**

The forecasts shown below are econometric forecasts developed for GRE’s 19 all-requirements members plus fixed amounts of demand and energy for the eight fixed members. GRE’s fixed members purchase their supplemental requirements from suppliers other than GRE. In addition to GRE’s member-owners’ demand and energy, the forecasts include power supply sales to Dakota Spirit AgEnergy in Spiritwood, North Dakota, transmission losses, and GRE’s own use.

The following figures show GRE’s most current energy and demand forecasts from 2023 through 2033.

Year	50/50 All Requirement Member Forecast (=) (MWh)	Transmission Losses (+)* (MWh)	Alliant Load Southern Coops Forecasts (+)* (MWh)	Fixed Member Requirements (+)* (MWh)	Dakota Spirit Ag (+)* (MWh)	Energy Requirement Forecast (MWh)
2023	9,152,940	481,461	0	1,504,599	41,600	11,180,600
2024	9,223,822	484,651	0	1,504,599	41,600	11,254,672
2025	9,252,539	490,970	111,704	1,504,599	41,600	11,401,411
2026	9,292,086	492,749	111,704	1,504,599	41,600	11,442,738
2027	9,337,748	494,804	111,704	1,504,599	41,600	11,490,454
2028	9,396,239	497,436	111,704	1,504,599	41,600	11,551,577
2029	9,426,689	498,807	111,704	1,504,599	41,600	11,583,398
2030	9,461,632	500,379	111,704	1,504,599	41,600	11,619,913
2031	9,498,961	502,059	111,704	1,504,599	41,600	11,658,922
2032	9,553,222	504,501	111,704	1,504,599	41,600	11,715,625
2033	9,583,933	505,883	111,704	1,504,599	41,600	11,747,717

\* All Forecasts share these components regardless of sensitivities

5-Year CAGR**	0.69%
10-Year CAGR	0.52%

Year	50/50 All Requirement Member Forecast (=)	Transmission Losses (+)*	Alliant Load Southern Coops Forecasts (+)*	Fixed Member Requirements (+)*	Dakota Spirit Ag (+)*	Coincident Peak Demand Requirement
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)
2023	1,877	94	-	205	6	2,182
2024	1,875	94	-	205	6	2,180
2025	1,881	95	28	205	6	2,215
2026	1,886	96	28	205	6	2,221
2027	1,892	96	28	205	6	2,227
2028	1,899	96	28	205	6	2,234
2029	1,905	96	28	205	6	2,241
2030	1,911	97	28	205	6	2,246
2031	1,917	97	28	205	6	2,253
2032	1,924	97	28	205	6	2,260
2033	1,930	98	28	205	6	2,267

\* All Forecasts share these components regardless of sensitivities

5-Year CAGR\*\* 0.51%

10-Year CAGR 0.39%

July 1, 2024

14

**CERTIFICATE OF SERVICE**

I, the undersigned, hereby certify that a true and correct copy of the following document:

**NOTICE OF FILING TEN-YEAR PLAN: 2024-2034**

was served on the 1st day of July 2024 by placing the same in the United States mail, postage prepaid, properly addressed to the following:

North Dakota Office of Attorney General  
600 E. Boulevard Ave.  
Dept. 125  
Bismarck, ND 58505

North Dakota Aeronautics Commission  
P.O. Box 5020  
Bismarck, ND 58502-5020

North Dakota Department of Agriculture  
600 E. Boulevard Ave.  
Dept. 602  
Bismarck, ND 58505-0020

North Dakota Department of Health  
600 E. Boulevard Ave.  
Bismarck, ND 58505-0200

North Dakota Department of Human Services  
600 E. Boulevard Ave.  
Dept. 325  
Bismarck, ND 58505-0250

North Dakota Department of Labor and Human Rights  
600 E. Boulevard Ave.  
Dept. 406  
Bismarck, ND 58505-0340

North Dakota Department of Career and Technical Education  
State Capitol, 15th Floor  
600 E. Boulevard Ave., Dept. 270  
Bismarck, ND 58505-0610

North Dakota Department of Commerce  
1600 E. Century Ave., Suite 2  
P.O. Box 2057  
Bismarck, ND 58503

Energy Infrastructure and Impact Office  
North Dakota Department of Trust Lands  
1707 North 9th Street  
P.O. Box 5523  
Bismarck, ND 58506-5523

North Dakota Game and Fish Department  
100 N. Bismarck Expressway  
Bismarck, ND 58501-5095

North Dakota Industrial Commission  
State Capitol, 14th Floor  
600 East Boulevard Ave., Dept. 405  
Bismarck, ND 58505-0840

Office of Governor Doug Burgum  
State of North Dakota  
600 E. Boulevard Ave.  
Bismarck, ND 58505-0001

North Dakota Department of Transportation  
608 E. Boulevard Ave.  
Bismarck, ND 58505-0700

State Historical Society of North Dakota  
612 E. Boulevard Ave.  
Bismarck, ND 58505-0830

North Dakota Indian Affairs Commission  
State Capitol Building  
600 E. Boulevard Ave.  
1st Floor - Judicial Wing, Rm. #117  
Bismarck, ND 58505-0300

Job Service North Dakota  
P.O. Box 5507  
Bismarck, ND 58506-5507

North Dakota Department of Trust Lands  
1707 North 9th Street  
P.O. Box 5523  
Bismarck, ND 58506-5523

July 1, 2024

16

North Dakota Parks and Recreation Department  
Century Center  
1600 E. Century Ave., Suite 3  
PO Box 5594  
Bismarck, ND 58506-5594

North Dakota State Soil Conservation Committee  
c/o NDSU Extension Service  
2718 Gateway Ave., Suite 304  
Bismarck, ND 58503

North Dakota State Water Commission  
900 E. Boulevard Ave., Dept. 770  
Bismarck, ND 58505-0850

United States Department of Defense  
1400 Defense Pentagon  
Washington, DC 20301-1400

United States Fish and Wildlife Service  
North Dakota Field Office  
3425 Miriam Avenue  
Bismarck, ND 58501-7926

United States Army Corps of Engineers  
North Dakota Regulatory Office  
3319 University Drive  
Bismarck, ND 58504

Federal Aviation Administration  
United States Department of Transportation  
800 Independence Ave. SW  
Washington, DC 20591

North Dakota Transmission Authority  
c/o North Dakota Industrial Commission  
State Capitol 14th Floor  
600 E. Boulevard Ave. Dept. 405

North Dakota Pipeline Authority  
c/o North Dakota Industrial Commission  
State Capitol 14th Floor  
600 E. Boulevard Ave. Dept. 405  
Bismarck, ND 58505-0840