

S&C's 2021 State of Commercial & Industrial Power Reliability Report



An S&C report in collaboration
with Frost & Sullivan



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Introduction

S&C Electric Company's "2021 State of Commercial and Industrial Power Reliability Report," researched in collaboration with Frost & Sullivan, focuses on U.S. commercial and industrial (C&I) companies and their perspectives on power reliability. This report gauges the companies' present reliability experiences, the impacts of poor reliability on their organizations, and their preferences and expectations for improving power reliability.

The 253 companies surveyed have average yearly revenues of \$2.8 billion—constituting key C&I companies across various industries. These business sizes and industries represent utilities' most ambitious customers, with growing needs for continuous, reliable, and high-quality power.

The individuals surveyed were high-level managers responsible for power-related decisions, such as facility directors, facility managers, operations directors, energy managers, property managers, and purchasing managers. By surveying these decision-makers and influencers, the research represents an accurate pulse of the market for utility-related concerns and considerations across an important swath of the U.S. economy.

Research results were analyzed across four regions of the United States and five major C&I company categories: manufacturing, healthcare, education, small franchises, and retailers.

The objectives of this year's research were to:

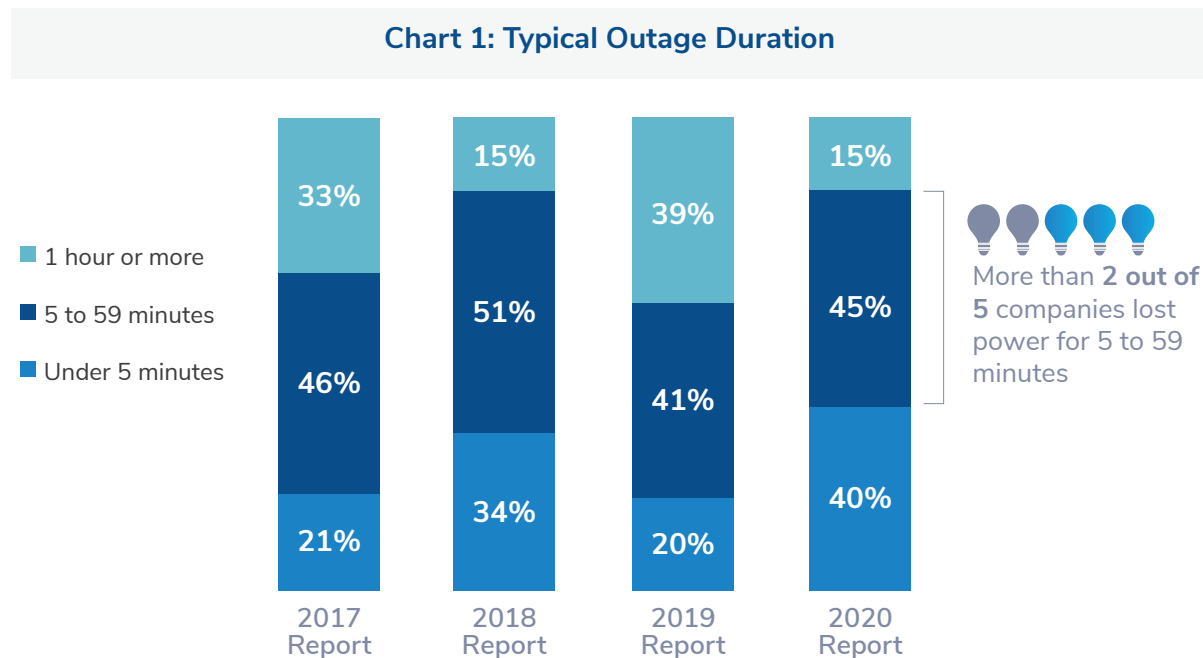
- Measure the duration and frequency of outages C&I companies have experienced and compare them over time
- Quantify and differentiate the physical and cost impacts of various outages to C&I companies by duration and gauge their importance
- Understand the value of reliability and resilience to C&I companies, including their incurred costs from outages and willingness to pay utilities to mitigate outages or restore power quicker
- Discover whether C&I companies are able to discuss their reliability concerns with their utility



Section 1: Outage Audit

The State of C&I Power Reliability

Since the first “State of Commercial and Industrial Power Reliability Report” in 2017, there has been clear and consistent evidence that energy reliability is not improving for C&I companies and has even worsened in some ways. To evaluate C&I company reliability over time and the importance of improvements for these key utility customers, the report continued to audit the duration and frequency of the outages these customers experience.



Base: Comparable groups for 2017, 2018, 2019, and 2020 surveys (same industry and company size representation)

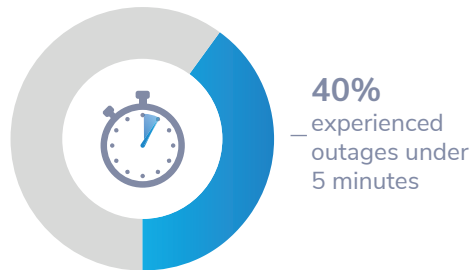
Question: What was the duration of the typical power outage that you experienced in the past 12 months?

Source: S&C Electric Company

As with previous surveys, the 2021 survey asked C&I companies to share the duration of the typical power outages they experienced. The findings were then compared against previous survey findings to track trends over four years. The duration breakdown of typical outages changed little compared to previous years’ findings, and coupled with outage-frequency findings in Chart 3 on page 7, contribute to the ongoing trend of stagnant reliability for these important utility customers.

When comparing the 5- to 59-minute outage duration category over the four years, nearly half (45%) of companies have continued to see outages of this duration. See Chart 1. While utilities have invested considerable sums to modernize the grid, the 2021 study finds the reliability experience for C&I customers has not improved—showing a disconnect between the progress utilities have made and the end-user experience.

Chart 2: Short Outage Prevalence



Base: Comparable groups for 2017, 2018, 2019, and 2020 surveys (same industry and company size representation)

Question: What was the duration of the typical power outage that you experienced in the past 12 months?

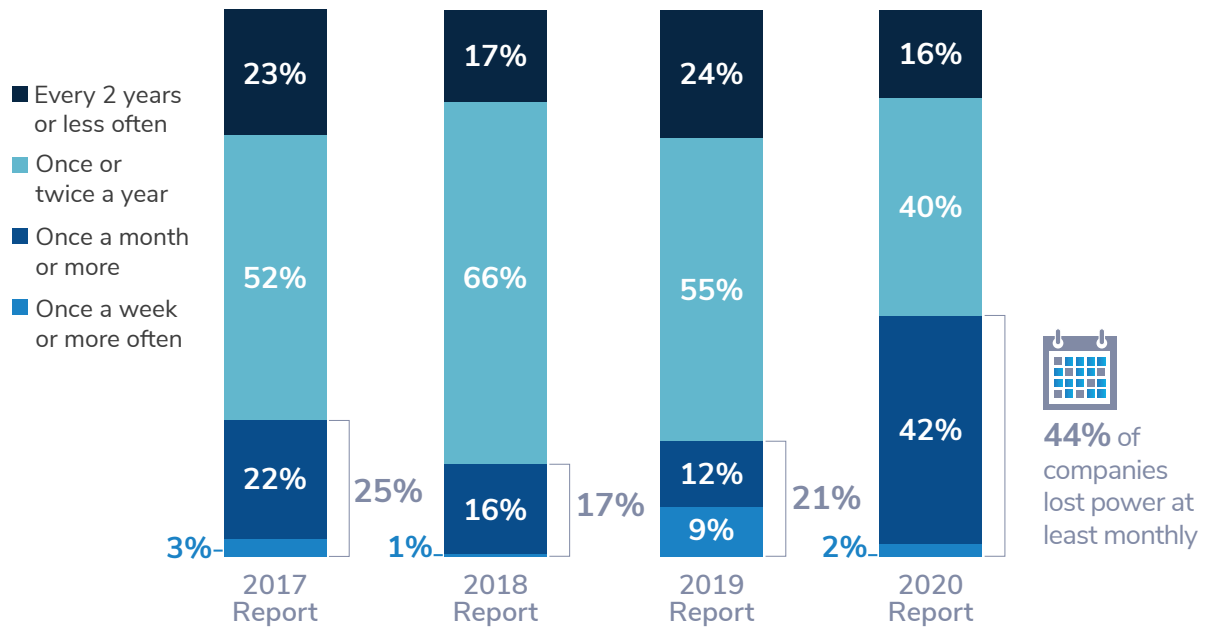
Source: S&C Electric Company

Though overall outage duration has not changed significantly in the past four years, there was a noticeable jump in short-duration outages. The 2021 survey found the percentage of companies experiencing outages lasting less than 5 minutes (otherwise known as momentary outages) increased from 20% to 40% in just one year. See Chart 2. The doubling of companies whose typical outage was momentary over such a short period suggests these outages are becoming much more prevalent, and C&I companies are recalling them more clearly because they are increasingly impacting operations.

