

RESILIENT

Delivering exceptional resilience
for extraordinary healthcare

se.com/healthcare



Life Is On

Schneider
Electric

Table of contents

In healthcare,
there's no time
for downtime

1

Ensure 24/7
power availability

2

Keep infrastructure
cybersecure

3

Boost resiliency with
remote operations

4

Mitigate risk
and comply
with regulations

5

Design flexibility into
the infrastructure

6

Protect critical
assets to reduce
costs

7

End-to-end
resilience for future-
ready healthcare

8

In healthcare, there's no time for downtime

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



In healthcare, there's no time for downtime

From treating injuries to curing illness, healthcare facilities perform extraordinary services every day.

Under the strain of aging populations and worker shortages, it only takes one local or global event to threaten the resiliency of those services.

Existing and emerging policies help safeguard essential healthcare services; however, their availability depends on the resilience of your facility's infrastructure.

Keeping your services running, your people safe, and your assets and campuses secure requires data-driven power distribution and building management systems that proactively resist, recover from, and adapt to threats.

Smarter buildings for more resilient healthcare

An IoT-enabled infrastructure is foundational to resilience, helping you ensure 24/7 operational continuity, uninterrupted access to patient data, and robust clinical monitoring systems.

Technology research firm Guidehouse Insights [surveyed 600 global healthcare executives](#) and found that most executives consider resiliency a critical reason to invest in IoT. Yet, many administrators cited ROI uncertainty as a hurdle to investing in IoT building technologies, which may hinder adoption.¹

18M

estimated healthcare worker shortage by 2030.²

33

hospitals across 10 countries cite power loss as the single most common cause of equipment failure.³

194

out of 216 countries report one or more COVID-19 related disruptions to essential health services.⁴

Sources:

¹ Guidehouse Insights, "Global Insights: IoT & The Future of Healthcare," 2021

² [Global Health Workforce Labor Market Projections for 2030](#)

³ [You can't fight pandemics without power—electric power](#)

⁴ [COVID-19 continues to disrupt essential health services in 90% of countries](#)

**In healthcare,
there's no time
for downtime**

Ensure 24/7
power availability

Keep infrastructure
cybersecure

Boost resiliency
with remote
operations

Mitigate risk
and comply
with regulations

Design flexibility into
the infrastructure

Protect critical assets
to reduce costs

End-to-end
resilience for future-
ready healthcare



According to a 2016 study conducted by Ponemon Institute, **healthcare organizations face an average cost of \$740,357 per downtime incident.**

Ponemon’s calculation accounts for the cost of business disruption, productivity, and lost revenues, but it doesn’t capture costs related to patient safety or quality of care.

In an environment where downtime can be the difference between life and death, IoT-based power and building management systems prove their value the first time they prevent a downtime event.

IoT is the backbone of resilient healthcare

This e-guide explains how integrated, IoT-based solutions can help optimize six essential dimensions of healthcare resilience.

- 1. **Power availability**
- 2. **Cybersecurity**
- 3. **Remote operations**
- 4. **Risk mitigation and compliance**
- 5. **Flexibility**
- 6. **Asset protection**

\$1M

average cost of an 8-hour outage at a 200-bed hospital.⁵

\$740,357

average cost per downtime incident.⁶

“An IoT platform is foundational to advancing a hospital’s energy, operational, financial, and patient satisfaction targets.”

— Guidehouse Insights

Sources:
⁵ [How Secure Power Solutions Support Healthcare Facility Infrastructure Stability and Safety](#)
⁶ [Interbit Data, “Costs and Impact of HCIS Downtimes,” 2017](#)

