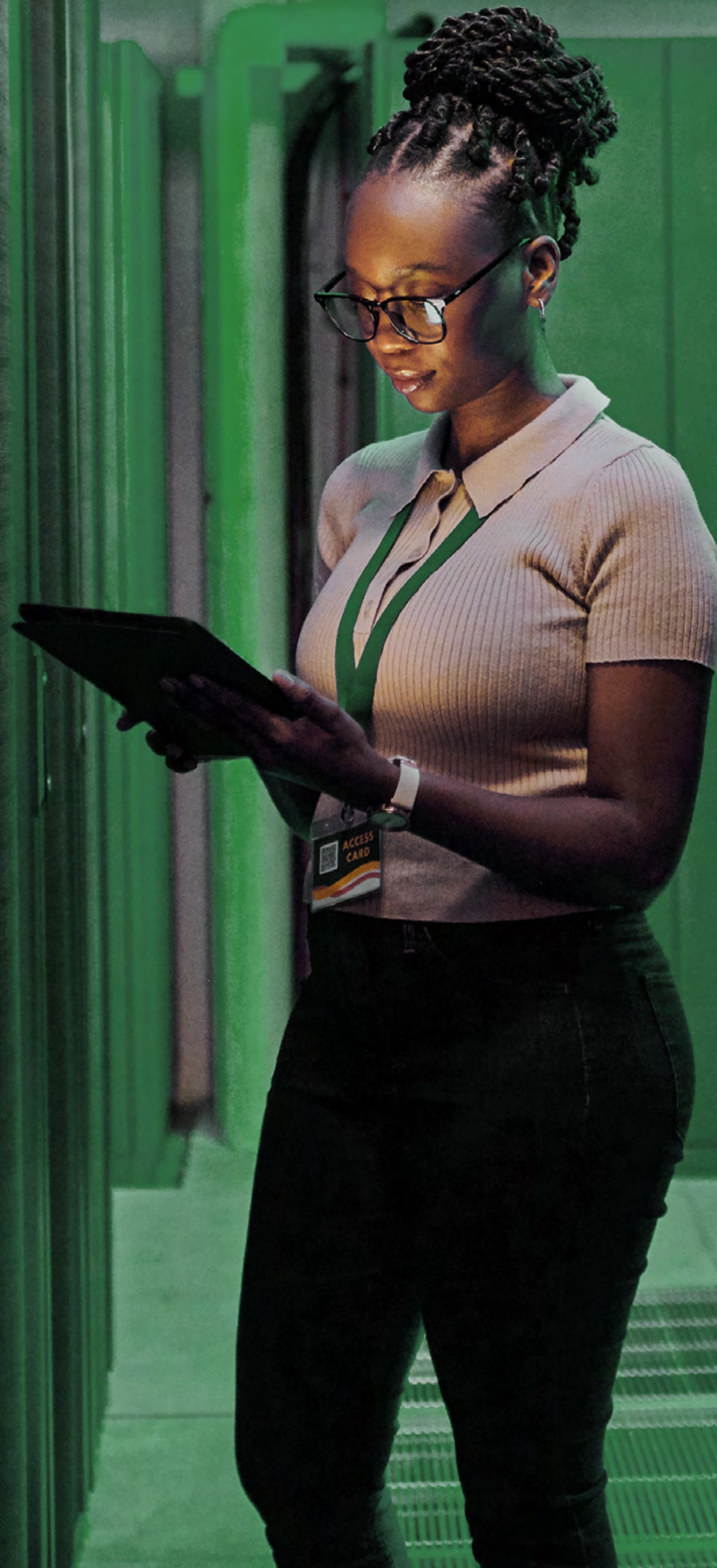# Data Center Modernization

A guide to more sustainable, efficient, resilient, and adaptable facilities

Life Is On | Schneider Electric

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Sustainable Modernized Data Centers

Shaping your sustainable data center

Data is an ever-growing global need, maturing and changing as industries and everyday tasks are made easier, faster, or more convenient through connected devices. Data centers must rise to meet those needs with improved sustainability, efficiency, resiliency, and adaptability.

