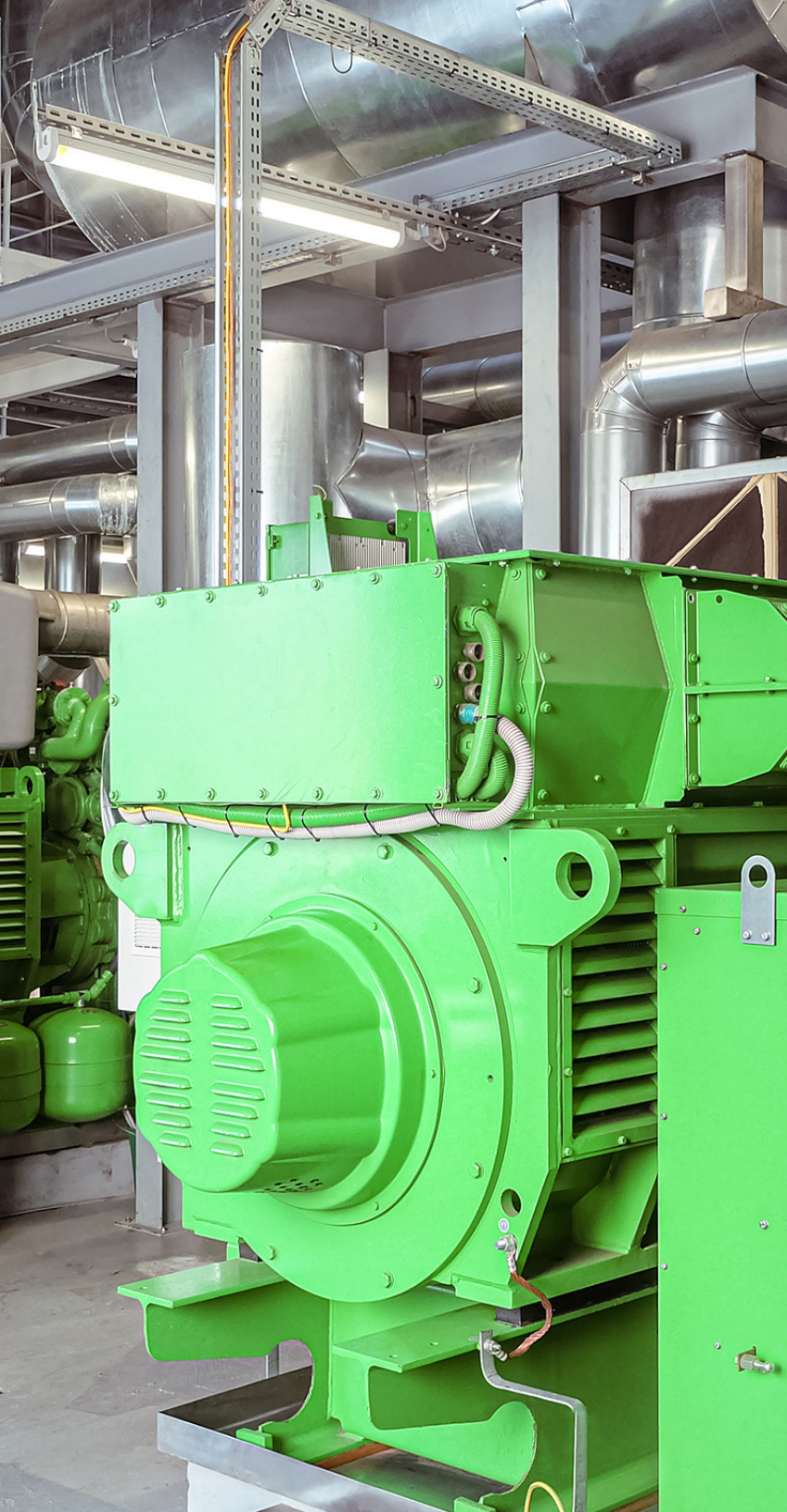




Backup Power and The Future of Sustainable Energy

For decades, diesel generators have provided backup power for facilities that need to sustain critical processes during outages.

Today, there are other cleaner, more reliable, and more cost-effective options. Natural gas generation is gaining favor due to increasing restrictions on emissions and shifting requirements for on-site power generation, while battery storage and uninterruptible power supply (UPS) solutions offer added resiliency. Additionally, microgrids are becoming a prominent solution for enhancing energy reliability and sustainability.



Why Diesel Generators Aren't Enough

Traditionally, companies rely on diesel generators for backup power when public utility services are interrupted, but there are downsides. Diesel generators are:

- Dependent on nonrenewable fossil fuels
- Unable to handle long-term outages
- Prone to maintenance issues
- Unable to provide an uninterrupted power supply when there's a sudden loss of utility power

Additionally, diesel generators can fail to start or operate as intended approximately during emergencies, often due to issues like battery failure, fuel system problems, and maintenance lapses.

Benefits and Drawbacks of Diesel Generation + UPS

An Uninterruptible Power Supply (UPS) is a system that combines a generator and energy storage to provide continuous power in the event of an outage. It ensures that sensitive electronic loads are protected from power interruptions and meets specific compliance standards, such as UL 1776, which sets guidelines for safety and performance. A diesel generator paired with an uninterruptible power source (UPS) bridges the gap for a facility's most sensitive electronic loads.

