DIGITAL

Driven by Digital: from EcoStruxure Power to Data Centers
Philippe Delorme
Executive Vice President Low Voltage & Secure Power

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EcoStruxure's integrated architecture serves four end markets with its six domains of expertise
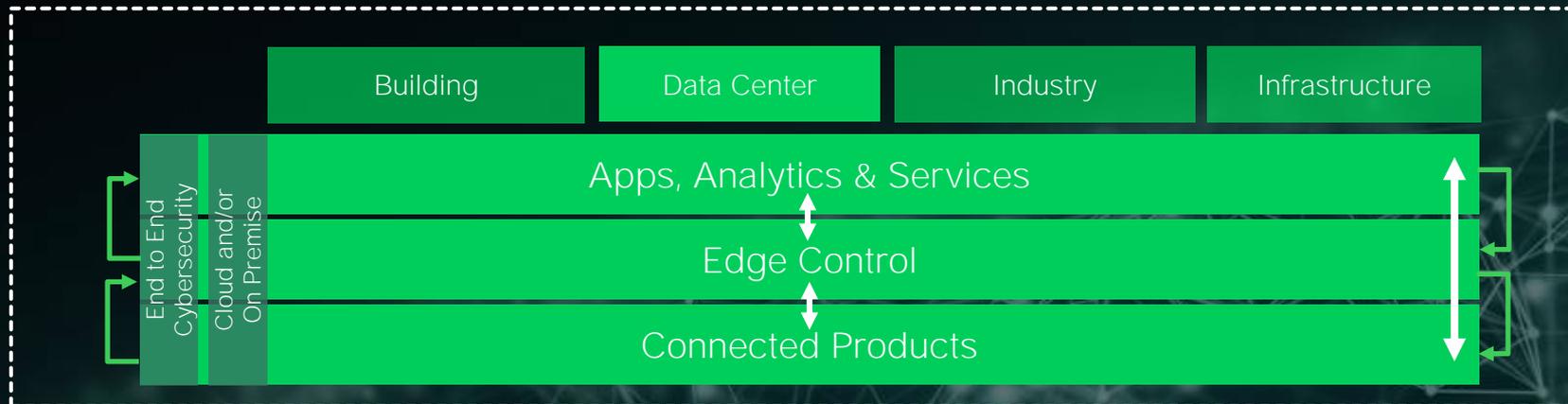
Building | Data Center | Industry | Infrastructure

Apps, Analytics & Services

Edge Control

Connected Products

End to End Cybersecurity

Cloud and/or On Premise

EcoStruxure Building | EcoStruxure Power | EcoStruxure IT | EcoStruxure Machine | EcoStruxure Plant | EcoStruxure Grid

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TRANSMISSION

DISTRIBUTION

CONSUMPTION

Energy Management backbone serves all our end-markets

€19bn Revenue per annum

€9bn

€3bn

€5bn

€2bn Utilities

Residential

Small Buildings & Large Buildings

Data Centers

Industry & Infrastructure

*

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Energy Management: Different Systems for Different End-Markets

Residential

Small buildings

Large Buildings & Data centers

Industry & Infrastructure

Final Distribution & Wiring Devices

Final Distribution & Secondary LV panels

Final Distribution Secondary & Primary LV Panels and Medium Voltage

Level of criticality & power

What makes us #1 in Energy Management?

Global Reach

Leading Brands

Broad Network
of Partners

Industrial Size

SCALE MATTERS

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30 years of leadership in digitized Energy Management

Power Meters & Relays

Masterpact
Air Circuit Breaker

Compact
Molded Case Circuit Breaker

Acti9
Miniature Circuit Breaker

+ Smart Panels

1980's

1990's

2000's

2010's

+ Software & Apps

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The world of Energy Management is changing

More demanding Customers

IoT Technology As an accelerator

More CapEx Efficiency
- Efficient Designs
- Lower Risk
- Faster Project Completion

More OpEx Efficiency
- Efficient maintenance
- Power reliability
- Energy Efficiency

Fewer skilled resources

Cost of connectivity dropping

Apps replacing more complex software

The Power of the Cloud & Analytics

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6 foundations

are driving our success in the digital space

1 One IoT-ready architecture and platform

2 Open partner ecosystem

3 Domain and segment expertise

4 Digital lifecycle management

5 One Edge

6 Large Digital Services Portfolio

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Power

One IoT-ready architecture and platform

EcoStruxure™ Architecture

End-to-end Cybersecurity | Cloud and/or On Premise

Apps, Analytics & Services
- EcoStruxure Asset Advisor
- EcoStruxure Power Advisor
- EcoStruxure Facility Advisor
- EcoStruxure Resource Advisor and Energy & Sustainability Services

Edge Control
- EcoStruxure Facility Expert
- EcoStruxure Power Monitoring Expert
- EcoStruxure Power SCADA Operation
- EcoStruxure Substation Operation

Connected Products
- PowerLogic Meters
- Acti 9 Control & PowerTag
- Enerlin'X Com'X
- Masterpact MTZ
- Smart Panel
- UPS
- Premset
- Easergy P3
- SM6

- Comprehensive and differentiated portfolio driving high customer intimacy

- Customized software solutions for customers from the smallest to the largest organizations.