Ensure 24/7 power availability

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

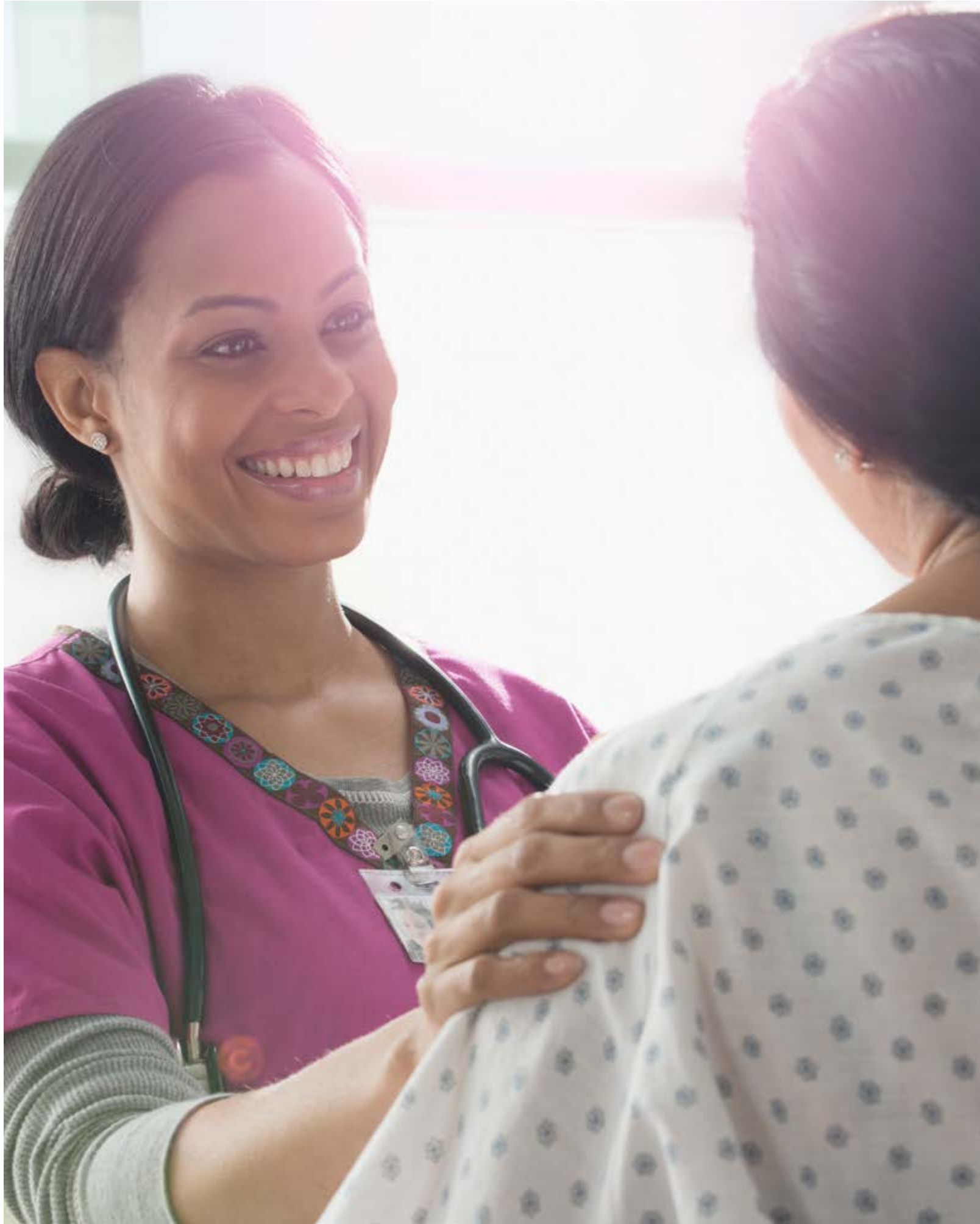
Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Ensure 24/7 power availability



In medicine, your facility simply can't afford a power problem disrupting a surgical procedure, an ICU, or other care areas.

Power quality issues can be an unseen factor in electrical reliability. Invisible conditions like harmonics and voltage fluctuations can cause malfunctions or shorten the life of sensitive healthcare equipment. Unfortunately, these issues may only come to light following an incident or crisis.

From design and build, to operate and maintain, EcoStruxure,[™] our [IoT-enabled platform](#), solutions, and services can help healthcare facilities achieve the highest level of resilience.

