



An Introduction to Decarbonizing

Delivered by:
Schneider (Thailand)

Mongkhon TANGSIRIWIT

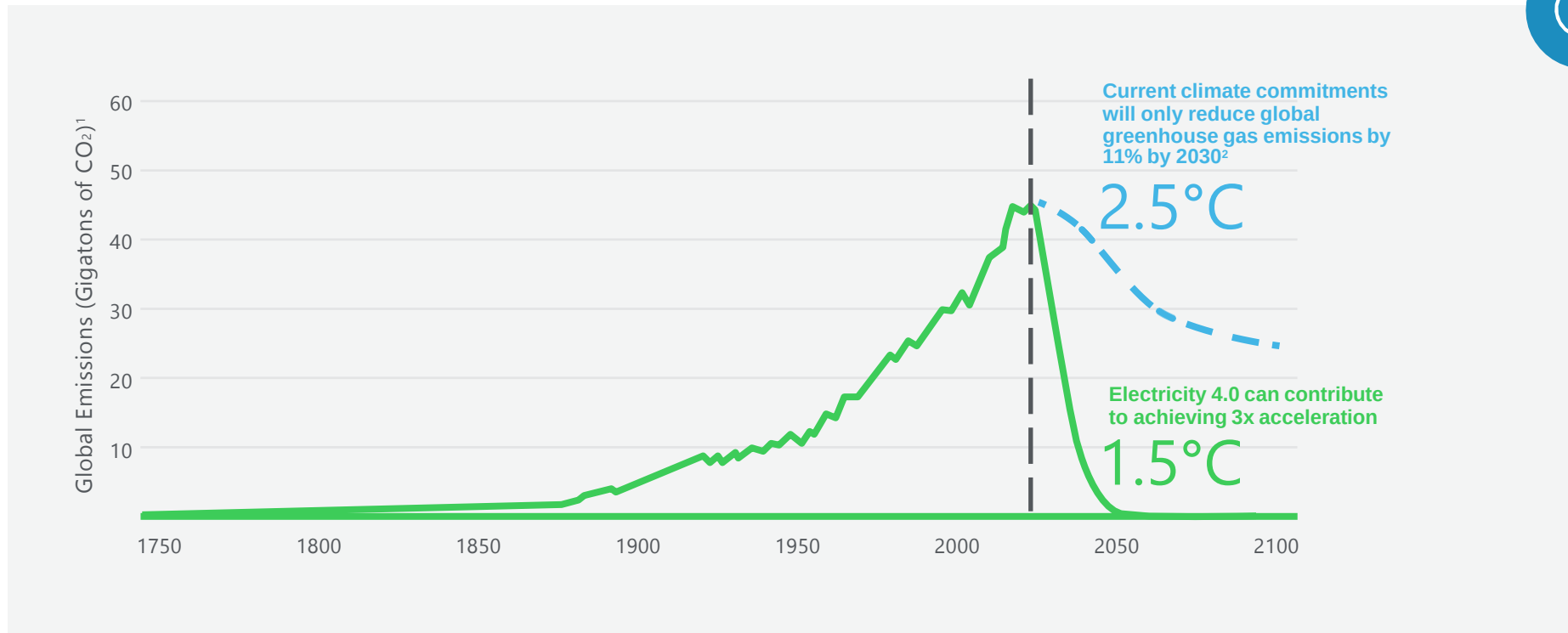
Business Vice President Strategic Accounts

Life Is On

Schneider
Electric

Decarbonization Progress is Being Made...

But we need to go **3x faster**



The Intergovernmental Panel on Climate Change (IPCC) warns that we must limit human-caused global warming to 1.5°C or risk catastrophic planetary impacts. Impacts already being felt today will dramatically increase without immediate and substantial emissions reductions.

Electricity 4.0 is a combination of **digital** and **electric**. Digital for efficiency - and electric for decarbonization. The combination of both is what makes energy **green** and **smart**, creating a more sustainable world.

¹ Global Carbon Budget (2019); IPCC (2020), ETC, [Making clean electrification possible](#) (2021), Schneider Electric Research Institute, Note: View includes industry process emissions, changes in land uses, such as deforestation

² [International Monetary Fund](#)

