

An aerial night photograph of a city skyline, featuring numerous illuminated skyscrapers and a river. A large orange rectangular box is overlaid on the right side of the image, containing white text. The text is arranged in a hierarchy: a large main title followed by a subtitle. The background image is partially obscured by the orange box and a network of white lines that crisscross the scene, suggesting a digital or data-driven theme.

Strategies for cutting costs and navigating uncertainty

How energy storage can help



Executive summary

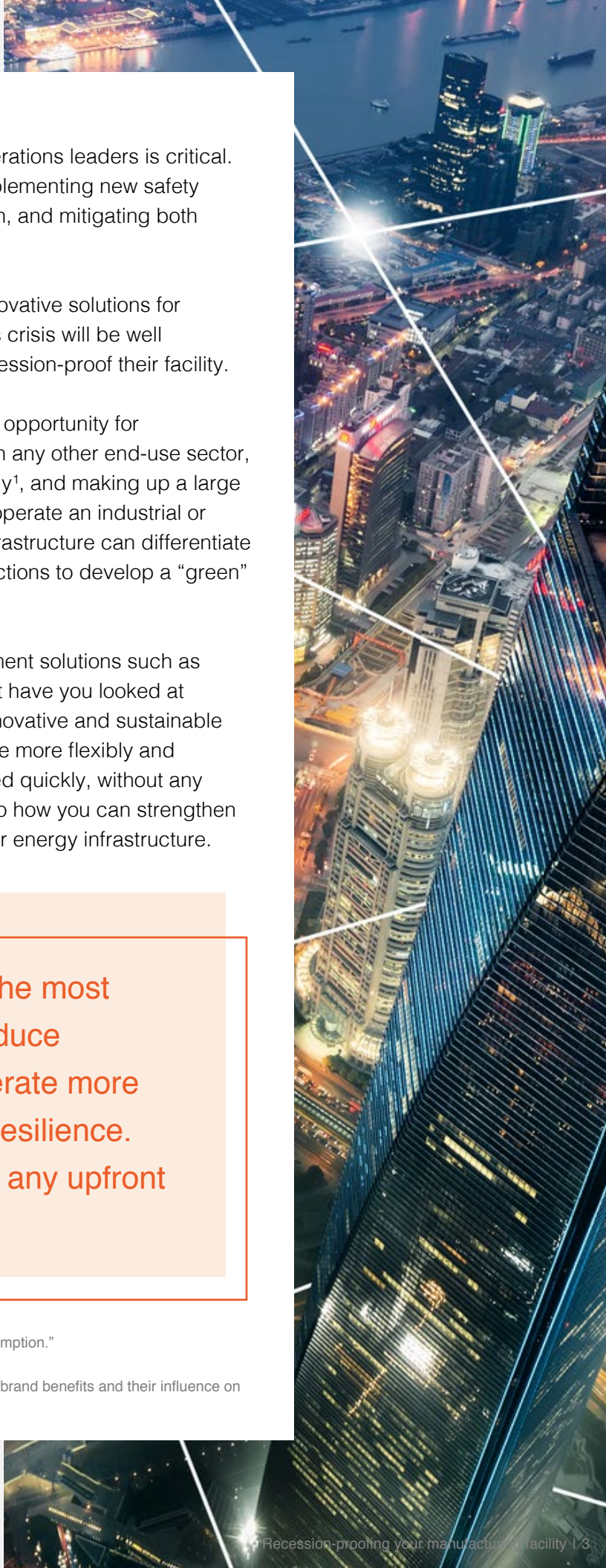
Whether you operate a retail store, a warehouse, or a food processing facility, you have undoubtedly had to make major changes to your operation because of COVID-19. There is not a single part of the economy that has been untouched by the pandemic.

As COVID-19 has spread throughout the world and reshaped the global economy, Stem's product development and operations teams wanted to understand how this crisis is impacting our client base, how our customers are responding to the unprecedented challenges, and how we, as experts on energy and artificial intelligence, may be able to help.

We've developed this ebook with the operations leader in mind, as a resource to help you navigate the unprecedented challenges you're undoubtedly facing and reveal how intelligent energy storage can help. This content brings together what we learned from market intel, feedback from our customers, and discussions with our leadership team, who are facing many of these challenges themselves.