Many utilities are not including momentaries in their standard reliability metric reporting. Without tracking and reporting momentary outages, utilities are unlikely to effectively implement strategies to reduce these outages, and their impact on C&I customers will continue to increase. The increased impact of momentary outages on C&I companies indicates a need for further utility action to treat these as major reliability problems and mitigate them as they would longer-duration outages.



Chart 3: Outage Frequency



Base: Comparable groups for 2017, 2018, 2019, and 2020 surveys (same industry and company size representation)

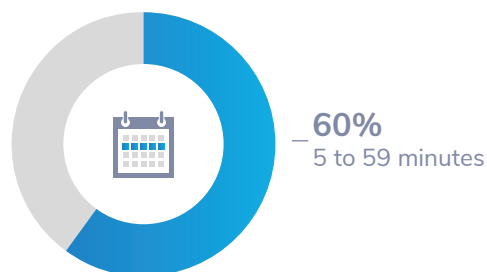
Question: How frequently does your company lose power?

Source: S&C Electric Company

As with the previous years' surveys, the 2021 survey measured the frequency of outages C&I companies experienced. There was a considerable increase in the number of companies that experienced outages at least monthly—almost doubling from every year prior. See Chart 3.

With this large increase, the 2021 report sought to better understand the experiences of the 44% of C&I companies that lost power monthly. Of the 44% of companies that lost power monthly or more frequently, 40% reported momentary outages as their most typical. See Chart 1 on page 5. With C&I companies clearly experiencing more frequent outages than in years past, they are also experiencing more negative impacts. Even if the duration of the outages they experienced stayed the same over time, how often they are seeing the outages has become more of a problem.

Chart 4: Typical Outage Duration for Companies Experiencing Monthly Outages



Base: Filtered respondents with outages once a week or more often and once a month or more (n=112).

Question: What was the duration of the typical power outage you experienced in the past 12 months?

Source: S&C Electric Company

Because the monthly outages C&I companies experienced increased drastically over a year, the 2021 survey explored how long these outages last each month. Of the 44% of C&I companies experiencing outages monthly, as shown in Chart 3 on page 7, the majority (60%) experienced outages lasting between 5 and 59 minutes. See Chart 4.

If each C&I company experienced one 59-minute outage per week across one year, for example, that equates to a potential total loss of up to 48 hours per customer. This kind of significant power loss is especially taxing on mission-critical industries, such as manufacturing and healthcare, which require a constant supply of power to provide essential goods and services. That these industries are experiencing power outages monthly, even if they only last for 5 minutes or less, is a major challenge—not only jeopardizing critical operations but potentially risking their reputations as reliable goods-and-services providers as well.

Section Comments

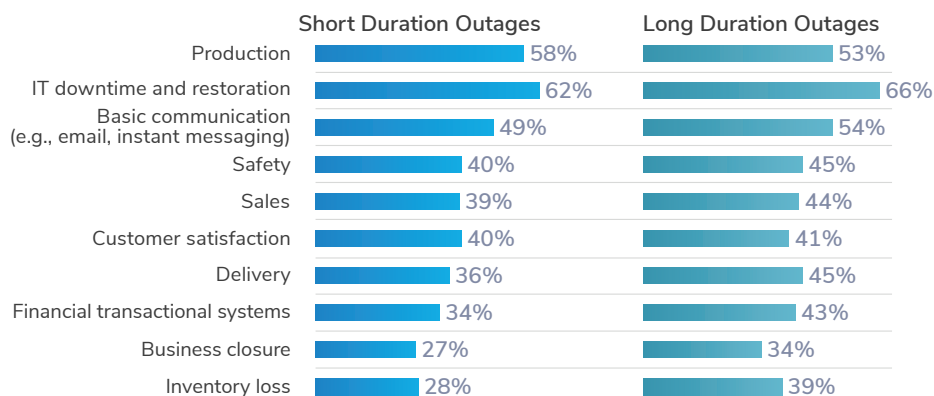
For the fourth consecutive year, this report presents evidence that C&I companies' reliability has not improved overall. Moreover, the data reveal more companies are experiencing outages monthly, or more frequently, and a greater percentage report momentary outages as their most common, representing a widening gap between the energy reliability these companies need and the ability of utilities to meet those needs. The doubling of momentary outage experiences over just a year is a compelling reminder of the need for utilities to track even short outages—an uncommon practice in most utilities' standard reliability reporting. Additionally, with C&I companies seeing double the amount of monthly outages compared to the previous year, poor reliability continues to loom large over their ability to meet their missions.

Section 2: Outage Impacts

Tracking Outage Occurrence and Cost Impacts

With C&I companies experiencing outages more frequently this year than in previous years, they have a clear understanding of how significantly these outages affect their organizations. Regardless of outage duration, the clear material impact the outages have on company operations has contributed to their implementation of outage-tracking methods and even to their seeking compensation from utilities.

Chart 5: Short- and Long-Duration Outage Impacts



Base: All respondents (n=253).

Question: What parts of your organization have been affected by short-duration outages (Less than 5 minutes) in the last 12 months?

Question: What parts of your organization have been affected by long-duration outages (5 minutes or more) in the last 12 months?

Healthcare

“ As a healthcare provider any type of outage is very critical to our business model.”

“ Power outages affect a healthcare organization equally, whether it is for a minute or for an hour. ”

Manufacturing

“ Outages of any duration disrupt the whole manufacturing process and affect the supply chain. ”

“ Two 50,000-dollar machines get completely ruined, and it causes a lot of problems in our facility because when the power comes back then we have to bring everything online, which takes time. ”

“ We have a lot of equipment and machinery in the company that stops working once there is a power cut. It does not matter for us if the power cut is of a short duration or long duration, as in either of the scenarios our production line is stalled.”

Retail and Small Franchise

“ Most of our computers, which have customer information and phones, are wireless. If power goes out, I cannot do [anything]. I even can't get customer information, can't move a compressor, can't use tools, so for that I need power. ”

Base: Filtered respondents who felt both outage types had about the same impact on their business (n=52).

Question: Please explain why both outage types had about the same impact on your business.

Source: S&C Electric Company

With C&I companies experiencing more outages, the survey sought to determine whether the length of outage determined the gravity of the impacts. C&I companies found that both short- and long-duration outages had a nearly equal impact on various operational aspects of their business. See Chart 5. This distribution indicates outage duration does not mean different outcomes for C&I companies. Regardless of how long it is, an outage still negatively impacts various areas of their organizations.

Respondents were also asked to explain why short- and long-duration outages had about the same impact on their companies. In the quotes received across industrial lines, a common theme was evident: loss of time. Any outage requires staff and equipment to reset their operations and recover from the interruption. While a long outage may mean more downtime, there is a baseline impact of any outage, regardless of length.