Decarbonization is Growing in Importance to Our Customers

Net-zero commitments continue to rise, increasing pressure to act

140+

countries have proposed or committed to net-zero carbon emissions by 2050¹

63%

of Global Fortune 500 companies have emissions reduction targets²

96%

of companies with approved SBTi targets include Scope 3³

50%

of today's building stock will still be in use in 2050⁴

37%

buildings contribution to global GHG emissions⁴

¹ International Monetary Fund

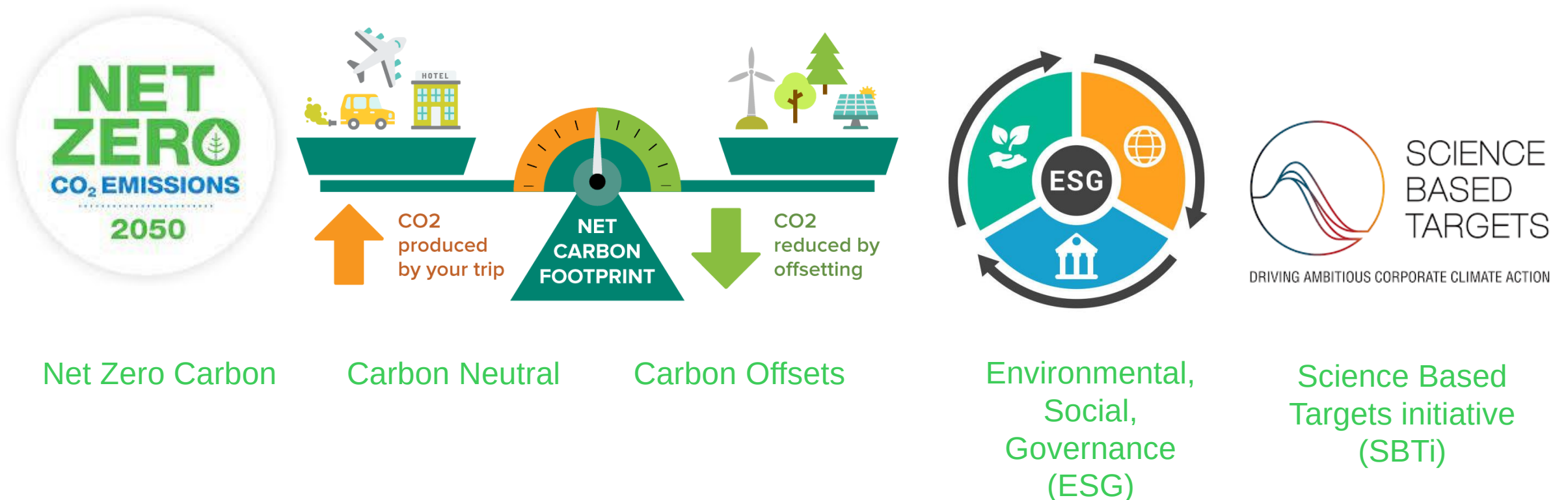
² Fortune

³ SBTi, Annual Progress Report, v 1.2 June 2022

⁴ IEA Energy Technology Perspectives, Note: When both the construction and use phases are taken into consideration, it contributes around 37% of today's global CO₂ emissions

Decarbonization Defined

Take the time to learn the basic language and feel confident explaining the key definitions to your customers