As data usage skyrockets, data centers consume more power. The electricity our facilities require to keep up with demand must be cleaner and greener in the face of the global climate crisis. Eco-friendly modernization is essential to responsibly manage the power consumption that comes with an increasing number of hyperscale data centers. Through high-level integrated architecture, intelligent power management, building management, and AI-based data center infrustructure management solutions, you can ensure your data center is ready for whatever you'll need.
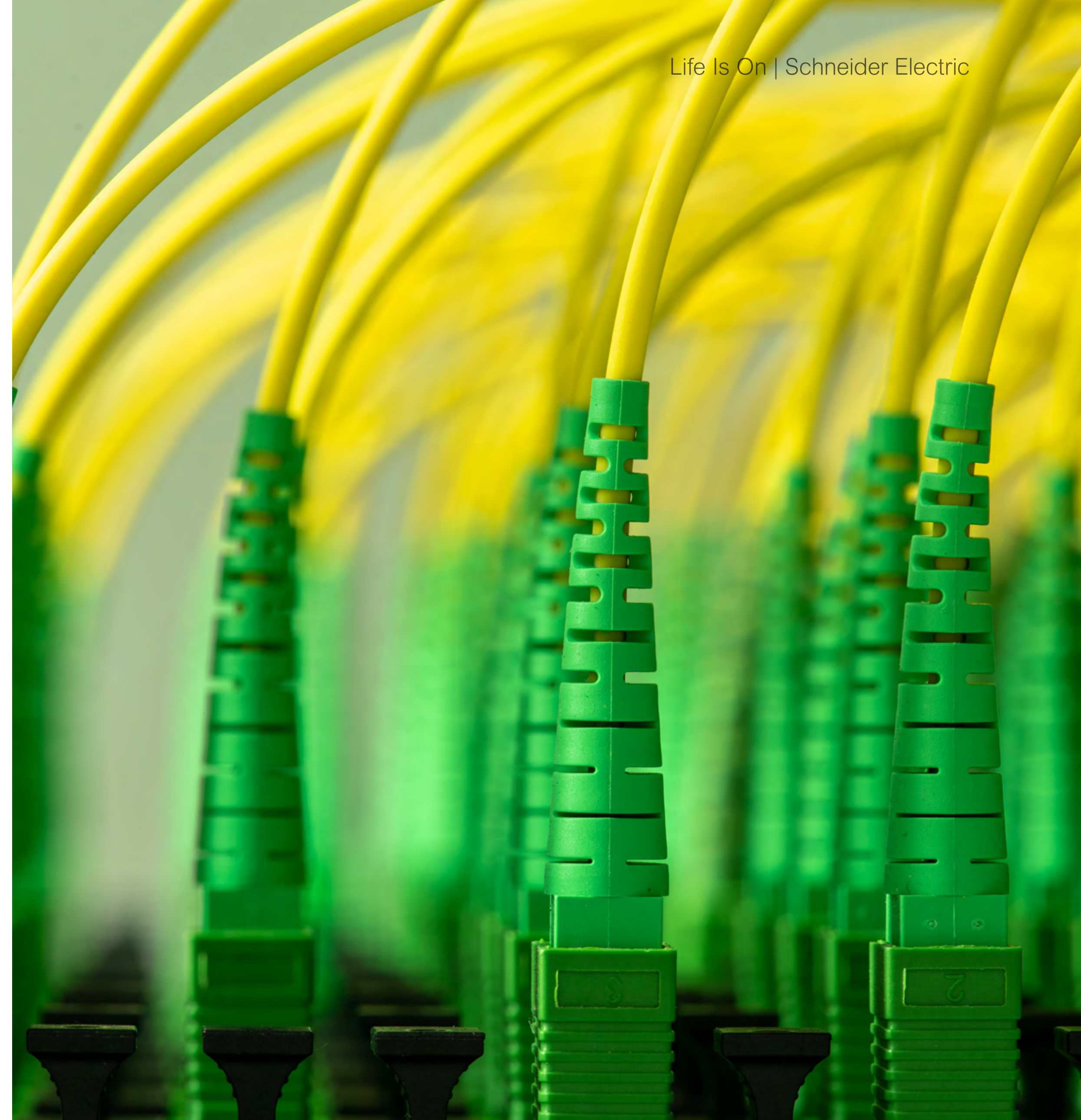
Picking your partner
for modernization

There are thousands of data centers globally; many are decades old and can no longer meet performance requirements, are not supported by their manufacturer, or require higher maintenance costs as they age. When faced with an existing, inhabited facility, modernization must take place in isolated areas, floor by floor. These facilities often can be successfully modernized but require careful planning and partnership. Who you choose to collaborate with on your modernization journey is one of the most important decisions you'll make.

