

**STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION**

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August 8, 2023

**Great River Energy 2023-2037 Integrated
Resource Plan**

Docket No. E002/RP-22-75

**COMMENTS OF SIERRA CLUB
PUBLIC DOCUMENT - NOT PUBLIC DATA HAS BEEN EXCISED**

Sierra Club submits these comments in response to the Minnesota Public Utilities Commission's ("PUC" or "Commission") July 27, 2023 Notice of Extended Comment Period in the above-named docket.

On March 31, 2023, Great River Energy filed its 2023-2037 Integrated Resource Plan (IRP). GRE provides electricity to approximately 1.7 million people through its 27 member-owner cooperatives and customers. Through its member-owners, GRE serves two-thirds of Minnesota geographically. GRE is the second largest power supplier in Minnesota by peak demand. GRE is not a rate-regulated public utility in Minnesota, but GRE's largest member-owner cooperative, Dakota Electric, is rate-regulated. (Until recently, Connexus Energy Cooperative was Great River Energy's largest member, serving 140,000 customers in the north metro area of Minnesota. Connexus announced in 2022 that it was terminating its all requirements contract with GRE. Connexus instead is contracting with GRE as a customer, rather than as a member, and continues to represent 22% of GRE's energy demand.)

Great River Energy has entered a time of significant transition. The company sold its largest power plant, the 1,100 megawatt Coal Creek coal plant, to Rainbow Energy in May 2022. As part of the deal, GRE entered into a purchase power agreement (PPA) with Rainbow Energy for 1,050 megawatts (MW) of capacity and energy, meaning that it continues to receive a significant amount of its needs from the coal plant. (GRE's system peak in 2023 is 2,210. (GRE IRP at 25, Table 4.)) Under its current terms, the PPA will be stepped down to 550 MW in 2023, 350 MW in 2025, and exited in 2031. GRE also owns the 100-MW Spiritwood combined heat and power plant, which co-fires lignite coal and gas, as well as 1,700 MW of gas combustion turbines. GRE also has PPAs with 960 MW of wind generation.

GRE has not publicly shared whether it has the ability to renew the PPA with Rainbow Energy. As a result of the sale and power purchase agreement with Rainbow Energy, only 18% of the energy

GRE needs to meet customer demand is currently met with assets it owns. GRE has not made public any information about the cost or key terms of its PPA with Rainbow Energy.

In its IRP, GRE's five-year action plan includes the following:

- Indefinitely operate the Spiritwood coal and gas plant.
- Continue the PPA with Rainbow Energy (Coal Creek), which phases from 1,050 MW to 550 MW in 2023, 350 MW in 2025, and ends in 2031.
- Continues operation of 1,700 MW of gas combustion turbines.
- Add 866 megawatts (MW) of new wind generation by 2026.
- Add 1.5 MW Form Energy multi-day storage pilot project at Cambridge Station, operational by Dec 2024.

GRE's preferred plan, presented in Table 2 of its IRP, also identifies a need for 200 MW of storage in 2030, and proposes to begin a pumped hydro energy storage feasibility study. It adds a 200 MW solar resource in 2031 and another 400 MW wind resource in 2032.

While we support the new wind, solar, and battery storage (including long-duration storage pilot) included in GRE's IRP, GRE has not considered the potential benefits to customers of taking full advantage of the Inflation Reduction Act's programs for rural cooperatives. GRE could deliver far greater savings to customers by using the New ERA program to invest in a much larger clean energy portfolio that would replace Spiritwood and completely end reliance on the Rainbow Energy/Coal Creek PPA by the time the contract ends in 2031. As discussed in greater detail below, an assessment conducted by experts at the U.C. Berkeley Center for Environmental Public Policy (CEPP) found that GRE could reduce customer costs and reliably serve customer requirements by replacing Spiritwood and ending reliance on the Rainbow PPA by investing in 989 MW of solar photovoltaics, 1,577 MW of wind, and 1,051 MW of battery storage. This portfolio would reduce wholesale electricity costs by more than 20%, and would deliver annual 2032 savings of \$129 million. We recommend that GRE further explore this opportunity by conducting updated EnCompass modeling to share with the Commission in advance of the September 15, 2023 deadline to apply for New ERA funding.