Chart 6: Short-Duration Outage Impacts



Healthcare

- “Our plant mechanics have to manually reset large equipment such as air handlers and exhaust fans and get chillers to startup and get in sequence. This is difficult with a skeleton staff on 2nd and 3rd shift for an 80 acre facility with equipment throughout the campus.”
- “Lack of communication.”
- “Frequent outages lead to safety concerns.”

Education

- “We are mostly online right now. We lose data as we do not have anyone onsite, so it shuts our server room when there is an outage.”
- “The impact or damage depends on the location of the building. But if it is unscheduled even for a short duration, the systems crash, resulting in loss of data, and the infrastructure is not supported for research.”

Manufacturing

- “There is equipment that shuts down due to these outages, and it increases downtime. We have things going around that are heated and cooled, and there are things happening when heating and cooling stops, so having a power cut definitely impacts our work.”
- “Our production stops due to short-duration outages. It doesn't matter whether the outage is short, it has an impact on the production and increases the downtime.”
- “For every single minute of downtime, our production takes a hit.”

Retail and Small Franchise

- “The business is all tied to email, computer use and phone too. Phone and computer being down due to outages.”
- “When it's frequent, a lot of people are in front of you. And once the outage occurs, it will be difficult to manage. Also, you can't use the equipment.”

Base: Filtered respondents noting that short-duration outages had a greater impact on their business (n=47).

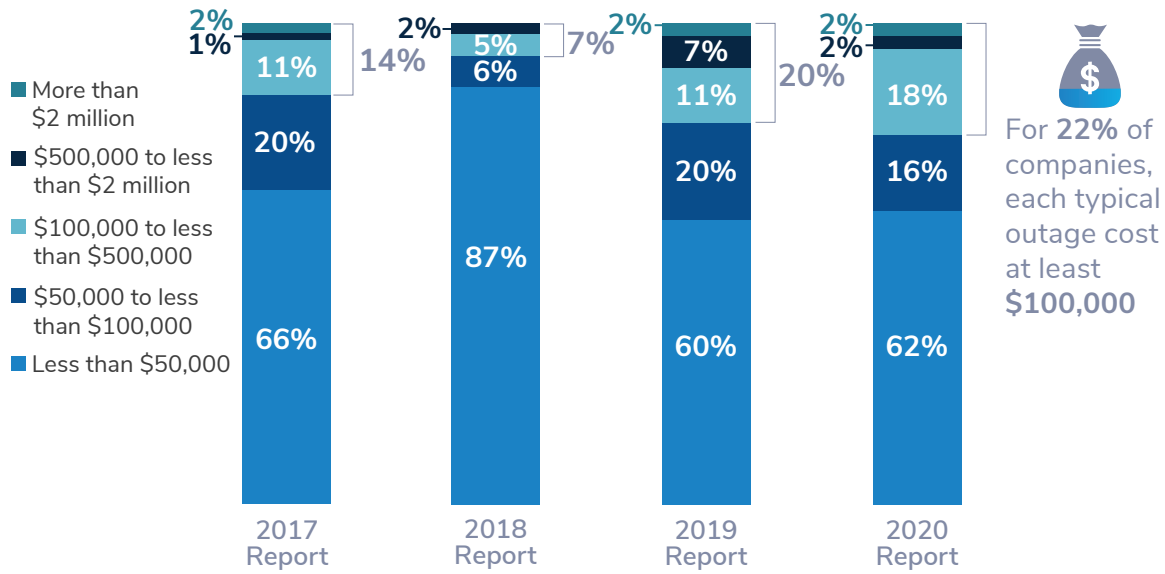
Question: Please explain why the impact of frequent, short-duration outages had a greater impact on your business.

Source: S&C Electric Company

For certain C&I companies, the impacts of short-duration outages are even more cumbersome than are long-duration outages, especially if they occur frequently. With that in mind, the survey asked the respondents who said that frequent short-duration outages had a greater impact on their organizations why that was the case. Nearly half (49%) of C&I companies said frequent short-duration outages had a greater impact on their operations. Though short-duration outages may only last moments, they were memorable because of the lasting impacts they had on critical systems these C&I companies use daily. This is especially worrisome when 40% of companies' typical outages last less than 5 minutes. See Chart 1 on page 5.

Indeed, upon reviewing the details C&I companies shared about these impacts, a commonality among the organizations was the time it took to bring complex systems or processes back online after a short-duration outage. Across the board, the need to manually reset systems or processes led to downtime that could have otherwise been avoided if these outages were not occurring—and wasted time means wasted money.

Chart 7: Estimated Financial Impact of a Typical Outage



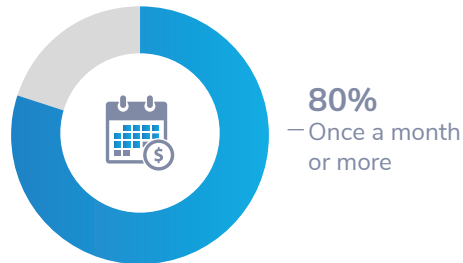
Base: Comparable groups for 2017, 2018, 2019, and 2020 surveys (same industry and company size representation)
Question: On average, how much did each typical power outage cost your company?

Source: S&C Electric Company

To determine whether the cost of outages for C&I companies changed over time, the 2021 survey asked respondents to approximate the average cost of a typical outage they experienced. The responses revealed a typical outage cost 22% of companies \$100,000 or more. See Chart 7. This finding is about the same as the percentage of C&I companies that lost \$100,000 or more last year—supporting the contention that outages have continued to have a considerable material impact on C&I customers.

Moreover, because reliability has not improved overall, C&I companies have not made much progress in mitigating the economic impact of these outages over the years. As the cost impacts of poor reliability become ever more problematic for C&I customers over time, the pressure mounts on utilities to improve reliability.

Chart 8: Outage Frequency (for those companies who lost \$100,000 or more)



Base: Filtered respondents whose typical outage cost \$100K or more (n=41).
Question: On average, how much did each typical power outage cost your company?
Question: How frequently does your company lose power?

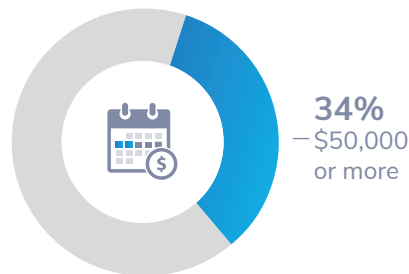
Source: S&C Electric Company

Another driver for reliability is the increasing frequency of outages and the costs they incur for C&I companies. To determine the financial impact of these recurring outages, the survey focused on finding the outage frequency among C&I companies that noted a loss of at least \$100,000 per outage. See Chart 7 on page 11. The survey discovered that 80% of the C&I customers who lost at least \$100,000 per outage also experienced outages every month or more. See Chart 8.

To extrapolate this significant finding, if these C&I companies experienced only one outage per month for a year, and each outage cost them at least \$100,000, they would lose \$1.2 million annually. This is an overwhelming loss of money and underscores the need for utilities to mitigate outages.



Chart 9: Cost of Monthly Short-Duration Outages



Base: Filtered respondents with outages once a month or more (n=101).

Question: How frequently does your company lose power?

Question: Approximately how much does a short-duration outage (under 5 minutes) cost your organization?

Source: S&C Electric Company

Regardless of their duration, frequently occurring outages are costly to C&I companies. To gain a sense of just how costly they are, the survey analyzed respondents that experienced outages monthly. Of the companies that experienced outages monthly or more often, 34% reported costs of \$50,000 or more per outage. See Chart 9. With this cost in mind, if these C&I companies experienced just one short-duration outage per month throughout a year, they would lose \$600,000 annually. For other companies that experienced more frequent short-duration outages, the annual cost would be even greater. While these costs may seem astronomical from just minutes without power, many C&I companies referenced the valuable time lost bringing their sensitive systems and machinery back to a normal state. See Chart 6 on page 10. Indeed, the very real costs make even the shortest outages memorable to C&I companies and have motivated many to track their impacts.