Finding a company that's knowledgeable about technical topics as well as value creation is essential to creating a facility built for your unique business. To smooth the planning process, that partner must also understand the needs of end users and your general contractors. Plus, having a wide network of architects, engineers, technology providers, installers, integrators, and facility management companies that understand the priorities of your building owners allows your project to be as local or as global as you need. With a broad toolbox of solutions and strategies on your side, you can tackle any project — no matter how big or small.

Modernization Explained

How modernization helps you

Though there are many ways to take on modernization, data centers ultimately need to be modified to accommodate your business goals. Having an older data center may be stopping you from meeting your targets. Common issues that need to be resolved include lack of space, inefficient cooling, or even larger, facility-wide issues like an electrical infrastructure that isn't flexible enough to accommodate rapid growth. These problems often result in a higher risk of power failure.
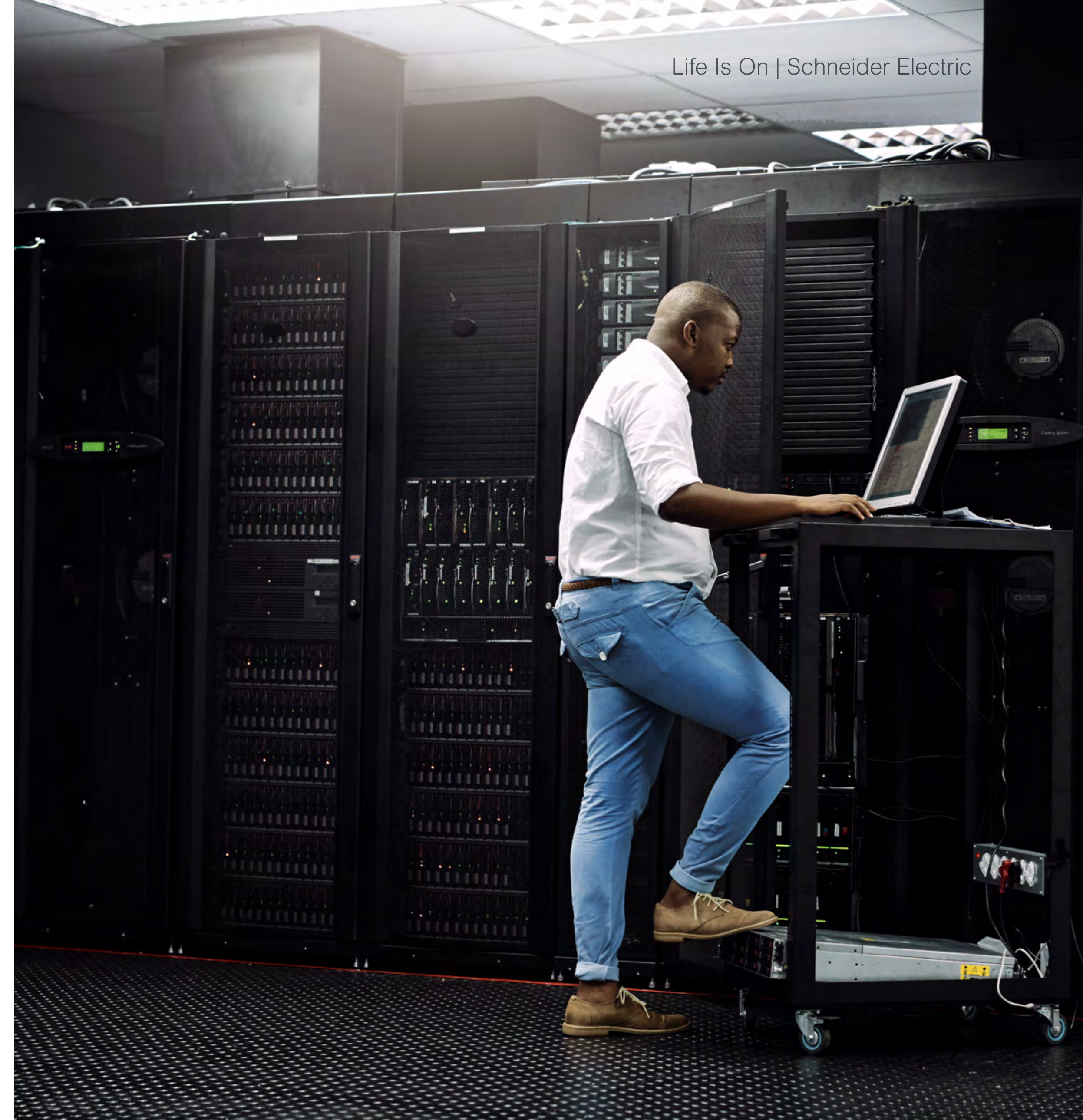
The benefits of your modernized facility