Summary of the New ERA Opportunity

The Inflation Reduction Act offers the largest investment in rural electric infrastructure in a generation through the creation of two programs: direct-pay tax credits for clean energy (dollars directly given to rural cooperatives), and USDA's Empowering Rural America ("New ERA") program. Combined, these two initiatives alone can pay for more than 75 percent of the cost of renewable energy, energy storage, and other clean energy projects, drive down the cost of energy for rural communities, and empower cooperatives - a cornerstone of rural economies - to lead the energy transition, all while driving job creation and sustainable economic development. Great River Energy has a unique opportunity to harness USDA's New ERA program, and drive deep cost savings and community revitalization for its customers.

The New ERA program is geared to provide up to \$970 million in direct cash grants and other financing to each cooperative that can deploy portfolios of clean energy at scale to replace expensive and inefficient fossil generation. Moreover, historically, rural cooperatives generally were not able to

take advantage of federal clean energy tax credits; the IRA fixed that issue so that rural cooperatives can now receive direct-pay tax credits via the production tax credit and the investment tax credit. Combined, these incentives can pay for more than 75 percent of the total project costs.

USDA opened the Notice of Funding Opportunity for New ERA on May 16, 2023. Letters of Intent for this competitive program are due **September 15, 2023**. After that, some applicants will receive an Invitation to Proceed and will have 60 days to accept it by filing an application. Final awards will be made beginning in March 2024.¹

Analysis

GRE did not provide detail in its IRP or in response to discovery questions regarding specific actions it is planning to propose in response to the USDA Notice of Funding Opportunity for New ERA. In response to DOC IR 16, GRE stated that:

GRE is exploring an array of project options. These include ambient-adjusted ratings (AAR) and dynamic line ratings (DLR) technologies that will reduce transmission energy line losses. GRE is also exploring investments that will alleviate transmission congestion and also exploring financing options for projects approved through MISO's Long-Range Transmission Plan (LRTP). Additionally, there are many power supply opportunities such as direct pay incentives or power purchase agreements that are new in the IRA that Great River Energy is investigating. Furthermore, member-owners are also looking into the array of opportunities for power supply and system upgrades.

GRE did not specify any particular power supply options it might be considering. Based on a review of GRE's description of its EnCompass modeling, GRE did not allow the model to consider self-build solar, and only looked at one 200 MW self-build wind project in one sensitivity. (GRE IRP Appendix H.) GRE also capped new lithium-ion batteries at 200 MW. (Id.) From a review of the IRP documents, it does not appear that GRE's modeling accounted for the \$970 million it could secure from the New ERA program.

It appears that GRE is overlooking significantly greater savings it could deliver to customers if it were to pursue a larger portfolio of clean energy that ends reliance on Spiritwood and the Rainbow PPA by 2031. Below we summarize an assessment conducted by experts at the U.C. Berkeley Center for Environmental Public Policy (CEPP) of the opportunities presented by the New ERA program for all of the largest rural cooperatives in the U.S., including for Great River Energy, in consultation with experts at Sierra Club.² A spreadsheet summary of CEPP's analysis for GRE is attached to these comments as Attachment A. This study found that GRE could reduce customer costs and reliably serve customer requirements by replacing Spiritwood and ending reliance on the Rainbow PPA by investing in 989 MW of solar photovoltaics, 1,577 MW of wind, and 1,051 MW of battery storage.

¹ The official USDA Notice of Funding Opportunity can be viewed at <https://public-inspection.federalregister.gov/2023-10392.pdf>.

² For a summary of this study, see Abhyankar, Nikit, Umed Paliwal, Amol Phadke. "A New Era for Rural Electric Cooperatives: New clean energy investments, supported by federal incentives, will reduce rates, emissions, and reliance on outside power" (June 2023), available at <https://gspp.berkeley.edu/research-and-impact/centers/cepp/working-papers>

This portfolio would reduce wholesale electricity costs by more than 20%, and would deliver annual 2032 savings of \$129 million.

To conduct this study, CEPP used the ReEDS (Regional Energy Deployment System) model³, which was developed by the National Renewable Energy Laboratory (NREL) to assess how the US electric system can integrate renewables, storage, and other technologies. ReEDS is a capacity expansion model with in-depth characterizations of renewable energy resources, including clean energy and storage performance and cost at a high spatial resolution. The model is also designed to assess what elements of a clean portfolio are required to meet reliability on an hour-to-hour basis. While ReEDS is not a utility-specific model, it breaks down the US electric system into accurate representations of 134 balancing areas, with transmission constraints. All of the inputs used in the model are sourced from public information.