- One single consistent connectivity stack for a wide range of devices

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Partners deliver on the EcoStruxure promise
Open Partner Ecosystem

②

CapEx cycle	OpEx cycle

Design | **Build** | **Operate** | **Maintain**

Today's value chain in electrical distribution is highly fragmented and inefficient from design to maintenance

→

1. Bringing partners on one platform
2. Developing tools that drastically simplify the CapEx phase

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Residential

Small buildings

Large & Critical Buildings &
Data centers

Industry, Infrastructure
& Utilities

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Retrofitting Buildings

Digitizing Our Massive Installed Base

Domain and segment expertise

③

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PowerTag
video

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EcoStruxure Power in Small Buildings: It Simply Works

IEP Lille university In France

- No space in current switchboard
- Simple installation and cabling = 5% efficiency gain
- Plug and Play integration with BMS

5 Villas Project in Hong Kong

- No space in new switchboard
- Simple installation and cabling = 5% efficiency gain
- Easy energy monitoring

Marugen Fish Farm in Singapore

- No space in current switchboard
- Simple installation and cabling = 5% efficiency gain
- Easy Alarming = peace of mind

AFFORDABLE

RELIABLE

SIMPLE

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Residential

Small buildings

Large & Critical Buildings &
Data Centers

Industry, Infrastructure
& Utilities

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④

Critical Building

CapEx cycle		OpEx cycle	
Design	Build	Operate	Maintain

Digital Life Cycle video

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Critical building power outage demo

CapEx cycle	OpEx cycle
Design Build	Operate Maintain

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Critical Building Demo video

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EcoStruxure Power delivers tangible benefits for large & critical applications

EFFICIENCY

- Maintenance costs cut by 15% with predictive analytics
- Time to restore power shaved by 80%
- Energy Costs lowered by 10%

RELIABILITY

- Critical load supported by frequent generator testing
- Predictive maintenance to avoid incidents

SAFETY

- Power outages and fire risk reduced by 50%
- Field Technician protected during power restoration

ROI

- Less than 2 years

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6

The power of our apps & analytics for the C-suite

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Blackstone video

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Energy & Sustainability Services = Huge Savings & C-Level Intimacy
Trusted expertise and innovation

SCALE

6000+
clients globally

80GW
of Energy Managed ~
Size of France

DEDICATED EXPERTISE

1800+
experts from energy
supply, sustainability,
and resource efficiency

€30B
managed energy spend

27%
reduction of our own
energy spend

40
million metric tons
of CO^2 managed

VERDANTIX

The only leader in both energy &
sustainability management software

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EcoStruxure Power: Leadership driven by digital

Key indicators

PRODUCTS & SYSTEMS

~ €12 B Sales

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EcoStruxure Power: Leadership driven by digital

Strong growth of connectable products 1 Mln/yr

500K Connected Partners

CONNECTED PRODUCTS	Increased value for customers
PRODUCTS & SYSTEMS	

1 Million/year
500K connected partners

~ €12 B Sales

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EcoStruxure Power: Leadership driven by digital

Key indicators

APPS, ANALYTICS, & SERVICES	Un-paralleled intimacy with end-users	1 Mln asset under mgt 20 Advisors/Apps
EDGE CONTROL	Additional Business and differentiation	220k Buildings
CONNECTED PRODUCTS	Increased value for customers	1 Million/year 500K connected partners
PRODUCTS & SYSTEMS		~ €12 B Sales

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EcoStruxure Power: Leadership driven by digital

Key Takeaways

Where we stand today Global leadership in Energy Management

| Comprehensive digital offerings from connected products to software and services that manage them | Serving customers from the smallest to the largest | High, sticky customer intimacy | A network of over 500,000 partners delivering our offerings |

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EcoStruxure Power: Leadership driven by digital
Key Takeaways

Where we're going tomorrow Opportunities for significant profitable growth

Driving efficiency on the Design/Build phase

Digitizing and retrofitting a massive installed base of small buildings – simplicity

Digitizing large and critical buildings with substantial efficiency gains

Applications, analytics and services that generate new revenue streams and unparalleled customer intimacy