Power distribution failure impacts every part of your facility, not just your data centers.
There are significant, measureable losses that modernization can help prevent.

The cost of not modernizing

59%

of total business interruption losses are due to fires and explosions.[*]

56%

of all electrical fires are due to lack of proper maintenance.[**]

25 million

electrical motors fail each year.[***]

*Allianz Global Corporate & Specialt   **Source: Factory Mutual Insurance Group; FM global   ***Source: Factory Mutual Insurance Group; Emerson estimate

Modernized data centers can be more sustainable, efficient, and digitally connected, helping you stay ahead of the three trends driving innovation across the industry.

Sustainability

Up to

70%

of our customers consider it crucial to have a product repaired and serviced for longer lifetime.*

Efficiency

Up to

25%

average CapEx cut in 2020 by our customers looking to improve operations to free up cash.**

Digitalization

03

digital trends which will transform the energy industry: Energy decentralization, the Internet of Energy, and Data Everywhere.***

*Source: Internal Survey on 1,500 customers in eight countries. Repaired and serviced is the main solution expectation in term of circularity-related topics
**Source: McKinsey June 2020 Resetting capital spending in the wake of Covid 19
***Source: International Energy Forum

Your options for modernization

When it comes to data center modernization, you'll have many choices to make. Depending on your unique situation, you may consider:

- Upgrading your entire facility

- Consolidating your small server rooms and wiring closets into a larger data center

- Designing a completely new build-out

- Integrating new capacity through prefabricated power and cooling modules

- Offloading certain applications and platforms to private or public clouds

- Migrating to a colocation facility

In particular, how much of your data center operation remains in-house and how much you outsource to the cloud and/or colocation facilities is critical. For example, over a 10-year period, it may make sense to upgrade or build a data center as part of your facility, but that can be influenced by your sensitivity to cash flow, cash crossover point, deployment time frame, data center life expectancy, regulatory requirements, and other strategic factors.

What equipment matters for modernization?

To help you envision which scenario might work best for you, it's important to focus on the physical infrastructure aspects of data center modernization, rather than IT infrastructure (i.e., servers, switches, storage). Physical data center infrastructure includes:

- Power systems, such as uninterruptible power supplies (UPSs), power distribution units, overload protection, isolation transformers, automatic transfer switches, switchgear, and generators to provide uninterrupted, conditioned, clean power to critical loads

- Precision cooling systems that provide an optimal environment by regulating temperature and humidity (including both chillers and precision air handlers and air conditioners)

- Building and power management systems that give you more insights into your facility

- Programmable logic controllers

More Sustainable, Efficient, and Digital

Become more sustainable, efficient, and digital

Sustainability	Efficiency	Digitalization

Modernizing your data center's physical infrastructure plays a major role in making the path to net zero clearer. Whether you refurbish, retrofit, or completely replace your existing equipment, you'll gain more visibility into your energy management data through digital connectivity. This lets you better monitor your energy consumption and perform condition-based maintenance, extending the life of your assets and saving time by eliminating unneeded service visits.

Refreshing
Enhancing existing equipment with improved connectivity and sensors can lengthen the lifetime of your assets and let you optimize your power consumption.

Retrofitting
Upgrading the active components of your existing electrical equipment reduces material waste throughout your modernization process. Plus, our end-of-life program for SF_6-based equipment ensures sustainable waste disposal.

Renewing
Entirely replacing your equipment with connected solutions lets you optimize and maximize your data center's performance and availability on every level.

When you upgrade, we'll provide safe and sustainable end-of-life options for your obsolete equipment.

