

# Scalable Modular Mobile Power Containers for Data Center Backup: A Practical Guide

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## The Real Problem with "Just Add More"

Let's be honest. If you're managing a data center's power infrastructure, your backup strategy has likely followed a simple, decades-old playbook: size your UPS and diesel generators for the worst-case peak load, and hope you never have to fully test it. It's a capital-intensive, space-hungry, and frankly, rigid approach. I've walked through dozens of facilities where the backup power room is a monument to over-provisioning a huge chunk of real estate sitting idle 99.9% of the time, depreciating, and requiring constant maintenance.

The real pain point today isn't just about having backup power; it's about the flexibility and efficiency of that backup. What happens during phased expansion? Or when you need to provide temporary, high-density power for a specific client rollout? Or when local grid codes start penalizing your diesel gensets during non-emergency testing? The traditional model cracks under these pressures. According to the [National Renewable Energy Laboratory \(NREL\)](#), data center energy demand is a significant and growing portion of the grid load, making flexible, grid-interactive solutions not just nice-to-have, but imperative.

## The Hidden Cost of Rigidity

Let's agitate that pain point a bit. That monolithic backup system represents a massive, sunk capital cost. Its lifecycle is tied to the initial build-out. Need more power in two years? You're looking at another complex, disruptive, and expensive engineering project. Furthermore, the operational model is binary: it's either off or on (at full emergency capacity). There's no in-between, no ability to participate in grid services or demand response programs to generate revenue or offset costs.

From a safety and compliance standpoint, large, fixed-installation battery systems trigger a whole other level of permitting, fire suppression design (think sprinkler vs. aerosol systems), and ongoing inspections. In the US, navigating UL 9540 and NFPA 855 for a large, room-based system is a project in itself. In Europe, IEC 62933 and local fire safety directives add layers of complexity. The risk? Project delays, cost overruns, and a system that's difficult to adapt to evolving standards.





## A Mobile, Modular, and Smarter Solution

This is where the concept of a scalable modular mobile power container shifts the paradigm entirely. Think of it not as a fixed piece of building infrastructure, but as a power asset on wheels. The core idea is simple: pre-engineered, self-contained battery energy storage systems (BESS) housed in standardized shipping containers, built and certified off-site, and delivered ready to connect.

At Highjoule, we've moved beyond just selling containers. We provide a deployable power strategy. The "scalable" and "modular" parts are key. You start with what you need today, say, a 1 MWh container to shore up your backup runtime or handle a short-term load. When your needs grow, you simply add another identical module. The "mobile" aspect is the game-changer: these units can be repositioned within your campus, leased for temporary projects, or even redeployed to a different site entirely. It turns capex into more flexible, manageable opex.

## Case in Point: A California Colocation Facility

I want to share a recent project that really brought this home. We worked with a large colocation provider in Silicon Valley. Their challenge was classic: a major client was moving in and needed 2 MW of additional, ultra-reliable power for a 12-month period, after which the load would migrate to a new building. Building a permanent substation and backup for a temporary need was a non-starter.

Our solution? We deployed two of our UL 9540-certified mobile power containers in a matter of weeks. They were sited in the parking lot, connected to the facility's medium-voltage switchgear via a temporary interconnect. These units provided the needed N+1 backup power. But here's the insight: they weren't just sitting idle. During normal grid operation, the facility manager, with our software, set the system to participate in the CAISO demand response market. Honestly, over that 12-month period, the revenue from grid services covered a significant portion of the leasing cost. The client got their power, the data center turned a cost center into a revenue-positive asset, and after 12 months, we disconnected the containers and they rolled to their next assignment.

## Key Specs That Actually Matter on Site

When you look at the technical spec sheet for these solutions, don't get lost in the marketing fluff. Focus on these few, critical items that I've seen make or break a project:

- **C-rate & Thermal Management:** The C-rate tells you how fast the battery can charge or discharge. A 1C rate means a 1 MWh battery can deliver 1 MW for 1 hour. For backup, you often need high power (a high C-rate) for short durations. But high power creates heat. The spec that matters most is the thermal management system. Is it active liquid cooling or just air? In a sealed container in Arizona or Texas, passive air cooling might not cut it, leading to throttled performance or reduced lifespan. Our containers use a closed-loop liquid cooling system that keeps cells within a 2-3C range critical for longevity.
- **Grid-Forming vs. Grid-Following Inverters:** For pure backup, grid-following is standard. But if you want your container to "black start" a portion of your data center or operate as a microgrid if the main grid is down, you need grid-forming inverters. This is a spec worth discussing for future-proofing.
- **The "Mobile" in Mobile Power:** Check the actual design. Is it just a container plopped on a trailer? Or is it engineered for repeated transport? Look for features like internal seismic bracing, shock-absorbing mounts for battery racks, and quick-disconnect electrical interfaces. I've seen units fail after their first move because the internals weren't built for the road.



## Thinking Beyond the Box: Total Cost of Ownership

The final piece is understanding the total value. The metric we use with our clients at Highjoule is Levelized Cost of Storage (LCOS) or, in a broader sense, how it impacts your overall operational costs. A modular mobile container might have a slightly higher upfront cost per kWh than a giant, poured-in-place system. But when you factor in:

- Drastically reduced site construction and engineering costs
- Faster permitting (using pre-certified units)
- Revenue potential from grid services
- Re-deployment value and avoidance of stranded assets
- Predictable, factory-based maintenance

The financial picture completely changes. You're not buying a static battery; you're acquiring operational flexibility and financial optionality.

So, the next time you're reviewing your data center's power resilience plan, ask yourself: are we building a cathedral, or are we assembling a fleet? The difference isn't just in the technology; it's in the strategic and financial outcomes for your business. What's the one power flexibility challenge you're facing that a traditional system just can't solve?

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URL: <https://glenproperty.co.za/articles/technical-specification-of-scalable-modular-mobile-power-container-for-data-center-backup-power>

