Oglethorpe's Path to Clean Energy Independence

Tapping the near-term New ERA Program to drive cost reductions and economic development

The Inflation Reduction Act created the largest investment in rural electric infrastructure in a generation, through direct-pay tax credits for clean energy, and USDA's Empowering Rural America (the "New ERA program"). Combined, these two initiatives can drive down the cost of energy for rural communities and pay for most of the costs of clean energy projects, including renewable energy and storage. **Oglethorpe Power Corporation (Oglethorpe)** –a cornerstone of Georgia's rural economy– has the opportunity to apply for New ERA grants to reap the benefits of the energy transition. Oglethorpe generates power for 38 electric membership corporations and the 4.4 million people they serve, and may drive deep cost savings for its customers through the New ERA program. Oglethorpe is one the biggest cooperatives in the country and stands to gain the most out of the New ERA program.

As detailed below, our modeling shows that if **Oglethorpe** chooses to add enough renewables to replace its 60% ownership share of Plant Scherer Units 1 and 2, it can leverage tax credits and **New ERA** funds to drive massive investments in clean energy. Today, Oglethorpe operates 7,300 MW of fossil generation, 1070 MW of which are locked up in the two aging Scherer coal units.[1] Together, these units provided 67% of Oglethorpe member's peak requirements in 2022.

Our modeling shows that Oglethorpe could retire its share of the expensive Scherer coal plant, serve rapidly growing demand, **and** serve **all** of its members' requirements through new solar and storage. Meeting all of Oglethorpe's requirements through solar would entail 12 GW of new solar, paired with 4,140 MW of storage. By building out new solar and storage and tapping direct-pay tax credits to meet customer demands, Ogethorpe would drive down costs to customers by nearly 25% - and save almost $640 million per year by 2030.

Oglethorpe Clean Energy Independence New ERA Scenario

Remove	Build	Build	Save	Serve
1,070 MW	**12,000 MW**	**4,140 MW**	**$ 637 M**	**100%**
Coal	Solar	Battery	per year	Member peak requirements

The investment required to deploy 12 GW of solar and 4,140 MW of storage is not small. We estimate that through 2032, this portfolio would result in $17 billion in local investments. However,

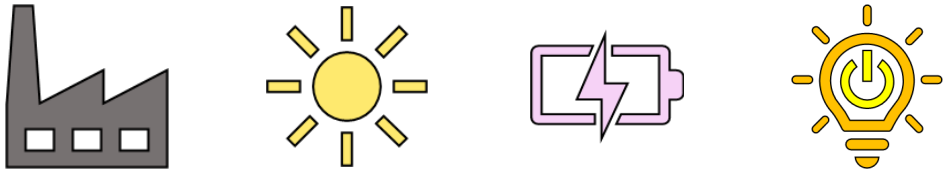
[1] Oglethorpe Power Corporation. Form 10-K Annual Report for Fiscal Year Ending December 31, 2022. Filed March 27, 2023. https://opc.com/wp-content/uploads/2023/03/2022-Form-10-K.pdf

over 61% of that investment would be recouped through federal incentives, including direct pay tax credits and the New ERA program.

Replacing Scherer alone does not require Oglethorpe to drive this substantial investment in Georgia's clean energy economy, rather it's the outcome of a system that simply shows that **investing in substantial solar and storage at Oglethorpe is a no regrets strategy.**

From a firm replacement strategy perspective, our modeling suggests that Oglethorpe could **comfortably retire Scherer and replace its capacity with 2,000 MW of solar and 700 MW of battery storage**, a $2.8 billion capital outlay. Under this more limited scenario, Oglethorpe would recover **nearly 80% of clean energy costs** through federal incentives, including a $700 million New ERA grant, and avoid more than $115 million in imported coal costs each year.[2]

Oglethorpe Clean Energy Replacement for Scherer



Remove	Build	Build	Maintain
1,070 MW	**2,000 MW**	**700 MW**	reliability
Coal	Solar	Battery	

The opportunity to tap New ERA funds to accelerate clean energy procurement and drive down costs —whether a 2,700 MW clean replacement for Scherer, or a 16,140 MW build that renders Oglethorpe energy independent—is a short window, and must be tapped by the end of the summer, 2023.

