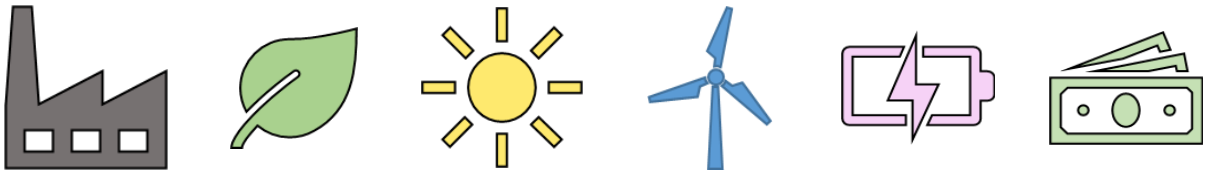
Getting Cooperative in a New ERA

Associated Electric and USDA's New ERA Program

The Inflation Reduction Act created the largest investment in rural electric infrastructure in a generation through direct-pay tax credits for clean energy and the United States Department of Agriculture's (USDA) Empowering Rural America, or New ERA program. Combined, these two initiatives alone can pay for more than 75 percent of the cost of renewable energy, storage, and other clean energy projects, drive down the cost of energy for rural communities, and empower cooperatives - a cornerstone of rural economies. **Associated Electric Cooperative, Incorporated** (AECI), which serves customers across Missouri, Iowa, and Oklahoma, has a unique opportunity to harness **USDA's New ERA program**, driving deep cost savings for its customers.

Recent modeling shows that AECI can leverage $970 million in New ERA grants and loans to drive $4.05 billion in clean energy investments: **1,500 MW of solar photovoltaics, 2,500 MW of wind, 167 MW of energy efficiency, and 500 MW of 4-hour storage**. This clean portfolio can completely replace the more than 50-year old coal units at Thomas Hill 1 & 2, and it **saves customers nearly $358 million (2023-2037).**[1]



Remove	Invest	Build	Build	Build	Save
1,157 MW	**167 MW**	**1,500 MW**	**2,500 MW**	**500 MW**	**$358.6M**
Coal	Energy Efficiency	Solar	Wind	Battery	2023-2037

The replacement of AECI's coal plants saves money, reduces fuel costs and volatility, substantially improves energy diversity, and creates large opportunities for local economic development in Missouri. Tapping into USDA's New ERA program can drive down costs for AECI's critical industrial customers and rural communities alike.

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 and inefficient 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.

[1] On a present value basis, where Thomas Hill is retired in 2027 and replaced with clean energy.

USDA opened the Notice of Funding Opportunity for New ERA on **May 16, 2023**, and letters of interest must be submitted **between July 31, 2023 and August 31, 2023**. USDA encourages utilities to submit ambitious, 'blue sky' applications, and will rank applications by their 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:

- **Lower cost:** 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 and energy independence**: Utilities with broad clean energy portfolios are resilient to market price shocks, labor and supply inflation, supply chain disruptions, 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.

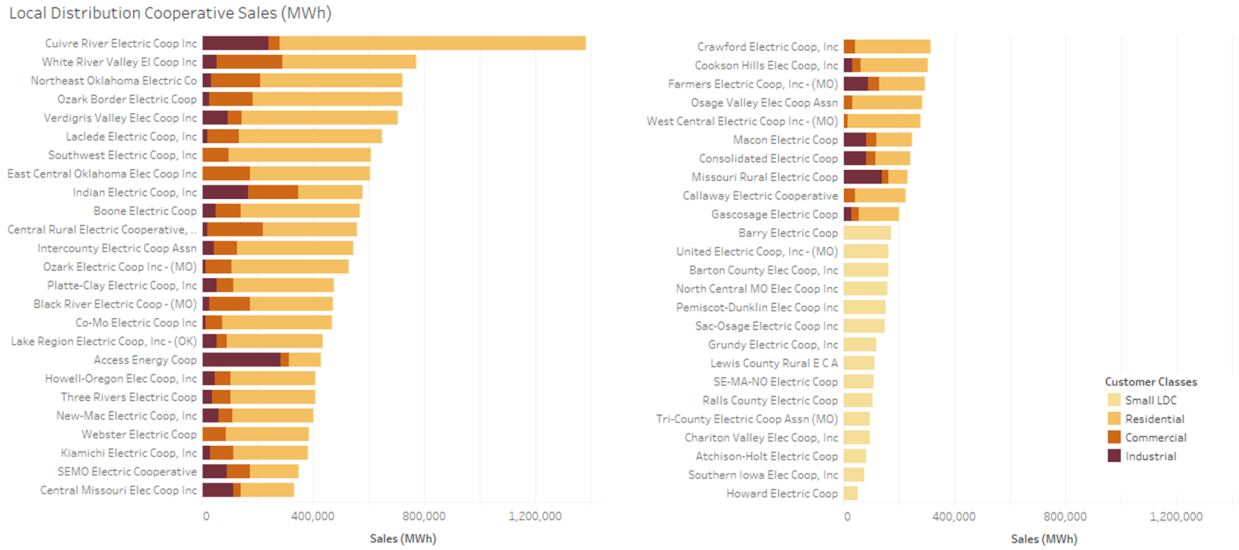
Historically, tax credits and financing mechanisms have made it difficult for rural cooperatives to invest in clean energy. Direct-pay tax credits and the once-in-a-generation New ERA program provide the opportunity for cooperatives to become clean energy leaders. However, to effectively harness this 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 provides a pathway for AECI to position itself for success, and tap up to $970 million in federal grants - **nearly $1,410 per customer** over the incentive period.[2]