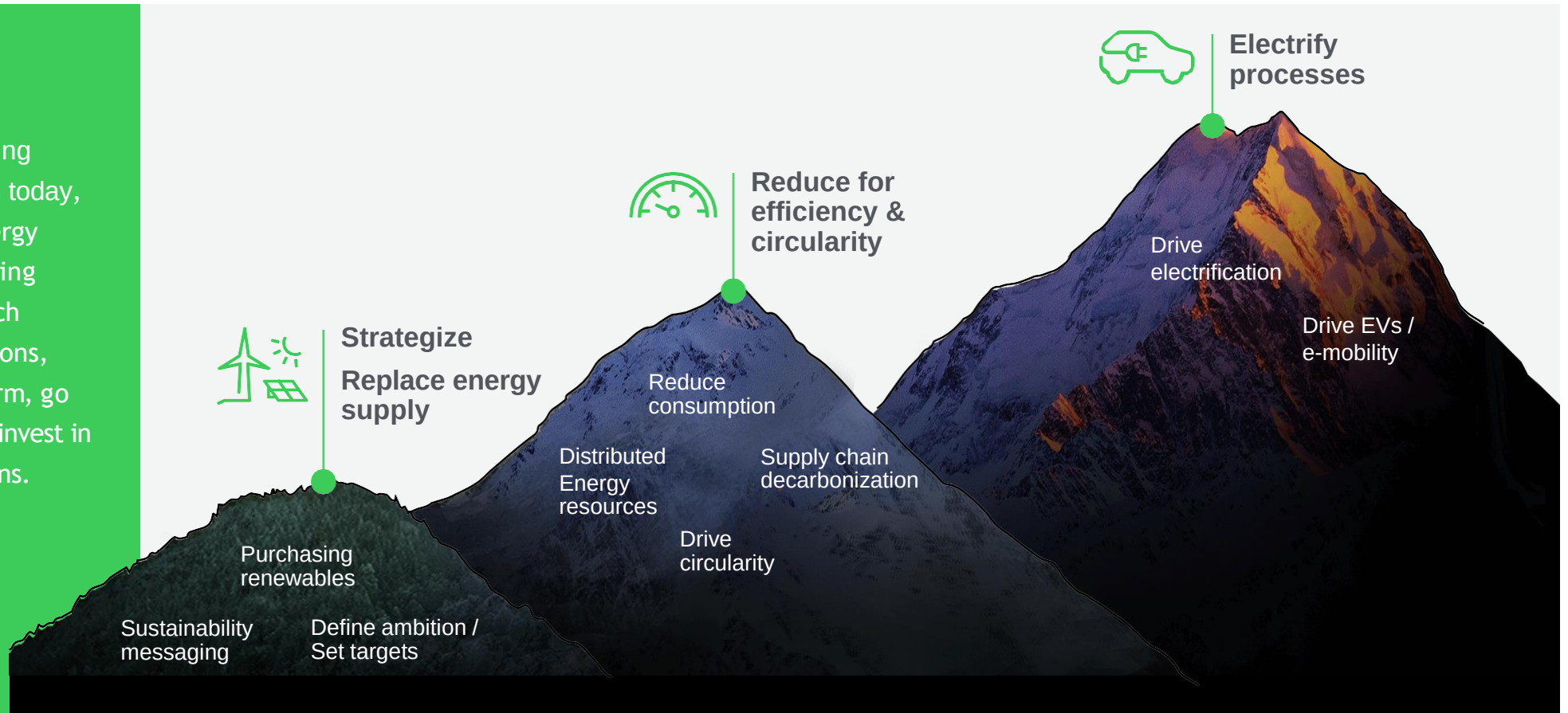
Decarbonization Defined

Take the time to learn the basic language and feel confident explaining the key definitions to your customers

Key Words	Definition
Net-Zero Carbon	Net-Zero carbon buildings achieve zero operational and embodied greenhouse gas emissions over their life cycle, using carbon offsets as necessary.
Carbon Neutral	Carbon Neutral generally means reaching zero operational GHG emissions (converted to CO ₂ equivalents) without any limit on how much is accomplished through purchasing carbon offsets.
Carbon Offsets	Carbon Offsets , or Carbon credits, are measurable, verifiable emission reductions from certified climate action projects that reduce, remove or avoid GHG emissions. Companies often purchase carbon offsets voluntarily as a means to compensate for the residual emissions remaining after carbon reduction efforts to help reach carbon neutrality commitments or emission reduction targets. Typical carbon offset measures include technology-based solutions such as renewable energy, carbon removal, or carbon capture and storage, and nature-based solutions such as reforestation, regenerative agriculture, and ecosystem conservation.
Environmental, Social, Governance (ESG)	ESG covers 3 dimensions of Sustainability: Environment, Social and Governance. Carbon emissions primarily relate to the environment.
Science Based Targets initiative (SBTi)	SBTi is a global initiative (https://sciencebasedtargets.org/) that mobilizes the private sector to take the lead on urgent climate action. It groups, on a voluntary basis, the companies with ambitious corporate climate change commitments fully aligned to the latest climate science (targets max 1.5°C increase scenario and net-zero carbon by 2050). More and more companies (such as Schneider Electric) are committing to set SBTs and submitting targets to SBTi for independent assessment and approval.

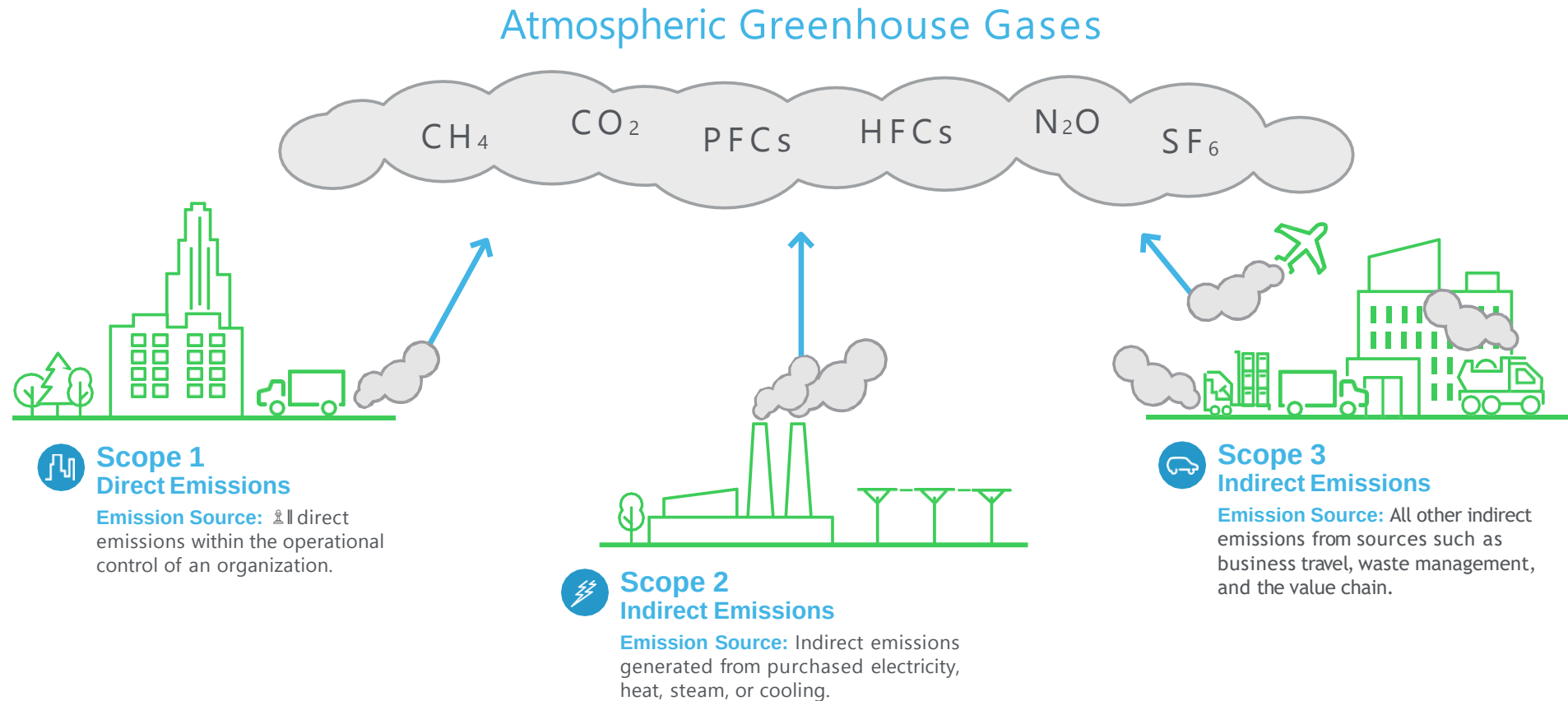
What Decarbonization Activities are Customers Pursuing Most Today?

