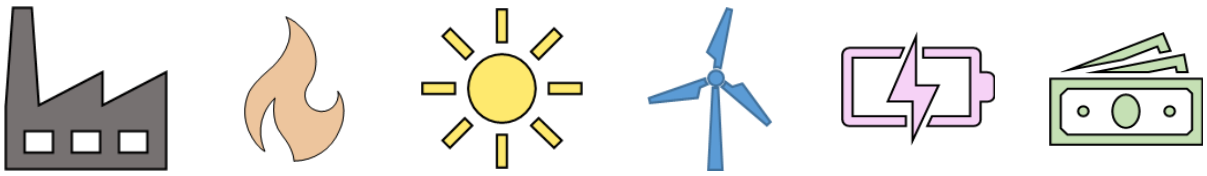
Leveling the Playing Field

How Arkansas Electric Cooperative Corporation can leverage USDA's New ERA Grants to drive down costs for customers

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, 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 - to lead the energy transition. **Arkansas Electric Cooperative Corporation** (AECC), which serves 572,000 customers throughout Arkansas, has a unique opportunity to harness USDA's New ERA program, and drive deep cost savings for its customers.

Under a federal consent decree, two coal plants in Arkansas, co-owned by AECC, are required to be closed by 2028 and 2030, respectively. AECC can use New ERA to acquire clean energy that can cost-effectively and reliably meet its obligations in the absence of those two plants, significantly reducing costs to its consumers. Our modeling shows that AECC can leverage $930 million in New ERA grants to drive $3.7 billion in clean energy investments - **1,372 MW of solar photovoltaics, 934 MW of wind, and 374 MW of 5-hour storage** - saving customers nearly **$90 million every year** relative to replacement gas plants.



Remove	Avoid	Build	Build	Build	Save
1,260 MW	**850 MW**	**1,400 MW**	**930 MW**	**370 MW**	**$90 M**
Coal	Gas	Solar	Wind	Battery	per year

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 a cooperative that can deploy a portfolio 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.

USDA opened its Notice of Funding Opportunity for New ERA on **May 16, 2023**, and expects pre-applications for this competitive program by **August 31, 2023**. USDA encourages utilities 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.

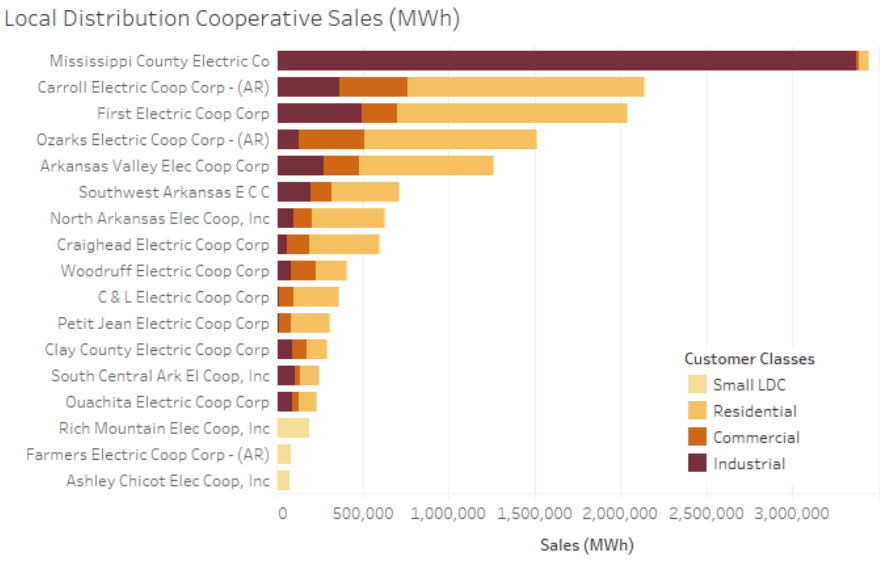
With New ERA and direct-pay tax credits, cooperatives can **own the clean energy transition**, and pass the benefits of reliable clean energy portfolios to their customers and communities:

- **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**: Utilities with broad clean energy portfolios are resilient to market price shocks, fuel availability risks, 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.