Chart 10: Outage Measurement



Retail

- “Currently not tracked for duration. Systems track number of cycles and reboots of systems. Prolonged outages require systems to be rebooted by electricians.”
- “We have 1,160 stores, and at any given time there are power outages due to storms or wire cuts. We have monitors on our servers and network gear that respond back with the outage information.”

Education

- “Computer systems help us to measure or track outage frequency duration.”
- “The system in place handles all the data analytics, and we work with different external vendors as well to monitor the outages in our facility.”
- “Admin department measures outage frequency and keeps a record of it.”

Manufacturing

- “We have a dedicated team to track outage duration and frequency, etc. They maintain a record, and we share the report with our service provider.”
- “We use MAIFI to measure and track outage frequency and distribution.”
- “We have a system to keep track of frequency and duration. We then analyze the records and assess the loss because of the outages.”

Healthcare

- “We track and measure outage frequency by using an in-house software.”
- “We follow a work order system. We get a call and then it gets put into the system and then we get to see the utility failures.”

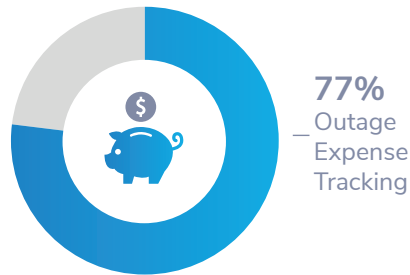
Base: All respondents (n=253).

Question: What process or system do you use to measure or track outage frequency and duration?

Source: S&C Electric Company

The millions of dollars C&I companies lose annually because of recurring outages is enough justification to begin measuring outage duration and frequency. When the 2021 survey asked about outage measurement, more than half (58%) of companies indicated they have, or soon will have, a system or notifications in place to measure outage duration and frequency. See Chart 10. Without a way to measure outages, C&I companies can find it challenging to determine how much money is lost each time an outage happens. An outage-measurement system provides C&I companies quantifiable evidence of the impacts they cause, and this can be a powerful tool to use when approaching their utility for compensation.

Chart 11: Outage Expense Tracking (for those companies measuring outage duration and frequency)



Base: Filtered respondents who are measuring outage duration and frequency (n=44).

Question: Do you have equipment or a system in place to track expenses from outages?

Source: S&C Electric Company

The 2021 survey further asked whether the companies surveyed are also tracking monetary losses from outages. Of the C&I companies presently using a system or notifications to track outage duration and frequency, 77% said they already have, or plan to have, equipment or a system in place to track outage expenses. See Chart 11.

Along with proof of outage duration and frequency, noting how much the outages cost on average also helps C&I companies build a case for asking their utilities to compensate them for poor reliability. The dedicated investment in effort, time, and money to track outage expenses proves how highly these companies value and expect improved reliability and rapid restoration.

Section Comments

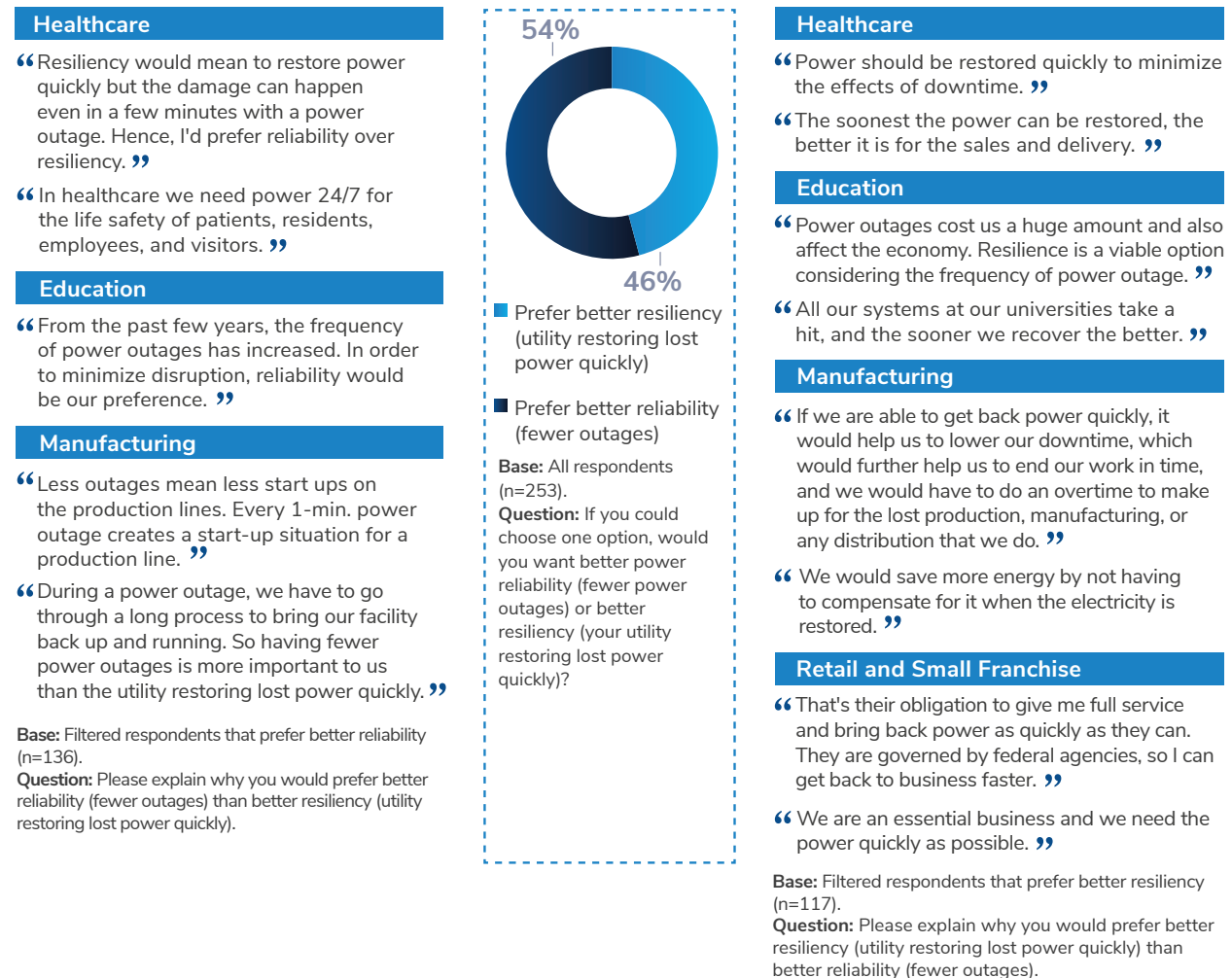
C&I companies have realized the distribution of impacts of short and long outages is about the same. The pain momentary outages have caused C&I companies is evident in the nearly half (49%) of respondents that shared details of the operational impacts they incurred. With C&I companies poised to lose up to \$2.6 million annually if they see even one short-duration outage per week costing \$50,000, many companies are increasingly pressed to act on mitigating outages on their own—especially if utilities continue to exclude momentaries from their standard reliability metric reporting. A large swath of C&I companies indicated they have already implemented, or will soon implement, an outage measurement system. Others are tracking expenses from outages to seek compensation from their utilities.

Section 3: Outage Mitigation

The Value of Improved Reliability

The financial impact outages create for C&I companies has contributed to the growing importance companies place on improved reliability and resilience. This importance has contributed to these companies' intolerance of frequent outages and their demand to pay utilities for improving reliability. However, almost one-third of C&I companies are not given the opportunity to discuss their outage concerns with their utilities.