Customers are taking steps to deliver results today, such as improving energy efficiency and purchasing renewables, but to reach net-zero carbon emissions, they must think long-term, go beyond efficiency and invest in next-generation solutions.



Based on 2022 CXO ESG Report, Out of 539 respondents

What are Scope 1, 2, and 3 Emissions?

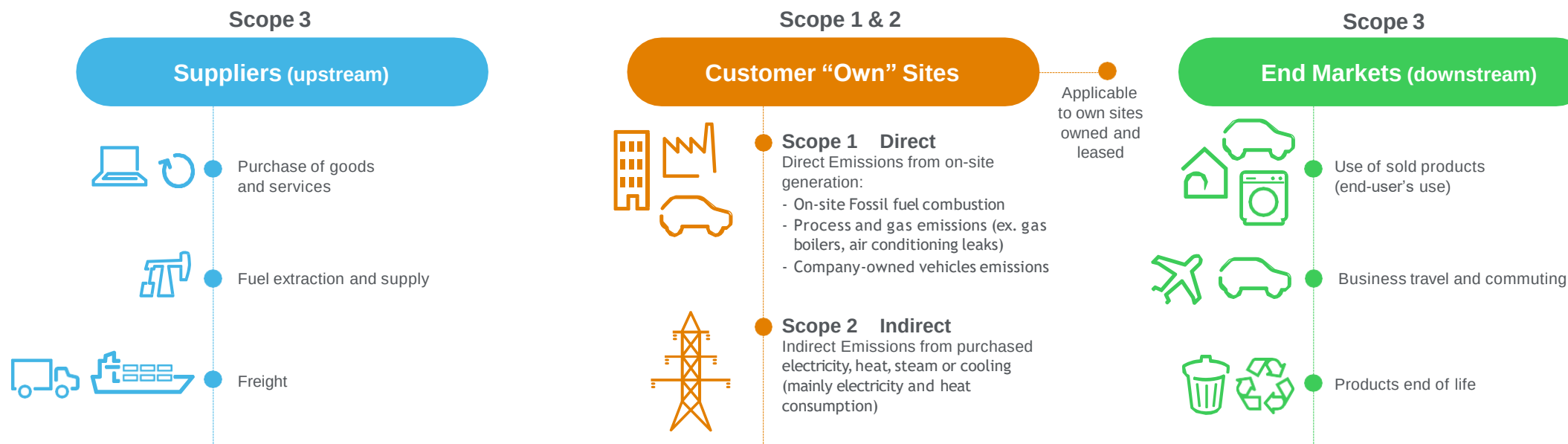


Schneider Helps Reduce the Carbon Footprint of Our Customers

Scope 1: EcoStruxure solutions designed to reduce energy consumption & to electrify the load

Scope 2: Implementation of Green Power Purchase Agreement (PPA) and on-site power generation

Scope 3: Our Green Premium products, circularity strategy offers, and supply chain PPA aggregation services