New ERA: A One-Time Fast-Moving Opportunity

New ERA is a one-time $9.7 billion program designed to help level the playing field for rural electric cooperatives. The program is geared to provide up to $970 million in grants and other financing to cooperatives that can deploy portfolios of clean energy at scale to replace expensive fossil generation. New ERA will support **renewable energy, storage, transmission, demand-side management, electrification, and even stranded asset relief**, allowing cooperatives to create full portfolios that reliably meet their customers needs, even under extreme conditions.

USDA has issued a Notice of Funding Opportunity for New ERA on **May 15, 2023**, and letters of intent for this competitive program are due by **August 31, 2023**. USDA encourages cooperatives to submit 'blue sky' applications, and **will rank applications by their ambition and ability to reduce emissions.** By statute, programs funded by New ERA must be in place by September 2031.

With New ERA and direct-pay tax credits, cooperatives can **own the transition**, and pass the benefits of reliable clean energy portfolios to their customers and communities:

[2] Our analysis did not assess the savings associated with a Scherer-only replacement scenario.

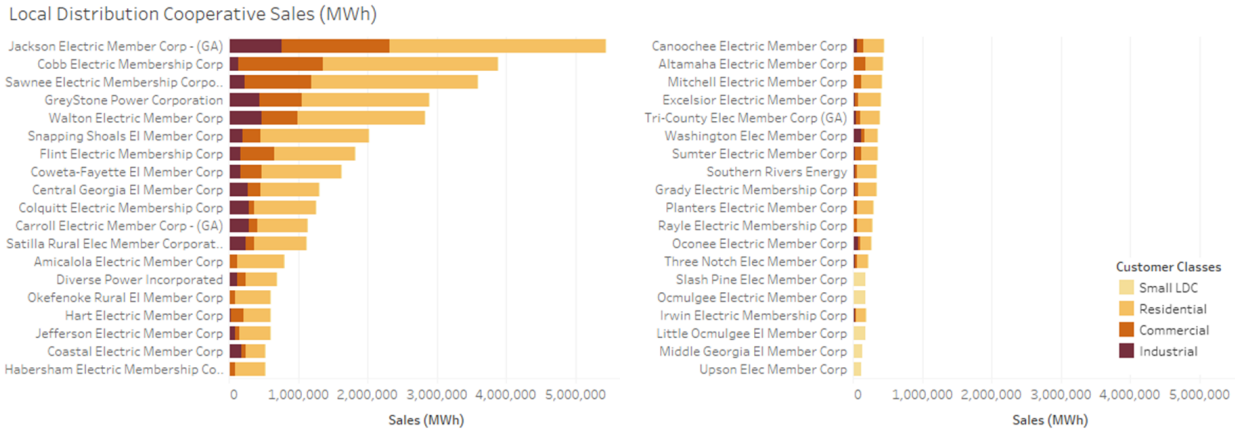
- **Lower cost and affordability:** Clean energy provides low-cost energy, and once installed has a near-zero marginal cost. Cooperatives are uniquely positioned to benefit by passing cost savings to members;
- **Reduced volatility**: Transitioning to clean energy reduces a cooperative's reliance on expensive and volatile fuels, promoting price stability.
- **Improved resilience**: Utilities with broad clean energy portfolios are resilient to market price shocks, fuel shortages, labor and supply inflation, and tightening environmental obligations.
- **Modularity:** Clean energy can be deployed incrementally to control costs and reduce construction risks; storage can be strategically co-located with load to improve congestion.
- **Member-oriented economic development**: Cooperatives serve some of the most economically advantageous clean energy territory, and can drive economic growth towards their own customers.