66%

of USA hospitals experienced a power outage, with 12% having to relocate patients or close.⁷

Source:
⁷ [Health Facilities Management / ASHE 2018 Hospital Construction Survey](#)

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare

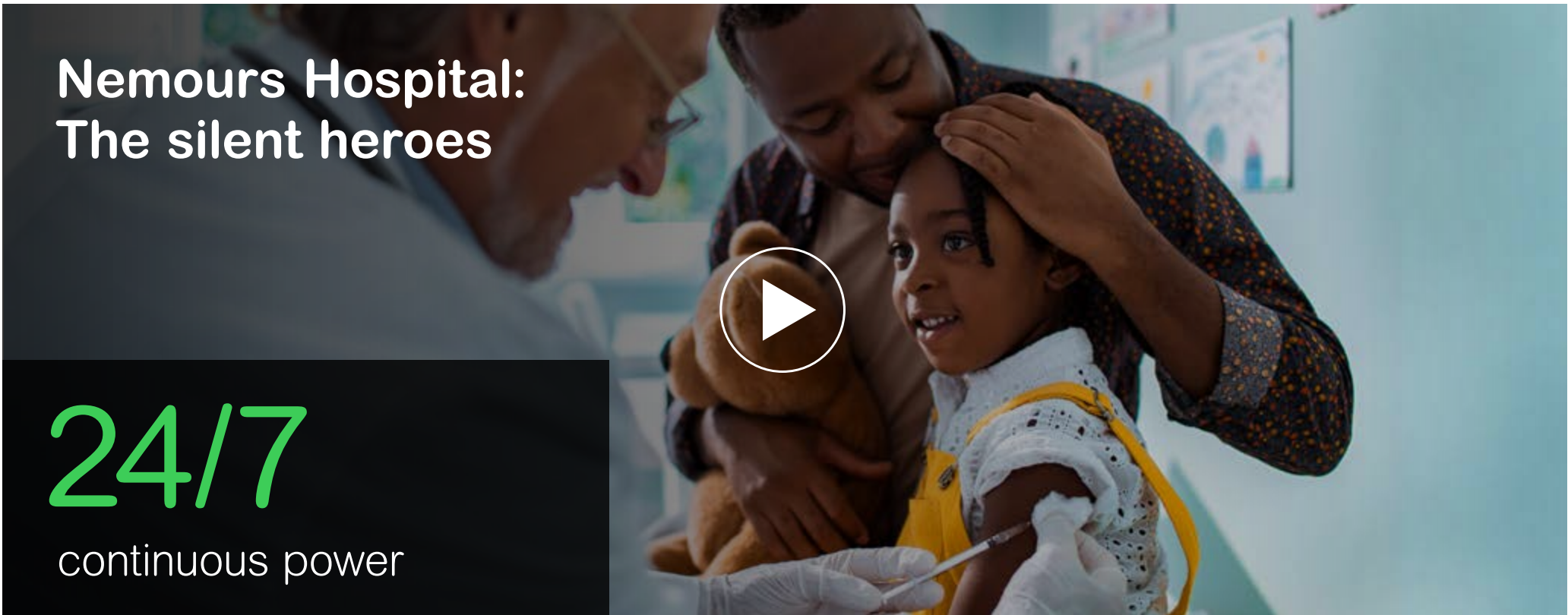


Software simplifies power management

EcoStruxure Power Monitoring Expert provides rich energy visualization and power analysis for more efficient and reliable operations. Integrated with intelligent apps, EcoStruxure Power Monitoring Expert provides your team with early warnings of potential problems and the insights needed to act quick.