Key Priorities for Net-Zero Buildings



Key Priorities for Net-Zero Buildings

Strategize

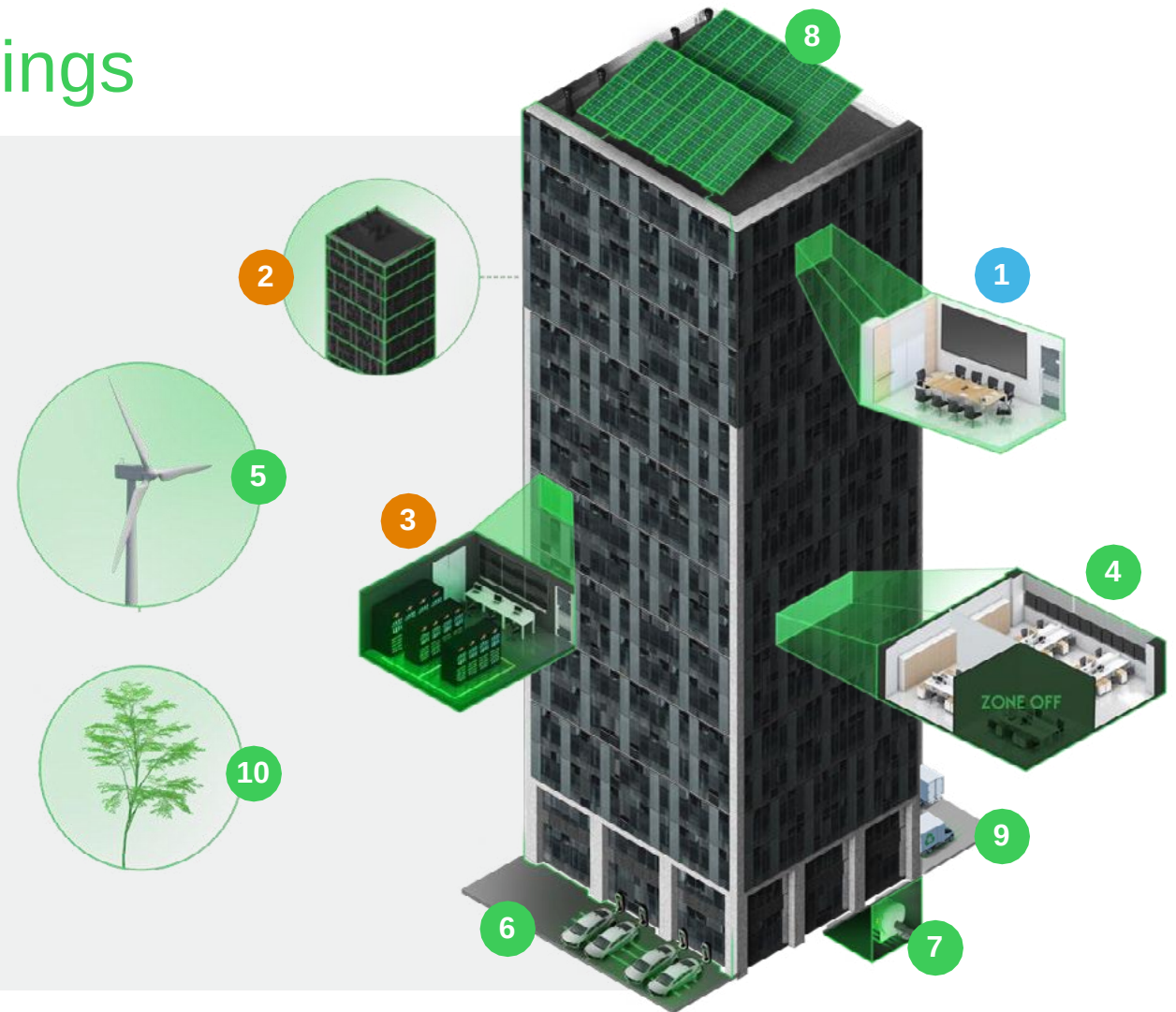
- 1 Create decarbonization roadmap

Digitize

- 2 Track embodied carbon
- 3 Measure and monitor energy and carbon

Decarbonize

- 4 Reduce energy and carbon
- 5 Purchase offsite renewables
- 6 Electrify transportation
- 7 Upgrade building electrical infrastructure
- 8 Install onsite renewables
- 9 Limit embodied carbon
- 10 Offset residual carbon emissions





Digitize Solutions





Centralize, Analyze, and Report on Energy and Carbon Data

EcoStruxure Resource Advisor

Unlock the power of global carbon data and transform intelligence into action

EcoStruxure Resource Advisor is your one source of truth for energy, emissions, and sustainability data. It allows you to:

- Utilize a best-in-class carbon management reporting platform and fully maintained emissions library
- Manage the complexity of enterprise data integration from many sources, locations, and stakeholders and ensure data integrity
- Rank & benchmark facilities to identify improvement opportunities
- Track projects and their ROI to facilitate decisions and action
- Track and report enterprise sustainability data (energy, carbon, water, waste, supply chain and more)