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DIGITAL

Kevin Brown
Chief Technology Officer
Secure Power Business

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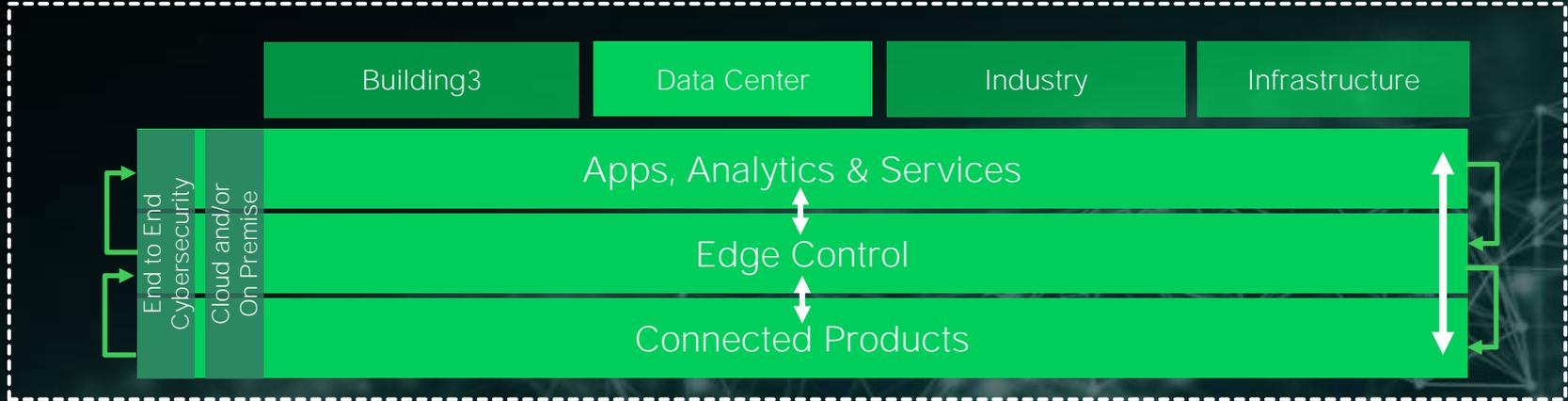
EcoStruxure for Data Centers

| Building3 | Data Center | Industry | Infrastructure |

End to End Cybersecurity | **Cloud and/or On Premise**

Apps, Analytics & Services

Edge Control

Connected Products

EcoStruxure Building   EcoStruxure Power   EcoStruxure IT   EcoStruxure Machine   EcoStruxure Plant   EcoStruxure Grid

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In just over ten years, we've witnessed rapid progression

2006–2007

Part of the debate is who should get credit for inventing the idea. The notion of network-based computing dates to the **1960s**, but many believe the first use of "cloud computing" in its modern context occurred on **August 9, 2006**, when then Google CEO Eric Schmidt introduced the term to an industry conference. Oct 31, 2011

en.wikipedia.org

Who Coined 'Cloud Computing'? - MIT Technology Review

PRESS RELEASE

<< Back

Amazon Web Services Launches

SEATTLE--(BUSINESS WIRE)--March 14, 2006-- S3 Provides Application Programming Interface for Highly Scalable, Reliable, Low-Latency Storage at Very Low Costs

Amazon Web Services today announced "Amazon S3(TM)," a simple storage service that offers software developers a highly scalable, reliable, and low-latency data storage infrastructure at very low costs. Amazon S3 is available today at http://aws.amazon.com/s3.

2016–2017

INDUSTRY PERSPECTIVES

The Era of the Smart Data Center

BY INDUSTRY PERSPECTIVES ON OCTOBER 26, 2016

ADD YOUR COMMENTS

INDUSTRY PERSPECTIVES

Cloud Computing Moves to the Edge

BY INDUSTRY PERSPECTIVES ON APRIL 5, 2017

ADD YOUR COMMENTS

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Edge Computing will drive more complexity

From a centralized cloud vision ---------> To a decentralized, interwoven hybrid system
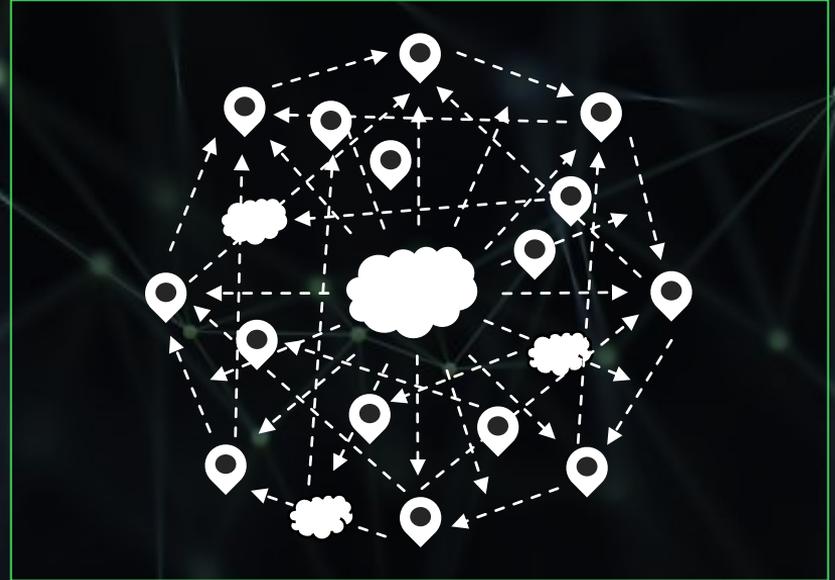
And new generations are more dependent on the network

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Imagine taking her phone away

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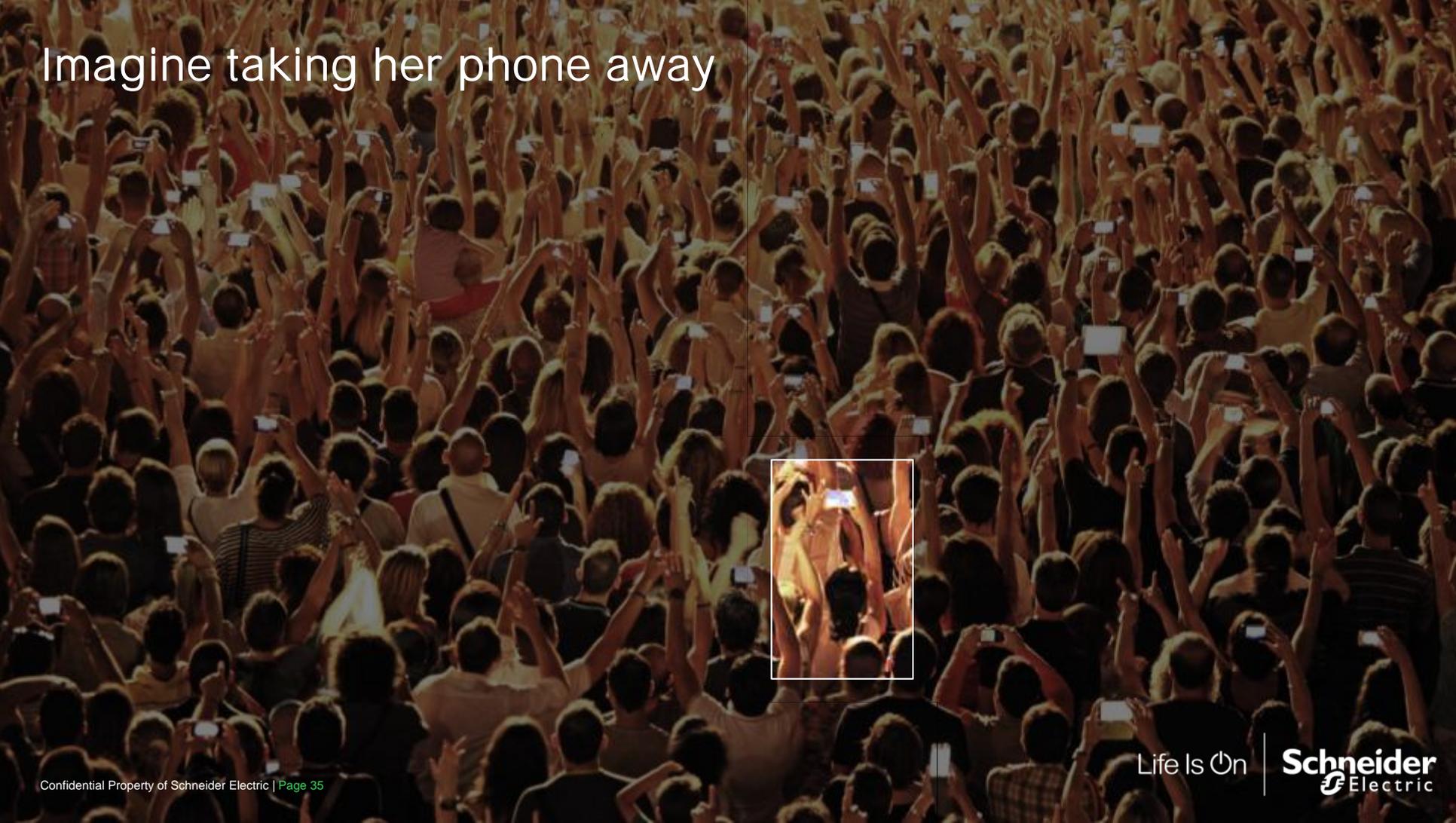
Over these same 10 years, we've also seen a dramatic increase in data center efficiency

80%

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Where will the next 80% improvement come from?

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Success will take more collaboration and more openness

Grid

Physical
Infrastructure

IT

Power   Building   IT

Server

Network

Storage

Software is the key enabler

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EcoStruxure™ for Data Centers
Innovation At Every Level
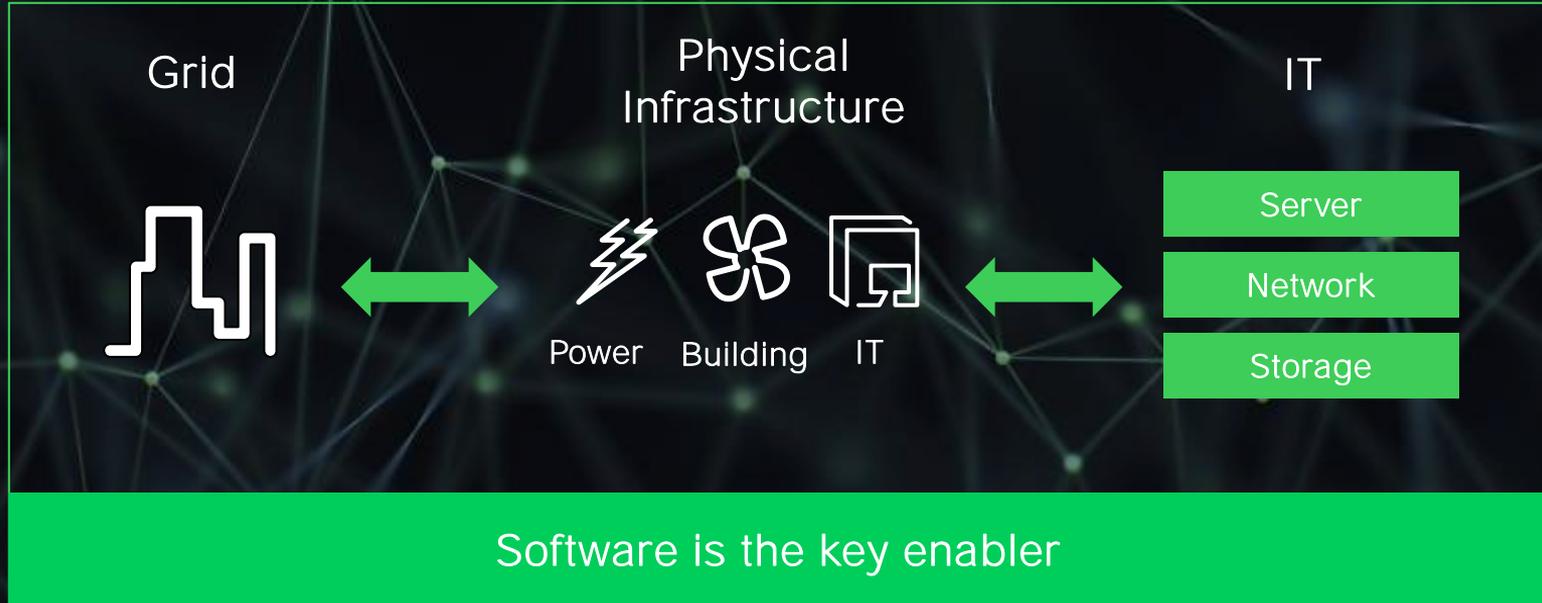
Objectives

- Increase customer intimacy with all segments
- Create positive feedback throughout the life cycle: planning, deploying, operating and maintaining
- Be open and collaborative with partners and developers

Value Proposition

Increase Efficiency
- 33% more staff productivity
- 25% increase in energy savings
- 30% increase in infrastructure utilization

Maximize Availability
- 50% faster service dispatch
- 30% reduction in false alarms
- 35% faster site problem resolution

Reduce Time
- 60% faster to deploy
- 50% faster design time
- 30 minutes to first insights

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CapEx cycle ➜ OpEx cycle ➜

Design   Build   Operate   Maintain

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We've created a large portfolio of digital planning tools serving small and large data centers

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Connecting to customers early drives long-term success

Reference Designs

- 100+ EcoStruxure designs
- 6,000 downloads per year

"… covers the high level requirements of my clients and gives them quickly a realistic view of the project so we can kick off the project faster in a more controlled and deterministic fashion."

Design/configuration tools

- 80,000 configurations per year
- 70 GW of capacity configured

"I use (ISX) Designer often, and the output helps 'paint a picture' for the customer."

TradeOff Tools & White Papers

- 200+ papers and tools
- 400,000 paper views per year
- 20,000 users of tools per year

"… tools let me quickly and easily analyze complex technology choices to help me justify business decisions regarding my data center."

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Results of open technical collaboration

A 300 MW data center example

Traditional approach

- Fragmented product design
- Time consuming Factory Acceptance Testing (FAT)
- Engineering/integration services = 50% of total expenditure

EcoStruxure approach

- Optimized architecture
- Integration of power equipment and control software
- Design pre-tested and prefabricated units

Incredible results from open technical collaboration

A 300 MW data center example

20%

Engineering labor cost
reduction

20%

Footprint reduction

10%

Power system CapEx
reduction

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CapEx cycle | OpEx cycle

Design   Build   Operate   Maintain

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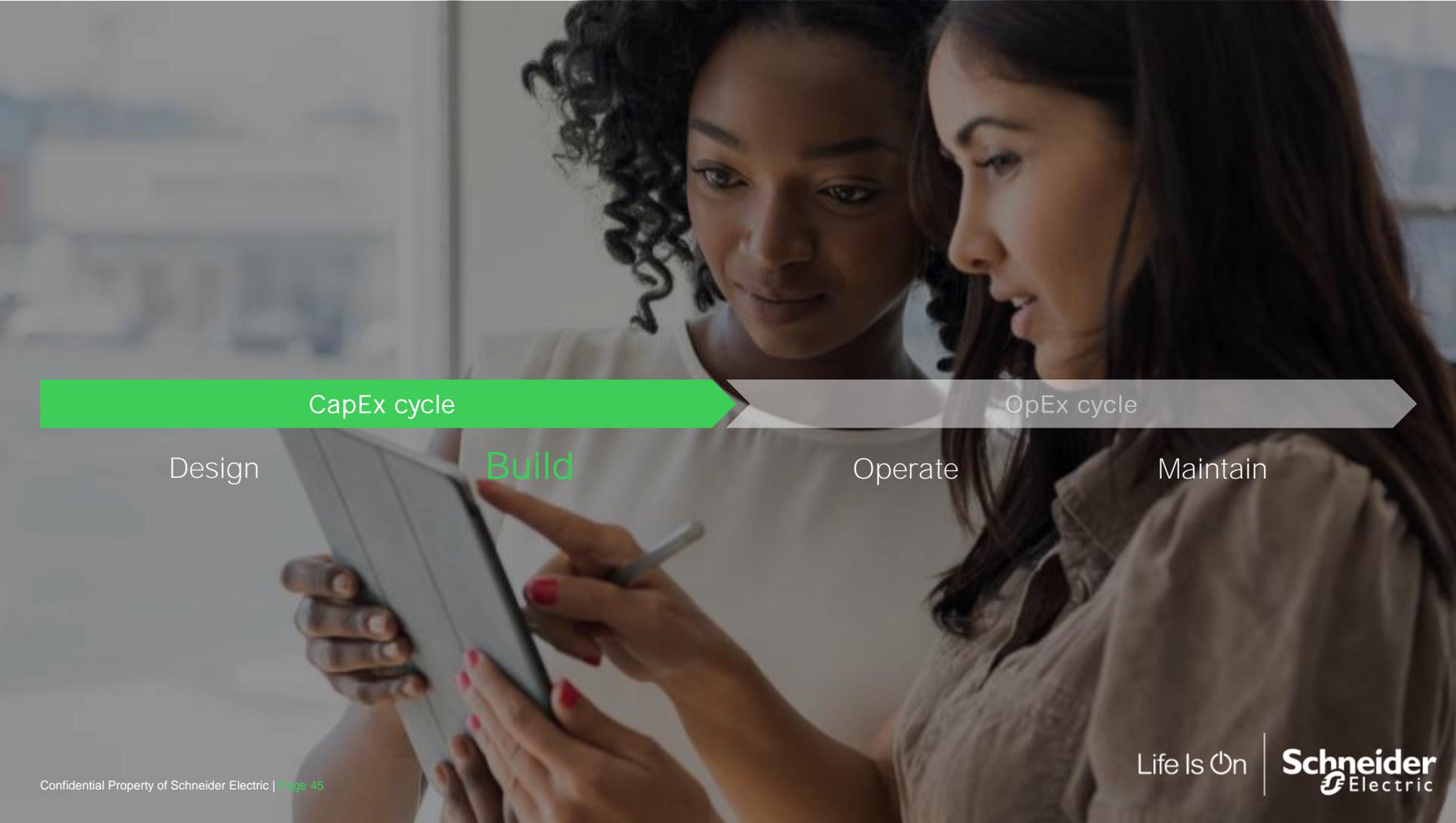
Global partner with local execution expertise

Technical staff

205
NAM

135
EMEA

270
APAC

Highly skilled planners, application engineers, designers, and supply chain managers that deliver the best customer experience

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"Schneider was the only organization that could talk colocation design…From the sales team to the engineering group, they have tremendous knowledge throughout the data center lifecycle."

Jeffrey Springborn,
President and COO, LightEdge

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LightEdge video

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CapEx cycle | OpEx cycle

Design | Build | Operate | Maintain

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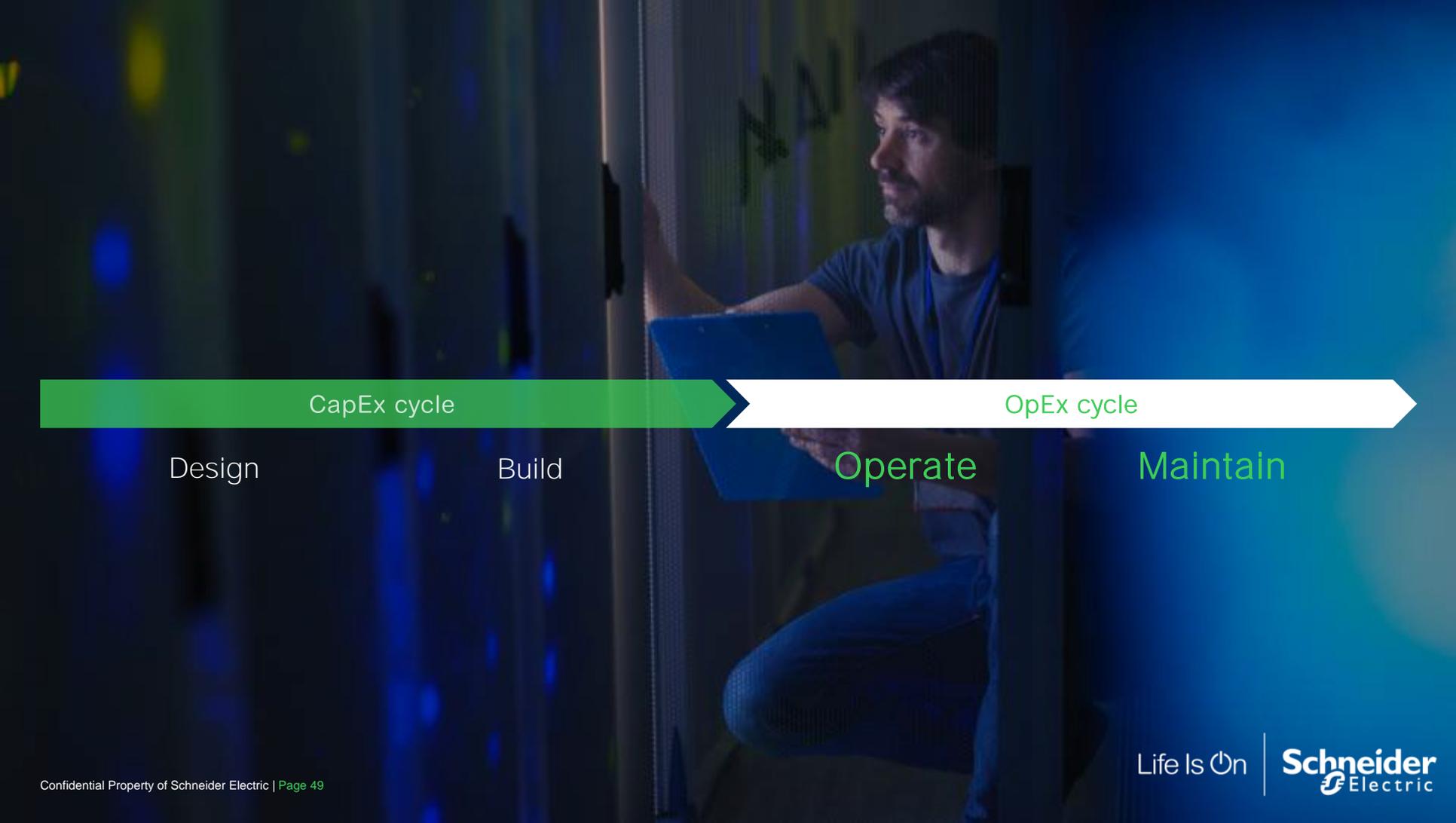
We believe cloud-based management systems are the only way to meet these challenges

Collect & analyze

massive amounts of data; scope & depth of analytics is much larger

Remotely monitor & manage

all of your sites from a single device; and connect outside experts to remotely monitor & service

Scale management systems

easily without limit

Better performance with predictive capability

by utilizing 'big data analytics' to spot trends and forecast failures

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Example of benefits by operating EcoStruxure at a global retail chain

Improved store stability by

88%

Decreased average active UPS faults from

70 to 10

Allowing employees to focus on selling returned over

5,600 work hours

Easily manage global standards for security and settings to

2,300 devices

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Service experts are a critical part of the system

5,500
trained partners
available

6
regional service bureaus
in 2018

(up from 3 in 2017) provide digital
remote monitoring service

7,000
professional & field
service experts

Technicians
Program managers
Support staff
Solution Architects

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Schneider Electric
in association with

