

The Operation Leader's Guide to Backup Power:

How To Improve Operational
Resilience With Energy Storage



stem

Energy Superintelligence™

Executive Summary

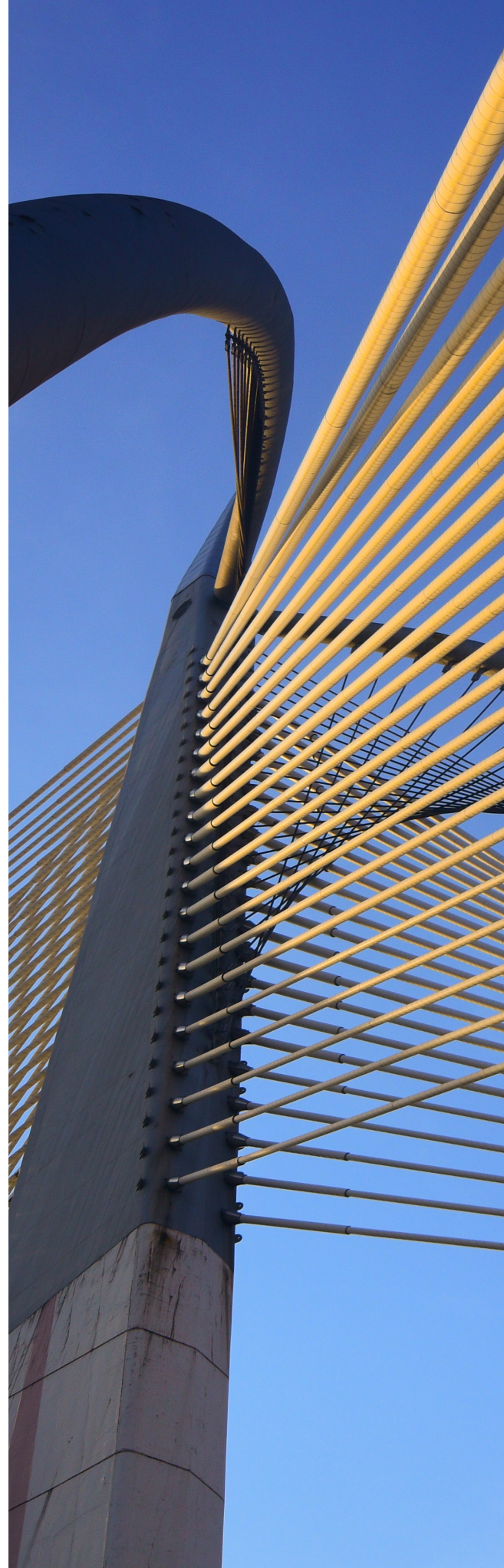
For many enterprise and industrial organizations in the U.S. and Canada, power interruptions are a costly disruption.

This problem is not going away anytime soon. Utilities are facing a host of unprecedented challenges to providing reliable power, from increased population density, to inclement weather, to wildfires. Combined, all of these factors make power interruptions an unavoidable part of operating a business.

Often enough, interruptions are fairly brief. But even a five minute outage puts strain on equipment, spoils products mid-process, and kills worker productivity, disrupting operations and putting you in the red for the day. With that much at stake, your only option is developing power resilience.

But funding backup power solutions can be challenging: Historically, they're a huge CapEx expenditure that offers no CapEx return, only OpEx savings. Plus, accurately measuring both the value of lost load and the ROI of a backup power solution is extremely tricky.


Thanks to Artificial Intelligence (AI)-energy storage systems, that has changed. This eBook is a straightforward guide to the new lay of the land. Whether you sign the budget or execute it, sell aerospace parts or groceries, this is your guide for understanding how energy storage solves your power disruption problem, and it can help you build the case for a backup power solution at your organization.



The Impact of Power Interruptions

Whether you're a Chief Operations Officer or a Site Engineer, you likely experience and may be held responsible for the negative impacts of power interruptions. Aside from being an annoyance, power disruptions—even short outages—can have a major impact on your organization. Here are 7 ways power interruptions may be affecting your business:

1. The now-infamous 2003 Northeast Blackout cost businesses in New York City an estimated \$4-10 billion, a large part of which was **lost capital** due to overtime wages and unrealized earnings.
2. Within industries such as manufacturing, retail, and cold storage, being unprepared and without immediate backup power during an outage can cost crucial time and spoil products, leading to **product loss**.
3. Potential **unsafe work environments** due to environmental risks/liabilities, such as a chemical spill during an outage. Even in retail, power disruption in a full store can create unexpected safety issues.
4. Power outages can cause high-heat, energy-intensive machines to go from full-on to full-off without a cool down, causing strain and even **equipment damage**.
5. Leading psychology research on focus¹ suggests it takes up to 30 minutes for workers to regain concentration after even a minor interruption, like a brief power outage. What's worse, returning to the task **increases worker stress, frustration, time pressure and effort**, leading to **higher turnover**.
6. Your workers need time to get running at peak efficiency. When the power goes out, the opportunity cost of attempting to start a different task is often too high, leading to **unscheduled downtime**.
7. In a retail environment, customers may leave stores during a power outage without completing their purchase, leading to **lost revenue**.



The U.S. has reported
\$119-188 billion in annual
losses due to outages
and other power
quality issues

(Source: EPRI survey)

Stem clients
report between
\$250K-\$1.5M
in lost revenue
from power
interruptions

1. Mark, G., Gudith, D., and Klocke, U. (2008).

The Cost of Interrupted Work: More Speed and Stress.

<https://www.ics.uci.edu/~gmark/chi08-mark.pdf>

The Benefits & Challenges of Backup Power

The benefits of backup power are substantial, and solutions like Uninterruptible Power Supplies (UPS) and backup generators are available, but they are costly, and can be hard to make a case for at your organization.

A host of challenges, such as measuring the specific cost impacts of power interruptions, and the typically high upfront cost of emergency power solutions, have left many staring at the sky-high hurdle of getting finance to approve a solution that just doesn't add up.

Benefits

- Consistent uptime
- Steady, uninterrupted production
- Predictable output
- Improved equipment reliability
- Improved operational efficiency
- Safe and efficient workplace

Challenges

- Historically, backup power—such as an emergency generator—comes with a high upfront cost and hefty price-tag.
- The challenge of measuring lost load makes it difficult to develop a reliable ROI for a backup power solution.
- Even if you can quantify the ROI for a traditional backup power solution, the returns may not justify the upfront investment.
- Part of the difficulty in justifying the upfront investment is that traditional backup power solutions require a CapEx investment, but their value to your organization all falls in the OpEx budget. This can make the budgeting process incredibly convoluted.



Back Up Your Business Without Breaking the Bank

As a result of the challenges of traditional backup power, organizations continue to let power interruptions hamper production, put workers at risk, and frustrate workers.

Those days are over.

Leading organizations are adopting AI-energy storage with backup capabilities. In the process, they are eliminating high upfront costs, and funding part of their backup power through the savings avenues only AI-energy storage can offer.

Funding a Backup Power Solution

Energy storage systems with backup capabilities will automatically optimize your utility bill, allowing you to reap savings from peak demand management, energy arbitrage, and demand response. These savings are immediate and backed by a performance guarantee, and they provide cashflow that can be used to justify a backup power solution.

Backup power capability may be purchased under a service agreement as part of an energy storage solution, with no upfront payment. Plus, part or all of the service fee could be offset by the savings from utility bill optimization. Meanwhile, you rest easy knowing your operations will not be interrupted by power outages.



How it Works

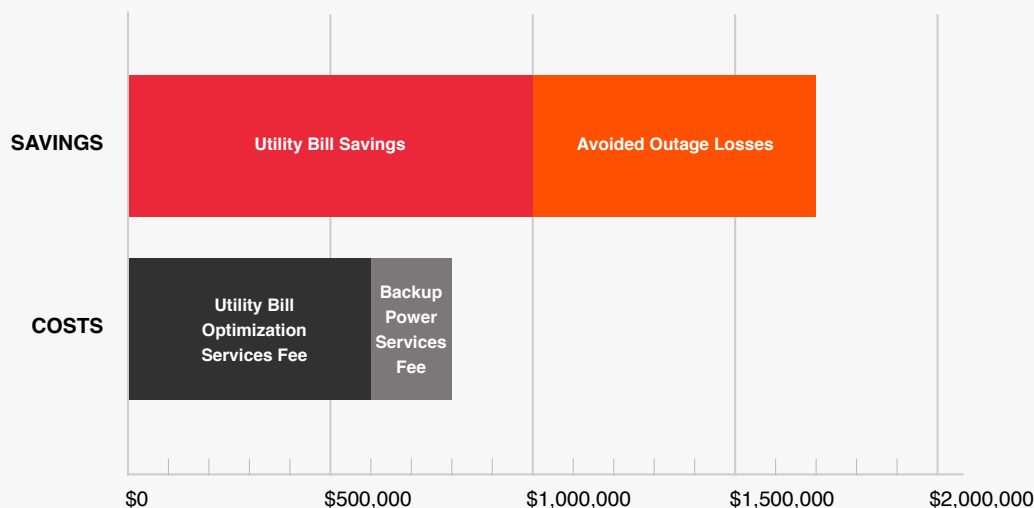
Energy storage solutions can support part or all of your facility's load when grid power is interrupted. Stem can prioritize backup power, thereby ensuring that a portion of the battery's energy capacity is always reserved to ride through an outage. Or, Stem can use the full capacity for utility bill optimization and any remaining energy available at the time of an outage will go towards backup power. The third option is that Stem can place a value on the backup energy and prioritize either the backup application or bill optimization application depending on which one will deliver more value at that particular time. Stem will tailor the offering to your unique needs.



Case Study: Industrial Facility Gets Backup Power With Zero Capital Outlay

Take a look at how the financials for backup power with Stem's energy storage system actually add up. This facility has no room for power interruptions, but no CapEx budget set aside to pay for a backup power system. With Stem, they found an energy storage system that saved hundreds of thousands of dollars through utility bill optimization. All together, the Stem system's savings allowed them to offset the expense of backup power.

Annual Energy Storage Cash Flows for 2MW Site



Energy Storage System Size: 2 MW / 4 MWh

Facility max demand: 2 MW

Net Savings: \$900,000

Wrap-Up: How to Make Backup Power Work For Your Organization

If your organization experiences operational disruption due to power interruptions, then it would benefit from a backup power solution that can support consistent uptime, steady production, and a safe workplace.

But you may have a hard time justifying the expense of a system designed exclusively for backup power, since it often requires a CapEx investment for an OpEx return.

So consider a storage solution that supports utility bill optimization plus backup power. It gives you a way to fund backup power and increase your operation's resilience without all the upfront CapEx expenses. A service agreement model that generates guaranteed savings from demand management will deliver cashflow to help offset the cost of backup power.

Backup your operations with energy storage.

Reach out to the energy storage experts today by visiting www.stem.com/request_evaluation or email info@stem.com.