60k+
Users
across 140+
countries



250k+
Sites
managed
globally



128M
Metric tons
of CO₂
managed



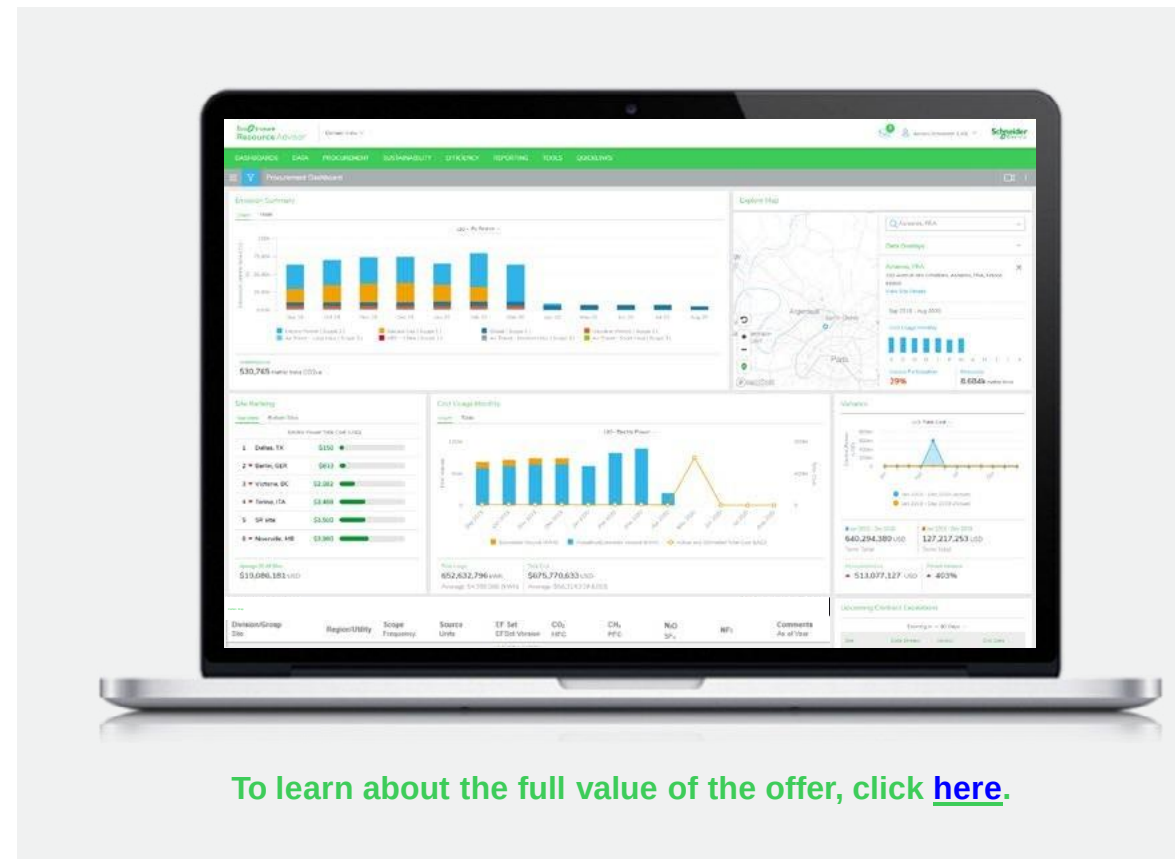
€30B
Energy spend
managed
globally



70k
Tariffs



4bn
Data
points



To learn about the full value of the offer, click [here](#).



Gain Energy and Carbon Insights

EcoStruxure Power Advisor for large and critical facilities

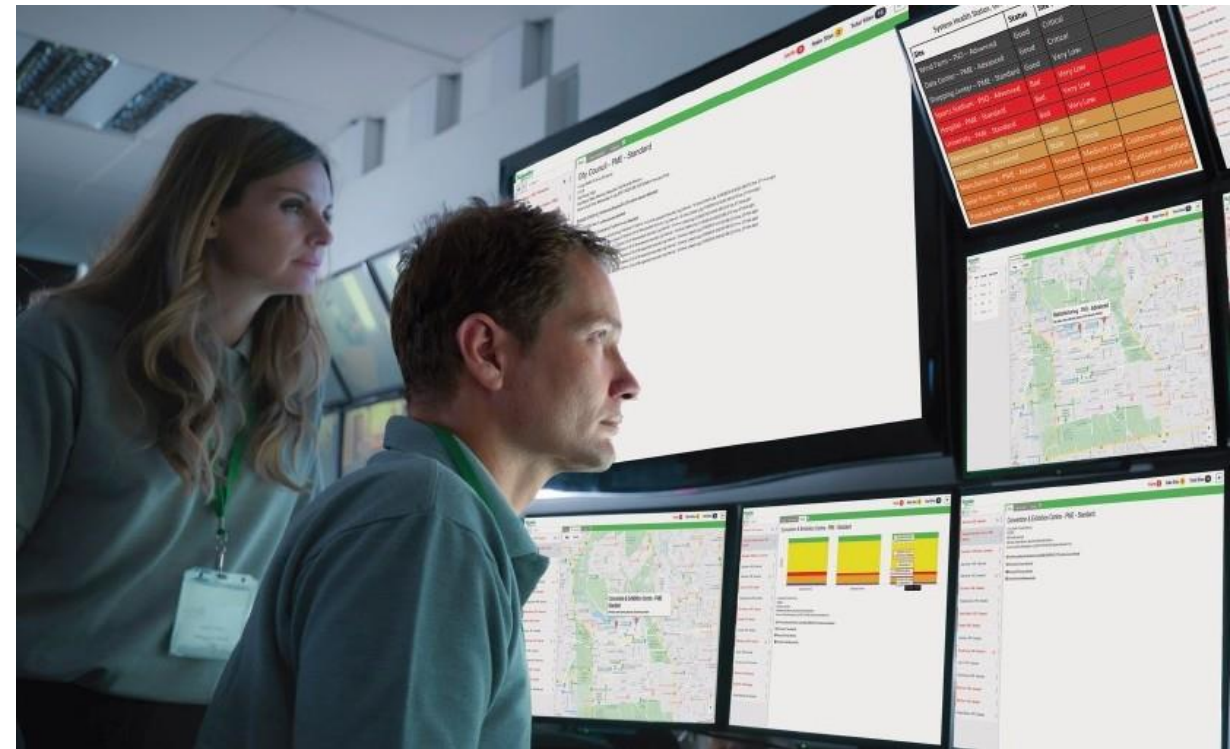
EcoCare Service Memberships delivered with **EcoStruxure Power Advisor** to optimize your power system performance