Explore recycling options

Become more sustainable, efficient, and digital

Sustainability	Efficiency	Digitalization

Downtime risks and excessive maintenance costs ultimately have a huge impact on your facility's efficiency. Modernizing to a modular design for better flexibility, using lithium-ion batteries for your UPS systems, and incorporating SF_6-free switchgear into your power system can help boost your uptime.

Because every facility is unique, our online tools can help you decide when the time is right for you to modernize.

Weigh your options and decide when the right time to upgrade is.

Modernization trade-off tool

Find out which state-of-the-art UPS is right for your needs.

UPS modernization calculator

Discover the cost savings in switching from VRLA to lithium-ion batteries.

Lithium-ion vs. VRLA battery calculator

Compare which UPS system is best for your facility's goals.

eConversion vs. double conversion calculator

Become more sustainable, efficient, and digital

Sustainability	Efficiency	Digitalization

The power of data is at the heart of a modern facility. The more connected devices within it, the more possibilities exist for optimization, adaptability, and efficiency.

Digitalization plays a foundational role in active energy management and efficient facility operations. For existing data centers, this can be done by retrofitting electrical systems with smart devices in combination with energy and power management, allowing you to:

- Gain better insight into your electrical systems with remote monitoring

- Avoid time wasted on unneeded service visits with condition-based maintenance

- Improve the lifecycle of your assets with digitally connected sensors

Is Modernization Right for You?

Upgrading an existing data center — more cost effective than you might expect

A data center may run out of power and cooling capacity before it runs out of available space in the IT room. When additional load is identified and easily implemented modernization options either have already been used or deemed impractical, one or more rows of racks can be added to a larger, low-density data center to increase capacity.

This type of upgrade can be achieved in a number of ways. One is to add capacity via high-density pods. These pods consist of one or more rows of racks containing high-density equipment clustered together with dedicated row-based cooling, deployed as a unit. A high-density pod resides within the borders of a larger, low-density data center and is not the same as a high-density data center, which is dedicated to supporting nothing but high-density racks.

In traditional data centers with room-based power and cooling, unmanaged high-density racks can cause destabilizing effects such as cooling inefficiency, loss of cooling redundancy, hot spots, thermal shutdown, and circuit overload. However, modern power and cooling technologies, when configured in high-density racks within the framework of a pod, offer an opportunity for dramatically increased efficiency and predictability.
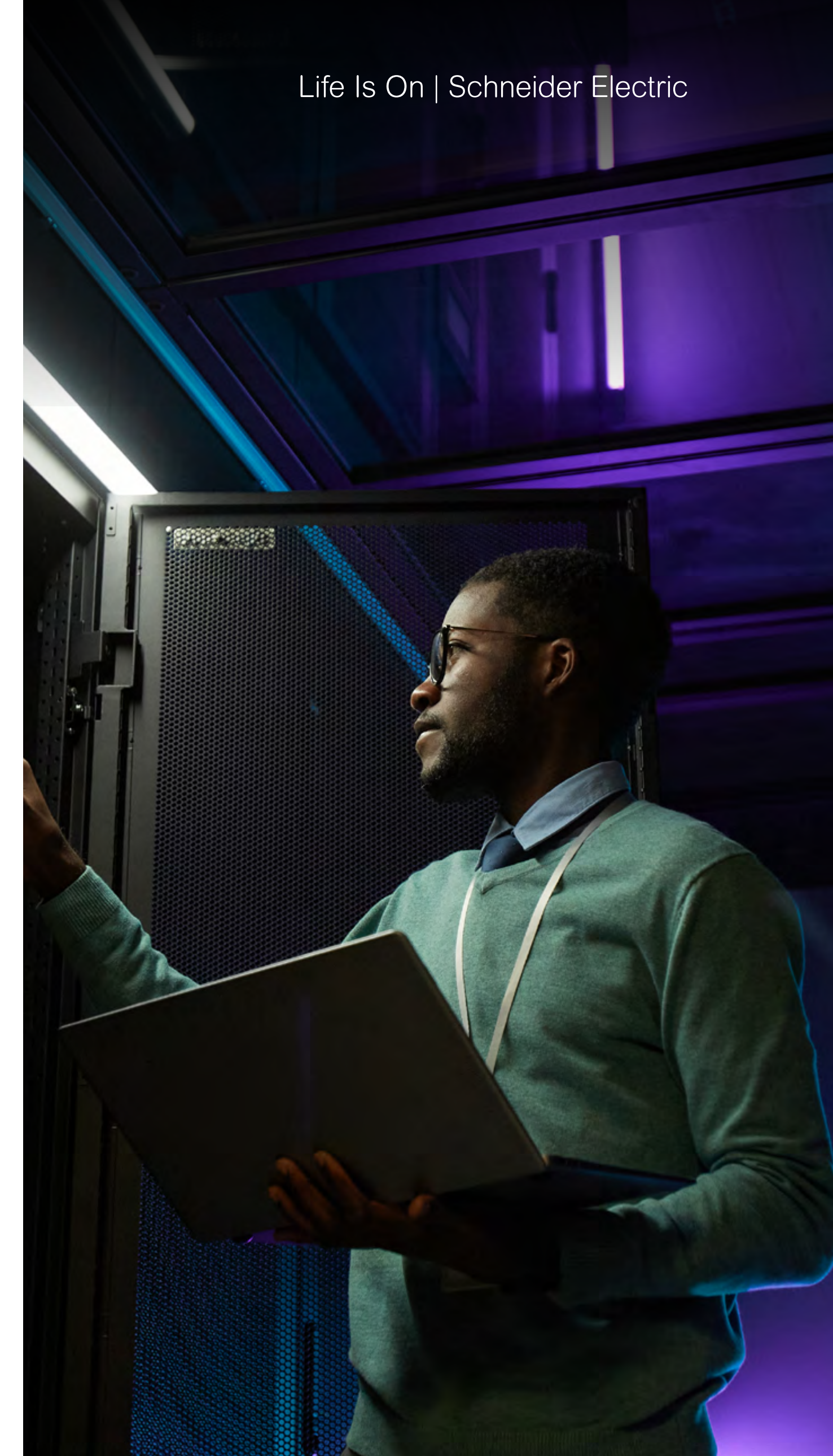
Extending the life of existing infrastructure