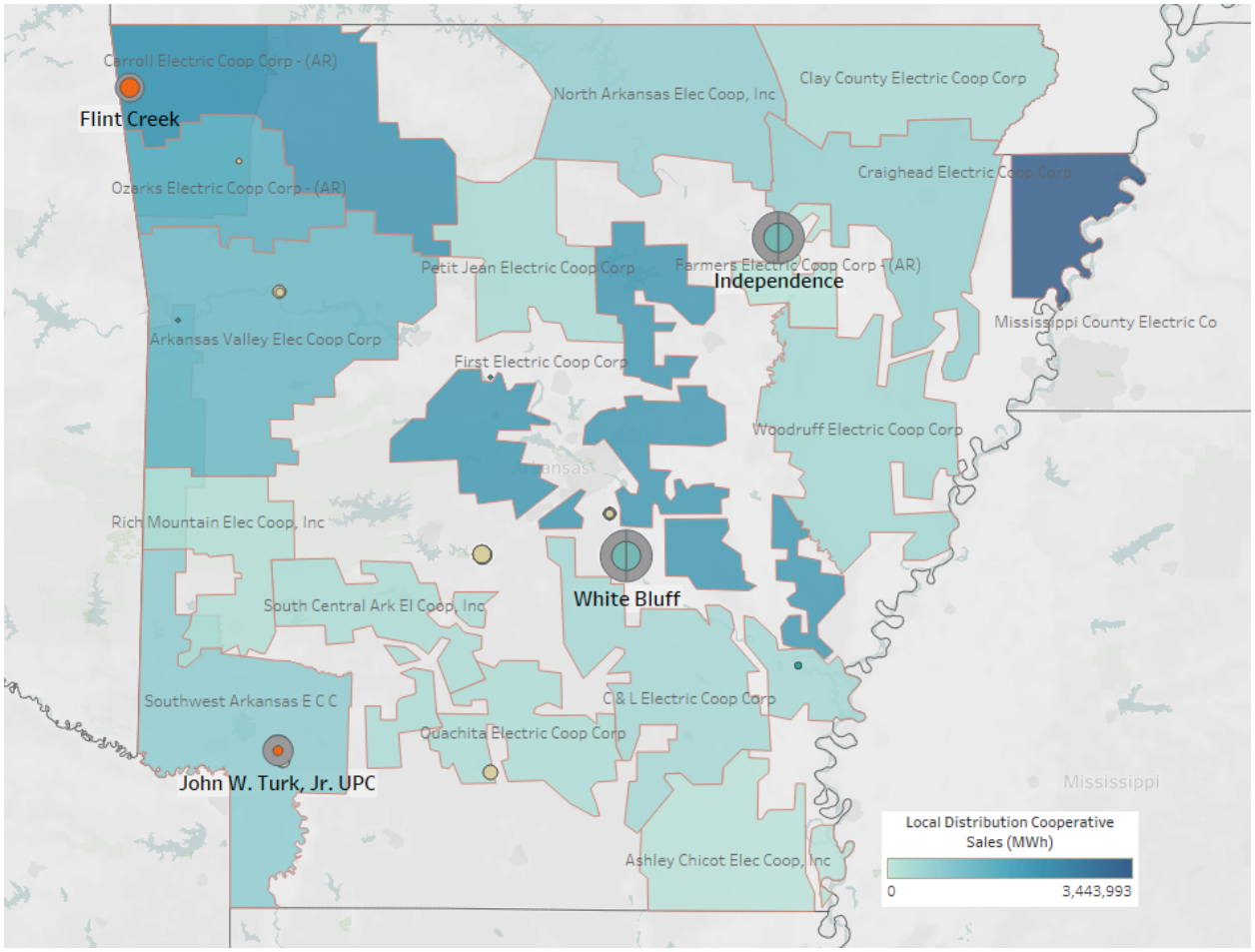
Historically, tax credits and financing mechanisms have made it difficult for rural cooperatives to invest in clean energy. Direct-pay tax credits and the once-in-a-generation New ERA program provide the opportunity for cooperatives to become clean energy leaders. However, to effectively harness this 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 Arkansas Electric Cooperative Corporation to position itself for success, and tap up to **$970 million in federal grants**.

Arkansas Electric Cooperative Corporation

Arkansas Electric Cooperative Corporation, or AECC, serves 572,000 customers throughout rural Arkansas, including some of the state's largest industrial customers. In total, the utility serves 30 percent of the state's electric requirements. As a generation and transmission (G&T) company, AECC serves the full and partial requirements of seventeen local distribution cooperatives.



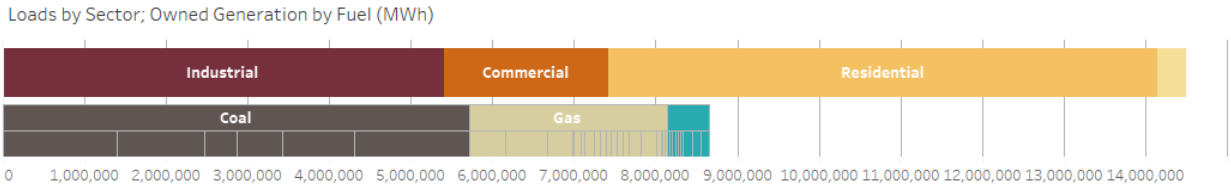
Its single largest local distribution cooperative in terms of demand is Mississippi County Electric, which in turn serves predominantly industrial customers, including the Nucor-Yamato steel manufacturing facility and adjacent metal manufacturers in the northeastern corner of the state.