Decarbonization benefits include:

- Proactive, analytics-based service, delivering optimized power system performance based on applying diagnostics to Power Monitoring Expert metering data
- Expert analysis of power and energy data to identify opportunities for increased energy efficiency and carbon savings

Co-benefits include:

- Improve power reliability and safety for your power management and distribution system
- Identify power quality issues and root causes within your electrical distribution system
- Ensure your system - your meters, power quality mitigation equipment, and power monitoring software - is functioning properly so your operations run smoothly, minimizing unexpected downtime
- Notify site staff of system issues and concerns before they become critical



To learn about the full value of the offer, click [here](#).



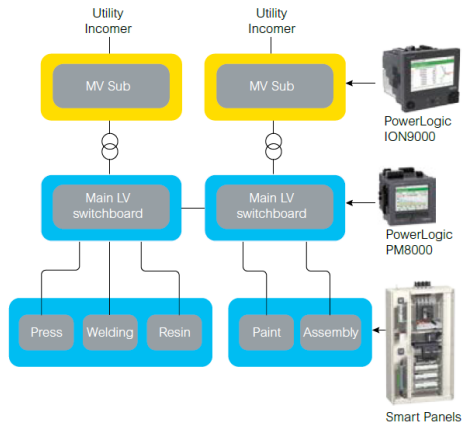
Decarbonization Solutions





Energy Management System by Schneider

1. Installation

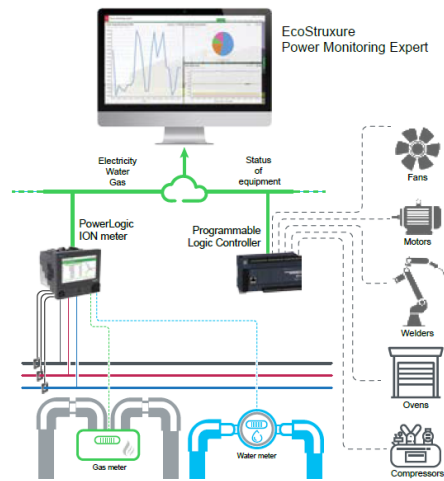


ION9000 meters to monitor the incoming utility power

PM8000 meters to monitor the primary LV feeders

Smart electrical panels with embedded metering

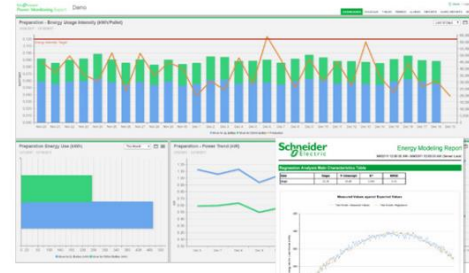
2. Connected



Meter collect information about water and natural gas usage

PLC collect information about the real-time status of equipment

3. Configured



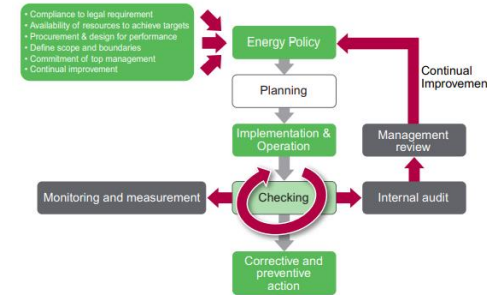
KPI report

Energy Modeling report

Energy Performance Indicator (EnPI)

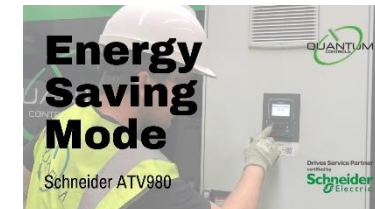


4. Action



Adjusted operation of specific equipment

Fine-tuned process automation



Investments buy efficient machine

5. Results

12% reduced energy costs in 15 months

Success Case

5 GWh CO₂ reduction in one year

Energy Management System and establish policies and procedures to improve energy efficiency

Operational changes and continuous improvement actions for energy reduction



Reduce Energy and Carbon Emissions

EcoStruxure Power Monitoring Expert for large and critical facilities

EcoStruxure Power Monitoring Expert gives insight into electrical system health and energy efficiency so you can make informed decisions to improve performance

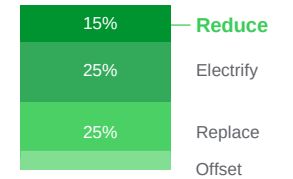
Decarbonization benefits include:

- Perform energy usage analyses to identify abnormal energy usage and reveal opportunities for energy and carbon savings
- Certified ISO Energy Data Management System for structured approach to energy management and performance verification

Co-benefits include:

- Maximize operational efficiency with a digitized power network
- Maximize uptime and improve reliability with advanced power quality analysis to ensure reliable network operation, equipment performance and reduced network outages

Operational Carbon



To learn about the full value of the offers, explore these links:

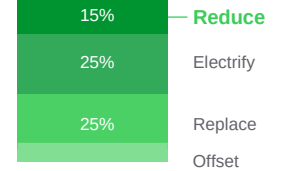
[EcoStruxure Power Monitoring Expert Web](#) and
[EcoStruxure Power Monitoring Expert Video](#).