Associated Electric Cooperative Incorporated

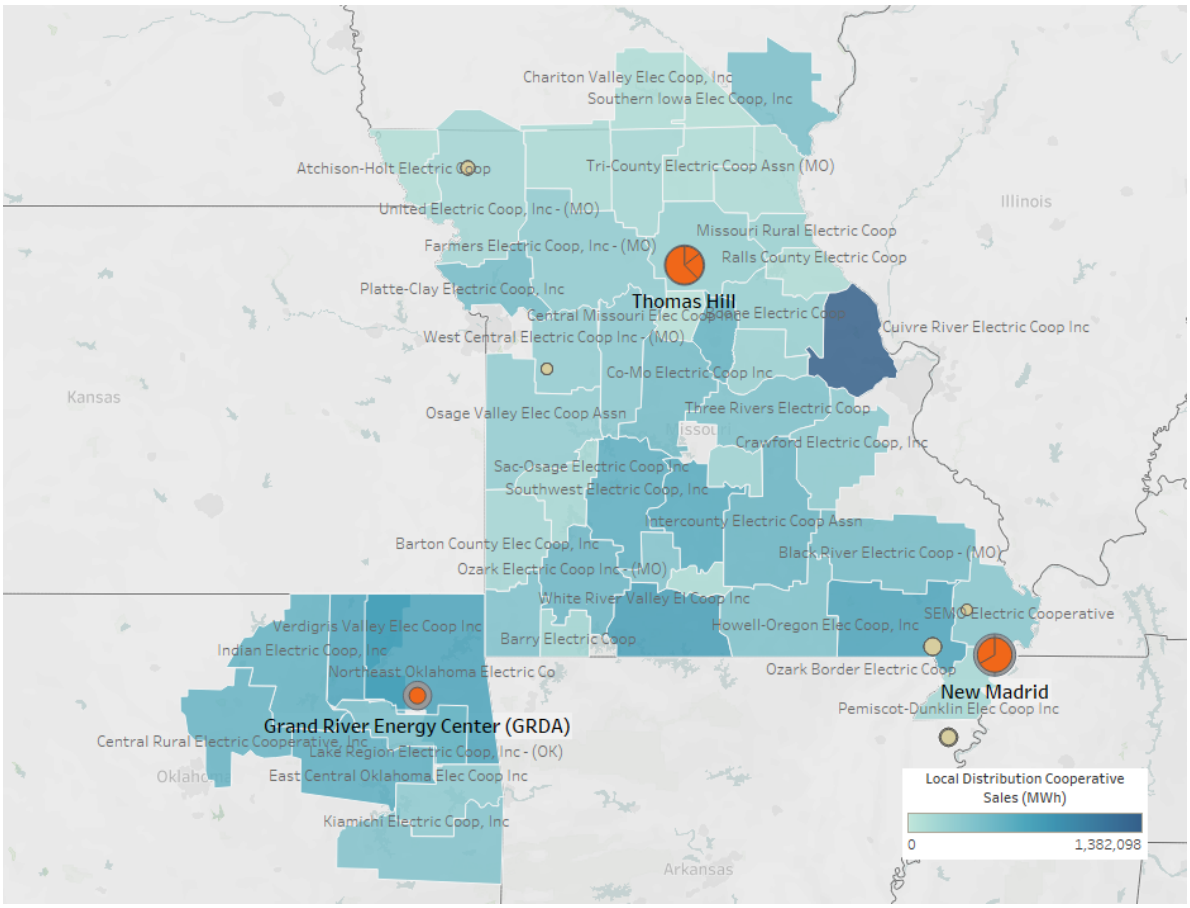
Associated Electric Cooperative Incorporated (AECI) provides wholesale power generation and high-voltage transmission to six transmission co-op member-owners who, in turn, supply 51 local electric cooperatives across Missouri, southeast Iowa, and northeast Oklahoma serving about 935,000 member homes, farms, and businesses. The graphic below shows some of AECI's largest co-op members and their customer class percentages. Of these, Cuivre River Electric Cooperative is the largest member, serving more than 70,000 homes and businesses across five Missouri counties: Lincoln, Montgomery, Pike, St. Charles, and Warren. AECI's member cooperatives largely serve residential loads. However, not pictured here are AECI's sales to large wholesale industrial

