Datacenter of the future - NOW
Enabling a smarter today.

Smart Sustainability and Digital Transformation.

Comment les data centers peuvent évoluer de façon durable et augmenter leur efficacité ? How can data centers improve in a sustainable way and increase their efficiency ?

Mourad YOUNES C&SP MEA

Our mission

In this digital era, we enable **a world that is always on.**

Our mission is to empower the **digital transformation** of our customers by ensuring their critical networks, systems, and processes are **highly available and resilient.**

Industry Trends & Challenges

Data Centre of the Future

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Regardless of business model, colocation is here to stay to support the growth of digitization

Mobility

5.5 B mobile active users by 2030

Internet of Things

Up to 50 B connected things by 2030

Cloud computing

+16.5% annual growth

Video streaming

75% of all mobile traffic by 2025

Artificial intelligence

2 MB created per second, per human by 2025

https://www.statista.com/statistics/802690/worldwide-connected-devices-by-access-technology

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Industry Challenges for the Colocation Operator

	Power	Land	Connectivity	Human Capital
Trends / Challenge	+ Power shortages in major markets + Alternative Power sources being considered in the short term + Facilities are being build with only a proportion of the overall sellable power purchased	+ Land constraint in prime locations + In come prime Tier 1 markets brownfield land with data centre consent is trading for more than twice the amount of residential + Cost of land in Tier 1 Data centre cities is doubling	+ Subsea fibre connectivity to emerging markets & territories + Bandwidth & latency intensive applications & streaming + Resiliency & diversity of connectivity providers into Colocation facilities	+ Shortfall of skilled labour/workforce in the industry + Demand for talent from cloud providers is affecting talent retention and recruitment + Construction bottlenecks exist in major markets with significant lead times construction teams
Outcome	• On site power generation & energy storage • Out of town campus • Shift to secondary markets	• Move to secondary markets • Price uplift • Data Centre Innovation – removal of Generators	• Cloud Services proliferation to emerging markets • New Landing Stations to be built	• Resource fight in industry • Turnover is high • Salary increase to retain talent

Market Trends of the Colocation Data Centre

	Growth	Speed	Cost	Prefabrication
Trends	+ 3 Year CAGR ~12% + ~13,000 new MW build + Cloud Servies driving Colocation explosion – CAGR 16% + Global expansion into new markets & territories	+ Cloud Services rollout explosion & demand + Reduced time to market + Halving of on-site construction + Go-Live & phased builds now weeks, not months + New agile entrants	+ Reduce Cost per MW halved in recent years + Optimise DC Design, Build & Construction costs + Pricing pressures on Colocation Operators & EcoSystem + Competitive differentiator	+ Predictable outcomes on design and performance + Optimisation of Power train + Standardisation & industrialization + Prefabrication & off-site assembly + Ease of scalability
Outcome	• Huge growth in Data Centre build & construction • Spill over into new & emerging markets • Price pressures	• Technology & design innovation • Prefabrication of Data Centre construction • Global standardisation	• Prefabrication of Data Centres • Optimised designs • Design flexibility & resiliency	• Standardised & industrialised designs • Fast rollout • Vendor inventory • Partnerships

Technology Trends of the Colocation Data Centre

	Digital	Power Generation	Cooling	Decentralised UPS
Trends	+ Visibility of Data centre assets + Remote monitoring and diagnosis + Behaviour & trending of infrastructure to system predict failure + Data lake to make real time & remote informed decisions & actions	+ On-Site power generation due to availability of power in Tier 1 capital cities + Minimise risk of supply + Diversity of electrical sources + Cheaper, predictable and consistent cost of power	+ New cooling techniques required for increasing chip densities + Larger systems for 50MW+ Data Centres + Water usage management & optimisation + Adaptable for emerging markets	+ Hyperscale Cloud Providers driving designs of Colocation Operators + OCP architecture driving decentralisation of UPS with In-Rack UPS or Batteries + Reduced risk of Data Centre failure & downtime, moved to rack level
Outcome	• Site wide software management systems/BMS • Multi site/global standardization • Digital services/automation	• New technology • Energy storage • Generator-less Data Centres • New markets	• Bespoke cooling solutions • Large/XL Fan Wall designs • Liquid cooling • WUE focus & measurement	• Move to Li-Ion in rack • Management of assets becomes difficult • Balance between secure IT load and energy storage