Bainbridge Island
School District

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Bainbridge Island video

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EcoStruxure IT

Building upon our €3.6B Secure Power Business to accelerate our Digital growth

Key indicators

Prefabricated
Data Centers

Symmetra
UPS

Galaxy
3ph UPS

infraStruxure

InRow
Cooling

Micro Data
Center Xpress

HyperPod

Smart-UPS

rPDU

PRODUCTS and SYSTEMS   UPS Cooling and Rack Systems

€2.8 B Sales

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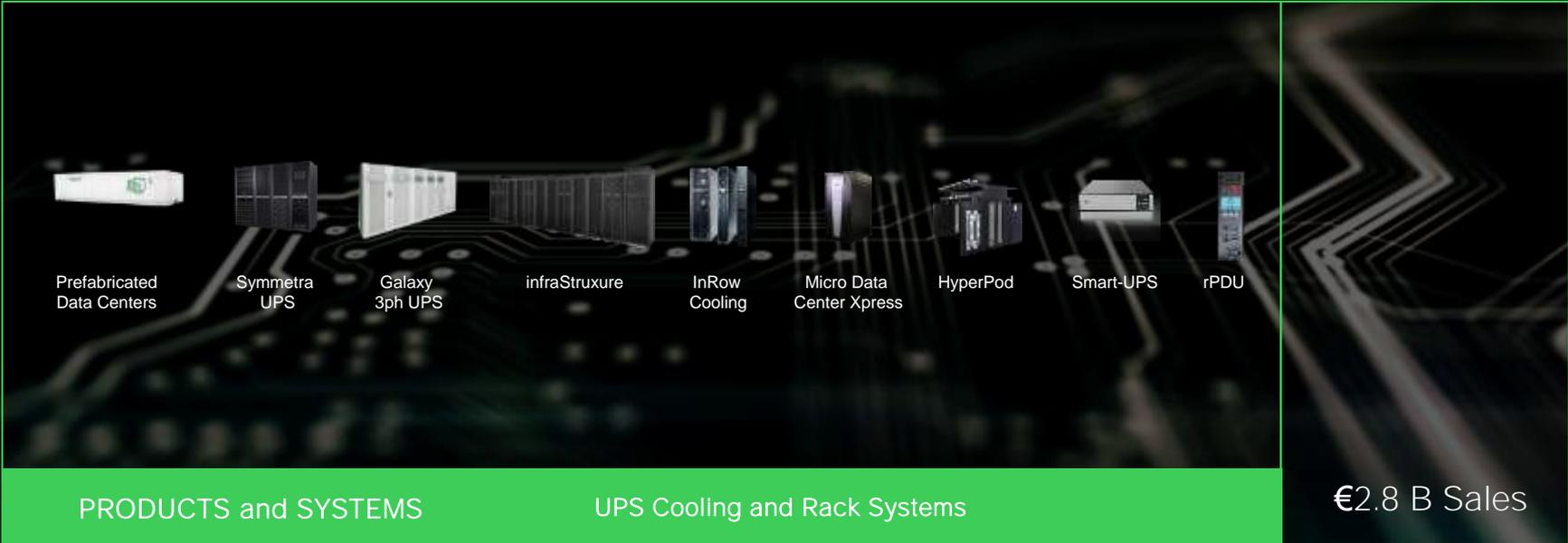
EcoStruxure IT

Building upon our €3.6B Secure Power Business to accelerate our Digital growth

~ 1.7 million connectable products   >20K connected partners

Prefabricated Data Centers	Symmetra UPS	Galaxy 3ph UPS	infraStruxure	InRow Cooling	Micro Data Center Xpress	HyperPod	Smart-UPS	rPDU

CONNECTED PRODUCTS   Enabling Software as a Service and Digital Services

PRODUCTS and SYSTEMS   UPS Cooling and Rack Systems

~1.7 million
connectable per year
20K connected Partners

€2.8 B Sales

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EcoStruxure IT

Building upon our €3.6B Secure Power Business to accelerate our Digital growth

Key indicators

APPS, ANALYTICS, & SERVICES   Enhanced end-user intimacy

100k Assets under mgt

EDGE CONTROL

10K sites

CONNECTED PRODUCTS   Enabling Software as a Service and Digital Services

~1.7 million
connectable per year
20K connected Partners

PRODUCTS and SYSTEMS   UPS Cooling and Rack Systems

€2.8 B Sales

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Driving customer intimacy digitally throughout the life cycle

Engaging at every phase of the life cycle creates
a positive feedback loop

CapEx cycle | OpEx cycle

Design
Research, design tools, and engineering expertise

Build
Global reach with local expertise

Operate
Cloud-based, IoT-enabled software management tools and services

Maintain

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Schneider is uniquely positioned with a comprehensive platform

Most complete offer and global supply chain with local expertise

Unique life cycle intimacy with our customers

Broad global network of technical experts and partners & powerful digital planning and design tools

Unparalleled operational insight through IoT, Cloud, & big data analytics technologies

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