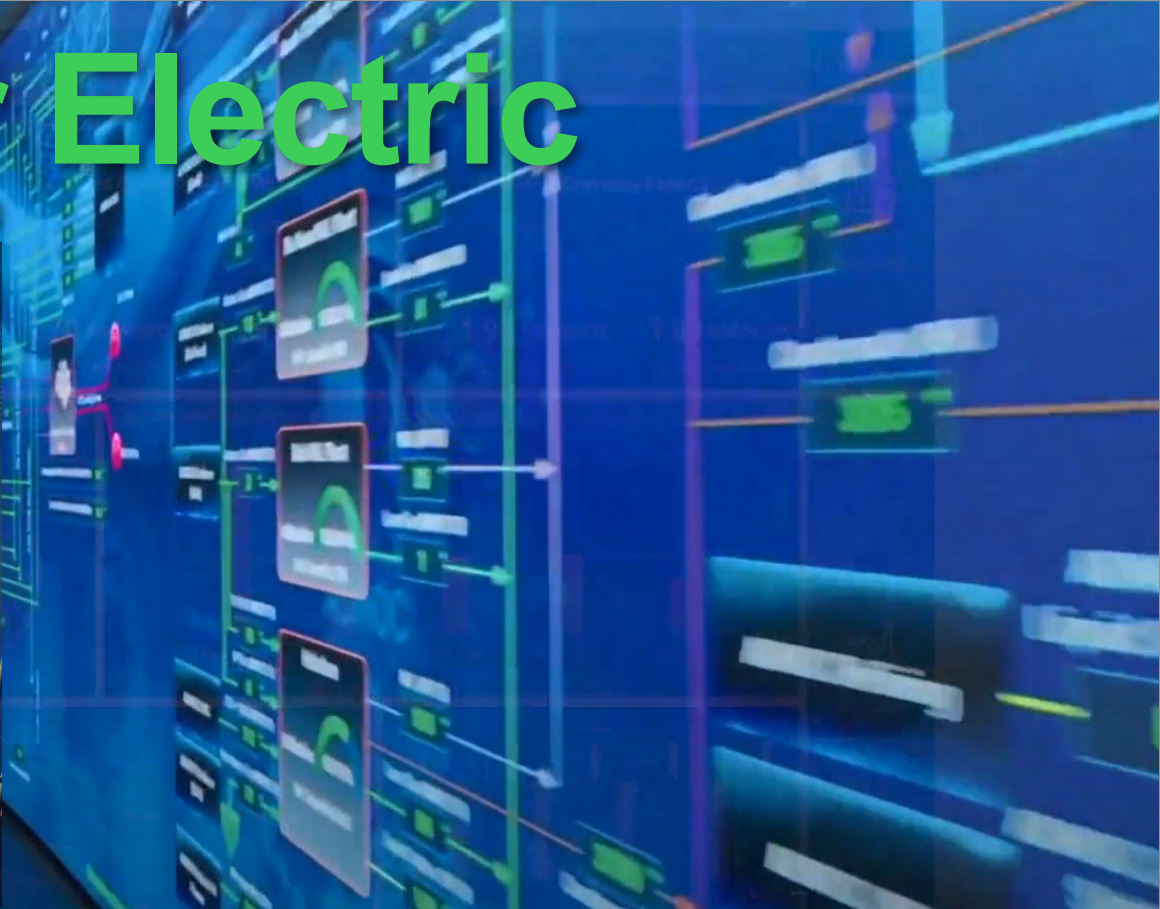


Schneider Electric

Datacenter Predictive Maintenance



Kenneth Eriksson

Global Solution Architect
kenneth.eriksson@se.com

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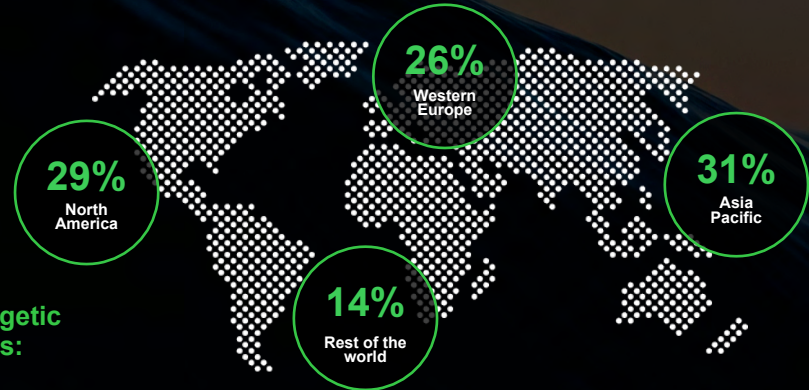
Key figures

128,000+
employees in 100+ countries

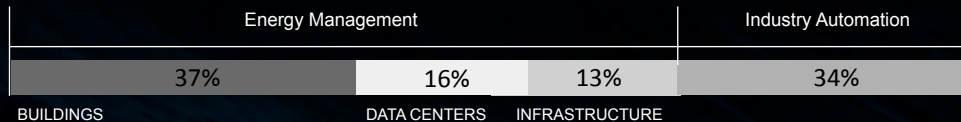
€29 bn
2021 revenues

R&D c.5%
of revenues

A global presence FY 2021 revenues breakdown



Two synergetic businesses:



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Most Sustainable Corporations in the World

GLOBAL100

#1

Our purpose is to **empower all to make the most of our energy and resources**, bridging progress and sustainability for all.

Leading by
example in our
ecosystem



Be your digital
partner for
**Sustainability and
Efficiency**

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 **>90**

countries where we are recognized as **Mission Critical**

 **40%**

of the world's **hospitals**

 **20**

of the largest **Oil and Gas** companies



50%

of the world's **data centers**



Top 4

hyper-scale **cloud providers**



40k

water & wastewater installations in **150** countries



10

of the world's top **electric utilities**



14

largest **city metro** in **14** countries



10

of the world's largest **airports**

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An aerial photograph of a winding asphalt road with yellow double lines, curving through a dense, lush green forest. A small dark car is visible on the road. The background is a solid black color where the text is placed.

Data Centers

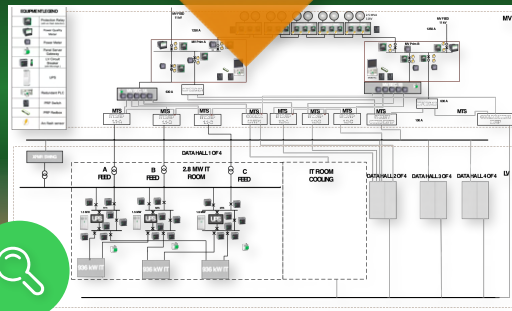
Schneider Electric's Portfolio & Perspective

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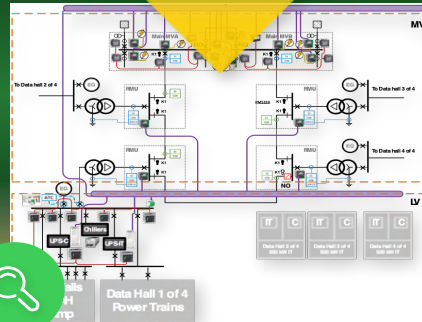
Schneider
Electric

EcoStruxure™ Digital Architecture examples

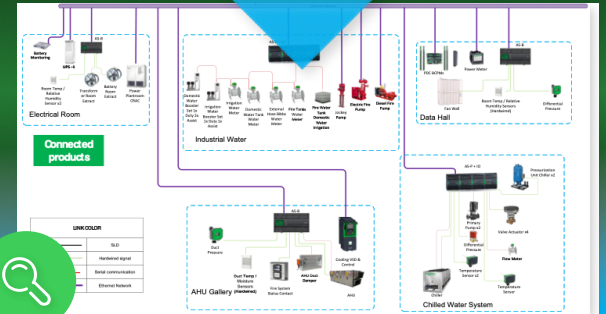
Connected devices



Medium Voltage Side Automation



Low Voltage Side Automation



Cooling, Mechanical, and Environmental Monitoring

EcoStruxure™ for Data Center

EcoStruxure™ Architecture



EcoStruxure™ for Data Centers

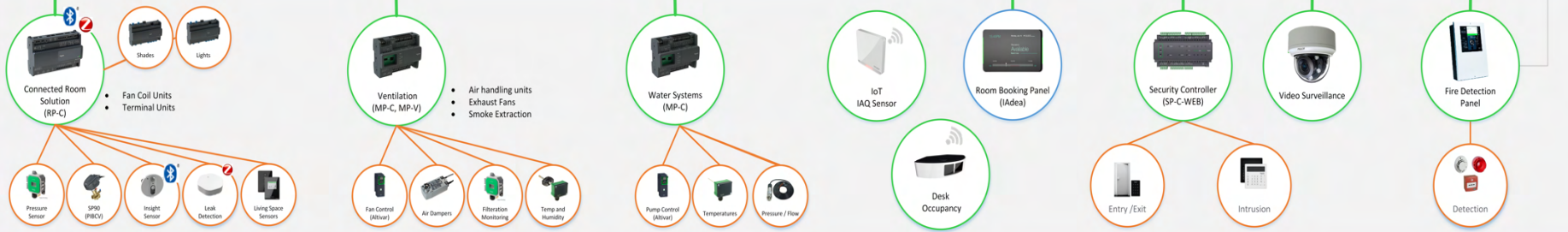
Apps - Analytics



Edge Control



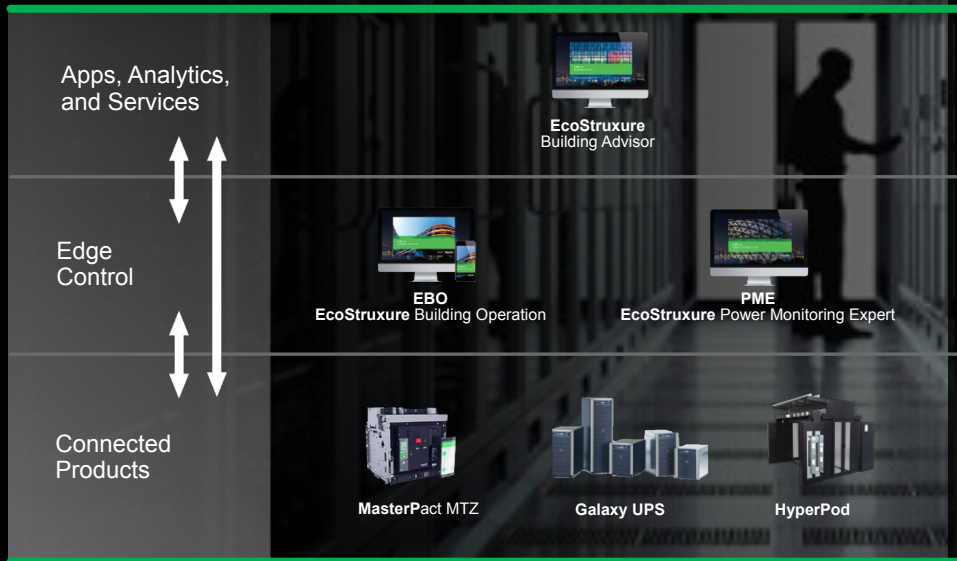
Connected Products



While we're on our own sustainability journey, our products and solutions help clients reach their sustainability goals

EcoStruxure™ for Data Center

Innovation At Every Level



EcoDataCenter

EcoDataCenter, Sweden

1,15

PUE at 2N redundancy with reuse of heat waste

99%

energy efficiency

EER*


of 132 from Schneider Electric CRAH units in basic operations

*Energy efficiency rating

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European Datacenter Project of the Year på DCD Awards!

 > Awards | 2023

European Data Center Project of the Year Award

Sponsored by



Congrats to our category finalists!
Find out who wins on December 6...













Schneider Electric and EcoDataCenter have been nominated for the prestigious European Datacenter Project of the Year award at the DCD Awards!



Advanced energy storage



High temperature chilled water solutions



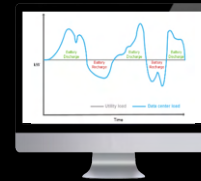
UPS Designed for Sustainability



Liquid cooling



SF6-free switchgear



Interaction with grid
FFR
FCR up
FCR down

To highlight one impact, Schneider Electric's MV switchgear with SF₆-free technology uses pure air instead of SF₆, a gas with 23,500 times the warming potential of CO₂!

Portfolio & Perspective

Apps, Analytics & Services



EcoStruxure Resource Advisor



EcoStruxure™ Building Advisor



EcoStruxure IT Advisor



EcoStruxure Asset Advisor



EcoStruxure™ Power Advisor



Climate Change Advisory Services

Edge Control



EcoStruxure™ Building Operation Software



EcoStruxure IT Expert
[EcoStruxure IT Expert](#)



EcoStruxure Power Monitoring Expert



EcoStruxure™ Power Operation

Connected Products



Galaxy



Galaxy Lithium-ion Battery Systems



Communicating Sensors



Uniflair



EcoStruxure Data Center Solutions



APC Smart-UPS



APC Netshelter



Set Series



Pact Series



PowerLogic

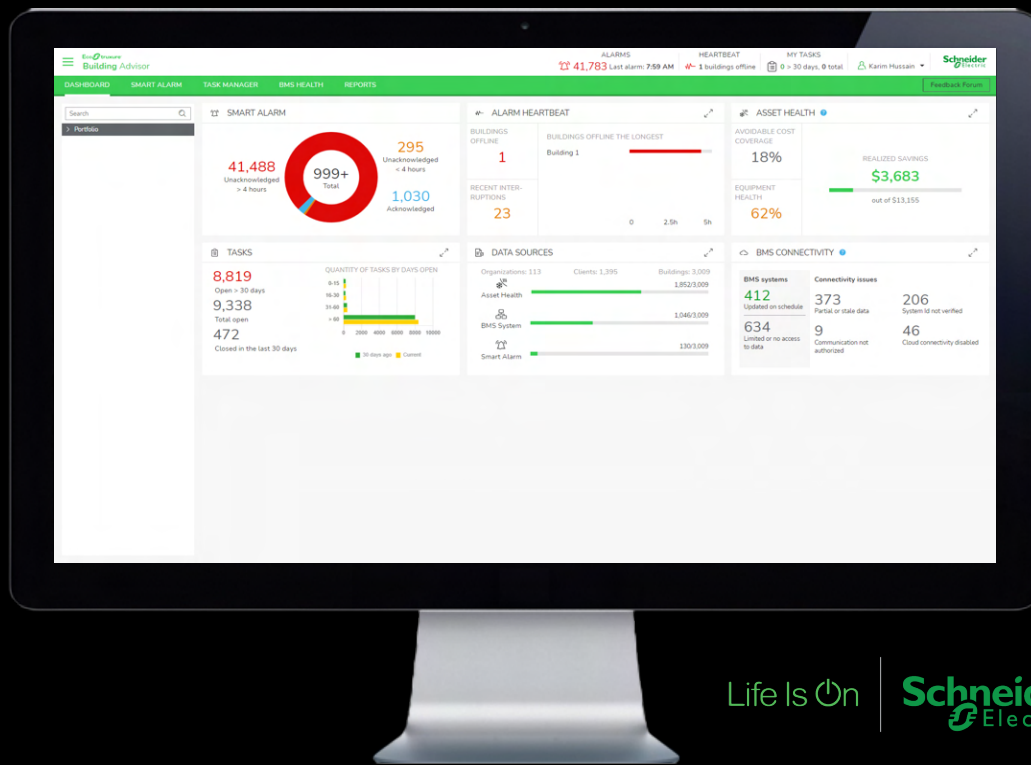
<https://www.se.com/us/en/work/solutions/for-business/data-centers-and-networks/>

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Building Analytics: Portfolio view of DC buildings and their performance.

- **Consolidated view** of all your clients, their buildings and deployed system and services
- **Aggregated view** of three core services: BMS Health, Asset Health and Smart Alarm in one pane
- **Multi-language** interface improves adoption by field service teams across a global portfolio
- **Administrative** features enable granting access across teams and end-users



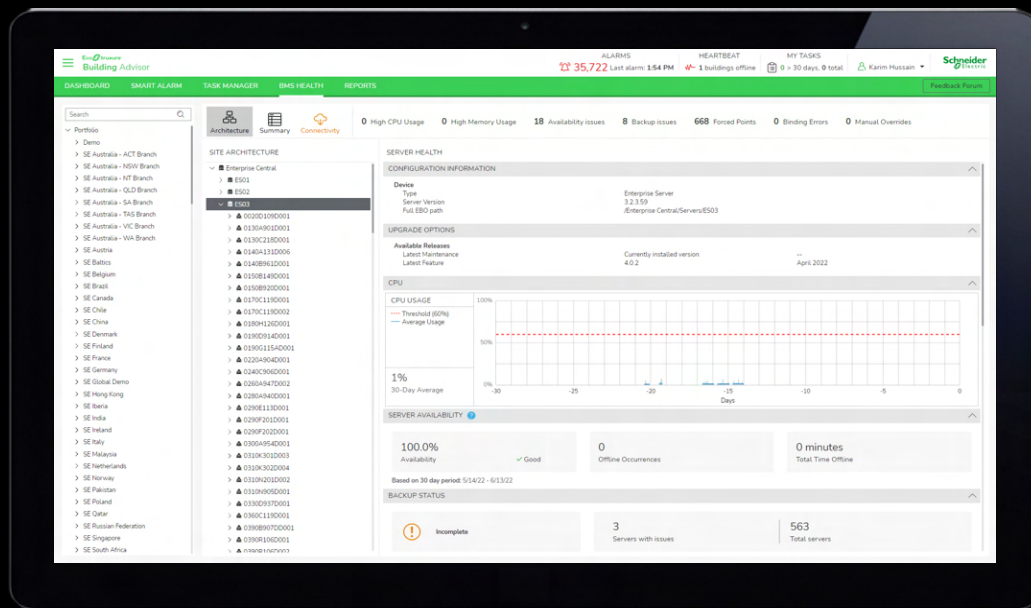
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BMS Health:

Automation in preventive checks of BMS.

- **Consolidated view** of all your EBO systems & their status across multiple clients & buildings
- **Automatic detection** of BMS performance & configuration issues on servers & controllers
- **Continuous checks** across entire system, improves coverage & early detection
- **Automated reports** summarize BMS issues & opportunities for upgrades



Asset Health:

Digital Twin and Digital Operations Technician to detect & diagnose HVAC faults.

- **Advanced digital twin** for HVAC detects faults & diagnosis issues with greater accuracy
- **Quantified impacts** based on energy, cost & maintenance helps clearer prioritization
- **BMS-agnostic solution** allows portfolio-wide roll-out at campus & enterprise levels
- **CMMS/IWMS integrations** enable more effective closure of tasks & budget allocation

The Diagnostics module provides a prioritized, searchable list of identified faults and energy saving opportunities across your portfolio.

Search Criteria:

View By: Select Building Group: View All | Select Building: View All | Select Equipment Class: View All | Select Equipment Type: View All | Select Equipment: View All | Select Analysis: View All

Display Interval: Half Day | Daily | Weekly | Monthly

Date Range: Start Date: 4/10/2021 | End Date: 4/10/2021

Filters: Notes Summary: | Tracking Code: | Results Only:

[Download Current Diagnostics Page](#) | [Download Full Diagnostics Results](#)

410 data records found for 4/10/2021 to 4/10/2021 in daily intervals.

Building	Equipment	Analysis	Start Date	Notes Summary	Tasks	Cost	E	C	M	Actions
South Boston	Heating Plant (Heating System)	Heating Plant Energy	4/10/2021	Boiler efficiency is low.	0	\$919	10	10	10	ⓘ
South Boston	AHU-3 (Air Handler)	AHU Coils	4/10/2021	Leaking pre-heating coil valve. Return RH higher than setpoint. Return air RH setpoint below suggested min (34%). Simultaneous heating and cooling. Supply temp reset error.	3	\$791	10	10	10	ⓘ
Sydney	AHU-3 (Air Handler)	AHU Economizer	4/10/2021	Heating on economizer should be off. Mixed air temp lower than setpoint.	1	\$578	10	10	10	ⓘ
Inman	AHU-2 (Air Handler)	AHU Fan	4/10/2021	Fan on longer than expected. Occupancy not compliant with schedule.	2	\$400	10	10	10	ⓘ
Fareham	AHU-3 (Air Handler)	AHU Coils	4/10/2021	Leaking cooling coil valve. Negative temp difference across heating coil. Return air RH below suggested min (34%). Simultaneous heating and cooling. Supply temp short cycling.	0	€160	10	10	10	ⓘ
Paris	AHU-3 (Air Handler)	AHU Coils	4/10/2021	Over-aggressive freeze prevention. Return air RH below suggested min (34%).	3	118 €	10	10	10	ⓘ
Sydney	AHU-4 (Air Handler)	AHU Coils	4/10/2021	Jumping sensor error. Leaking cooling coil valve. Out of range sensor error. Return air RH below suggested min (34%). Simultaneous heating and cooling. Supply temp short cycling.	4	\$107	10	10	10	ⓘ
Inman	AHU-1 (Air Handler)	AHU Coils	4/10/2021	Jumping sensor error. Leaking cooling coil valve. Out of range sensor error. Return air RH below suggested min (34%). Simultaneous heating and cooling. Supply temp short cycling.	0	\$101	10	10	10	ⓘ

Asset Health: Digital Twin and Digital Operations Technician to detect & diagnose HVAC faults.

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Cybersecurity

in IT and OT-networks

Threats and consequences



Every **14 sec** a ransomware attack occurs



\$3.8 million USD - average cost of a breach



Within **5 min** the average time it takes for an IoT device to be attacked after going online



67% is the increase in security breaches over the last 5 years



49.6 days typically pass between breach discovery and reporting dates



70% of employees don't understand cybersecurity



Only **2%** of IT budget is used for security



92% of malware is spread by email



22% of security issues stem from outdated and unpatched software



95% of HTTPS servers are vulnerable to man-in-the-middle attacks

Source:
Hashed Out

The three pillars of cybersecurity

Any cybersecurity strategy is only as strong as its weakest link. That's why it is fundamental to identify and mitigate risks by applying standards and good practices throughout the whole line of defense which must integrate people, processes, and technology.



People

Strong cyber protection requires an educated and aware workforce.

In many cases, your people are your first and last line of defense. A crucial element of this area is creating and communicating a company-wide security culture, advanced by ongoing training.



Processes

In order to identify and eliminate cyber risks, you need to establish and adhere to good processes, practices, and policies. Companies should begin with consistent, regular risk and threat assessments and gap analyses.



Technology

Your cyber defense is only as strong as the technology deployed to manage and control your operations. This aspect is all about protecting what your company develops and deploys, as well as ensuring that the technology coming from your supply chain vendors is secure.

Management

I care about risk to my business. I rely on my IT team to master cybersecurity.



IT

I know Cybersecurity. I don't know anything about facilities.

Enterprise Networks Group



Facilities

I know facilities. I don't know anything about Cybersecurity.

Does an OT Networks Group exist?



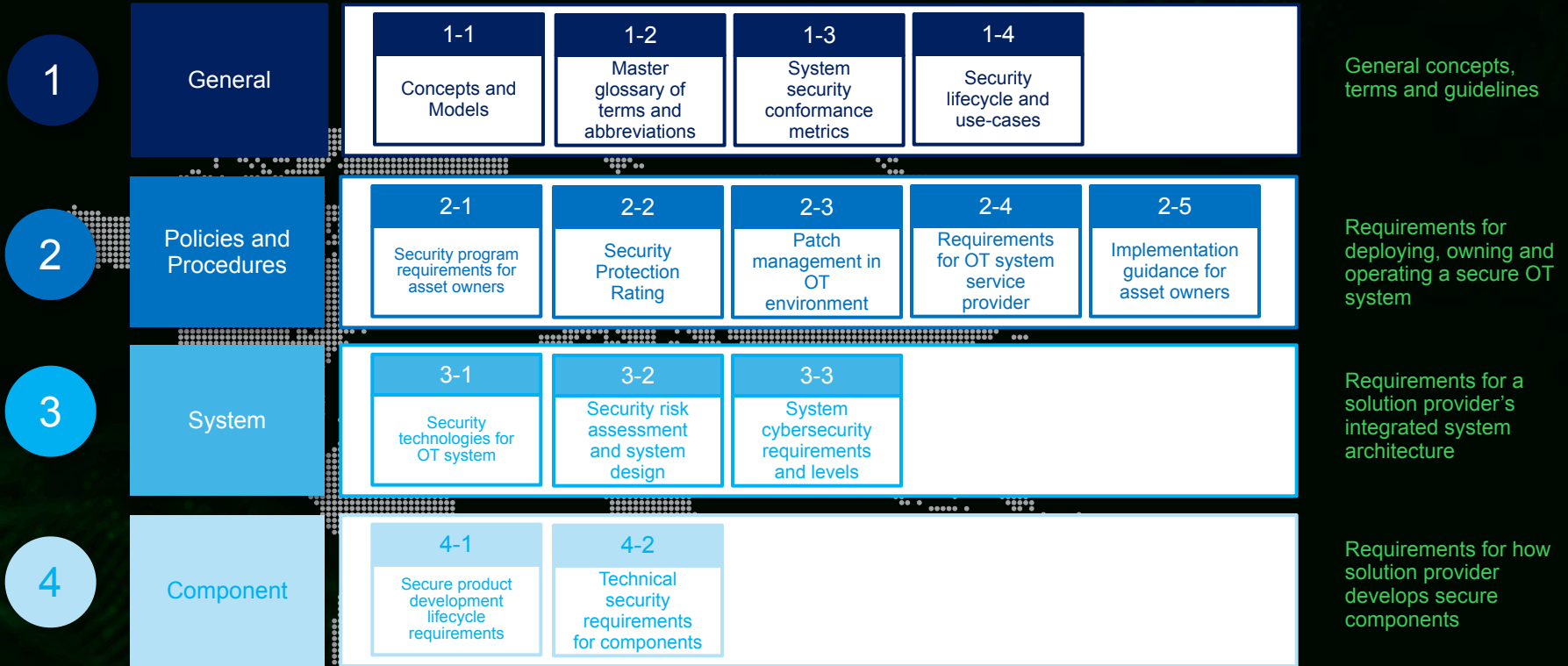
Facility Operations



IEC 62443



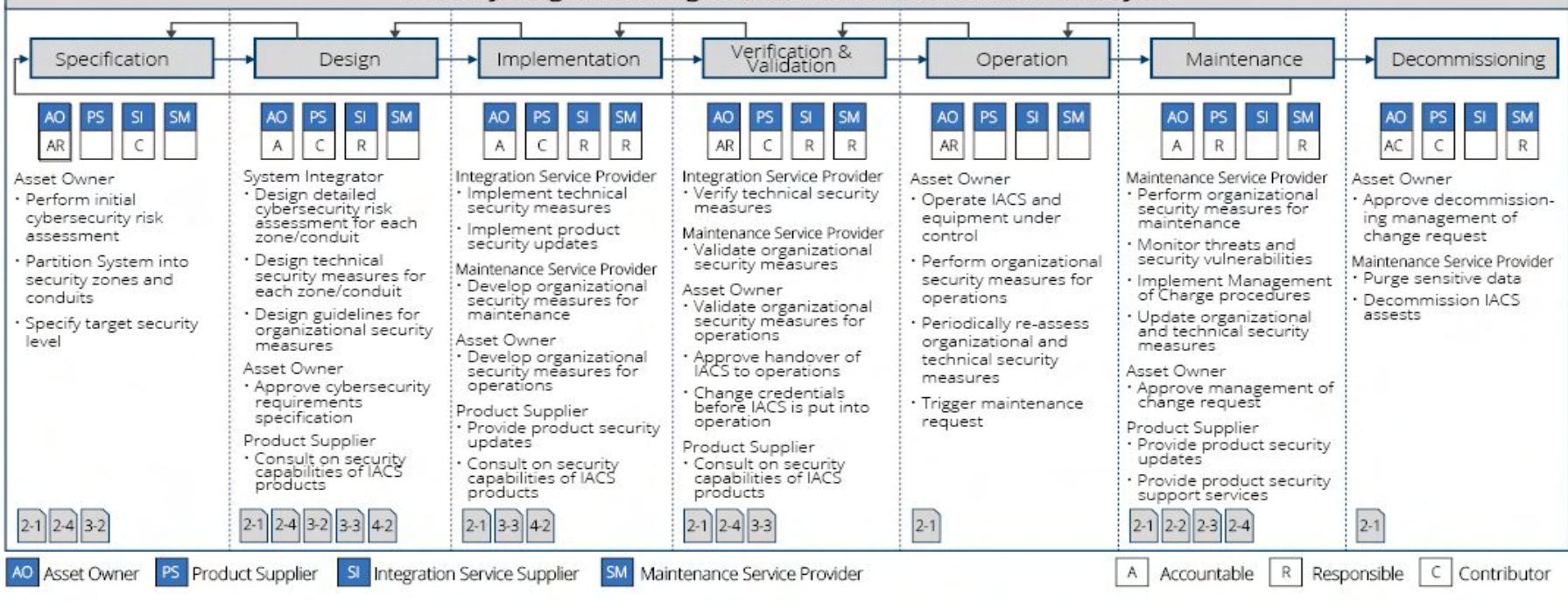
IEC62443 addresses People, Processes and Technology



IEC 62443

The Cybersecurity lifecycle for systems

Security Program throughout the Automation Solution Lifecycle



<https://www.se.com/cybersecurity>

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Cybersecurity solutions

Cybersecurity threats are an unfortunate reality for everyone. Can you protect your business while still embracing new technologies that enable you to grow and deliver the best possible results? With Schneider Electric, you can.

[Read more about our solutions >](#)

Scroll Down





Cybersecurity Application Platform – CAP 1.3

What's New

Cybersecurity for your digital transformation

Services and Solutions from Schneider Electric



Enhances compliance to standards The Cybersecurity Application Platform offers support to meet IEC 62443-3-3 SL1, SL2 and SL3 requirements. Based on IEC 62351-8, -14 for Central Management functionalities



IT/OT Convergence The Cybersecurity Application Platform is an IT/OT bridge to leverage existing IT skills and infrastructure.



Helps protect critical digital assets (IP) The Cybersecurity Application Platform provides security management and baseline definition for Maintenance and Services to preserve security posture of industrial systems.



Contributes to cybersecurity risks reduction The Cybersecurity Application Platform reduces risk and monitors cyber threats that could impact customer operations



Inspires customer confidence Integrated, tested and validated solution positioned at one central location for industrial systems.

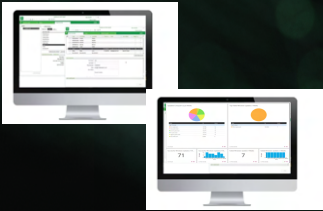


**Cybersecurity
Application Platform**

The solution: dedicated OT cybersecurity services

Permit

Filter the access to the system through network & physical controls.



CAE (Cybersecurity Admin Expert) :

- System-coherent security configuration & user management.
- Define Role based access control capabilities
- List of supported products are growing

CAP (Cybersecurity Application Platform) : authentication & authorization proxy

Protect

Implement specific defense to prevent unwanted access to the system



“Secure by design” solution :

Secure Development Lifecycle (SDL) certified solution :

- IEC 62443-4-1 : development process
- IEC 62443-4-2 : product security functions
- IEC 62443-3-3: system security functions

Detect

Monitor the operating environment to uncover & communicate threats.



CAP (Cybersecurity Application Platform): detect & monitor Cybersecurity Threats thanks to

- CS OT Dashboard

- Anomaly Detection
- EPAS-M : Ecostruxure Power Automation System Maintenance tool

Respond

Rapidly contain & mitigate attacks; maintain the security level over time



SE Support Portal : report Vulnerabilities and Incidents
<https://www.se.com/www/en/work/support/cybersecurity/overview.jsp>

Security Patch Management : maintain the security level of supported system throughout the lifecycle



The Intrusion Detection System (IDS) provides :

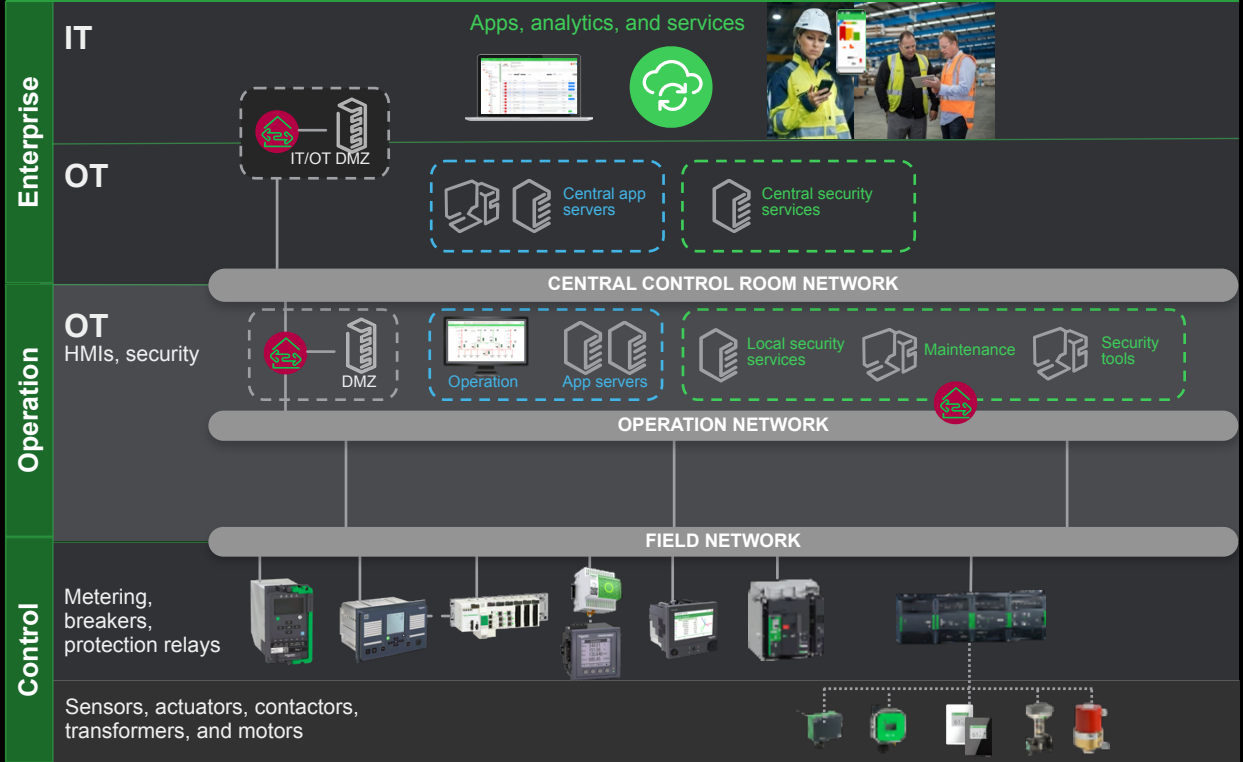
- 24/7 network monitoring;
- Alerts on anomalous activities;
- List of all assets on the monitored network;
- Real-time & historic view of connexions down to asset level;
- Protocols identification;
- Recording of all activities for future play back and forensic investigation.

Cybersecurity services

Resilient & Safe essentials



EcoStruxure Digital Platform



Permit

Protect

Detect

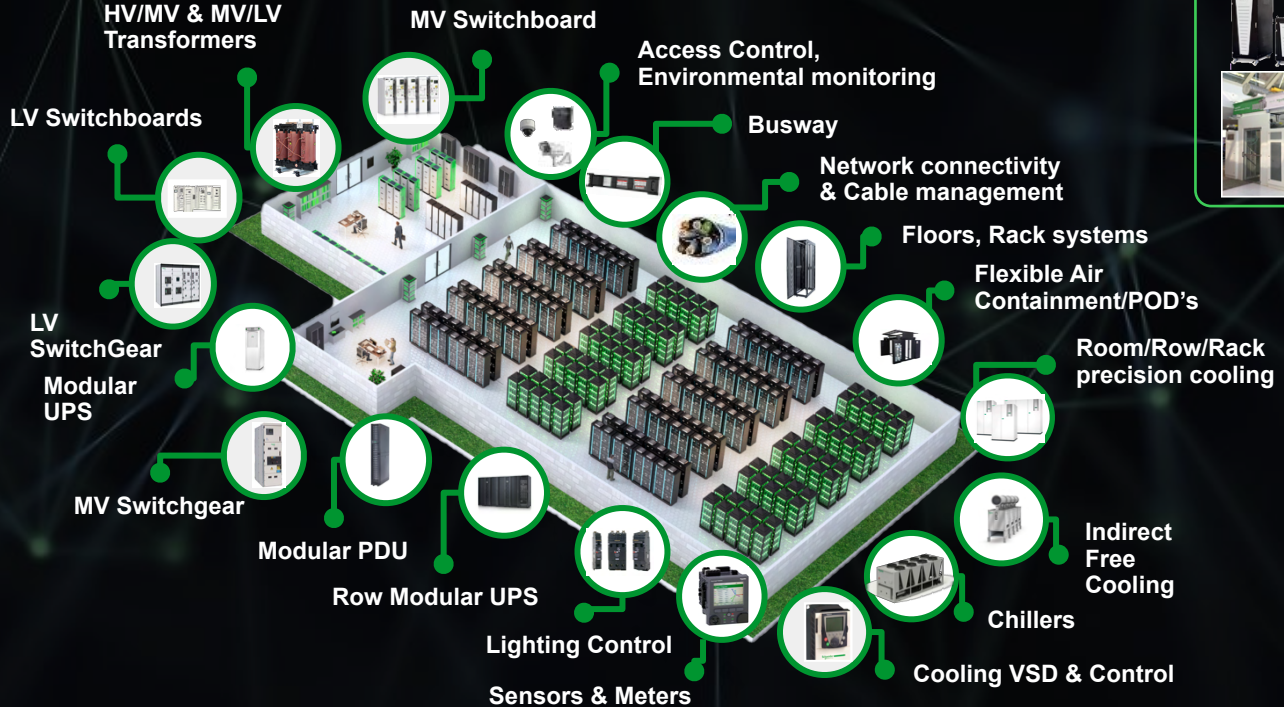
Respond

Details Link
(Click to view detail)

Our large portfolio of connectable data center solutions spans from rack to row to room to building

Prefabricated
Edge Computing Solutions
& Micro Data Centers

Microgrid / Prosumer /
Renewable energy
Solutions



Software and Services

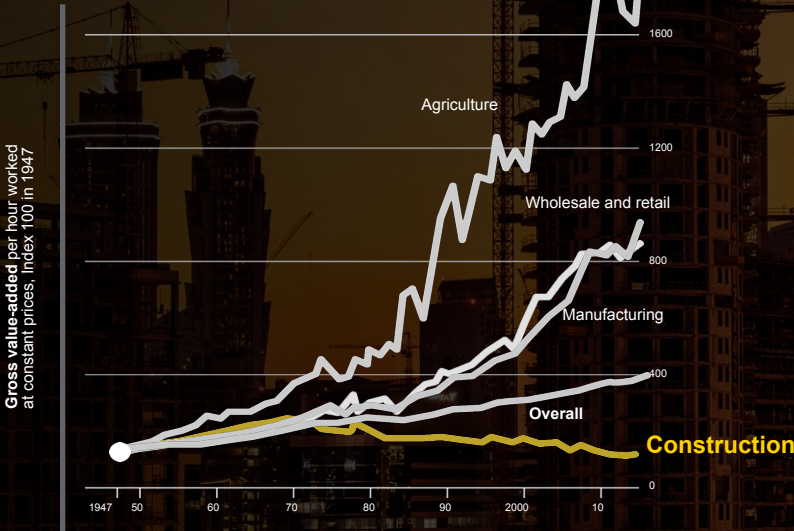
- Monitoring and Dispatch
- Asset Advisor
- Resource Advisor
- Building Advisor
- Power Advisor
- IT Advisor
- IT Expert
- Power Monitoring Expert
- AVEVA Unified Operations Center
- Security Expert
- Building Operations
- Power SCADA Operations
- ETAP
- RIB

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Meanwhile, construction writ large remains stubbornly inefficient

Construction has had the lowest efficiency gains of the last 60 years



Source: McKinsey Global Institute, World Green Building Council

10-20% higher construction cost due to a lack of coordination

170 million tons per year of materials go to waste

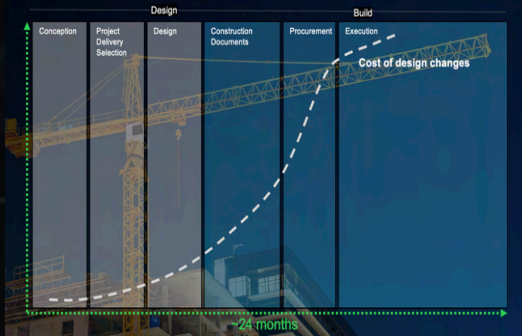
~30% of construction cost is rework

Source: IEA, Engineering News ; The National Human Activity Pattern Survey (NHAPS)

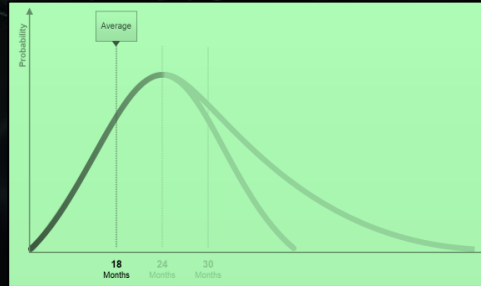
We leverage digital design tools throughout to package solutions in a quick and precise way, forming foundation for digital transformation