[2] Based on 687,895 member-owners in Missouri, per EIA, available at https://www.eia.gov/electricity/sales_revenue_price/pdf/table10.pdf

customers, including critical metals producers. Those customers are some of the largest power users in Missouri.



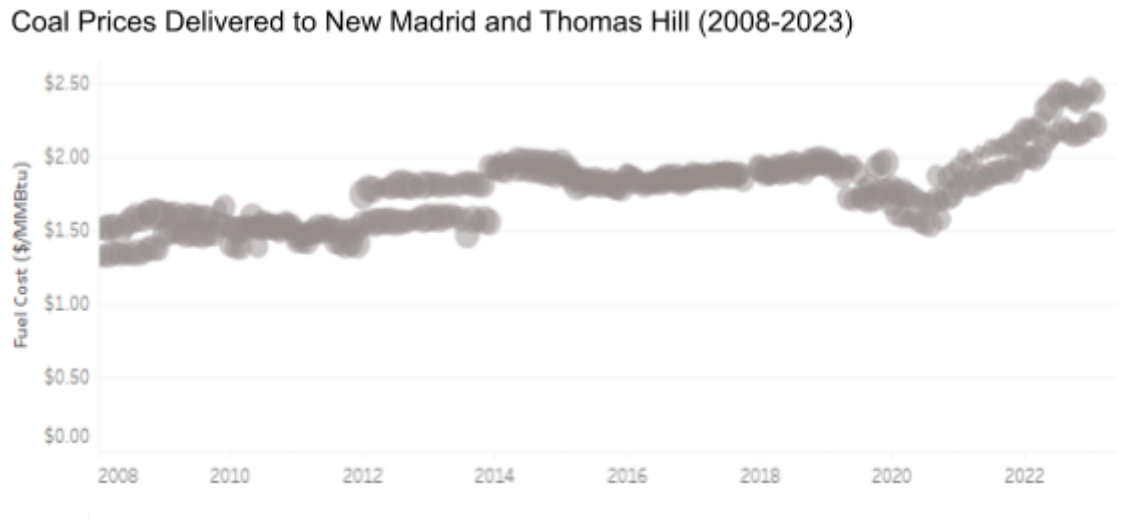
The map below depicts AECI's expansive territory, along with the locations for AECI's two large coal-burning power plants. Member cooperatives are shaded by their power demand.



AECI's Coal Plants

AECI owns and operates two coal-burning power plants in Missouri: the Thomas Hill plant in north-central Missouri, and the New Madrid plant in Missouri's Bootheel region. Together, these plants provide around 2,340 MW of total capacity. These aging coal plants face a number of challenges, including the imposition of increasingly stringent environmental regulations that could result in capital-intensive plant retrofits or outright unit retirements.

Moreover, as shown in the chart below, coal prices for New Madrid & Thomas Hill have steadily increased over time. This changing landscape for fossil generation will likely squeeze AECI's profit margins and/or result in rising rates for customers.



Source: EIA Form 923

The New ERA Opportunity for AECI

AECI has an opportunity to reduce costs for its members and industrial customers by harnessing USDA's New ERA program. Under this program, AECI can drive local economic development, reduce costs to its members, take significant steps towards energy independence, and dramatically reduce its emissions. However, to provide a competitive application, AECI will have to demonstrate that it can achieve deep emissions reductions, not just incremental growth in clean energy. With updated and pending federal rules that could result in significant operational cost increases for both Thomas Hill and New Madrid, this program could not come at a better time.