Historically, tax credits and financing mechanisms have made it difficult for rural cooperatives to invest in clean energy. However, direct-pay tax credits and the once-in-a-generation New ERA program provide the opportunity for cooperatives to cost-effectively become part of the energy transition. To effectively harness this program, cooperatives will have to submit ambitious (albeit high-level) clean energy plans that meet the statute's requirements to achieve the greatest amount of greenhouse gas emissions feasible. This paper proposes a pathway for Oglethorpe to position itself for success, and tap up to **$970 million in federal grants**.

Oglethorpe Power Corporation

Oglethorpe is among the country's largest electric cooperatives.[3] It serves 38 electric member co-ops (EMCs) and the 4.4 million people they serve throughout Georgia.[4] In total, Oglethorpe generates power for 30% of the state's electric requirements and covers more than 70% of the state's land area. Its largest member is Jackson EMC, which in turn serves 228,873 residential and 24,766 commercial and industrial meters in a service territory that includes a 10-county area stretching from metro Atlanta north to Gainesville and east to Athens.

[3] https://opc.com/about/
[4] *Id.*

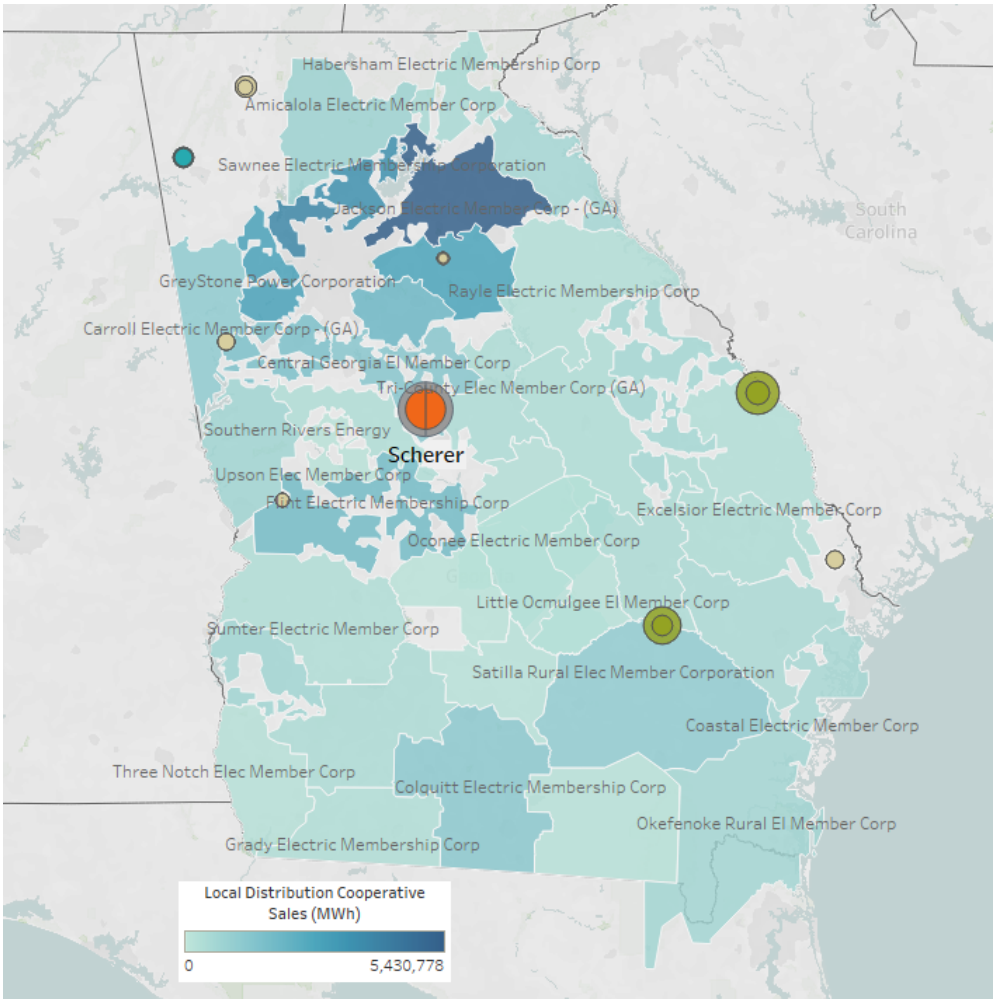


Jackson EMC's kilowatt-hour sales are 60% residential and 40% commercial and industrial. Jackson EMC serves the counties of Gwinnett, Hall, Jackson, Barrow, Madison, Clarke, Banks, Oglethorpe, Lumpkin, and Franklin.

Nearly 15% of Oglethorpe's capacity is provided by coal, and more than 60% by gas.[5] About two-thirds of Oglethorpe's energy comes from gas-fired power plants that it owns, or partially owns.[6] For its renewable portfolio, Oglethorpe partners with Green Power EMC, a not-for-profit corporation that secures resources like hydro, biomass, landfill gas, and solar to generate electricity.[7]