In some cases, older existing physical infrastructure components, such as UPS and electrical distribution systems, can be upgraded by substituting old parts for new ones. In the case of a UPS, for instance, batteries, AC and DC capacitors, fan assemblies, power supply units, static switches, silicon-controlled rectifiers, and IGBTs can all be replaced, depending on vendor and model. The UPS can be restored to "like new" condition at significant cost savings when compared to buying a new system. In the case of low-voltage breaker assemblies, old ones can be replaced with brand new ones that simply fit into the existing switchgear cell with minimal modification for 60 – 70% of the cost of replacing the entire lineup.
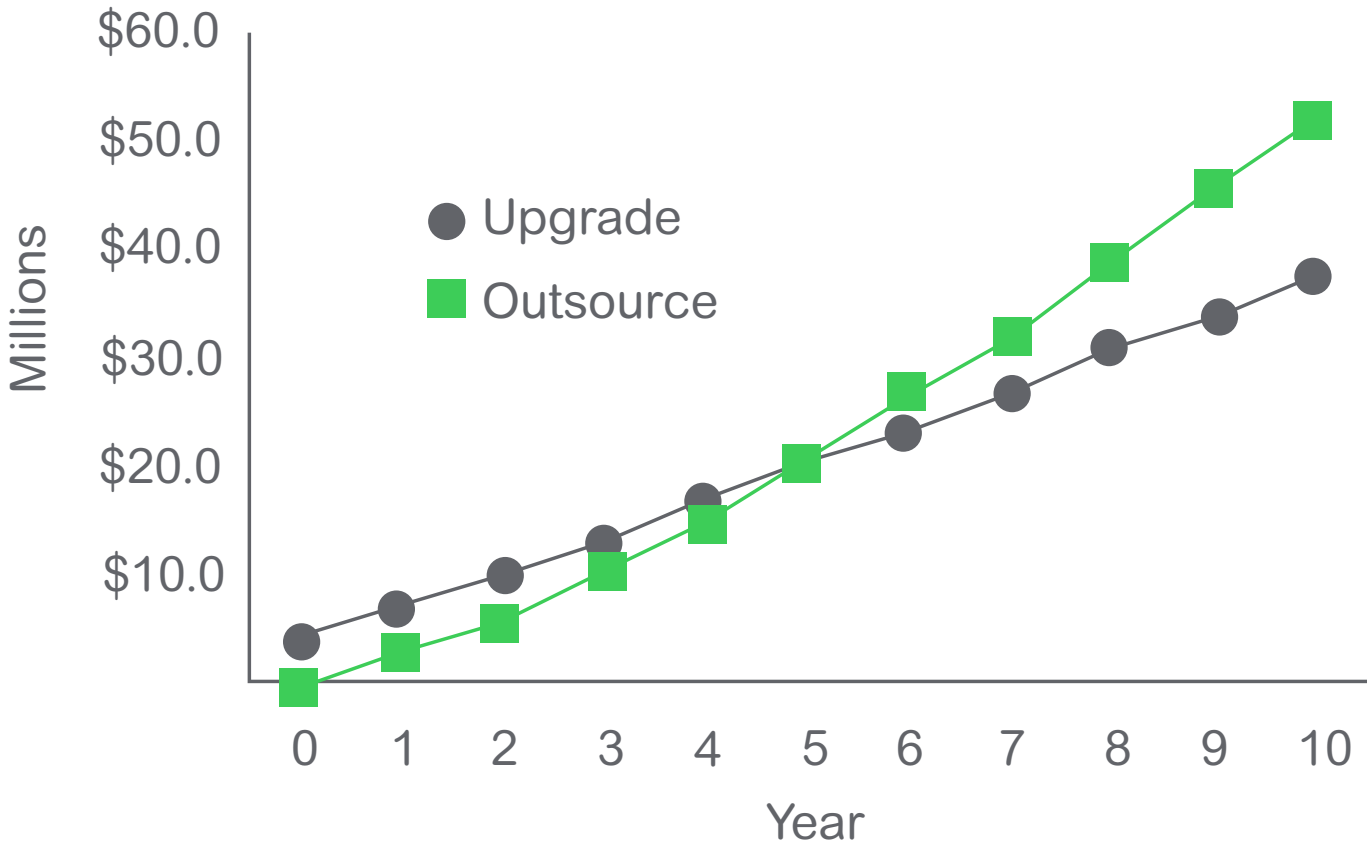
The cash crossover point for a facility module upgrade is three years (vs. an outsource scenario).