The modelers assessed two scenarios: the estimated cost of the current system as of 2021, and scenario in which all electricity is coal free by 2031. As a conservative measure, they assumed electrification load growth through 2032, resulting in nearly 19% energy growth and 22% peak requirements growth.

They also assumed that balancing areas had to serve at least the same amount of generation in 2032 as 2021, forcing new renewable energy to be largely local. They limited the model's ability for utilities with retired coal units to draw on market-based resources, and assumed that utilities had to serve at least as much energy as they had in 2021. Finally, they assumed that utilities had to substantially improve their capacity position—i.e. not simply rely on the market for capacity purchases.

Conservatively, the model assumed that GRE could not lean on MISO and SPP's capacity markets, and therefore had to dramatically improve its capacity position with new clean energy. The value of these conservative assumptions is that the model was forced to build a replacement portfolio as if GRE were largely independent of the market, a stance that would typically require greater costs. The reasoning is that if GRE can build a cost-effective portfolio independent of the market, then any shared market resources just make the portfolio less expensive.

In the New ERA scenario, the modelers required the model to meet GRE's requirements by 2031 (including the replacement of Spiritwood and ending reliance on the Rainbow/Coal Creek PPA), relying exclusively on local wind, solar, and up to 10-hour lithium-ion battery storage. The model used clean energy prices from the Annual Technology Baseline (ATB) from the National Renewable Energy Laboratory. The model was built on a load profile based on hourly requirements in 2021, and then grew that load profile at 1.6% per year using an intensive electrification scenario. The modelers estimated wholesale electricity costs at the ReEDS balancing area level and then allocated to the individual G&T. The modelers required that the model reliably meet customer requirements - with room to spare - in every hour using real weather conditions coincident with load. The model could consider the direct-pay tax credits (up to a 10% adder for domestic content, and the energy communities adder for solar), and only assessed USDA's New ERA program after the model was run.

³ National Renewable Energy Laboratory, 2022. Regional Energy Deployment System Model (ReEDS). <https://www.nrel.gov/analysis/reeds/>

Thus the value of New ERA is not included in the modeled cost savings. They assumed that GRE could tap a 25% New ERA grant, for up to \$970 million.

The model found that GRE could reduce customer costs and reliably serve customer requirements by replacing Spiritwood and ending reliance on the Rainbow PPA by investing in **989 MW of solar photovoltaics, 1,577 MW of wind, and 1,051 MW of battery storage**, the latter of which is broken down as follows:

GRE Battery Storage Installed Capacity MW in 2032			
Battery 4 hour	Battery 6 hour	Battery 8 hour	Total Battery
172	468	398	1,051

The entire portfolio incurs a capital expenditure of around \$4.5 billion. Of that, more than \$1.8 billion is recovered through the direct payment of production tax credits on both solar and wind, another \$690 million is recovered through direct payments of the investment tax credit for storage systems, and \$970 million is paid in cash through USDA's New ERA program. In total, GRE's long-term debt would reflect less than a quarter of the cost of the clean energy and storage systems.

The modeling found that this investment would **reduce wholesale electricity costs by more than 20%, and would deliver annual 2032 savings of \$129 million.**

This portfolio would also avoid the significant risk GRE faces of additional pollution control requirements at Spiritwood. As GRE summarized in response to discovery, Spiritwood faces the following environmental compliance risks associated with EPA's proposed 111(d) rule:

GRE's Spiritwood Station may be impacted if the 111(d) rule is finalized and implemented as proposed. Specifically, Spiritwood will either need to install carbon capture and sequestration (CCS) by 2030, if it plans to operate after 2039. Otherwise, Spiritwood can operate through 2039, but will need to co-fire natural gas at least 40% from 2035-2039. Spiritwood is able to co-fire natural gas now. Per the IRP Section 4, GRE is conducting a carbon capture feasibility study to better understand potential costs and implications for Spiritwood Station.

(GRE Response to DOC IR 6(D).) The ReEDS modeling summarized above indicates that continued reliance on Spiritwood past 2039 is not in the interest of customers, even without considering the substantial costs of carbon capture and storage. Retiring that plant by 2032 and transitioning to clean energy would deliver substantial cost savings to customers.