AECC covers much of the state of Arkansas, but its heaviest customer loads are its industrial consumers in Mississippi Electric Cooperative. AECC's bulk rates are about 10% higher than those of investor-owned utilities in Arkansas.[1]

Today, 75 percent of AECC's capacity is provided by coal (37.9 percent) and gas (37.2 percent), while another 20 percent is provided through power purchase agreements.[2] About one-third of AECC's energy comes from coal-fired power plants that it owns, or partially owns.[3] The utility is not contracted with solar providers, and does not have utility-scale storage facilities.

[1] EIA Form 861 (2012-2021).
[2] AECC Annual Report. 2021.
https://2021report.aecc.com/wp-content/uploads/AECC-Financial-Report-2021.pdf
[3] EIA Form 860 (2021), EIA Form 923 (2021), EPA Clean Air Markets Dataset (2021).



AECC interacts with two wholesale electricity markets, the Midcontinent Independent System Operator (MISO) and the Southwestern Power Pool (SPP). In 2021, AECC recognized net market revenues of $83.7 million through sales of energy to those wholesale markets.

Arkansas Electric Cooperative Corporation's Coal Plants

AECC has partial ownership of four coal plants in Arkansas. These facilities emitted nearly 18.5 million tons of CO2 in 2022, with AECC's ownership share alone accounting for 6.1 million tons of CO2.

AECC owns half of the **Flint Creek** power plant, a 558 MW coal-fired facility built in 1978. Flint Creek burns coal shipped in from Wyoming's Powder River Basin. In 2022, Flint Creek emitted just shy of 3 million tons of CO2. The estimated all-in cost of operation at Flint Creek is around $31/MWh. However, the cost of delivered coal has increased in recent years - up nearly 20% since pre-2020 costs, and to continue operating the plant is likely to require new environmental controls. Flint Creek lacks state-of-the-art controls to reduce pollution of oxides of nitrogen (NOx), and it will likely need to control those emissions to comply with EPA's Good Neighbor rule.[4]

AECC has a 35 percent ownership share in the **Independence** and **White Bluff** coal plants. Both of these 1,800 MW power plants consist of two 900 MW coal-fired units, neither of which has state-of-the-art pollution controls for NOx or sulfur dioxide (SO2). Both of these plants burn coal shipped in from Wyoming as well. In 2022, the plants emitted an extraordinary 12 million tons of CO2.

To meet the terms of a federal pollution requirement, the owners of White Bluff and Independence have agreed to an enforceable commitment to cease operations at White Bluff and Independence in 2028 and 2030, respectively. As a result, AECC (and its co-owners) will be seeking replacement resources for these plants over the next few years.

Finally, AECC has a small minority (11.6%) ownership stake in the 609 MW **John W. Turk** coal plant, built in 2012. Like the other plants here, Turk receives coal from Wyoming. Turk emitted 3.6 million tons of CO2 in 2022.

The New ERA Opportunity for Arkansas Electric

Arkansas Electric has an opportunity to reduce costs for its members and industrial customers by harnessing USDA's New ERA program. Under this program, AECC can drive local economic development, reduce costs to its members, and dramatically reduce its emissions. However, to

[4] https://www.epa.gov/csapr/good-neighbor-plan-2015-ozone-naaqs

provide a competitive application, AECC will have to demonstrate that it can achieve deep emissions reductions, not just incremental growth in clean energy. Since AECC is already required to replace the Independence and White Bluff power stations, one of its strongest application measures may be to ensure that the replacement capacity for these power plants is derived entirely from renewable energy.

AECC could drive deep benefits to its members through a portfolio that replaces Independence and White Bluff with clean energy. Our modeling demonstrates that a clean portfolio - i.e. one built entirely of renewable energy and battery storage - could result in dramatic cost reductions while maintaining reliability.

Sierra Club commissioned an independent assessment of a clean energy portfolio that could meet AECC's reliability and energy needs after the retirement of Independence and White Bluff power stations. This analysis uses GenX, an open-source electric system evaluation model developed by researchers at MIT and Princeton to assess how energy systems integrate renewables, storage, and other technologies. The model is equipped to assess how combinations of renewable energy and storage can meet the hour-by-hour needs of an electric utility. In this case, the model was used to assess AECC's system. Our assessment conservatively assumed that AECC had no opportunity to interact with regional electricity and capacity markets in MISO and SPP, despite the fact that it does so on a regular basis. We also limited interaction between AECC's MISO and SPP segments to just 275 MW of transfer capacity, reflecting AECC's projection of demand in SPP that is "pseudo-tied" into MISO. The value of these conservative assumptions is that the model was forced to build a replacement portfolio as if AECC were entirely independent of the market, with limited interaction between the SPP and MISO portions of their system, a stance that would typically require greater costs. Our reasoning is that if we can demonstrate that AECC can build a cost-effective portfolio independent of the market, then any shared market resources just make the portfolio less expensive.

In our baseline, we assumed that AECC pursued 850 MW of gas-fired combined cycle capacity to replace Independence and White Bluff, an assumption based on AECC's recent integrated resource plan put forward before Arkansas regulators.

In our New ERA plan, we charged the model with meeting AECC's requirements by 2030 (including the replacement of both Independence and White Bluff), relying exclusively on local wind, solar, and up to 10-hour lithium-ion battery storage. The model used clean energy cost estimates from the National Renewable Energy Laboratory Annual Technology Baseline (ATB), estimated for 2028 (to account for the potential timing of new additions to meet 2030 system needs). Conservatively, we added a 10% cost increase, reflecting supply chain considerations that we believe will be relieved before the start of construction for new clean energy.

The model was built on a load profile based on hourly requirements in 2022, including the dramatic requirements of Winter Storm Eliott. Drawing on existing resource adequacy standards in AECC's market regions, we required that the model meet a reserve margin of 12% in SPP and 8.7% in MISO in every hour of the year, irrespective of load. In other words, not only did we grow load from the most extreme conditions experienced in AECC's territory, but we required that the model reliably

meet customer requirements - with room to spare - in every hour using real weather conditions experienced at the time.

We allowed the model to tap both direct-pay tax credits (up to a 10% adder for domestic content, and the energy communities adder for solar), and the USDA New ERA program as a 25 percent grant, up to $970 million.

The model assessed that AECC could reliably serve customer requirements by replacing Independence and White Bluff with **1,372 MW of solar photovoltaics, 934 MW of wind, and 374 MW of 5-hour storage.**

Using DOE-developed gas-price forecasts from the Energy Information Administration (EIA) the model projected that a replacement 850-MW gas plant would result in annualized costs of $540 million (an all-in cost of $36.2/MWh), 60% of which is the cost of gas alone.

In contrast, our clean energy portfolio resulted in costs of just $451 million per year (or $30.2/MWh), **annual savings of $89 million per year,** and emissions reductions of nearly 3 million tons CO2 per year relative to the gas plant (far more if we count upstream methane leakage).

AECC reports that in 2021 it had operating expenses of $1,069.6 million. A savings of $89 million per year would translate to a bulk cost reduction of nearly 8 percent, which is significant for AECC's customers.

One substantial benefit of the clean energy approach is that it insulates AECC's customers against highly volatile and uncertain gas prices. Under high gas price projections from EIA (for 2028), **the clean portfolio saves customers $142 million per year**, insulating AECC from the bulk of the gas price shock. Even under low gas prices, customers still come out ahead, saving $65 million per year.

The clean energy portfolio is not a small investment, but it pays off quickly. We estimate that the entire portfolio incurs a capital expenditure of around $3.7 billion. Of that, more than **half is recovered through the direct payment of production tax credits** on both solar and wind, another **$245 million is recovered through direct payments of the investment tax credit** for storage systems, and **$930 million is recovered through USDA's New ERA program**. In total, AECC's long-term debt would reflect less than a quarter of the cost of the clean energy and storage systems.

A New ERA of Clean Energy Economic Development in Arkansas

The development of these solar and wind projects would invest nearly $1 billion in the local clean energy economy, create an estimated **12,000 jobs (FTEs) during the construction period**, and another **500 ongoing on-site or local supply maintenance and operations jobs**.[5] To the extent that steel supply for the projects are manufactured in Arkansas, a far larger fraction of the clean energy investment could stay within Arkansas.

[5] 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.

Taking the Shot

The New ERA program and direct-pay tax credits offer a unique opportunity for rural electric cooperatives to become America's clean energy leaders, driving rural economic development and lowering costs to members.

Arkansas Electric Cooperative Corporation can harness this **once-in-a-generation moment** to leverage USDA's New ERA program and drive deep cost savings for its customers, by acquiring clean energy that can meet its obligations after the closure of the Independence and White Bluff coal plants at the end of the decade.

With $930 million in New ERA grants, AECC can invest $3.7 billion in clean energy projects, saving customers nearly $90 million every year. Cooperatives can benefit from lower costs, reduced volatility, improved resilience, lower risk, member-oriented economic development. **AECC can drive deep benefits under the New ERA program, but it has a limited window to take the shot.** This is the cooperative's opportunity to lead the energy transition and pass the benefits of reliable clean energy portfolios to its customers and communities.