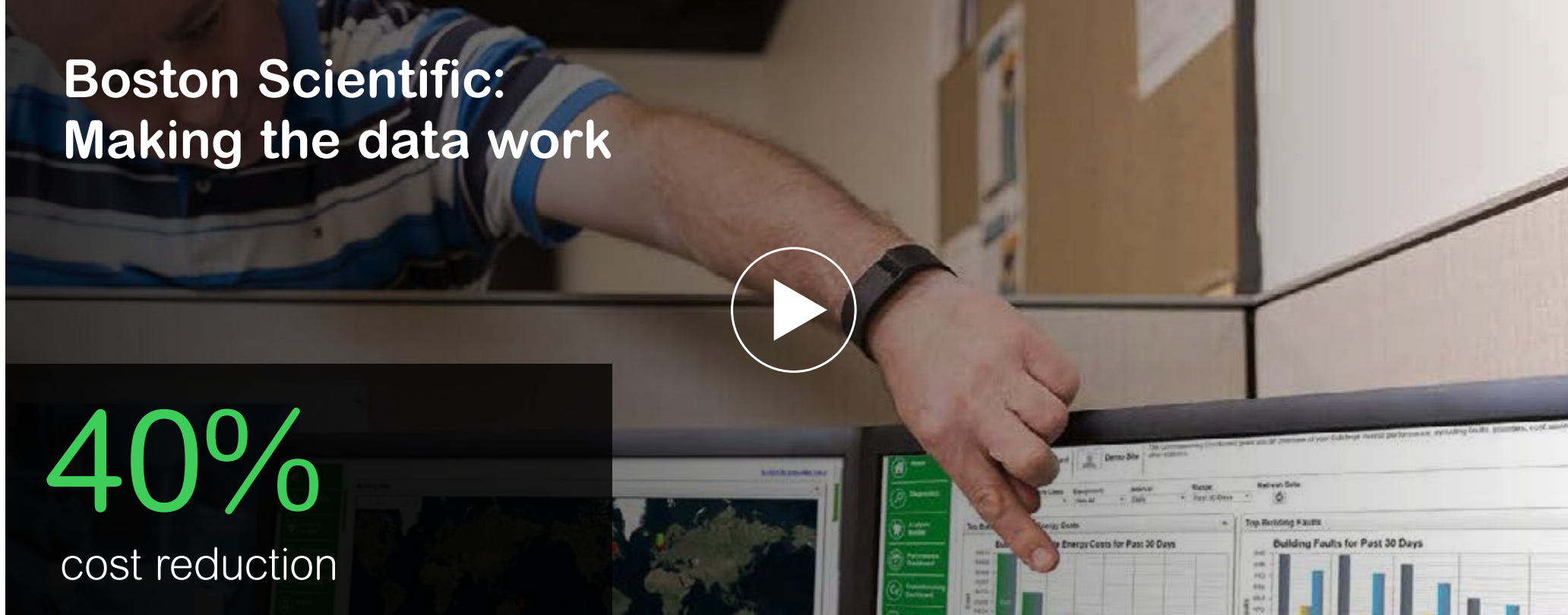
Field services support maintenance, modernization, and more

Our **field services** provide the support you need to minimize downtime while meeting safety standards. From maximizing asset performance to modernizing your critical infrastructure, our critical power and cooling, electrical distribution, and building field service experts support your resiliency strategy.



“Everything electrical at **Nemours Children’s Hospital** touches something of Schneider Electric.”

— Nelson Roque, Director of Facilities & Operations
Nemours Children’s Hospital



“**Boston Scientific** wants to do what’s right for the environment by minimizing our energy footprint as much as possible.”

— Greg Lamson, Senior Facilities Engineer
Boston Scientific

In healthcare, there’s no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Digital services protect power reliability and critical equipment

EcoStruxure Asset Advisor protects your most critical electrical equipment from power-related failure via smart alarming, remote troubleshooting, and 24/7 real-time monitoring sent directly to your smartphone.

EcoStruxure Power Advisor, powered by analytics and service experts, finds, prioritizes, and recommends solutions to resolve electrical issues across your entire infrastructure. EcoStruxure Power Advisor helps you concentrate on fixing problems instead of adding new ones to your maintenance backlog.



“In two incidents alone, [University of Rochester Medical Center](#) has saved several hundred thousands of dollars.”

— Mark Schwartz, Director of Facility Operations
University of Rochester Medical Center



“Schneider Electric offered [Grand Medica](#) the most comprehensive terms for delivery, installation, and project management.”

— Andrey Sergeev, Chief Engineer
Grand Medica

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare






Microgrids help withstand a grid blackout

Maintaining operations and delivery of essential services during an extended, unplanned power outage is a central requirement of your resiliency strategy. Preparing for and protecting against blackouts requires more than one line of defense.

1 Emergency Power Supply System (EPSS) maintenance

Testing your EPSS and maintaining your accreditation is a matter of compliance. EcoStruxure for Healthcare automates this process by:



-  Measuring power quality in compliance with IEC 61000-4-30 standard
-  Validating power compliance with standards like EN50160
-  Automating reporting for US organizations like JCAHO or AHCA as well as other international equivalents

2 Adopt microgrid

Microgrids bring together your energy sources while monitoring and managing supply and demand.

As a result, microgrids provide the resilience you need to maintain normal operations even if the utility grid goes down.

Unlike traditional backup generators, microgrids are always on and support day-to-day power capacity requirements to help connect, control, and monitor your energy resources:

-  [EcoStruxure Microgrid Operation](#) proactively manages energy production, promoting renewable energy, and automatically “islanding” in the event of losing the grid.
-  [EcoStruxure Microgrid Advisor](#) automatically forecasts and optimizes how and when to consume, produce, and store energy.