Oglethorpe interacts with one energy market: the Southeast Energy Exchange Market (SEEM), which launched in late 2022. SEEM facilitates sub-hourly, bilateral trading, and allows participants to buy and sell power close to the time the energy is consumed. SEEM members (which include Oglethorpe, Southern Company, TVA, and several others) represent nearly 23 entities in parts of 12 states with more than 180,000 MWs, and serve the energy needs of nearly 60 million people. SEEM is expected to achieve carbon reductions "through more efficient generation displacing less efficient generation and by avoiding renewable curtailments".[8]

[5] https://opc.com/where-power-originates/
[6] *Id.*
[7] *Id.*
[8] https://southeastenergymarket.com/faq/

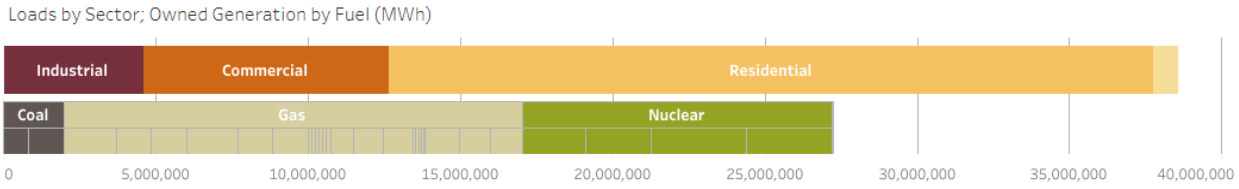


Oglethorpe's Power Supply and Scherer Coal Plant

Oglethorpe owns 60% of Plant Scherer Units 1 and 2 (approximately 1,070 MW), two 1982-vintage coal units located in Juliette, Georgia. Neither Oglethorpe nor its co-owner, Georgia Power Company, have announced any intent to retire the coal units, despite their increasing operational cost. In fact, as part of a 2022 planning process, Georgia Power Company informed the Georgia Public Service Commission that it would elect to build expensive environmental control equipment at Scherer rather than pursue retirement as a compliance strategy.[9] Despite these plans, Oglethorpe could opt to retire the Scherer units, avoiding compliance obligations and reducing fuel costs, while using New ERA funds to acquire clean energy. Our modeling shows that the procurement of substantial clean energy would significantly reduce costs to Oglethorpe's members and consumers. Even if Oglethorpe decides not to retire Scherer in the short term, it should explore adding sufficient solar and storage to reduce to a minimum Scherer's operation and operation costs.

[9] Ga. Public Service Commission. Georgia Power 2022 Integrated Resource Plan. Docket number 44160 & 4416. *Environmental Compliance Strategy Update*. April 2022 Revision. Georgia Power indicated that it had elected to pursue wastewater treatment for the sulfur dioxide scrubbers (FGDs) under EPA's effluent limitations guideline (ELG) rule rather than avoid those controls and pursue retirement, as allowed under the ELG rule.