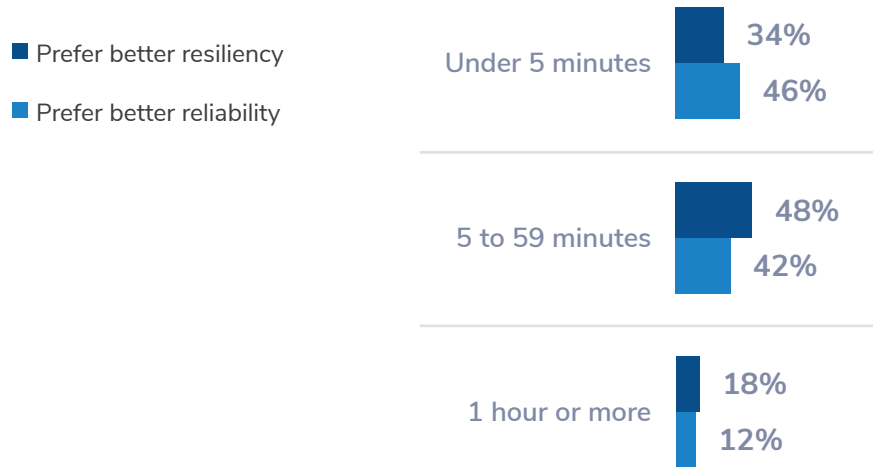
Chart 12: Preference for Reliability vs. Resilience



Source: S&C Electric Company

To C&I companies, outage mitigation does not stop at preventing outages from occurring—it is equally important for them to have power restored quickly should an outage occur. Indeed, asked whether they wanted better reliability or resilience, the company responses were almost evenly split. See Chart 12. For some companies, it was a matter of philosophy: improving reliability would mean mitigating outages, whereas improving resilience meant accepting the inevitability of outages but minimizing their duration. For other companies, it was a matter of their industry and whether their facilities could tolerate outages and the disruption they cause. For example, a university may not tolerate more outages if the outages caused them to lose valuable academic research.

Chart 13: Typical Outage Duration by Preference for Reliability vs. Resilience



Base: All respondents that Prefer better resiliency (n=117), Prefer better reliability (n=136).

Question: What was the duration of the typical power outage you experienced in the past 12 months?

Question: If you could choose one option, would you prefer better reliability (fewer outages) or better resiliency (utility restoring lost power quickly)?

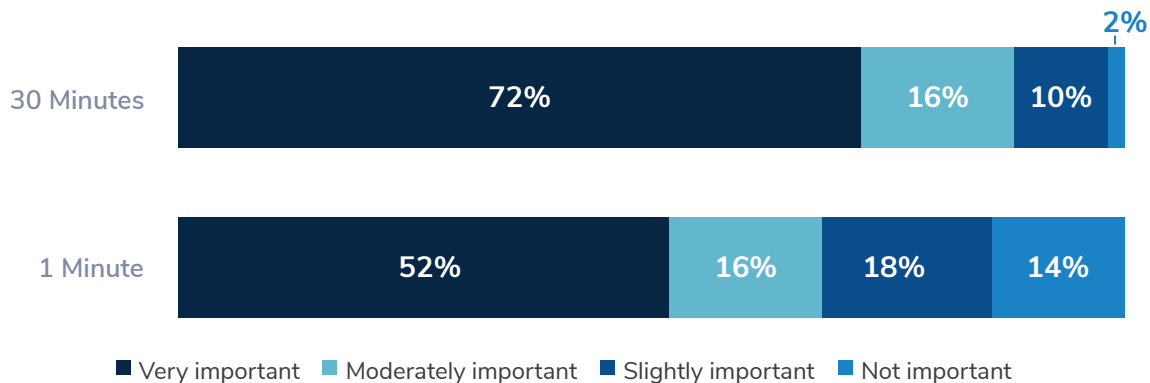
Source: S&C Electric Company

To determine whether outage duration affected C&I companies' preference for reliability or resiliency, the 2021 survey matched respondents' preference with the duration of typical outages they experienced this year. Almost half (46%) of C&I companies whose typical outages lasted less than 5 minutes noted a preference for better reliability, and about half (48%) of companies whose typical outages were 5 to 59 minutes long indicated a preference for better resiliency. See Chart 13. The similar percentage of respondents that want better reliability over better resiliency, and vice versa, shows C&I companies value reliability just as much as they do resiliency.

While there was not an overwhelming preference between the two options, the respondents experiencing outages lasting less than 5 minutes want better reliability because short-duration outages seem feasible to eradicate. On the other hand, the respondents experiencing outages lasting up to 59 minutes want better resiliency because they may see getting the power back on faster as the most realistic next step toward improving their experience.

Whether an outage lasts less than 5 minutes or up to 59 minutes, a significant portion of C&I companies find their mitigation equally important. Regardless of whether the business disruption is short or prolonged, any time wasted because of outages is too much time for these companies to lose.

Chart 14: Power Restoration Timeframe



Base: All respondents (n=253).

Question: How important is it to you to have your power restored by your utility within the following time frames:

Source: S&C Electric Company

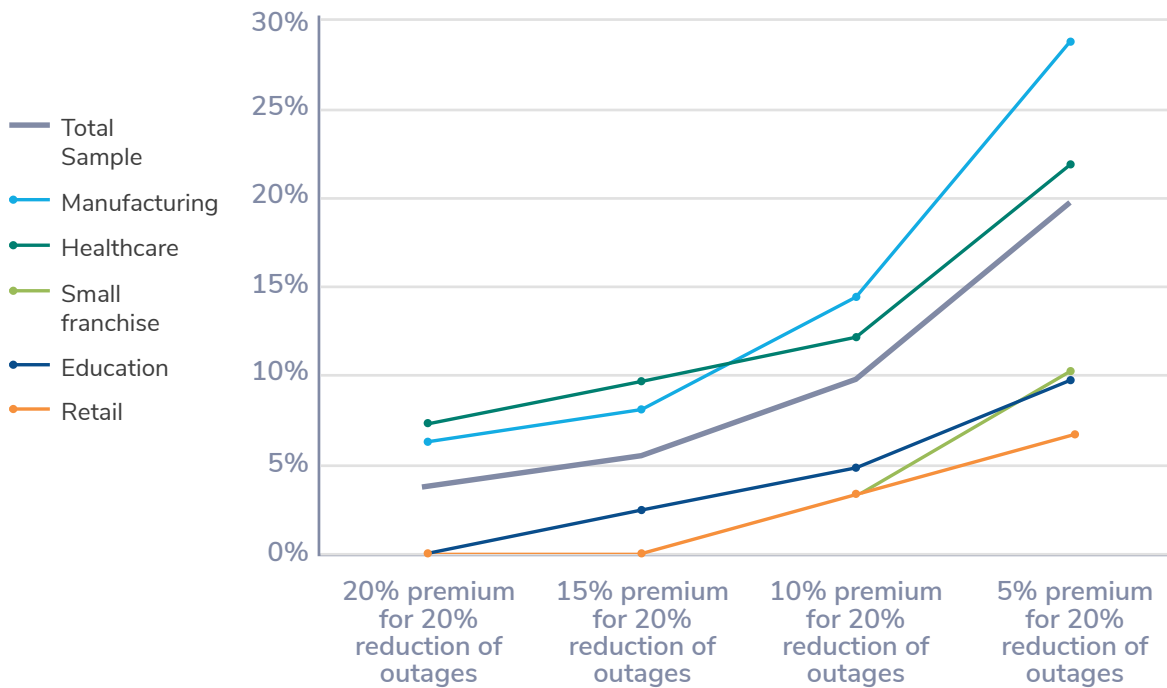
Time emerges as an important theme when discussing outage length and restoration after an outage occurs. The 2021 survey results showed more than half (52%) of companies believed power restoration within 1 minute was very important. See Chart 14. However, the 1-minute duration remains well below the threshold where many utilities start reporting outages. The lack of reporting on this data means utilities and regulators don't often prioritize addressing these challenges.