Key Needs of the Colocation Data Centre

	Sustainable	Efficient	Adaptive	Resilient
Needs				
Enablers	+ Maximum use of renewable energy sources + Resource-efficient designs that are carbon neutral/negative + Circular materials + Supply and demand services	+ High density IT space + Highest efficiency designs and equipment + Tailored capital structure + Streamlined processes + Digital services	+ Flexibility in design, deploy, service + More future proof + Enable workload and application portability + Software defined + Active energy management	+ Predictive analytics + Link between data analysis and field service dispatch + Highest power reliability + Enhanced cybersecurity + Automated and remote management
Outcome	Meet the business needs **responsibly,** without **compromising the future**	Optimize **cost, speed and capital** to increase **return on investment**	**Future-proof** designs to accommodate **new technologies**	Reduce **vulnerability** to **unplanned downtime**

Data centers **must** work towards sustainability…

C-level attention

99%

of large company CEOs agree that “sustainability issues are important to the future success of their businesses.”

(Harvard Business Review)

Need for action

49%

of the world’s annual GDP, equal to $39T, is now covered by nations, regions, and cities that are legislating for net-zero emissions.

(Energy and Climate Intelligence Unit (ECIU))

Investor expectations

75%

of investment executives agree that a company’s sustainability performance is important when making investment decisions.

(MIT Sloan Management, Investing for a Sustainable Future)

Industry leaders are already committed … but is that enough?

Microsoft

"By 2030, Microsoft will be carbon-negative, and by 2050, Microsoft will **remove** from the environment **all the carbon** the company has **emitted** either directly or by electrical consumption **since it was founded in 1975**."

facebook

"We are committed to reaching net-zero emissions **across our value chains in 2030.**"

"In our founding decade, Google became the first major company to be carbon neutral. In our second decade, we were the first company to achieve **100% renewable energy**. **By 2030, we aim to be the first major company to operate carbon-free**."

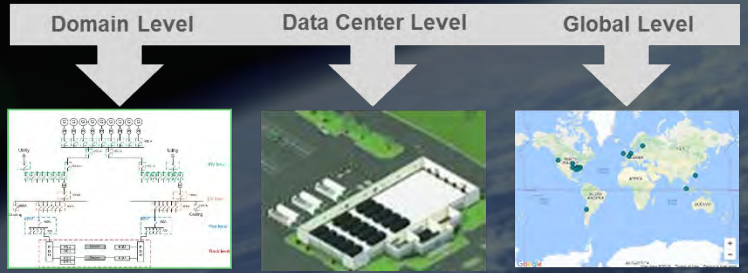
amazon

Co-founded the Climate Pledge with Global Optimism – **calls on big companies to be net-zero carbon by 2040** – a decade ahead of the Paris Accord's goal of 2050.

Apple's 2030 carbon-neutral pledge covers itself and suppliers – any company hoping to become a **supplier would have to commit to "be 100% renewable for their Apple production" within 10 years.**

Our global approach

Ease of Doing Business
Account Management
Program Management



Global SLA Consistency
Global Services Mgmt.

Go To Market Plan / Design Input
Solution Architecture

Speed to Market
Project Mgmt.
Construction Mgmt.

Bid/ Pricing Consistency / Solution Optimization
Bid Management
Standardization

Supply Chain Optimized / Testing Options
Quality Mgmt.
Supply Chain Mgmt.

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How it could manifest in a data center application

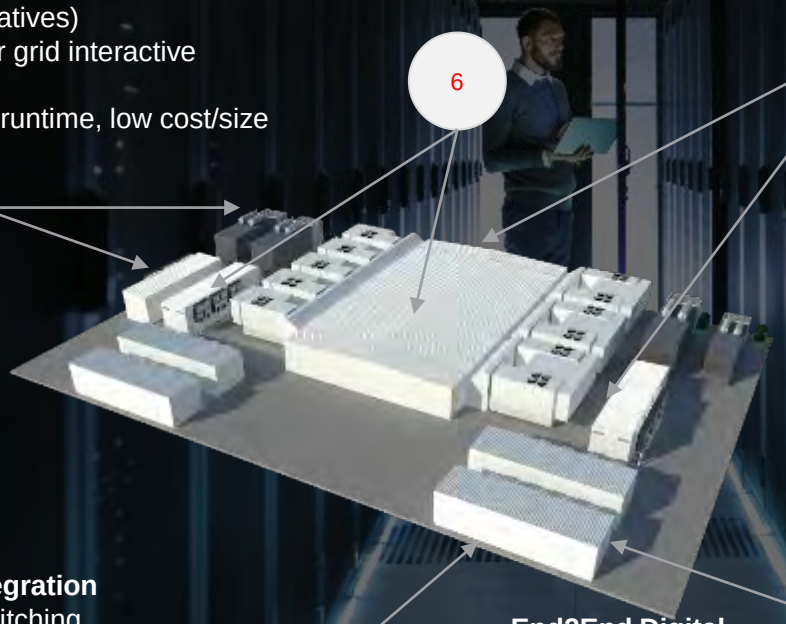
Battery tech impact
- Energy focus:
  - 1 to 2 day systems (genset alternatives)
  - 4 hour grid interactive
- Power focus:
  - Short runtime, low cost/size