This ebook will cover:

- The economic impact of COVID-19
- Business strategies for mitigating risks as you reopen or scale operations
- How intelligent energy storage can help operational leaders cut costs and navigate uncertainty



As businesses reopen or scale operations, the role of operations leaders is critical. These individuals must “keep the lights on” while also implementing new safety measures, shifting production, managing the supply chain, and mitigating both financial and employee risk.

Those leaders who are able to identify and implement innovative solutions for enhancing resilience, agility, and sustainability during this crisis will be well positioned to protect their employer’s bottom line and recession-proof their facility.

Energy infrastructure is one of the areas offering the most opportunity for improvement. The industrial sector uses more energy than any other end-use sector, consuming about 54% of the world’s total delivered energy¹, and making up a large portion of companies’ operating expenses. Whether you operate an industrial or commercial facility, bolstering your company’s energy infrastructure can differentiate your brand. Research has found that companies taking actions to develop a “green” brand image benefit from increased brand loyalty.²

Perhaps you have already implemented energy management solutions such as lighting retrofits, equipment upgrades, or solar power. But have you looked at batteries? Intelligent energy storage is one of the most innovative and sustainable ways to reduce operating expenses automatically, operate more flexibly and sustainably, and improve resilience. It can be implemented quickly, without any upfront capital investment. This ebook will offer insight into how you can strengthen your business resilience and cut costs by addressing your energy infrastructure.



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1. U.S. Energy Information Administration. (2016). “Industrial sector energy consumption.” <https://www.eia.gov/outlooks/ieo/pdf/industrial.pdf>

2. Lin, Jialing and Lobo, Antonio and Leckie, Civilai. (2017. pgs 425-440.) “Green brand benefits and their influence on brand loyalty.” Vol 35. Marketing Intelligence & Planning.

The economic impact of COVID-19 on industry

At-a-glance

20.5 million jobs lost in April 2020.³

7.1% drop in productivity in Q1 2020.⁴

Amongst the hardest hit industries are travel and hospitality, clothing retailers, movie theaters, and recreational facilities. Those with positive economic impacts include food manufacturers, grocery stores, and internet and TV service providers.⁵

As businesses reopen, operations leaders are responsible for creating a plan to keep employees safe, manage risk, and increase productivity



There's not a single part of the global economy that has not been impacted by COVID-19, though some industries have been hit harder than others. The Department of Labor reports that a total of 20.5 million jobs were lost in April 2020 alone. Overall, total productivity dropped 7.1%% in Q1 2020. While some industries, including travel and hospitality, clothing retailers, movie theaters, and recreational facilities faced devastating impacts, a few industries, including food manufacturers, grocery stores, and internet and TV service providers have actually experienced positive economic impacts.

Almost every organization has to maintain some physical footprint, however, creating challenges for operations leaders across all industries. The challenge many operations leaders are facing is how to keep the business running while keeping employees safe. A variety of facilities, from meat packing facilities, to warehouse and distribution centers, to restaurants, continue to experience outbreaks of the virus.⁶ As facilities like retail stores, hotels, and commercial real estate buildings reopen, it is up to operations leaders to guide the process mindfully, executing against a plan to keep employees safe.

In addition to keeping employees safe, executives will also want to see how operations leaders are managing risk and increasing productivity to minimize the financial impact of the pandemic. In this next section, we will offer suggestions for how operations leaders can mitigate risk while maintaining a productive workplace.

3. U.S. Bureau of Labor Statistics. (April 2020). "Employment by industry." <https://www.bls.gov/charts/employment-situation/employment-levels-by-industry.htm>. Long, Heather. (April 16, 2020). "U.S. now has 22 million unemployed, wiping out a decade of job gains." The Washington Post. <https://www.washingtonpost.com/business/2020/04/16/unemployment-claims-coronavirus/>

4. U.S. Bureau of Labor Statistics. (April 2020) "Labor Productivity and Costs." <https://www.bls.gov/lpc/>

5. Vertical IQ. (May 2020). "Industries Affected by Coronavirus (COVID-19)." <https://verticaliq.com/covid-19/>

6. Van der Zee, B. Levitt, T. & McSweeney, E. (May 11, 2020). "'Chaotic and crazy': meat plants around the world struggle with virus outbreaks." The Guardian. <https://www.theguardian.com/environment/2020/may/11/chaotic-and-crazy-meat-plants-around-the-world-struggle-with-virus-outbreaks>

Business strategies for mitigating risk as you navigate uncertainty

At-a-glance

Reduce operating expenses by identifying cost-cutting solutions that produce immediate returns.