Nearly three out of four (72%) companies believed power restoration within 30 minutes was very important. See Chart 14. That most C&I companies find it very important that power be restored within 30 minutes is a strong indicator the definition of a "long" outage has changed for utilities' key customers. With their ever-increasing reliance on digital technology and systems, these companies find even 30-minute outages too long and expect even quicker power restoration to avoid the organizational impacts they cause.

However, even with the importance C&I companies place on quick power restoration, not all utilities measure resilience as often they do reliability. According to a report by the National Association of Regulatory Utility Commissioners, industrywide standards for resilience do not exist, and there are few examples of resilience metrics.* The lack of standard utility metrics and reporting means standard "problem" and "good" power-restoration timeframes have not been defined. If these standards were more clearly defined and could be measured, utilities could benchmark the resilience of their service, determine whether it meets the needs of their customers, and set measurable goals for improvement.

*<https://pubs.naruc.org/pub/531AD059-9CC0-BAF6-127B-99BCB5F02198>

Chart 15: Demand Curve Based on Premium to Reduce Outages



Base: All respondents (n=253).

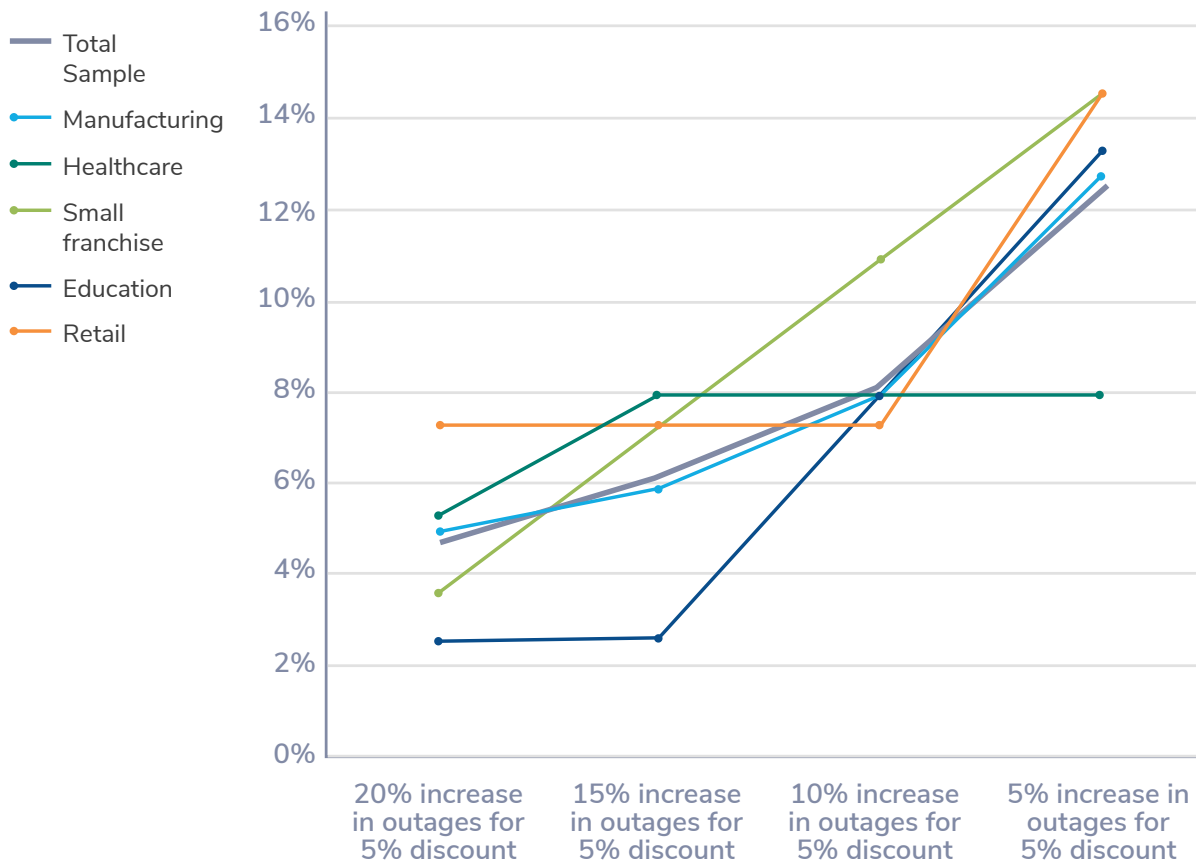
Question: Would you pay a X% premium on energy bill to reduce outages by 20%?

Source: S&C Electric Company

Along with the importance of improved resilience, the 2021 survey delved deeper into the importance of reliability improvements and attempted to quantify the value of those improvements to C&I companies. Asked how much of a premium they would pay utilities to reduce outages by 20%, the total sample of C&I companies noted a demand to pay at least a 5% or a 10% premium for a 20% reduction in outages. The percentage increased across all categories as the potential cost for the 20% reduction in outages decreased. See Chart 15. C&I companies' willingness to pay their utility at least a slight premium for reliability improvements reveals a financial incentive for utilities to improve reliability. With a 20% decrease in outages only used as a baseline to place value on reliability improvement, the question remains: How much more would C&I companies pay their utilities to make further improvements?

Another significant finding is that utilities' most energy-intensive C&I customers (namely healthcare and manufacturing) indicated a higher willingness to pay an even higher premium (up to 20%) for a 20% reduction in outages. See Chart 15. For mission-critical C&I companies, the reliability stakes are higher—many cannot afford to lose power because of the risk to their business or customers. To them, paying a utility more to improve reliability is well worth the reassurance of mitigating potentially catastrophic power disruptions.

Chart 16: Demand Curve Based on Outage Increase for 5% Energy Bill Discount



Base: All respondents (n=253).

Question: Would you accept a X% increase in outages if it meant a 5% discount on your energy bills?

Source: S&C Electric Company

To pressure-test C&I companies' responses, the survey probed the opposite side of the spectrum and whether they would accept an increase in outages if they were offered a small discount on their energy bills. The survey found only a very small percentage (about 5%) of C&I companies surveyed would accept an increase in outages (up to 20%), even if offered a small discount (5%) on their energy bills. See Chart 16. Because many C&I companies rely on a constant supply of power to remain productive or provide timely and essential services, it is not surprising to find most would not accept an increase in outages, even if it meant their electric bill was discounted. Ultimately, the costs these companies incur from dealing with more outages may trump what they might save on a discounted energy bill.

Another notable piece of data in Chart 16 is the relatively flat trend in healthcare facilities' tolerance of increased outages in general. While healthcare facilities are about as unaccepting as other industries of a 20% increase in outages, their tolerance of a 5% to 15% increase in outages levels off rather than rises, as the other industries' data show. Even if healthcare facilities were given a discount on their energy bill, they are no more accepting of a slight increase in outages as they are a large increase. As shown in quotes received from healthcare facilities in Charts 5 and 6 of this report, this intolerance stems from the unacceptance of outages of any duration because their power must be as seamless as the continuous care these facilities provide to customers who may be in a critical state.

Chart 17: Lack of Opportunity to Communicate with Utilities



Base: All respondents (n=253).

Question: Does your utility give you the opportunity to talk with them directly about your reliability concerns?

Source: S&C Electric Company

The demand for a decrease in outages across C&I industries and the willingness to pay for improved reliability present an opportunity for utilities to discuss reliability concerns with these customers. As such, the 2021 survey sought to determine whether C&I companies felt they could talk with their utilities about their reliability concerns. When asked, about one-third (31%) of respondents felt they were not given the opportunity to talk with their utility directly about their reliability concerns. See Chart 17. Although the survey finds these C&I companies value better reliability, a decent portion of them still contend their specific reliability concerns may go unheard by their utilities.

