

Re-powering or replacing peaker plants—typically older, inefficient fossil-fuel units—is driven by the need to reduce high operating costs and harmful localized emissions in overburdened communities. Shifting to cleaner alternatives like battery storage or modernized, lower-emission technology addresses environmental justice concerns while improving grid reliability to meet surging demand.



Clean Energy Group +5

- **Environmental and Health Benefits:** Peaker plants often lack modern pollution-control equipment and are concentrated in low-income neighborhoods or communities of color. Re-powering replaces high-emission nitrogen oxides and sulfur dioxide with cleaner, zero-emission technologies.
- **Economic Efficiency:** Fossil-fuel peaker plants are expensive to operate and maintain, often running only for short periods when electricity demand is highest. Replacing them with battery storage can be more cost-effective while offering faster, more accurate, and flexible response times.
- **Grid Reliability and Modernization:** As renewable energy penetration increases and climate change increases extreme heat events, quick-ramping resources are needed. Batteries can handle short-duration peak demand better than aging gas plants.
- **Environmental Justice:** Re-powering reduces the disproportionate pollution burden on disadvantaged communities, which often live near these, or older, plants.
- **Policy Drivers:** Federal policies like the Inflation Reduction Act's tax credits for storage, along with state-level decarbonization goals, are accelerating the transition.



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By upgrading or replacing these plants, utilities can ensure a more sustainable, cleaner, and reliable energy future.



Kleinman Center for Energy Policy +1

Batteries are generally not ideal for fully replacing traditional, long-duration fossil-fuel peaker plants because of their limited, short-duration capacity (typically 2–4 hours), high upfront capital costs, and inability to handle long-duration, multi-day, or seasonal spikes in demand when renewable generation fails.



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Key reasons why batteries face challenges as a total replacement for peaker plants include:

- **Limited Duration:** While batteries excel at quick, short-term power spikes (e.g., evening peaks), they cannot currently sustain power for days or weeks during low wind/solar periods.
- **High Cost:** While falling, lithium-ion battery technology remains expensive for large-scale, long-duration storage needs.
- **Environmental Concerns:** The mining, manufacturing, and disposal of large-scale battery systems present environmental risks.
- **Grid Charging Emissions:** If batteries are charged with electricity from a grid still reliant on fossil fuels, the overall emissions benefits can be diminished, or in some cases, increase net CO₂ emissions.
- **System Inefficiency:** Batteries are a "weak substitute" for the reliability of flexible gas turbines that can run continuously when needed.



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However, batteries are increasingly being used to complement or partially replace peaker plants by handling shorter, daily peaks, especially in regions with high solar penetration.