The portfolio identified by the ReEDS model would also deliver an 88% reduction in CO2 emissions by 2032 by replacing Spiritwood, displacing much of GRE's gas, and ending GRE's reliance on the Coal Creek contract as well as reducing other market purchases. (The ReEDS model baseline for GRE includes 172 GWh of coal, 1,443 GWh of gas and 7,178 GWh of market purchases in 2032. In the alternative scenario, coal drops to zero, gas drops to 655 GWh (a 50%+ drop), and market purchases drop to 2,270 GWh.)

In light of these findings, **we recommend that GRE update its EnCompass modeling to assess an alternative portfolio in which it retires Spiritwood and ends reliance on the Rainbow PPA and invests in 989 MW of solar, 1,577 MW of wind, and 1,051 MW of battery storage by 2032. This modeling should include all of the incentives and financing mechanisms offered by the IRA, including the \$970 million GRE could secure through the New ERA program as well as all tax credits.** In the alternative, GRE should conduct an optimized EnCompass modeling run in which it allows for solar, wind, and battery storage self-builds without constraints and considering both the New ERA grant potential as well as tax credits.

Carbon Emissions Associated with the Rainbow PPA

Another consideration in this IRP is how GRE accounts for the carbon emissions associated with its PPA with Rainbow Energy/Coal Creek. As noted above, the 1,050 MW PPA meets roughly half of GRE's peak demand. In its IRP, GRE states that it "has taken the step to assign the carbon intensity of Rainbow to the energy associated with this PPA." (IRP at 44.) **Sierra Club believes this is the correct approach and recommends that the PUC clarify that GRE must use this methodology going forward in all dockets.**

In a discovery response to the DOC, GRE marked as trade secret its "step-by-step description of how GRE calculated its CO2 emissions." (Trade Secret GRE Response to DOC IR 7.) First, Sierra Club objects to the trade secret designation of the methodology through which GRE calculates its CO2 emissions. It is in the public interest to make this methodology public. The legislature has made the public interest in reducing greenhouse gas emissions clear, and the public cannot understand GRE's role in reducing greenhouse gas emissions without understanding its greenhouse gas accounting methodology. GRE has not identified any competitive interest in keeping this methodology confidential.

In the trade secret response to the DOC, GRE states that **<TRADE SECRET DATA BEGINS**

[REDACTED]

TRADE SECRET
DATA ENDS>

It is Sierra Club's position that GRE's approach in this docket of assigning the carbon intensity of Rainbow to the energy associated with the Rainbow PPA is the correct one. It is well-established that the Rainbow PPA was entered into as a "deal" to keep the Coal Creek power plant operating; GRE had previously planned to retire it in 2022 because it was uneconomic.⁴ GRE played a vital role

⁴ See, e.g., Hughlett, Mike. "Minnesota's Great River Energy closing coal plant, switching to two-thirds wind power," May 7, 2020, Minnesota Star Tribune, available at <https://www.startribune.com/minnesota-s-great-river-energy-closing-coal-plant-switching-to-two-thirds-wind-power/570276822/>

in the continued carbon emissions from Coal Creek; but for its decision to enter this contract with Rainbow, those carbon emissions would have been entirely abated. GRE must take responsibility for the portion of emissions associated with the energy and capacity it receives under its PPA with Rainbow until that PPA ends.

Recommendations

1. We recommend that GRE update its EnCompass modeling to assess an alternative portfolio in which it retires Spiritwood and ends reliance on the Rainbow PPA and invests in 989 MW of solar, 1,577 MW of wind, and 1,051 MW of battery storage by 2032. This modeling must include all of the incentives and financing mechanisms offered by the IRA, including the \$970 million GRE could secure through the New ERA program as well as all tax credits. In the alternative, GRE should conduct an optimized EnCompass modeling run in which it allows for solar, wind, and battery storage self-builds without constraints and accounts for both the New ERA grant potential as well as tax credits.
2. The Commission should clarify that GRE should assign the carbon intensity of Rainbow to the energy associated with the Rainbow PPA in this and all future dockets.

Thank you for the opportunity to weigh in on this resource plan, and for the Commission's consideration of our comments.

Respectfully,

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