The lack of opportunity for almost one-third of C&I companies to discuss their reliability concerns with their utilities may contribute to the outage-duration and out-frequency findings over the past four years. If there is minimal opportunity for these customers to discuss poor reliability with their utilities, the extent of reliability issues within their facilities may not be understood well enough to be appropriately addressed. This lack of communication between C&I customers and their utilities also contributes to a missed opportunity for utilities to be paid more to improve reliability, especially considering the swath of C&I companies that expressed a willingness to pay their utilities a premium to improve their reliability.

Section Comments

For many C&I companies, resilience improvements are just as important to them as improved reliability—and the quicker their power is restored, the better. In fact, for more than half (52%) of the C&I companies surveyed, power is expected to be restored within one minute—a key finding when most utilities don't track outages under 5 minutes. This reveals a disconnect between what C&I companies need and the goals utilities set for system performance. While a very small percentage of the C&I companies surveyed are unwilling to tolerate an increase in outages, some industries are offering to pay utilities even more to mitigate them. However, even with a want for immediate power restoration and a willingness to pay their utilities more to improve reliability, 31% of companies are not given the opportunity to discuss their reliability concerns with their utilities—presenting a missed opportunity for utilities to be rewarded for satisfying the reliability needs of their key customers.

Overall Conclusions & Key Findings

The 2021 report continued to show reliability has not improved for C&I companies overall. The distribution of impacts frequent outages caused was about equal to C&I companies, to an extent many believe there is a need to begin tracking outages and sometimes seek compensation from their utilities. Outages have also contributed to the great importance and value C&I companies place on improved reliability and resilience, provided they are given the opportunity to communicate that value to utilities before their hope for the improvements is lost. The 2021 report's main findings and conclusions are outlined below.

Section 1 Conclusion: Although overall reliability has remained poor for C&I companies over the years, short-duration and monthly outages are on the rise.

- Short-duration outages (less than 5 minutes) were the most typical for 40% of companies—double the percentage from last year.
- 44% of companies lost power at least monthly—double the percentage from last year.

Section 2 Conclusion: The frequent outages causing costly impacts to C&I companies have led to the implementation of systems or installation of equipment to measure outages and track outage expenses.

- Short- and long-duration outages impact various organizational aspects of C&I companies in a similar way.
- Of the 22% of companies losing \$100,000 or more per typical outage, 80% experienced the outages at least monthly—an annual loss of at least \$1.2 million.
- 58% of companies have a system or equipment in place to measure outages.
- Of the companies measuring outages, 77% have, or will have, an outage-expense tracking system or equipment in place.

Section 3 Conclusion: Regardless of the high value C&I companies place on improved reliability and resilience, opportunities to discuss their reliability concerns with their utilities are few.

- The percentage of companies that want better reliability versus better resilience is about the same, but for various reasons.
- 52% of companies deem it very important that their power be restored within 1 minute.
- All C&I companies indicated a willingness to pay a 5% premium for a 20% reduction in outages.
- 31% of companies do not feel they are given the opportunity to discuss their reliability concerns with their utilities.

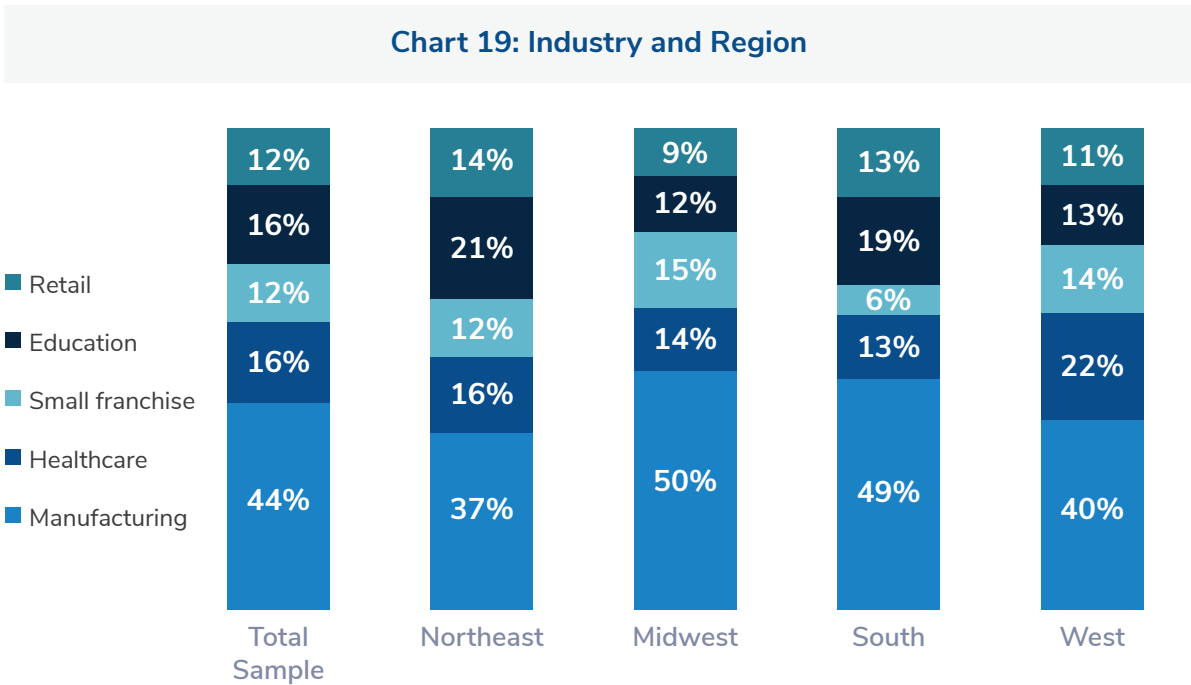
Appendix

Research and Methodology

<p>Methodology</p> 	<ul style="list-style-type: none"> • Telephone recruitment with web-based interviews
<p>Participants</p> 	<ul style="list-style-type: none"> • Survey was conducted blind. S&C Electric Company was not identified as the study sponsor. • Geographic and industry scope as follows: <ul style="list-style-type: none"> • The United States of America, distributed by U.S. census region • Manufacturing, healthcare, education, retail, and small franchise • Respondents match the following criteria: <ul style="list-style-type: none"> • Qualified respondents are senior level personnel involved in the decision process to select an energy provider for their respective organization.
<p>Sample</p> 	<ul style="list-style-type: none"> • Total: n=255 • Industry: Manufacturing n=111, Healthcare n=41, Education n=41, Retailer n=30, Small franchise n=30 • Region: Northeast n=57, Midwest n=65, South n=68, West n=63

Source: S&C Electric Company

Chart 19 shows the spread of respondents across industries and regions.