Keep infrastructure cybersecure

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Keep infrastructure cybersecure

While the IoT revolution enhances many aspects of healthcare, it also comes with an increased risk of cyberattacks. To protect everything from sensitive patient data to life-saving operational equipment, your entire infrastructure must be modernized and cybersecure.

Do you have a false sense of cybersecurity?

Deploying cybersecure-by-design operation technology (OT) is not enough. The network layer – where devices communicate and data turns into business value – must also be protected. As you add or decommission devices over time or as older software becomes less secure, IT/OT becomes a complex puzzle.

75%

of global healthcare organizations have experienced cyberattacks.⁸

25%

increase in cyber breaches in 2020.⁹

\$7.1M

average cost of a cybersecurity breach, plus up to 280 days recovery time.¹⁰

\$20.8B

cost of downtime for a healthcare industry ransomware attack.¹¹

In healthcare, cyberattacks aren't just an attack on data and devices, they are an attack on your vulnerable patient population.

Sources:

⁸ [Ponemon Institute, 2019 Global Stat of Cybersecurity in Small and Medium-Sized Businesses](#)

⁹ [HIPAA Journal Online, January 2021](#)

¹⁰ [Cost of a Data Breach Report, 2020 IBM Security](#)

¹¹ [Comparitech](#)

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

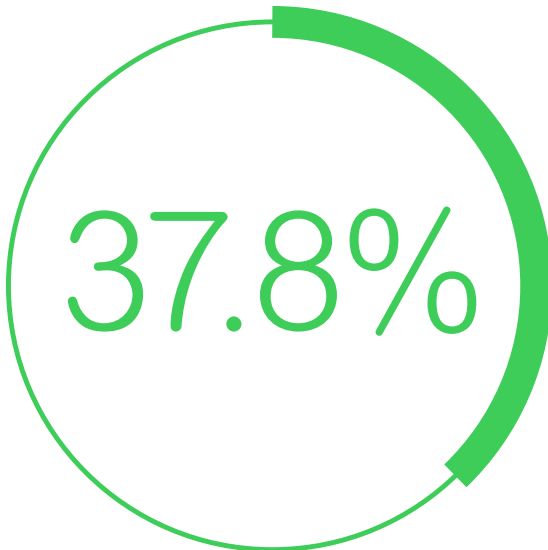
End-to-end resilience for future-ready healthcare



Create an in-depth cyber defense

Schneider Electric operates at the nexus between IT and OT and is uniquely suited to secure the connection of these systems. From consulting to design and implementation, monitoring, maintenance, and training, our [cybersecurity services](#) elevate your defenses against cyberattacks.

Our range of cybersecurity assessment services analyzes your operational environment for vulnerabilities and returns prioritized recommendations to help you remediate high-risk areas first.



of building management systems are affected by malicious cyberattacks.¹²

Source:
¹² [Kaspersky report: Nearly Four in Ten Smart Buildings Targeted by Malicious Attacks in H1 2019](#)

As your IT and OT architecture evolves, so must your approach to cybersecurity.

Our scalable, 24/7 managed services monitor and maintain your network, deploying technicians on-site as needed to help protect your power, systems, and patients.

Three steps to securing your networks



This structured approach helps identify outdated, vulnerable systems and provides a simplified path to [building system modernization](#).

Boost resiliency with remote operations

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Boost resiliency with remote operations

Remote operations deliver so much more than the ability to react to alerts. The true value of remote operations lies in its capacity to preempt, proactively troubleshoot, and prevent problems with hospital building management systems before disruption occurs.

Remote operations are a hallmark of resilient healthcare facilities

Our project with a hospital in Saudi Arabia demonstrates how remote services improve resiliency, minimize risk, and maximize on-site resource utilization.

With an on-site data center supporting critical emergency and administrative services, downtime was not an option. The hospital integrated [EcoStruxure Asset Advisor](#), with its secure power and cooling infrastructure to protect uptime.

Saudi Arabian hospital maximizes reliability with remote monitoring

500-bed hospital with an on-site data center supporting critical emergency and administrative services.



The challenge

Achieve 24/7 uptime while minimizing costs



The solution

EcoStruxure Asset Advisor enables remote monitoring and troubleshooting across 25 critical UPS assets

The results



In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare





Enable remote expertise and access

Digitalizing your power and building management systems opens a cybersecure, cloud-based portal to Schneider Electric’s remote service capabilities.

Our team of advisory experts remotely monitor and analyze each aspect of your facilities to help you:



Predict, troubleshoot, and prevent problems before they have a chance to cause disruptions. Remote experts will proactively identify and, in many cases, can resolve issues before your team knows they exist.



Access a service technician within minutes instead of waiting for technical help to arrive on-site.



Respond and adapt more quickly and flexibly when facing unprecedented circumstances, such as a pandemic or a natural disaster.



Provide remote mobile data access to your facility team, with 24/7 awareness of facility conditions.



Prioritize work based on condition-based maintenance rather than routine maintenance, helping you save time and costs while extending asset longevity.

In healthcare, there’s no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Mitigate risk and comply with regulations

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs




End-to-end resilience for future-ready healthcare



Mitigate risk and comply with regulations

Focused on patient care and safety, it is no surprise that healthcare facilities are highly regulated. To protect life-saving equipment, critical systems, software, and sensitive patient data, healthcare facilities must comply with international standards set forth by international organizations like [IEC](#) and regional standards set forth by groups like [NEMA](#).

EcoStruxure for Healthcare supports the design and build of healthcare infrastructure that is:

-  **Compliant:** Healthcare infrastructure experts design standard-compliant solutions without sacrificing innovation.
-  **Tested and validated:** [Reference architectures](#) provide tested and validated structures and integrations to help achieve specification and high-quality project delivery.
-  **Future-ready:** IoT-enabled, flexible architecture adapts to clinical and patient needs, critical events, new systems, and devices.



In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Design flexibility into the infrastructure

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Design flexibility into the infrastructure

The ability to react, respond, and adapt to emerging practices, technologies, trends, and crises is an important aspect of resiliency.

From the built environment to supporting equipment and systems, flexible infrastructure enables healthcare facilities to monitor and modify how to use spaces without disrupting the continuity of critical services.

The COVID-19 crisis and corresponding shortage of intensive care units, isolation, and negative pressure rooms highlighted flexible infrastructure’s criticality. Emerging trends and care models underscore the need for flexible infrastructure, from telehealth to acuity-adaptable patient rooms.

EcoStruxure for Healthcare’s open, IoT-enabled platform and solutions helps you create a connected, flexible, facility infrastructure that can adapt to meet any circumstance.

2-4%

of all U.S. hospital rooms were equipped for negative pressure when the pandemic hit.¹³

38x

increase in telehealth from the pre-COVID baseline.¹⁴

Planon™ Workplace Insights

Analyze **space management and utilization** to help assess service needs while increasing patient and staff comfort.

Power Monitoring Expert

Monitor **generator system power capacity management** to ensure a future-ready, always-on power environment.

Connected Room Solutions

Support **acuity-adaptable patient rooms**, a patient-centric care model that may minimize clinical error and patient risk.

Sources:

¹³ [Negative pressure rooms save lives. Why aren't there more of them?](#)

¹⁴ [Telehealth: A quarter-trillion-dollar post-COVID-19 reality?](#)

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Protect critical assets to reduce costs

In healthcare,
there's no time
for downtime

Ensure 24/7
power availability

Keep infrastructure
cybersecure

Boost resiliency
with remote
operations

Mitigate risk
and comply
with regulations

Design flexibility into
the infrastructure

**Protect critical assets
to reduce costs**




End-to-end
resilience for future-
ready healthcare



Protect critical assets to reduce costs

Safeguarding and maintaining your electrical and building management assets are mission-critical to healthcare. A reactive approach exposes everyone to risk and uncertainty.

The most effective approach is condition-based maintenance:

-  **Protect and extend asset life** while reducing downtime.
-  **Defer capital expenditure**, lowering total cost of ownership.
-  **Balance the maintenance backlog** by focusing on fixing problems instead of finding them.

Condition-based maintenance leverages the power of big data to help you anticipate problems and prevent disruption.

[Power and building systems digitalization](#) is the key to unlocking that data and using it to drive data-based decisions.

up to **75%***
reduction in electrical failure risk.

up to **40%***
increase in maintenance efficiency.

up to **50%***
reduction in operating costs.