In addition to the Scherer coal units, Oglethorpe maintains 2,330 MW of gas-fired combined cycle units, 1,990 MW of gas turbines, 630 MW of pumped hydro, and 1,280 MW of shared capacity at the Vogtle and Hatch nuclear power stations. In total, we estimate that Oglethorpe maintains around 6,450 MW of firm capacity on a system that served 10,810 MW of peak load in 2022.[10] The Scherer coal units served relatively little generation in 2022, maintaining a combined 36% capacity factor. The chart below shows the total requirements of Oglethorpe, and the generation owned by the cooperative that serves that load. The remainder is either acquired bilaterally, or through long-term contracts.

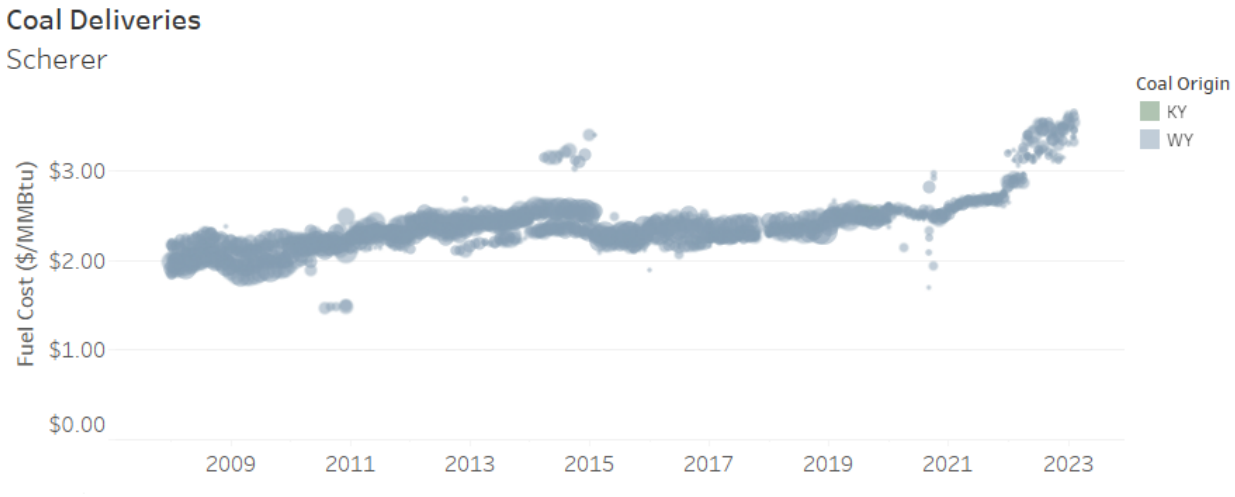


We estimate that Scherer 1 costs around $58.16/MWh to operate, about 49% of which is the fuel cost of coal. Scherer Unit 2 costs around $69.08/MWh to operate, about 42% of which is the fuel cost of coal.

The cost of delivered coal has increased in recent years. As Georgia Power Company admitted in its recent Fuel Cost Recovery Docket before the Georgia Public Service Commission, "geopolitical unrest [and] global supply chain constraints (...) not only drove the cost of natural gas to levels not seen since 2008, but also increased the cost of coal, as its supply did not keep pace with increased demand."[11] Additionally, as Georgia Power acknowledged during the 2022 IRP, "[e]conomic conditions continue to deteriorate for Plant Scherer", and "retirement studies reflect long-term economic risk associated with operation of Plant Scherer Units 1-3".[12]

The chart below shows that Oglethorpe's coal prices have risen dramatically in the last two years, growing from around $2.50/MMBtu in 2019 to nearly $3.50/MMBtu in 2022. Oglethorpe's total fuel costs increased by nearly 75% between 2021 and 2022 alone.[13]