The trade-off, though, is that all other loads — including HVAC and lighting — lose power while the generator gets up to speed. This is because traditional UPS systems are designed to primarily support critical loads to minimize cost and complexity. Non-essential systems must wait until the generator reaches operational capacity, which can take several seconds. This delay can disrupt operations, reduce comfort, and potentially cause data loss or equipment damage. Moreover, an intermittent power supply can cause voltage sags or surges, affecting the performance and longevity of connected equipment.



There's a better way to achieve instantaneous, uninterrupted power.

Meet R3Di®: A Resilient, Sustainable Turnkey Solution

The R3Di® System by e2Companies uses a fast-discharge battery energy storage system (BESS) with a traditional, rich burn natural gas generator. It provides clean power with low operating costs and 24/7/365 monitoring in our operations center, the Grove (Grid Response Optimization of Virtual Energy).

How the R3Di® System Works

All facility loads – not just the sensitive electronic loads – can be connected to the R3Di®'s instantaneous, uninterruptible power system because of the solution's high c-rate, fast-discharging LiFePO4 battery.

Because electricity does not flow continuously through the batteries in the R3Di®, their life can extend to **20 years or 10,000 cycles**.

The generator is paired to pick up the load as the batteries deplete, then recharge the batteries when they have dropped to a preselected level.



Advantages of the R3Di® System

Companies seeking energy resiliency and autonomy while achieving their ESG goals are increasingly turning to our Virtual Utility® solution. At its core is the R3Di® system, supported by round-the-clock, year-round monitoring. This innovative solution empowers businesses with reliable, sustainable energy management and oversight.



Power Conditioning

The R3Di®'s double conversion inverter system provides continuous power conditioning and uninterruptible power transfer. Unlike a traditional UPS system, the R3Di® utilizes bi-directional, full four-quadrant insulated-gate bipolar transistors (IGBT) inverters in both the AC-DC rectification and DC-AC conversion stages, protecting a company's sensitive equipment from voltage sags or surges.



Enhanced Safety

The R3Di®'s lithium iron phosphate (LiFePO4) battery chemistry is safer than other systems that utilize lithium-ion (Li+), VRLA, or lead acid. Because it does not use cobalt, the risk of fire ignition or propagation from thermal runaway is greatly reduced.



Lower Emissions

The R3Di® can reduce a company's emissions by up to 61–99% compared to a diesel generator. R3Di® is also future-proofed for stricter emissions restrictions — the system is hydrogen ready up to 20% and can run on multiple fuel sources including liquid natural gas (LNG) and renewable natural gas (RNG).



Revenue Generation

If a facility is located in a deregulated energy market, R3Di® users can take advantage of economic and other incentive programs to generate revenue along with energy by participating in demand response, capacity and transmission management, and price avoidance.



On-Site Fast Charging for EVs

As electric vehicles become standard, there will be a need for 1.2 million public chargers — and additional power capacity to support the increasing demand on the public grid. The R3Di® allows for on-site DC Fast Charging (DCFC) for EV cars, trucks, and fleets — something a diesel generator cannot do.



R3Di® vs. Traditional Microgrid:



Simplify the Path to On-site Power Generation

A microgrid is a localized group of electricity sources and loads that operates connected to the traditional grid or independently as an island. It is designed to enhance energy reliability and sustainability by integrating various energy sources such as solar, wind, and traditional generators with energy storage systems.

Microgrids can manage and optimize the flow of electricity within their network, providing a resilient power supply that can continue functioning even when the main grid experiences disruptions.

Setting up a traditional microgrid can be complicated and time-consuming, involving significant up-front costs for system engineering and design, approvals, permitting, and construction. If you're planning to connect the microgrid to the main grid, you will need to seek out an interconnection agreement in the U.S. — a bottlenecked process that can take up to two years to complete.

The R3Di® System provides all the benefits of a traditional microgrid in a turnkey solution.

		R3Di®	Traditional Microgrid	Diesel and Battery UPS	Tier 4 Diesel
System	No Interruption to Full Site Operations	✓	✓	✗ <i>limited</i>	✗
	Instantaneous Reliability & Resiliency without Interconnection	✓	✗	✗	✗
	Conditioned Power	✓	✗	✓	✗
Emissions	Cleanliness	🌿	🌿	🍂	🍂
	Compliance & Indemnification	✓	✗	✗	✗
Costs	Initial Cost	\$\$	\$\$	\$\$\$\$	\$\$\$
	Total Cost of Ownership	\$	\$\$	\$\$\$\$	\$\$\$
Utility	Continuous Sync	✓	✓	✗	✗
System Monitoring	24/7/365 Grid Optimization	✓	✗	✗	✗



Complete with 24/7/365 monitoring and optimization, the R3Di® System – the ‘heart’ of Virtual Utility® – delivers more than just back-up power for your business. It is an on-site power source that can serve as your prime source of power, providing you energy autonomy.

Ready to take your power into your own hands?
It costs nothing to schedule a call!

[Talk With Our Experts Today](#)