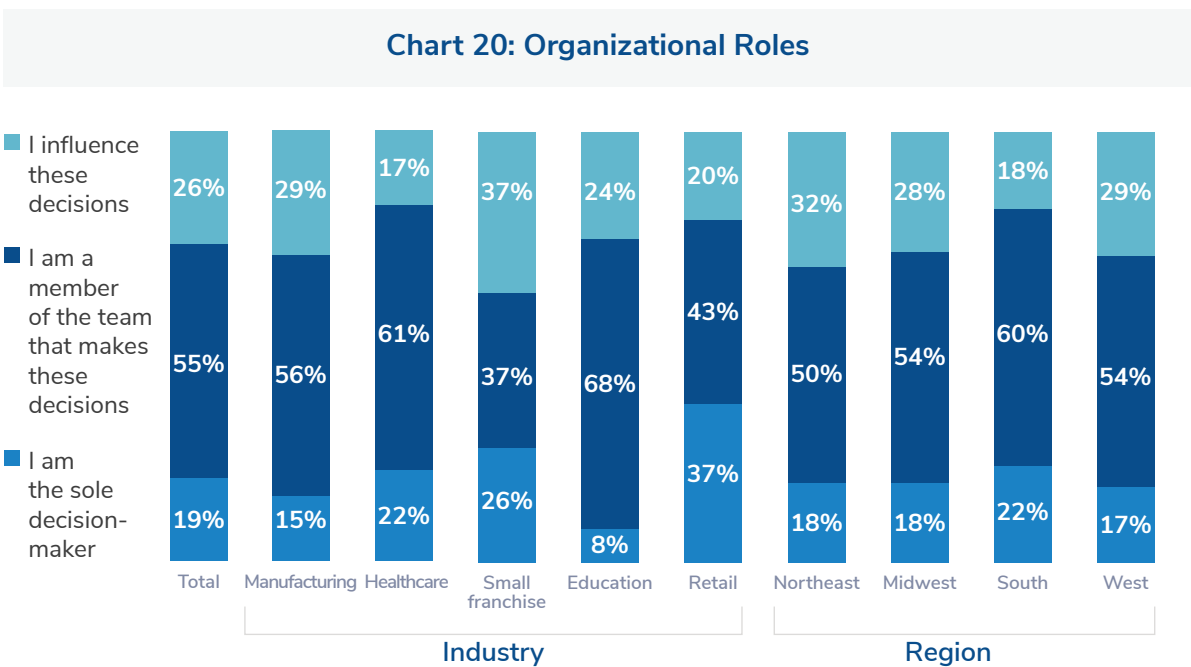


Base: All respondents (n=253).

Question: Which of the following industry sectors best describes your organization?

Source: S&C Electric Company

Chart 20 shows the role respondents have in their respective organizations.

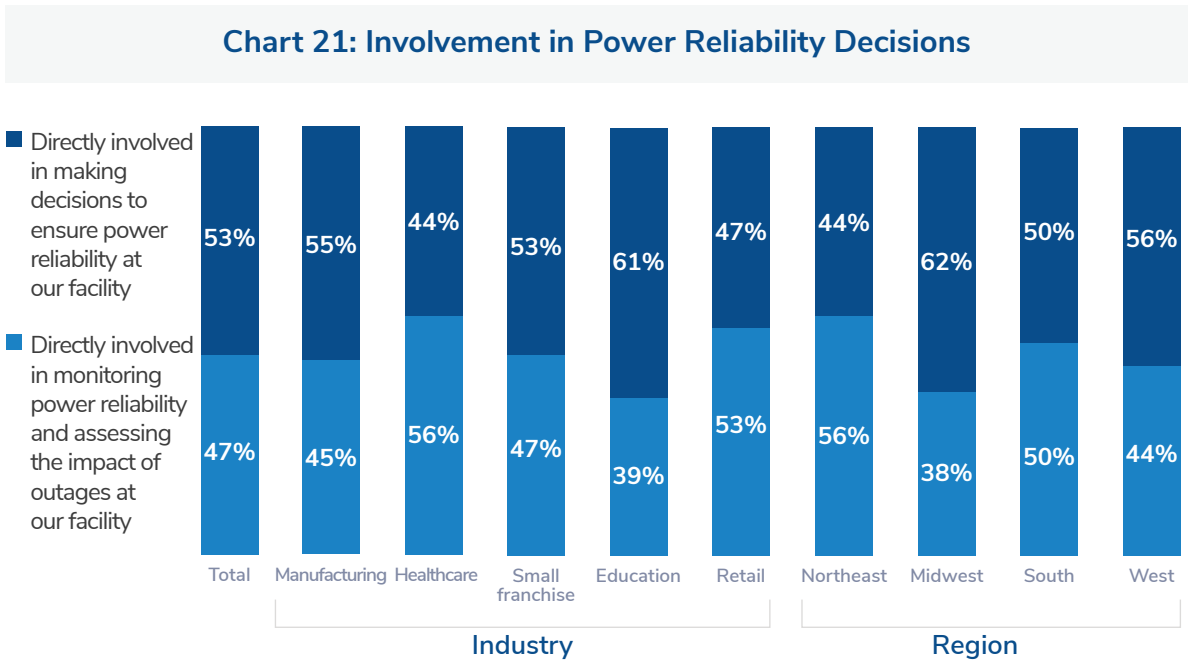


Base: All respondents (n=253).

Question: Which of the following describe your role in your organization for the selection of an electricity supplier?

Source: S&C Electric Company

Chart 21 shows the involvement respondents have in power-reliability decisions in their respective organizations.

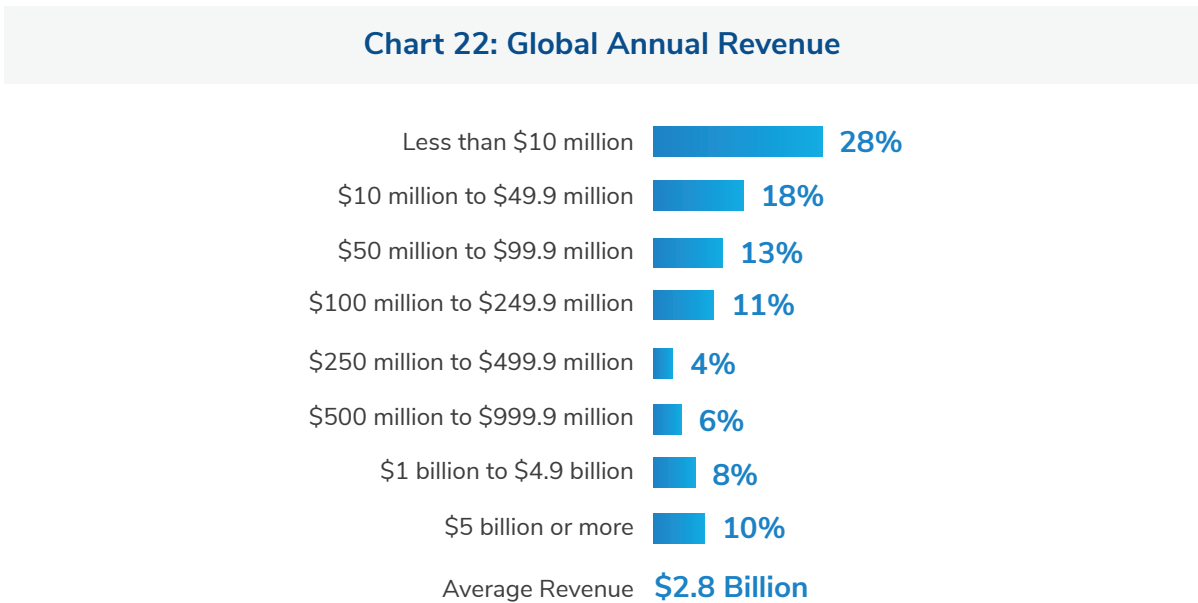


Base: All respondents (n=253).

Question: What is your involvement in monitoring power reliability in your organization?

Source: S&C Electric Company

Chart 22 shows the approximate annual revenue of the companies whose representatives participated in the survey.



Base: All respondents (n=253).

Question: What is your company's global annual revenue? As best you can, please provide the total annual revenues for your company in U.S. dollars.

Source: S&C Electric Company

About S&C Electric Company

S&C, with global headquarters in Chicago, is applying its heritage of innovation to address challenges facing the world's power grids, thus shaping the future of reliable electricity delivery. The mission of employee-owned S&C is to continually develop new solutions for electricity delivery, fostering the improved reliability, resilience, and efficiency required for the intelligent grid.

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Frost & Sullivan, the Growth Partnership Company, works in collaboration with clients to leverage visionary innovation that addresses the global challenges and related growth opportunities that will make or break today's market participants. For more than 50 years, we have been developing growth strategies for the Global 1000, emerging businesses, the public sector, and the investment community.



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