How to assess your infrastructure needs

Having a standard set of metrics and a standardized approach for assessing all of your data centers in a consolidation effort is crucial to effective migration planning. Simple, cost-effective assessment services exist to help establish your infrastructure capacities and capabilities as well as expansion for future growth, efficiencies, risks, and improvement opportunities. Assessment of physical infrastructure will reduce surprises, avoid wasteful backtracking, and assure a predictable outcome.

The common approach of trying to fit additional equipment into an existing, larger data center often results in hot spots, reliability problems, inefficiency, and running out of space. One way of avoiding these problems is to deploy a high-density pod overlay approach. This allows an existing legacy data center to transform into a high-density, high-efficiency data center during a consolidation project.

The self-contained nature of the pod means that minimal planning, design, or engineering is required to place it in any existing environment, allowing for a high degree of standardization and reduction of the deployment cycle time.

How modernization fits your business

CFOs and CIOs are often attracted to options that seem pragmatic. Investing in improvements on an already existing infrastructure appears less risky and disruptive than a radical jump to outsourcing or to the commissioning of a new data center. Beyond the cost advantages of a data center upgrade when compared to outsourcing or new build, other factors can make the upgrade scenario more attractive:

Predictable efficiency

Both pod and facility module approaches allow data center stakeholders to specify and manufacture to publish expected efficiencies based on real measurements of the design. This predictability is attractive for businesses with a focus on energy-efficiency initiatives.

Portability

If portability is important to your stakeholders, then pods and prefabricated facility modules may make sense. Consider the example of a business that needs to deploy data center power and cooling but whose lease runs out in eight months. If its lease is not renewed, it can physically move its data center infrastructure investment with it instead of leaving it behind.

Accounting benefits

From an accounting standpoint, pods and prefabricated facility modules could be classified as "equipment" instead of a "building." This may offer tax, insurance, and financing benefits, depending on the location of the data center and the insurance policies under contract.

Speed of deployment

The pod and facility module approaches to upgrading are relatively speedy. If an organization places a high value on early delivery (e.g., companies that want to be first to market with new products) and are resistant to outsourcing scenarios, then the facility upgrade could be the most attractive choice.