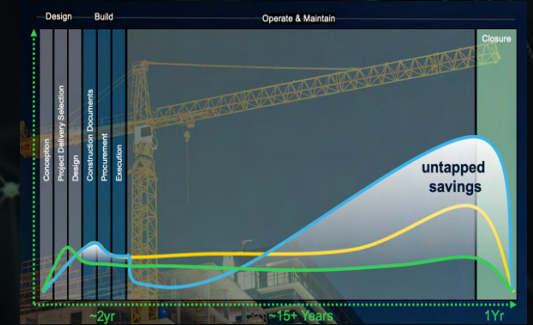
Eliminate costs associated with late-stage design changes



Shorten time-to-revenue by reducing project schedule and accelerating handover to ops



Reduce cost of operations, increase global visibility, lower carbon contribution



IGE+XAO
GROUP

ALPI

etap

RIB
CONSTRUCTION

RIB
CONSTRUCTION

AVEVA

EcoStruxure
Innovation At Every Level

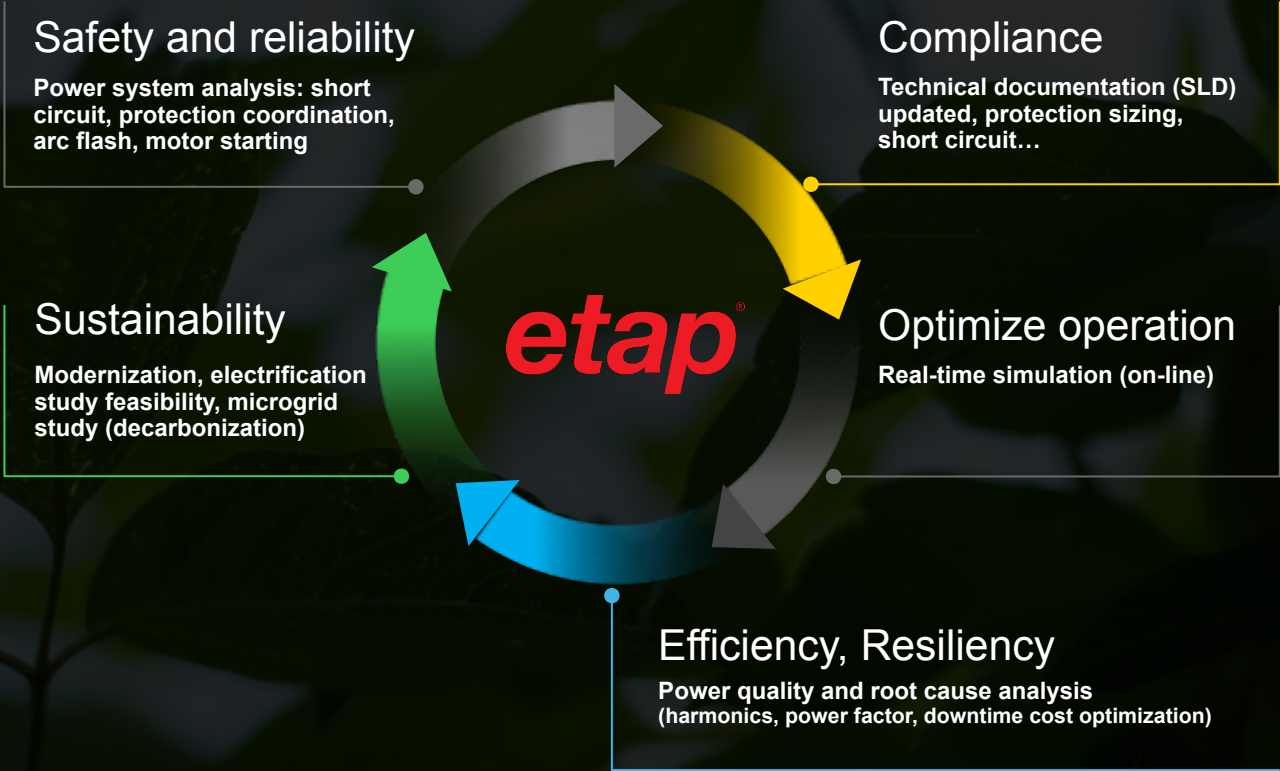
IT

PLANON

CLAROTY

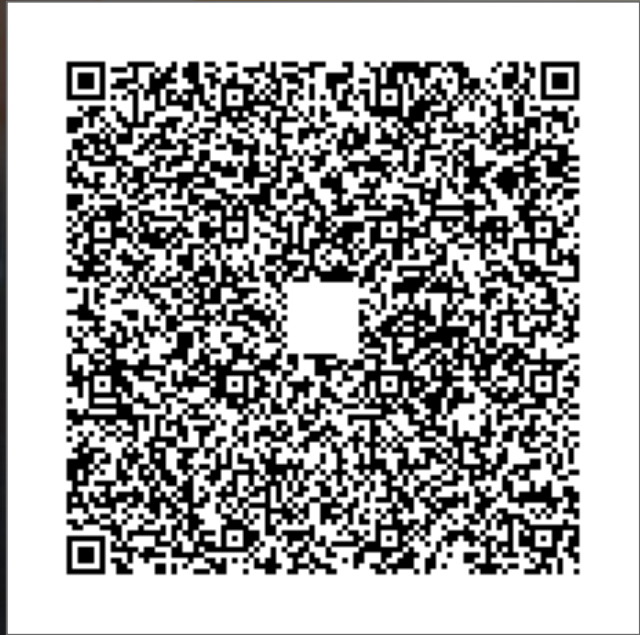
Customer has expressed a desire to leverage “digital twin” technology, recognizing a unique opportunity to design a DC platform from the ground-up. Our investments in digital solutions across the lifecycle transforms static documentation scattered across a fragmented phases into collaborative platforms like ETAP that connect design and operations.

etap as a digital twin



Countries regulation impose that SLD shall be kept updated

THANK YOU.



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