Automate your operations where possible, leveraging tools like artificial intelligence and remote monitoring to keep operations running smoothly while staff work remotely.

Enhance resilience so your facility can more quickly and flexibly adjust to economic, workforce, environmental, or market changes going forward.

Increase operational efficiency through continuous process improvements and technological innovation.

Build brand loyalty by making reliable data-driven decisions and incorporating feedback.

As operations leaders reopen or ramp up operations, you will be expected to keep the business running safely while maintaining operational excellence.

These 5 strategies will help you mitigate operational risk and recession-proof your facility.

1. Reduce operating expenses

Managing risk is critical in a dynamic and variable market, which seems to be the new norm in today's global economy. For operations leaders, this means closely managing the supply chain, cross-training employees, communicating with customers, and of course - reducing operating expenses. There is always pressure to cut costs, but during a pandemic and global recession, it becomes even more critical to shed opex wherever possible. Finding ways to trim the fat off operating expenses can mean the difference between being able to retain staff or having to lay them off.

What are the cost-cutting projects that you've considered but had on the back burner? Now that every dollar matters, this is the time to revisit cost-cutting solutions that can be implemented quickly and can start generating positive returns immediately.



2. Digitize and automate

In some cases, employees have to continue performing essential functions in-person - it's unavoidable. But where possible, identify parts of your employees' roles that can be performed remotely. Experts predict that remote work culture will continue to be the norm in the long-term.⁷ Move meetings online, and implement automation and remote monitoring capabilities. These technologies can help keep your team safe and will continue proving beneficial long after the threat of the virus recedes.

AI solutions can help your team operate remotely while increasing efficiency. They can reduce waste, provide transparency, and manage a variety of processes remotely, from forecasting and managing logistics, to automating visual quality control processes, to optimizing energy costs. Leveraging AI for automation can free employees from manual, in-person processes and give them time to cross train and uplevel their skillset.

3. Enhance resilience

Future-proofing your facilities means preparing and adjusting to immediate and long term changes that you may or may not be expecting. Adjusting to COVID-19 has been disruptive for almost everyone. Going forward, you will want to quickly and flexibly be able to adjust to unexpected changes, whether they are related to the economy, the workforce, the supply chain, the environment, or specific markets.

Inside the facility, you may be accountable for new operational hours and altered shift schedules. Outside the facility, the recession may strain electricity supply, reliability, and power quality.

Electricity markets are an oft-overlooked area of risk, specifically for industrial facilities, which rely heavily on electricity and whose costs are significantly impacted by changing energy supply. Severe weather, power quality issues, and costly power outages - even short ones - can threaten the bottom line. Now that every operational minute counts, it's time to make sure your energy supply is reliable, predictable, and affordable.

If there's anything this pandemic has taught us, it is the importance of planning for the unexpected. What are you doing now to ensure your uninterrupted access to electricity? What happens if your electricity supply is threatened by wildfire, severe weather, or even terrorism? Consider the potential scenarios and develop a plan that can be implemented quickly when the next disaster strikes.



7. Mulcahy, Diane. (Mar 30, 2020). "Remote Work is the New Norm. Will it Last?" Forbes. <https://www.forbes.com/sites/dianemulcahy/2020/03/30/remote-work-is-the-new-norm-will-it-last/#7cf5113c3dd7>

4. Increase operational efficiency

Identify opportunities to increase operational efficiency and flexibility. Focus on continuous process improvements, infrastructure upgrades, and technological innovation.

Despite the unprecedented challenges of running a facility in today's environment, it is now more important than ever to continue demonstrating operational excellence. Ensure quality standards remain high, while aligning products and services with your customers' needs. An economic downturn is no time to cut corners or lose focus on operational excellence. It is a time to sharpen your toolkit, shed inefficiencies, innovate, and enhance brand loyalty. Doing so will help ensure your business doesn't fall behind competitors in a time when the playing field may narrow.