Flexibility

Upgrade options are viable if you're unsure of future growth. The flexibility of scaling and right-sizing helps to minimize risk.

The Next Step

Optimizing your data center's operations

To make your data center as sustainable, efficient, and resilient as possible, you must constantly evaluate and manage your operation. Understanding your vulnerable areas and implementing preventative and proactive best practices can help you mitigate losses and adapt for the future.

Sustainability, efficiency, and resiliency are emerging as key priorities for data centers as new technology emerges. Here's why:

Sustainable	Efficient	Resilient
70%*	**25%***	**56%***
of our customers said having products repaired and serviced for longer lifecycles is very important.	cuts in CapEx on average were made in 2020 to free up cash and improve operations – applying a TotEx approach.	of electrical fires are due to lack of optimized maintenance.
98%*	**30%***	**60 minutes***
of a medium-voltage cubicle can be recovered during upgrades.	of cost savings comes from decreased material, downtime, and sitework costs.	is how long it takes to get your equipment configured.

*Based on previous data. This is not a guarantee of future performance or performance in your particular circumstances.

Starting the journey with consulting

From consulting to maintaining operations and more, our offerings enable you to provide long-term changes to increase business sustainability, efficiency, and resiliency. We're here to help you modernize with support, training, or services. With specialization in data centers, our consulting can help you modernize by:

Maximizing safety
Pinpoint potential safety risks and regulatory issues and recommend required corrective actions.

Enhancing your journey
Identify infrastructure weaknesses and prevent unplanned shutdowns.

Boosting system resiliency
Get expert advice on how to improve performance and availability to boost your overall power system.

Strengthening power and asset management
Perform a preliminary assessment and get recommendations on how to modernize any obsolete equipment.

Energy efficiency support — 24/7

Our consulting services give you access to our expertise, including a 360° assessment of your electrical system, so you can make sure you're operating at peak performance.

In addition, our digitalization consulting and services enable:

Up to
30%
saved in
energy
expenses.[*]

Up to
30%
saved in capital
expenses.[*]

Up to
10%
saved in utility
penalties and
operating
expenses.[*]

[*]Figures based on Schneider Electric's customer data. This is not a guarantee of performance in your specific circumstances.

Ensuring your data center's future health

From essential support to the most advanced expertise, EcoStruxure™ Service Plans are a set of tailored service contracts that combine the power of our EcoStruxure platform with remote consultancy and on-site and dynamic maintenance.

Going beyond just Schneider Electric products and software, our service plans encompass your entire facility, creating value with 24/7 remote assistance and dynamic condition-based maintenance performed by our expert field services team.

EcoStruxure Service Plan

How can services help you?

Each service plan is unique to your facility's needs. With the help of remote consultancy, on-site maintenance, and EcoStruxure Asset Advisor software that monitors, analyzes, and optimizes your critical connected products, you can:

Mitigate electrical failure up to

70%*

Reduce maintenance activities up to

40%*

Extend asset life by up to

25%*

Find out how we can create a customized EcoStruxure Service Plan for your facility.

Learn more

*Based on previous data. This is not a guarantee of future performance or performance in your particular circumstances.

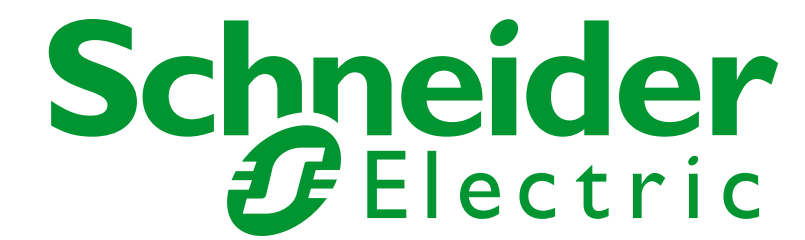# Are you ready for Data Centers of the Future?

Schneider Electric can help you create a more sustainable and efficient future as your data center grows. By mapping a tailored modernization journey, we'll use our diverse catalogue of solutions to help you meet your goals.

If you're ready to see what the future of your data center looks like, connect with us.

Talk to our experts

Explore your future

The Future of Data Centers

Modernization Explained

The Technology Behind Modernization

Modernization in Action

Is Modernization Right for You?

The Next Step

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To learn more about data center modernization, visit: