On the Record
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Rob Boaz, President/CEO
Carroll Electric Cooperative Corp.

INSULATING YOU FROM RISKS

Carroll Electric Cooperative Corp. (CECC) went **On the Record** in March 2021 to address growing concerns about the Bulk Power System (**BPS**) – the interconnected network of electric power generation, high-voltage transmission lines, and regional operators that deliver electricity to local utilities like Carroll Electric. The electric industry is facing measurable reliability and affordability pressures.

CECC, together with our wholesale power supplier, Arkansas Electric Cooperative Corp. (AECC), and our national trade association, NRECA, is proactively addressing these risks. Issue 6 outlines the risks and the steps we are taking to manage them. Reliability and affordability do not happen by accident—they result from disciplined planning, prudent investment, and thoughtful advocacy on your behalf.

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<tr><th>RISKS</th><th>RESPONSE</th></tr>
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AFFORDABILITY

The **historical evolution** of dispatchable and non-dispatchable resources and the policies that shaped their development **is on page 2**.

- All forms of electricity generation face criticism.
- Developing an **energy policy that is too narrowly focused** on the characteristics of a single generation source, rather than the performance of the complete electric system, **ultimately proves costly for Americans**.

VOLATILITY

The Federal Energy Regulatory Commission (FERC), through Regional Transmission Organizations (RTOs), oversees deregulated wholesale electricity markets, which produce:

- **Low** prices in **supply-abundant** markets.
- **High** prices in **supply-constrained** markets.

The deregulation of federal price controls on natural gas, coupled with increased reliance on natural gas-fired generation, suggests this volatility is likely to persist.

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ELECTRIC COOPERATIVES

- Not-for-profit electric cooperatives share the mission of providing safe, reliable, affordable electricity. **CECC's rates are 21% below[1] the national average**. In 2018, CECC implemented a billing mechanism to stabilize volatile wholesale price fluctuations.
- AECC advocates for a resource-diversified Balance of Power and connects CECC to the BPS through two RTOs. Each generation resource has strengths and tradeoffs. An affordable and resilient grid depends on maintaining balance across the entire system.
- When market prices are lower than AECC's own cost to generate power, **market benefits are harvested on your behalf**. When market prices are higher, **AECC's generation mitigates wholesale prices**. This includes sophisticated physical and financial hedging for generation fuels. These efforts provide *unseen savings* on your bill.

Recent Illustration: January's Winter Storm Fern produced RTO market prices (driven by natural gas) that were 11 times pre-storm prices. **Compared to full market exposure, AECC's owned generation reduced costs by approximately $60 million over nine days**.

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RELIABILITY

At the highest level, the North American Electric Reliability Corporation (NERC), our nation's watchdog for the electric grid, recently released its Long-Term Assessment, which indicates elevated risks of supply shortages presently and projects high reliability risks in 2028.

Inadequate generation supply will place additional pressure on affordability, and RTOs may need to implement controlled outages to preserve overall grid stability.

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ELECTRIC COOPERATIVES

- CECC, AECC, and NRECA are clear advocates for maintaining adequate dispatchable power generation at all levels of government.
- AECC is building new power generation to meet the dramatic growth in electric demand. These projects consider both reliability and affordability within the constraints of existing policy. The schedule and projected costs of these projects compare favorably to industry benchmarks.
- AECC is optimizing its existing power generation fleet. This includes physical hedging of power generation fuels, plant maintenance, and event planning initiatives.
- AECC operates in two Regional Transmission Organizations (RTOs) and works closely with each RTO to maintain reliability.
- If RTOs order controlled outages, AECC and CECC are prepared to respond.

INDUSTRY

RTOs have *reduced* the degree to which reliability can be assured with non-dispatchable intermittent resources—and *increased* utility requirements for maintaining additional dispatchable power generation.