AECI could drive deep benefits to its members through a portfolio that replaces Thomas Hill with clean energy. Recent modeling demonstrates that a clean portfolio—i.e. one built entirely of renewable energy, energy efficiency, and battery storage—could result in dramatic cost reductions for co-op members and industrial customers while maintaining reliability. Energy Futures Group, an independent consulting firm, conducted an assessment of a clean energy portfolio that could meet AECI's reliability and energy needs after the retirement of Thomas Hill. This analysis uses

EnCompass, a model used by utilities across North America, to develop an optimized portfolio for AECI. EnCompass provides both capacity expansion and production cost modeling. Capacity expansion modeling develops an optimized portfolio that minimizes the utility's system costs subject to key constraints, such as transmission constraints and reserve requirements. The production cost model is a simulation of the portfolio's hourly operation to ensure that needs are met even under strained conditions, in each year of the planning period (in this case 2023-2037).

The modeling built in the planning reserve margin as assessed by the reliability council for AECI, SERC.[3] It used the most recent projected peak demand total energy requirements developed by AECI, and merged that with hourly load shapes from a commercial database. AECI's fixed and variable costs were based on the same commercial database because little information is released publicly by AECI. Our assessment conservatively *did not* take into account the rapid rise in fuel costs seen in 2022 and 2023. By assuming that coal costs will stay at or near 2019-2020 levels, the model provides a very optimistic view of these stressed coal markets. The model also developed projected capital expenditures based on publicly available information.

For the New ERA plan, the model was directed to consider solar, 4-hour battery storage, 10-hour battery storage, and wind resources. The model used clean energy cost estimates from the 2022 National Renewable Energy Laboratory (NREL) Annual Technology Baseline. Two adjustments were made to the NREL estimates to consider impacts of inflation and supply chain pressures: (1) inflation was assumed to be around 5% until 2027 and, after, at 3%; and (2) Conservatively, additional costs were included to account for supply chain pressures: 30% in 2026, 25% in 2027, 20% in 2028, and 15% in 2029. Interconnection costs for all supply side resources were also accounted for, including costs based on the Lawrence Berkeley National Laboratory's PJM interconnection cost study.

The model was allowed to tap direct-pay tax credits, including the energy community bonus adder and the prevailing wage and labor multiplier. Solar and wind resources were modeled with the production tax credit and battery resources with the investment tax credit.

Finally, the model solved for a stress case simulating Winter Storm Uri conditions to ensure that AECI could meet its hourly demands with minimal levels of imports.

The New ERA modeled portfolio not only replaces the capacity obligation of Thomas Hill 1 & 2, but also meets the needs of AECI under even the most stressed conditions. Building 500 MW of four-hour battery storage, 1,500 MW of solar photovoltaics, 2,500 MW of wind, and 167 MW of energy efficiency allows AECI to improve reliability, reduce fuel cost exposure, and reduce costs to customers. The model also demonstrated—using conservative estimates for the cost of clean energy—that AECI could save nearly $358 million (on a present value basis) relative to holding a business-as-usual path, while also maintaining electrical service during a severe storm, such as those encountered during Winter Storm Uri.

[3] 2022-2031 SERC Annual Long Term Reliability Assessment Report. Available online at https://www.serc1.org/docs/default-source/program-areas/reliability-assessment/reliability-assessments/2022-2031-serc-annual-long-term-reliability-assessment-report.pdf

The New ERA portfolio reduces power supply costs for member customers by nearly 3% over the entire span 2023-2032, and the benefit only increases over time. Between 2023-2027, the New ERA scenario has virtually no differences from the BAU, but as new clean energy comes online to replace Thomas Hill, it drives further cost reductions. **Overall, the New ERA portfolio would save customers nearly $358 million on a present value basis by 2032 relative to the continued use of the existing system.**

The New ERA portfolio also has significant emissions benefits. This new portfolio reduces absolute greenhouse gas emissions by an estimated 5.6 million tons per year in 2031— more than 27% below the BAU. **This would make AECI's application strong and compliant with New ERA's statutory requirements.**

Under the modeled scenario, AECI would need to invest approximately $4 billion in capital, but it should expect to recover 40% of the cost of batteries through the investment tax credit, and 65% of solar and wind costs through direct pay production tax credits. In addition, with a $4 billion investment package, AECI can readily apply for the maximum $970 million grant in USDA's New ERA program.

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**.

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.

AECI 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 retire two high emissions and health-damaging coal units at Thomas Hill 1 and 2 well before the end of the decade.

Under the scenario examined here, AECI can invest $4 billion in clean energy projects, benefiting from lower costs to consumers, reduced volatility, improved resilience, lower risk, and member-oriented economic development. By harnessing New ERA funds, **AECI can drive 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.