5. Build brand loyalty through sustainability

Employees and customers rely on your company to deliver products and services - no matter the operational demands or challenges behind the scenes. Be open to feedback. Incorporate improvements. Prioritize sustainability. Make data-driven decisions. Improve customer communication. Doing so will align your brand with attributes like sustainability, resilience, and innovation.

Engaging your stakeholders to show how your company is adaptable, transparent, and committed to environmental and social issues is a great way to build brand loyalty. This includes being open about your energy usage and implementing sustainability strategies. Today's energy consumers overwhelmingly support sustainability goals. According to a recent Consumer Reports survey⁸, 81% of US residents support reducing pollution in energy generation and 76% think increasing renewable energy is worthwhile. This is a meaningful win-win.

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8. (2018). Consumer Reports 2018 Energy Utilities Survey Report. <https://advocacy.consumerreports.org/wp-content/uploads/2018/10/CR-2018-Energy-Utilities-Survey-Report-1.pdf>

How intelligent energy storage can help operations leaders cut costs and navigate uncertainty

At Stem, we design and deploy intelligent energy storage systems for businesses and developers.

Energy is a key part of your operating infrastructure. There are ample opportunities to optimize your energy infrastructure and reap the benefits of reduced opex, automation, sustainability, flexibility, and resilience.

At-a-glance

Reduce opex with energy cost savings that require no capital investment.

Increase operational efficiency by gaining the flexibility to use energy on your schedule, not the utility's.

Enhance resilience by mitigating power interruptions.

Improve brand loyalty by demonstrating a commitment to sustainability and innovative technology.



Here are 4 ways intelligent energy storage can help cut costs and enhance resilience.

1. Reduce opex with energy cost savings that require no capital investment.

Stem's intelligent energy storage requires no capital investment and begins reducing energy costs immediately upon activation. By intelligently monitoring and responding to energy use, Stem's AI for energy storage charges an onsite battery system during low cost electricity periods and discharges stored power during high-cost electricity periods. This energy arbitrage significantly reduces time-of-use energy costs.

Stem's AI-powered energy storage also reduces demand charges. Facilities with heavy industrial equipment or large air conditioning loads with inductive motors that cycle on and off often rack up steep demand charges that can make up more than 50 percent of the utility bill. Storage can cut the peaks off demand spikes by injecting stored energy during periods of high energy consumption, eliminating demand spikes and their related costs.

Intelligent energy storage can be implemented more quickly than you might think. Projects can become operational in less than a year and begin generating returns immediately, with no lengthy payback period. Projects are usually structured as a long-term energy service agreement, with no capital expenditure up front.

2. Automate energy savings and increase operational efficiency

Before working with Stem, many of our customers spent significant time tracking time-of-use rates and energy consumption in an effort to lower energy costs. Some customers traditionally managed costs either by operating during non-peak hours, staggering shifts and operations throughout the day to lower peaks, or manually curtailing energy use. These processes can be effective at reducing costs, but they are manual, time-consuming, and disruptive.

Intelligent energy storage automates these processes to optimize energy costs, without requiring any staff time to monitor energy rates, manually turn off equipment at certain times, or align your business hours with the utility's rate schedule. Intelligent energy storage optimizes your energy costs so you can design your hours of operation around your employees' safety and your customers' needs, without worrying about the impact on the utility bill.

3. Enhance resilience by mitigating power interruptions.

Intelligent storage can instantaneously switch from energy cost savings mode to back up power mode as local power conditions change. Whether it's a severe weather event or unreliable grid supply, storage can help avoid those costly outages and restarts.

Facilities with energy storage have consistent back-up power, reduced demand charges, and full visibility into real-time, historical, and projected energy usage and costs. Arm yourself against severe weather, unreliable grid supply, and costly power outages to enhance your resilience. Empower yourself with energy insights that can provide full transparency and visibility into your energy use.