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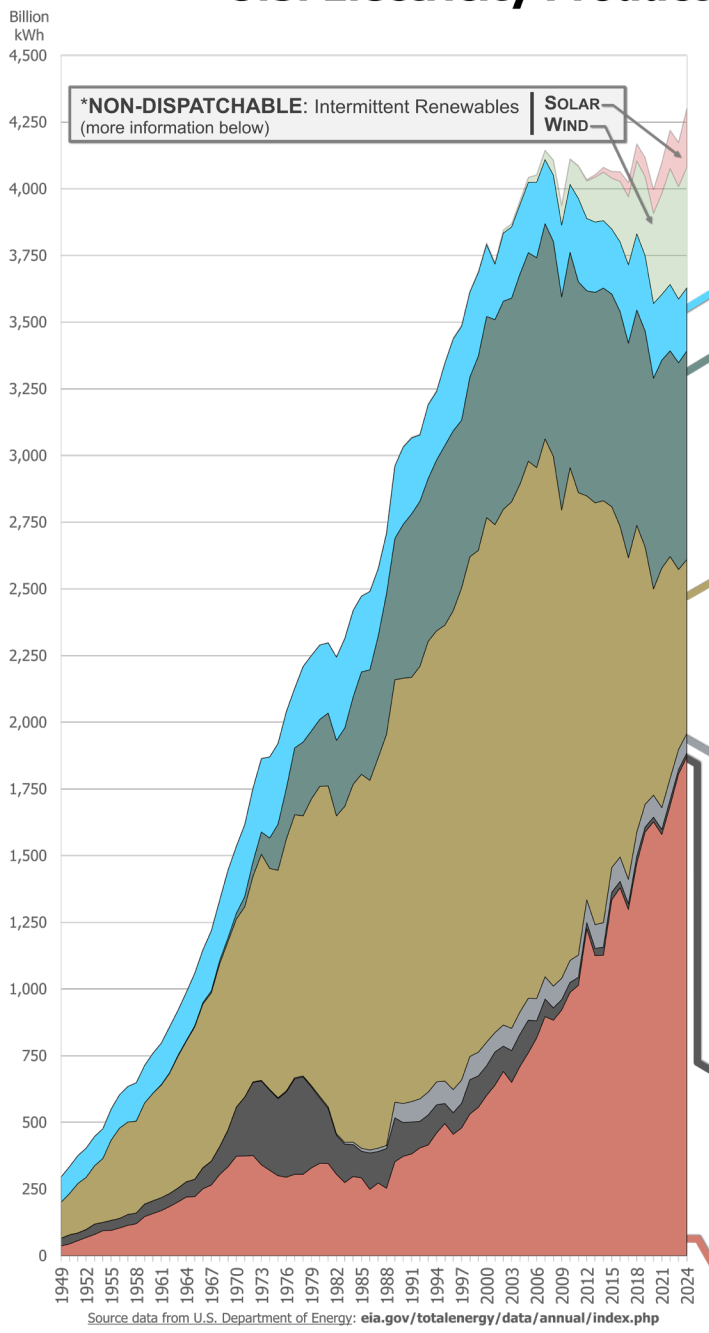
[1] Based on 2025 data reported to the U.S. Energy Information Administration (EIA) Independent Statistics and Analysis.

U.S. Electricity Production by Generation Source



Source data from U.S. Department of Energy: **eia.gov/totalenergy/data/annual/index.php**

DISPATCHABLE Power Generation

HYDROELECTRIC power in the U.S. was developed from the 1930s through the 1970s as part of multipurpose public-use water projects, which also enabled electric cooperatives and municipal utilities to reduce reliance on power purchases from for-profit investor-owned utilities.

- *While hydropower is generally dispatchable, its operational flexibility depends on water availability.*
- **No major new U.S. hydropower dam has been authorized and completed since the 1970s**, due to geographic limitations, landowner and tribal concerns, and the effects of National Environmental Policy Act of 1969 and the Endangered Species Act of 1973.

NUCLEAR power in the U.S. was enabled by the Atomic Energy Act of 1954, but construction slowed in the late 1970s and further declined following federal regulations after the Three Mile Island accident in 1979.

- While many reactors were completed in the 1980s, few new plants have been ordered since.
- **Only two reactors have entered service since the early 1990s**.
- High capital costs, schedule uncertainty, and cost overruns make new nuclear construction *financially risky*.