*Percentages are non-contractual and based on Schneider Electric's experience and expertise for the main root cause of electrical failure risk observed and for which Schneider Electric has developed solutions.





Asset performance management services combined with **digital services** can help you get even more out of your equipment. Tailor service plans to meet your needs, from essential support to expert consulting and on-site maintenance.



Asset performance assessment provides relevant recommendations and implementation plans.



Predictive services from our experts can help anticipate asset risks, identify critical asset weaknesses, and provide recommendations for preventative actions, upgrades, or modernization.



Always-on monitoring with asset health dashboard supports dynamic maintenance and mitigation plans. Do it yourself, or let us do it for you by enjoying 24/7 remote expertise, a chat function, and customized reports.



Efficient management of different Esmi fire detection systems provides easy and secure access to fire system information wherever you are, reducing inspection time and cost while helping avoid critical system failures.



End-to-end resilience for future-ready healthcare

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

Design flexibility into the infrastructure

Protect critical assets to reduce costs


End-to-end resilience for future-ready healthcare




End-to-end resilience for future-ready healthcare

Extraordinary healthcare requires extraordinary facility resilience. To achieve this, you need to predict, prepare for, and protect against any adverse event.

[EcoStruxure for Healthcare](#) is a future-ready, IoT enabled platform designed to help hospitals and healthcare facilities achieve peak resiliency. In collaboration with our network of partners, we deliver:

 **Compatible systems** that seamlessly integrate with your existing platform

 **Solutions that fit tight budgets**, time constraints, and performance goals

 **Flexible architectures** that support your unique requirements and integrations

 **Regulations expertise** and standards-compliant solutions

EcoStruxure™ for Healthcare

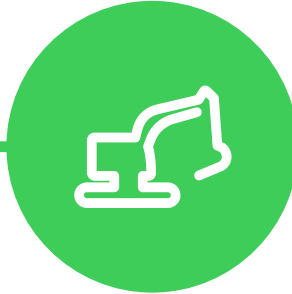


To ensure your healthcare facilities are fully resilient against critical events and risks, discover more about IoT-enabled [EcoStruxure for Healthcare solutions](#).

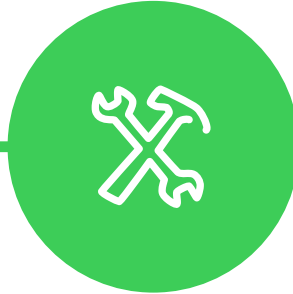
We drive efficiency and sustainability through lifecycle digitalization in healthcare facilities and infrastructure.



Design



Build



Operate & Maintain

Power, Building, Grid	Digital Operations		<p>RIB running together</p>	<p>AIM FOR THE OPTIMUM</p>
		<p>Innovation At Every Level</p> <p>Power Design</p>		<p>Innovation At Every Level</p> <p>Advisors Power Building Asset Microgrid Resource</p>
	Field	<p>Innovation At Every Level</p> <p>Edge Control</p>		
		<p>Innovation At Every Level</p> <p>Connected Products</p>		

In healthcare, there's no time for downtime

Ensure 24/7 power availability

Keep infrastructure cybersecure

Boost resiliency with remote operations

Mitigate risk and comply with regulations

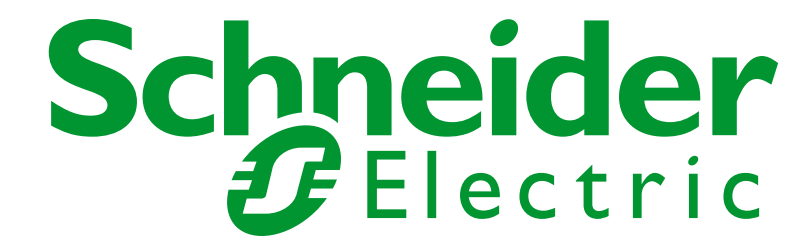
Design flexibility into the infrastructure

Protect critical assets to reduce costs

End-to-end resilience for future-ready healthcare



Life Is On



To learn more about building resiliency
into your healthcare facility, visit:

se.com/healthcare



Schneider Electric

35 rue Joseph Monier
92500 Rueil-Malmaison, France
Tel : +33 (0)1 41 29 70 00