[10] Oglethorpe Power Corporation. Form 10-K Annual Report, 2022
[11] Ga. Public Service Commission. 2023 Georgia Power Fuel Cost Recovery Application. Docket No. 44902. Direct Testimony of Sarah P. Adams and Adam D. Houston, at 3.
[12] Ga. Public Service Commission. Georgia Power 2022 Integrated Resource Plan. Docket number 44160 & 4416. IRP Main Document at 11-74. Georgia Power's share in Plant Scherer Units 1-2 is 8.4%.
[13] Oglethorpe Power Corporation. Form 10-K Annual Report, 2022



Source: EIA Form 923

The New ERA Opportunity for Oglethorpe

Oglethorpe has an opportunity to drive economic development and reduce costs for its members and industrial customers by harnessing New ERA funds. However, to provide a competitive application, Oglethorpe will have to demonstrate that it can achieve deep emissions reductions, not just incremental growth in clean energy. Because Scherer units 1 and 2 emitted more than 5 million tons of CO2 in 2022 –with Oglethorpe's share alone accounting for more than 3 million tons of CO2–, Oglethorpe's strongest and most competitive application would include Scherer's retirement and replacement with non-emitting energy.

Our modeling demonstrates that a portfolio built entirely of renewable energy and battery storage could result in **dramatic cost reductions** while maintaining reliability. The model we used, ReEDS (Regional Energy Deployment System), was developed by the National Renewable Energy Laboratory (NREL) to assess how the US electric system can integrate renewables, storage, and other technologies.[14] 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.

We assessed two scenarios: the estimated cost of the system in place as of 2021, and a scenario in which all electricity is coal free in the United States by 2031. As a conservative measure, we assumed steep electrification load growth through 2032, and 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. We 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

[14] National Renewable Energy Laboratory, 2022. Regional Energy Deployment System Model (ReEDS). https://www.nrel.gov/analysis/reeds/

2021. For coal-dependent utilities, the combination of retirements and clean energy buildout entailed substantial new renewable energy and storage.

For Oglethorpe, we assessed the buildout that would replace Scherer Units 1 and 2, and ensured that resources within Oglethorpe's balancing area were assigned to the utility. Conservatively, the model assumed that Oglethorpe had no additional opportunity to interact with regional electricity and capacity markets. Our reasoning is that if we can demonstrate that Oglethorpe can build a cost-effective portfolio independent of the market, then any shared market resources just make the portfolio less expensive.

We charged the model with meeting Oglethorpe's requirements by 2031 (including the replacement of Scherer 1 and 2), 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 1.7% per year using an intensive electrification scenario. We required that the model reliability meet customer requirements –with room to spare– in every hour using real weather conditions coincident with load.

We allowed the model to tap 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. The value of New ERA is *not* included in our modeled cost savings. We assumed that Oglethorpe could tap a 25% grant, up to $970 million.

Oglethorpe currently has 6,448 MW of firm capacity for a system that expects to see a peak load of 9,641 (1,640 MW of coal, 3,463 MW of gas, 1,283 MW of nuclear, and 632 MW of hydro, as reported in EIA Form 860 plant ownership data and Form 861 Utility Operational Data). Under a scenario where all coal is retired by 2032 and electrification grows, **our ReEDS modeling assessed that Oglethorpe could reliably serve customer requirements by replacing Scherer 1 and 2 with 11,963 MW of solar photovoltaics, 14 MW of wind, and 4,139 MW of battery storage,** with 701 MW of a firm capacity resource, which today would be met through a combustion turbine or similar technology, providing backup. Our modeling shows that an optimal mix of the 4,139 MW battery storage includes 17 MW of 2hr batteries, 3,513 MW of 4hr batteries, 577 MW of 6hr batteries, 19 MW of 8hr batteries, and 12 MW of 10hr batteries.

