

Ensuring Energy *Resilience*

How tried-and-true equipment like generators will combine with emerging technologies to deliver reliable and sustainable mission-critical power.



We often hear about the global energy crisis: threats of power cuts, soaring energy bills, and countries grappling with securing reliable energy supplies. But what's driving these challenges? Two key factors stand out: supply and demand.

The Supply and Demand Challenge

Demand for energy is surging, fueled by the electrification of everything from smartphones and IoT devices to data centers and electric vehicles. This rapid growth is outpacing utility providers, who are burdened by aging infrastructure that needs significant maintenance and expansion. On the supply side, power grids rely on multiple sources — coal, gas, oil, renewables like wind and solar, as well as biomass and nuclear. But conflicts and geopolitical instability can disrupt fuel supplies, leading to increased costs and lower availability.

Adding to the strain are regulatory requirements aimed at reducing emissions. These often require costly upgrades, such as emission control systems, to meet stricter standards. Finally, extreme weather events caused by climate change further stress the grid. These conditions both increase energy demand for heating and cooling and damage infrastructure, compounding reliability issues.

Building Resilience

These challenges underscore the need for resilient energy systems that can ensure an uninterrupted power supply.

New technologies and energy sources show great promise. Increasing overall grid capacity with renewables like solar and wind can help. However, their inherent variability — no sun, no power—requires complementary solutions to manage short-term fluctuations.

Batteries offer potential for energy storage but remain expensive and are still in the early stages of large-scale adoption. While costs are expected to decline, they currently struggle to deliver the scale of power required for grid-level resilience.

Another option is hydrogen, which has long been seen as a versatile energy carrier. To scale its use, however, two major hurdles remain: creating low-carbon hydrogen using renewables and adapting power systems like engines or fuel cells to consume it effectively.



Dealing with Outages

While emerging technologies like batteries and hydrogen hold future potential, today's most reliable option for energy resilience remains the backup generator.

Generators, historically powered by diesel, are evolving to meet the need for lower emissions. One significant development is the adoption of hydrotreated vegetable oil (HVO) as a fuel. HVO, also known as renewable diesel, can reduce the lifecycle carbon emissions of the fuel used by up to 90%, reducing dependence on fossil fuels without compromising performance.

Companies like Rehlko are leading the charge in providing cutting-edge backup power solutions, blending reliability with innovation to support businesses' energy resilience.

A Pragmatic Approach to Innovation

The path to sustainable energy resilience involves combining proven technologies with emerging innovations.

Generators, for instance, continue to play a vital role in supporting newer solutions like solar and batteries. A hybrid system can offer the best of both worlds: renewable energy supplemented by generators when the sun isn't shining or batteries are depleted.

Advances in adjacent industries are also driving improvements. For example, as batteries become more widely used in vehicles, their performance, safety, and affordability improve — making them more viable for broader applications.

Proven solutions also evolve. Generators powered by advanced engines now meet the most stringent emissions standards, including ultra-low NOx and particulate matter levels. These systems undergo extensive development and field testing to ensure they're ready for mission-critical applications before launch.



A Combination of Technologies

The global energy crisis calls for a blend of reliable and sustainable solutions. Tried-and-tested equipment like generators will remain essential, particularly when paired with renewable energy and storage systems to provide flexible, dependable power.

The future of energy resilience lies in leveraging the strengths of multiple technologies to ensure systems that can adapt to evolving needs. Because reliable power isn't just about keeping the lights on — it's about keeping your business running, no matter the challenge.