DC
- Rack level OCP v3 (48V) potential
- Hall/Pod/Rack 380VDC (or higher)

Liquid cooling impact
- Power Conv size (module)
- CDU, Manifold designs (data hall)
- Ext heat rejections

Autonomous & auto adaptive
- Autonomous – Oper & maint with few/no people
- Fast deployment – Both to build new and to update
- Scalable & flexible – Adjust capacity based on demand
- Adaptive & upgradable – Change in behavior based on SW updates & responsive to policy conditions

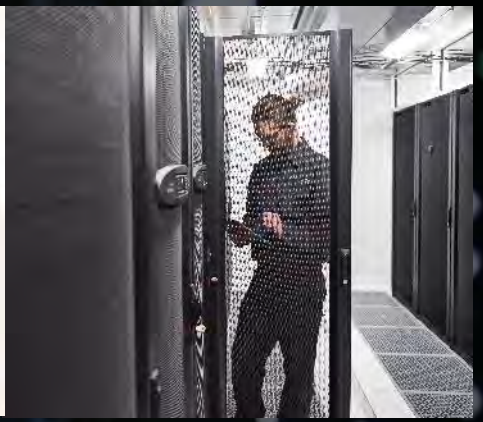
Sustainability
- Materials (capex and construction)
- Packaging
- Circularity
- Efficiency
- H2O



Footprint/Integration
- Arc-free switching
- Panel/Power/Dist integration
- Heat rejection (liquid, phase change, air, materials..)

End2End Digital
- Deeply sensorized
- Monitor/manage as a block
- Digital Design -> Maintain
- Predictive service

Our enhanced collaboration will support the growing demand & challenges faced by DC developers, owners & operators



Increase speed of deployment

Scalability & Industrialisation

Manage capex and lower opex

‘On Time & On Budget’

Improve customer satisfaction and differentiate from the competition

New market expansion

Sustainability

Risk Mitigation

Confidential Property of Schneider Electric | Page 13

Reasons why actual customers deployed Schneider Electric modular data center

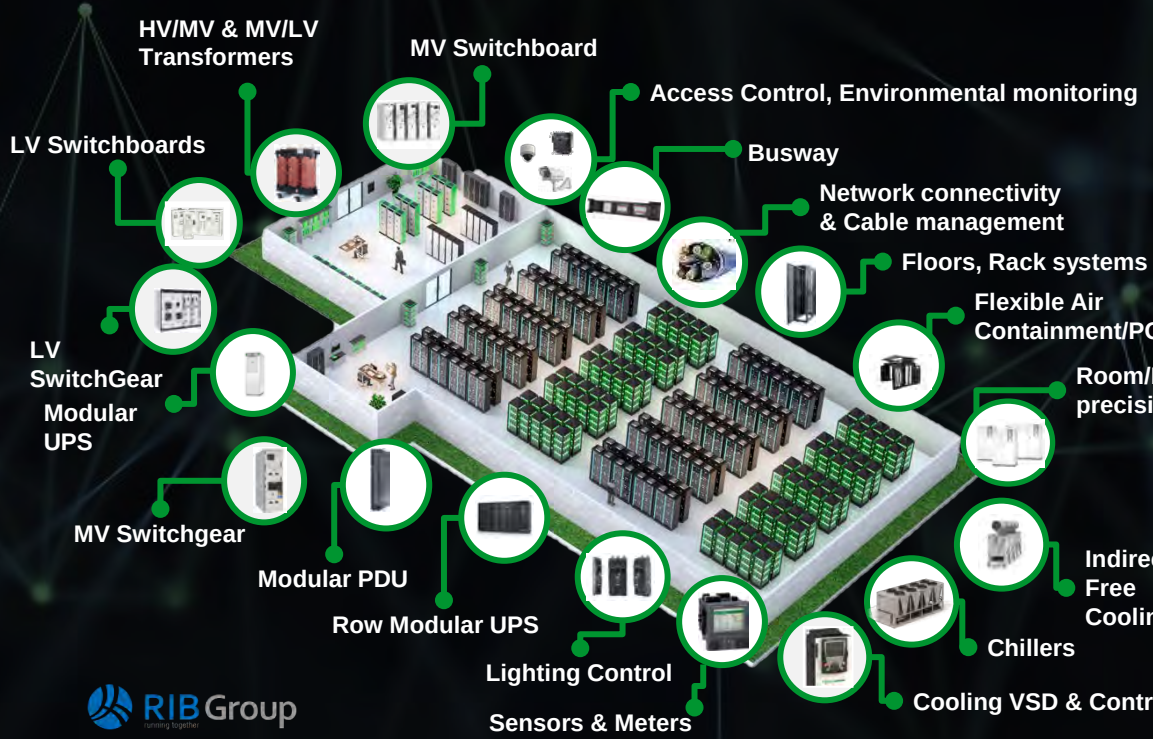
- Capacity or Business drivers require new capacity **fast**
- Reduce complexity and construction **costs** from changes and delays.
- Challenges in allocating or justifying space to build or expand
- Standardized build process ensures **Predictable** Cost and **Predictable** Performance
- Variances in labor quality in different regions

Comprehensive Data Centre Solutions

Now, with Starting Points and Physical Architecture set (Traditional or Modular), you can rely on a full portfolio of **connected product**, solution and software to move forward…

Microgrid / Prosumer / Renewable energy Solutions

Prefabricated Edge Computing Solutions & Micro Data Centers



Software and Services

Monitoring and Dispatch
Asset Advisor

Resource Advisor
Building Advisor
Power Advisor
IT Advisor

EcoStruxure™ Innovation At Every Level

IT Expert
Power Monitoring Expert
AVEVA Unified Operations Center
Security Expert
Building Operations
Power SCADA Operations

RIB Group

etap

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CONNECT

Connect everything from shop floor to top floor

COLLECT

Capture critical data at every level, from sensor to cloud

ANALYZE

Convert data into meaningful insights

TAKE ACTION

Drive action through real-time information and business logic

EcoStruxure Augmented Operator Advisor

EcoStruxure™ with focus on Edge solutions

Apps, Analytics & Services


EcoStruxure Asset Advisor


EcoStruxure Power Advisor


EcoStruxure Augmented Operator Advisor


EcoStruxure Building Advisor


EcoStruxure IT Advisor


AVEVA Unified Operations Center


ETAP Design & Simulation

Other Schneider Electric and Third-Party Connected Services

Edge Control


EcoStruxure Power Monitoring Expert


EcoStruxure Power SCADA Operation


SmartX IP Edge Servers


EcoStruxure Building Operation


Smart Connector Middleware API


EcoStruxure IT Expert

Third-Party System Integration via Smart Connector Middleware API

OTRS Ticketing System
CAMMS
Network Management System
Master System Overlay
KPI Dashboard & Reporting
Data Lake, etc...

Connected Products


PowerLogic


Acti9, Powertag


Enerlin'X Com'X


Prefabricated IT, Power, Cooling


Masterpact MTZ


SmartX IP Controllers


Galaxy UPS


Micro DC

Third-Party Connected Products

Fire Alarm System
Generators
Water Leak Detection
Refrigerant Leak Detection
BTU & Water Meters, etc...

End-to-end Cybersecurity

Cloud and/or On Premise

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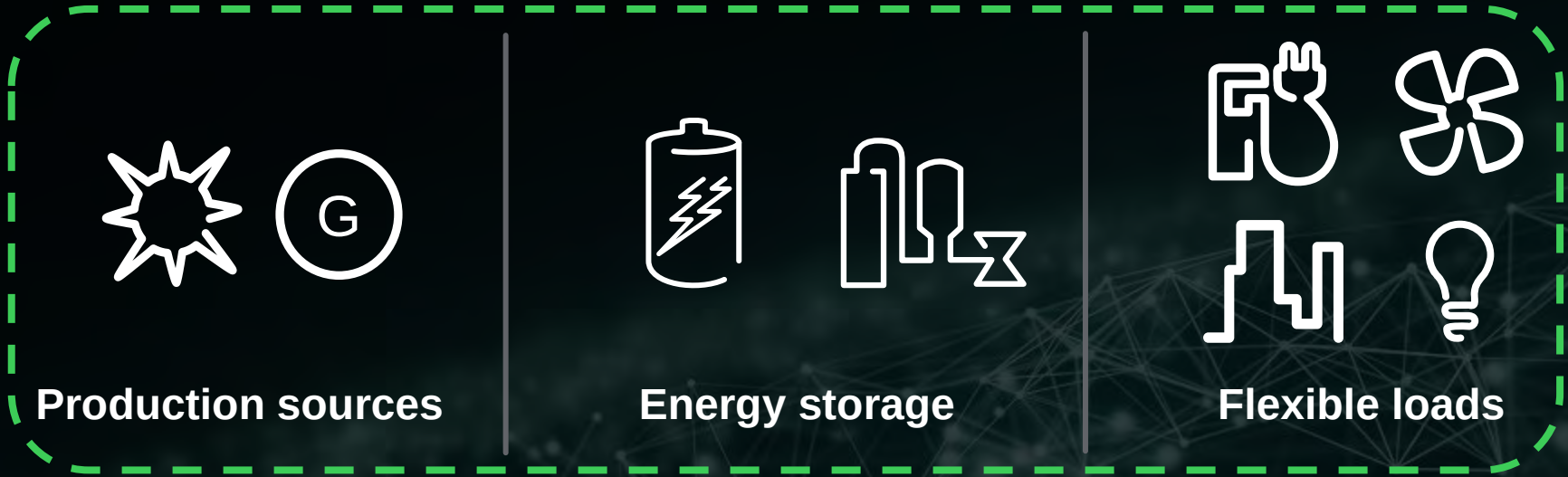
Distributed Energy Resources and Microgrids



Microgrids help to achieve all the EV Charging Trends: Solar Absorption, Demand Response, and Green Charging

Microgrid Benefits for Data Centers

Sustainability

Add onsite renewable generations
Increase renewable penetration
Reduce/Erase fuel usage during blackouts

Energy cost

Reduce grid imports
Prioritize renewable over costly resources
Monetize onsite renewable (net metering)

Reliability

Avoid grid reinforcement / contingencies
Local back up resources
Ensure quality power supply

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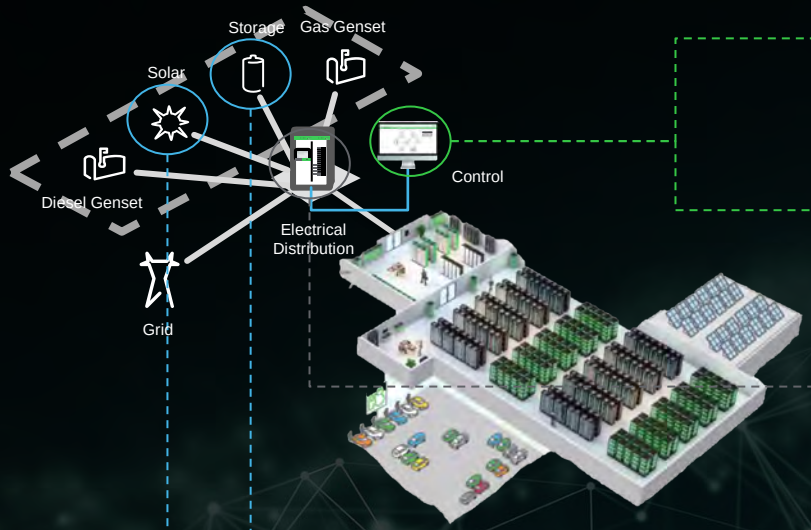
Applied for microgrid



EMS Energy Management System

EcoStruxure Microgrid Advisor

Forecast and Optimize when to consume, produce, Store, or Sell Energy

PMS Power Management System

EcoStruxure Microgrid Operation

Ensure stability and safety of energy supply in all grid conditions

ED Electrical Distribution

Power Meter, Circuit Breaker, LV panel, MV etc.