If you know that your facility is affected by power quality issues or carries a heightened risk of power outages due to grid congestion, wildfires, or hurricanes, put energy storage with backup power capabilities at the top of your technology wish-list. Traditional backup power solutions come with a high upfront cost, but Stem's backup power solution does not require any upfront investment. This is because of the system's dual purpose. The savings produced when the system is on cost savings mode cover most or all of the cost of adding backup power capabilities to the system.

4. Improve brand loyalty by demonstrating a commitment to sustainability and innovative technology.

Energy storage is critical infrastructure in the future of energy, enabling businesses to take control of their energy use and support the adoption of renewables. Many of Stem's customers are thought leaders and innovators in their industry. Research has found that taking actions to develop a "green" brand image is correlated with increased brand loyalty.²

Although adopting sustainable and innovative solutions may not seem like a priority at this time, it is not something to push to the backburner. During a recession, brand loyalty becomes more important than ever. Any way you can gain an edge over competitors becomes increasingly important to identify and pursue.

As the supply chain and operations procedures change due to COVID-19, there is an opportunity to take a long-run view on sustainability. Many new technologies will be implemented and key decisions will be made. As these strategies are developed, there is an opportunity to embrace sustainability and innovation for the benefit of your organization, employees, customers, and the planet.

Chemical Manufacturer



Location | Ontario, Canada

Challenge | Facility experiences around 10 outages per year, costing over \$1 million annually. Manually curtailing energy to achieve savings required staff effort and was disruptive to productivity.

Solution

Stem's intelligent energy storage solution, with backup capability add-on

Energy storage system size: 1,443 kW / 2,886 kWh

Backed up load: Entire facility

Backup duration: 15 minutes

Transfer time: <200 milliseconds

Financial model: Zero upfront cost, shared savings payment

Annual Value:

Avoided outage costs: \$1M

Utility Bill Savings: \$700k

Project Spotlight 2

University Campus



Location | Carson, California

Challenge | Demand charges had become a big problem. Over the last decade, these fees had increased more than 100%, raising the total cost of electricity despite having installed smart lighting controls, building automation, and sub-metering.

Solution

Stem's energy storage service powered by Athena learns energy usage patterns and activates the battery system before costly demand spikes occur. This happens without interrupting operations and requires no capital outlay.

Energy storage system size:

1.6 MW / 4.2 MWh

Financial model: Zero upfront cost, fixed monthly service fee

Annual Value (Year 1/ Lifetime Est.): \$80K / \$940K

"Stem's experience is unmatched. They have the analytic prowess and the track record to prove this stuff works."

– Energy Manager

About Stem

Stem leads the industry in developing and deploying artificial intelligence (AI)-powered energy storage that helps operations leaders control energy costs, while enhancing sustainability and resilience. Stem operates the world's largest energy storage network, serving hundreds of commercial and industrial customers.



Proven

- In 2019, Stem exceeded customer savings guarantees by 48%
- Stem's demonstrated track-record of performance has secured over \$650 million in project finance
- Stem customers have used the "PowerScope" software interface over 50,000 times since 2010

Experienced

- 400 MWh operating and contracted
- 1,000 + systems
- 300+ customers
- Operating in 3 countries and 9 states

Intelligent

- Stem's industry-leading AI, Athena, increased customer savings more than 15% in 2019
- Athena's software is updated daily to continuously enhance performance
- Athena orchestrated over 10,000 real-time market dispatches in 2019
- Stem supported corporate ESG targets and sustainability mandates in 3 states

We're in this together

COVID-19 presents challenges for operations leaders unlike anything even operations veterans have seen in their careers. Leaders who demonstrate resilience, innovation, and agility are best positioned to keep their business running successfully and keep their employees safe.

Five key business strategies for mitigating risk and navigating uncertainty include reducing operating expenses, digitizing and automating, enhancing resilience, increasing operational efficiency, and prioritizing sustainability. Delivering in these areas will help you impress executives, distinguish your company from competitors, and protect the bottom line.

Intelligent energy storage is one significant tool that operations leaders should consider as they are developing strategies to adapt to the new economy and become more resilient and sustainable going forward.

We hope this ebook has offered helpful ideas for tackling the unprecedented manufacturing challenges of today.

To learn more about how Stem can help operations teams and to learn how it works, request a demo at www.stem.com/request-a-demo.