Battery Storage Installed Capacity MW in 2032							
GT Name	Battery 2 Hour	Battery 4 hour	Battery 6 hour	Battery 8 hour	Battery 10 hour	Total Battery	Coal Capacity Retired in 2021
Oglethorpe Power Corporation	17	3,513	577	19	12	4,139	1,069

Together, the resulting clean portfolio provides **11,879 MW of firm capacity to cover a larger peak load of 11,874 MW by 2032.**

The New ERA portfolio that we modeled not only replaces the capacity obligation Oglethorpe, but improves its capacity position markedly. It increases the utility's reserve margin from -33.1% of its current peak to 0% of its expected 2032 peak. Oglethorpe would be able to meet 100% of its customers' peak requirements. And while Oglethorpe currently provides about 30% of its energy through the wholesale market (11,779 GWh of 38,989 GWh), the New ERA portfolio increases self-supply substantially— Oglethorpe would only use the wholesale market for around 11% of its generation (5,717 GWh of 49,035 GWh total).

The New ERA portfolio also has significant emissions benefits. **We estimate that this new portfolio reduces absolute emissions by 83% by 2032 relative to 2021, despite the load growth. This would make Oglethorpe's application strong and compliant with New ERA's statutory requirements.**

The New ERA portfolio—even without the value of the USDA grant—reduces power supply costs for member customers by more than 24%. We estimate that in 2021, the cost of fuel, operations and maintenance, and incremental investments amounted to around $54.24/MWh for Oglethorpe, while the New ERA portfolio reduces costs to around $41.25/MWh, including paying for both new clean energy and paying down existing debts. **Overall, we estimate that the New ERA portfolio would save customers nearly $637 million per year by 2032 relative to the continued use of the existing system.**

Under the Clean Energy Independence scenario, Oglethorpe would need to invest approximately $17 billion in capital, but it should expect to recover $6.9 billion in production tax credits, $2.6 billion in investment tax credits, and receive $970 million through USDA's New ERA program. A total of 61% (more than $10 billion) of Oglethorpe's investments would be recovered through both tax credits and New ERA funds.

Under the Clean Energy Replacement for Scherer scenario, Oglethorpe would need to invest approximately $2.8 billion in capital and recover nearly 80% of these costs (including $700 million through New ERA funds).

The clean energy portfolio is not a small investment, but **direct payment of production tax credits** on both solar and wind, **direct payments of the investment tax credit** for storage systems, and **the New ERA program go a long way**. In total, Oglethorpe's long-term debt would reflect less than 40% of the cost of the clean energy and storage systems. Other options with lower up-front investments can also be explored.

A New ERA of Clean Energy Economic Development in Georgia

The development of the solar projects alone would invest nearly $6.4 billion in the local clean energy economy, create an estimated **29,000 direct installation jobs (FTEs) during the construction period**, and another **3,200 ongoing local supply and maintenance & operations jobs**.[15] To the extent that PV components are manufactured in Georgia, a far larger fraction of the

[15] NREL Jobs & Economic Development Impact (JEDI) model for wind and solar, modified for 2028 build year. See https://www.nrel.gov/analysis/jedi/wind.html and https://www.nrel.gov/analysis/jedi/pv.html.

clean energy investment could stay within the state. Another 17,000 jobs are created from the manufacturing and siting of the solar facilities, and an additional 10,000 are induced by investment dollars flowing through Georgia's rural communities into local businesses. This unparalleled rural economic development opportunity doubles again with the development, installation, and maintenance of nearly $10 billion in battery storage systems.

Taking the Shot

The New ERA program and direct-pay tax credits offer a unique opportunity for rural electric cooperatives, driving rural economic development and lowering costs to members.

Oglethorpe can harness this **once-in-a-generation moment** to drive deep cost savings for its customers by acquiring clean energy that can meet its obligations and possibly retiring Scherer Units 1 and 2 well before the end of the decade.

Under the two scenarios examined here, Oglethorpe can invest anywhere between $2.8 billion and $17 billion in clean energy projects, benefiting from lower costs, reduced volatility, improved resilience, lower risk, and member-oriented economic development. By harnessing New ERA funds, **Oglethorpe can drive deep benefits to its members, but it has a limited window to take the shot.** This is the cooperative's opportunity to pass the benefits of reliable, affordable and renewable energy portfolios to its customers and communities.