Core offers of SE, ensure easy integration and management of DER

DER Distributed Energy Resources

BESS, PV inverter, BMS, UPS

Build your microgrid with core DER

Services

DER sizing

Power System Engineering

Financing through EaaS

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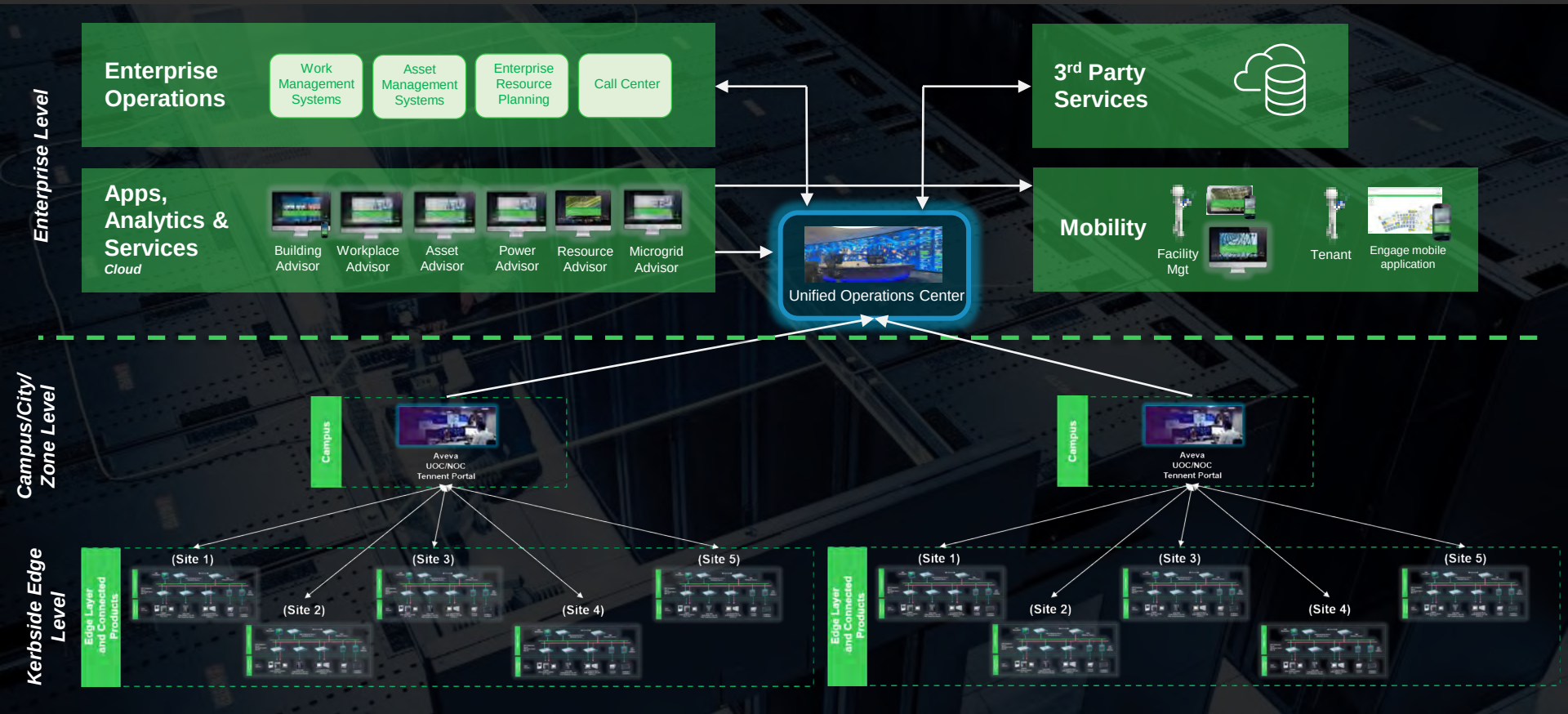
ESX + UOC integrated high level architecture

EcoStruxure™
Innovation At Every Level



Your benefits

We provide unique set of **Technologies and Services** that maximize the **Outcomes** from Energy resources and **de-risk** Microgrid Projects

World Wide Support for our Customers and Partners

Global, Regional, Country Organisation

Global Teams	Regional Teams	Country Team
Expertise & Strategy	Specialisation & Coordination	Holistic & Local
Segment team • Account executives • Program Managers • Global Solution Architects	Regional Application Centers	Local Execution Centers
Competency Center • DC Offer Expertise • DC Offer Solution Architects •Cumulus • R&D Support & Integration	Centres of Competence	Advanced and Field Services
	Regional •Solution Architects •Account Executives *•EcoSystem Partner Account Directors* *•Regional & Global engagement & alignment*	Local DC offer expertise
		Generalist Account Manager

Schneider has been committed to sustainability for 15 years.

… and in 2021, Schneider Electric™ was named **the most sustainable company in the world … and we're not done yet!**

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