COAL power in the U.S. was actively promoted following the oil embargo of the 1970s through federal policies aimed at reducing reliance on petroleum fuels, including provisions of the Energy Policy and Conservation Act (EPCA) of 1975 and subsequent fuel-use regulations.

- However, since the first United Nations Climate Change Conference in 1995, coal has faced **considerable regulatory and policy constraints**. Since 2000, ***an estimated 780 coal units have closed***. Coal's share of U.S. electricity generation declined from approximately 53% in the mid-1990s to about 15% in 2024, although **coal remains the largest single source of electricity generation worldwide**.
- In recent months, the U.S. Department of Energy has issued emergency orders requiring certain coal-fired power plants to remain online to preserve grid reliability.
- Given the risks associated with policy uncertainty, no utility-scale coal-fired power plants are under construction in the U.S.

OTHER power, such as ***GEOTHERMAL*** and *waste-to-energy* facilities (***WOOD***, ***BIOMASS***, ***LANDFILL GAS***, and ***OTHER BYPRODUCT FUELS***), are typically constrained by site-specific geological conditions and the availability of these fuels, which limit their geographic scalability.

PETROLEUM power in the U.S. was historically used primarily for peaking and reliability purposes. Its role declined significantly following the oil embargoes of the 1970s and the passage of the EPCA of 1975, which emphasized reducing reliance on petroleum fuels. Today, fuel oil (similar to diesel) serves as a **valuable hedge** against sharp fluctuations in natural gas prices and supply constraints – such as pipeline congestion – to maintain reliability during extreme conditions.

NATURAL GAS power in the U.S. also stalled following the EPCA of 1975 and the Powerplant and Industrial Fuel Use Act of 1978. However, natural gas grew from approximately 9% of the generation mix in the early 1980s to 43% in recent years. This growth occurred largely because natural gas generation faces *fewer siting and regulatory barriers*, *lower capital costs*, and *shorter construction timelines* than hydroelectric, nuclear, coal, or other dispatchable generation resources.

Several factors contribute to the sharp price volatility of natural gas, both low and high:

- Federal wellhead price controls ended through the deregulation of wholesale natural gas markets under the Natural Gas Policy Act of 1978 and the Natural Gas Wellhead Decontrol Act of 1989.
- The deregulation of wholesale electricity markets through the Public Utility Regulatory Policies Act of 1978, the Energy Policy Act of 1992, and Federal Energy Regulatory Commission Orders 888 and 889 enabled independent power producers (predominantly natural gas-fired) to sell electricity at **market prices**.
- Additionally, the widespread adoption of hydraulic fracturing, facilitated in part by reduced federal oversight following the Energy Policy Act of 2005, significantly expanded natural gas supply, enabling rapid production responses to **supply-abundant** and **supply-constrained** electricity *markets*, contributing significantly to price volatility.

*NON-DISPATCHABLE: Intermittent Renewables

HISTORY: A convergence of factors, including air-pollution concerns and energy-security risks in the 1970s, followed by growing climate-change concerns beginning in the 1990s, led to expanding government support for wind and solar energy. Support included public research and development funding, preferential rate and market treatment, and **significant tax incentives**, most recently through the Inflation Reduction Act of 2022. These incentives, combined with major technological advancements during the 2010s, have positioned utility-scale wind and solar generation to clear wholesale electricity markets at very low prices during periods of supply abundance, and at very high prices during periods of supply constraint.

PRESENT: Some of the earlier tax incentives and market treatments associated with these resources are being reevaluated by policymakers, particularly as grid reliability concerns are heightened.

REALITY: **Despite their positive attributes, wind and solar remain NON-DISPATCHABLE resources**. Until utility-scale energy storage becomes broadly economical and deployable at scale, the inherent intermittency of wind and solar output prevents grid operators from reliably dispatching these resources to meet instantaneous system demand, requiring continued reliance on dispatchable generation and grid-balancing resources.

We will continue to monitor risks and opportunities closely and make disciplined decisions to protect both reliability and affordability for the Cooperative's membership. For more information, visit carrollecc.com/on-the-record.