Reduce Energy and Carbon Emissions

Building management solutions for efficient building operations

Operational Carbon



Create the foundation for a modern digital building with **EcoStruxure Building Operation**

Decarbonization benefits include:

- Use advanced scheduling and energy conservation control sequences for equipment and systems
- Use alarms and event management to keep equipment and performance within desired parameters
- Leverage trend-logs, historical data, and visualizations to uncover savings opportunities
- Integrate with key decarbonization infrastructure to create a single pane of glass across power monitoring, on-site generation, EV charging, peak demand programs

Co-benefits include:

- Optimize occupant experience with tighter control of assets for improved comfort and indoor environment quality
- Enable LEED, WELL, BREEAM and other certifications



To learn about the full value of the offer, click [here](#).



Reduce Energy and Carbon Emissions

Space management solutions for carbon savings and occupant experience

Planon Workplace Insights and **Connected Room Solutions** with Space Logics sensors provide a suite of connected, IoT-enabled controllers, devices, and software

Decarbonization benefits include:

- Fine tune system performance based on occupant and space needs to drive better occupant experience and energy and carbon savings
- Implement demand driven temperature and ventilation control schemes based on real-time data to deliver energy and carbon savings

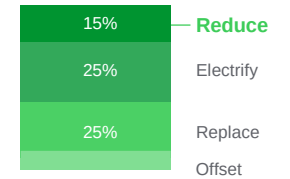
Co-benefits include:

- Maximize space utilization using anonymous people counting & occupancy monitoring and analytics
- Enable building certifications such as LEED and WELL

Planon Workplace Insights provides a software layer for added decarbonization benefits:

- Continuously optimize performance through automated WO management to turn Building Advisor insights into action
- Utilize space demand forecasts to drive maintenance savings and portfolio optimization decisions, and reduce the associated carbon footprint

Operational Carbon



To learn about the full value of the offers, explore these links:
[Planon Workplace Insights](#) and [Connected Room Solutions](#).



Electrify Transportation

EcoStruxure for eMobility

Building owners need to prepare for an increase of up to 45% electricity consumption due to EV charging demand. **EcoStruxure for eMobility** helps commercial and industrial buildings meet this demand and stay on their path to a net-zero future

Decarbonization benefits include:

- On-premise load management that dynamically distributes real-time available power in the building to charge EVs, avoiding peak hours and integrating renewable energy via **EcoStruxure EV Charging Expert**
- Remotely monitor and control the EV charging infrastructure to maximize efficiency and minimize the building's energy bill with advanced analytics through **EcoStruxure EV Advisor**
- Efficient operations enabled through **EVlink Pro AC**, a reliable, sustainable, and smart charger

Co-benefits include:

- Attract tenants and enhance tenant satisfaction with EV charging amenities
- Avoid costly electrical infrastructure upgrades by managing EV power demand to not exceed building power capacity
- End-to-end connected solution that is easy to install through a robust installer network – **Qmerit**

Operational Carbon

15%	Reduce
25%	Electrify
25%	Replace
5%	Offset



To learn about the full value of the offer, click [here](#).



Electrify and Upgrade Building Infrastructure

Hardware to enable electrification and improve efficiency

Schneider Electric offers a wide range of electrical distribution products to help improve energy efficiency and reduce greenhouse gas emissions, a sample of these solutions include:

- **Easy Altivar 610 VSDs** specially designed for better control of pump and fan building applications to reduce energy waste and the associated carbon
- **SM AirSeT** is a range of SF6 gas-free modular air-insulated switchgear that uses pure air to eliminate fugitive emissions of SF6, a potent greenhouse gas
- The **Galaxy Uninterrupted Power Supply (UPS)** delivers up to 97% efficiency in double conversion mode and up to 99% in EConversion mode, equivalent to 66% energy and carbon savings*
- The **PowerLogic AccuSine EVC+** provides power factor correction, phase balancing, and harmonic mitigation, ideal for modern electrical networks with fast-changing loads, multiple digital loads, and distributed power sources

*Compared to legacy 94% efficiency standard UPS

Operational Carbon

15%	Reduce
25%	Electrify
25%	Replace
5%	Offset



Galaxy UPS



Altivar VSDs



AccuSine
EVC Plus



SM AirSeT



Electrify and Upgrade Building Infrastructure

Advanced electrical design software

Leverage BIM-based electrical design solutions with tools like **BIM Electric** and **ETAP**

Decarbonization benefits include:

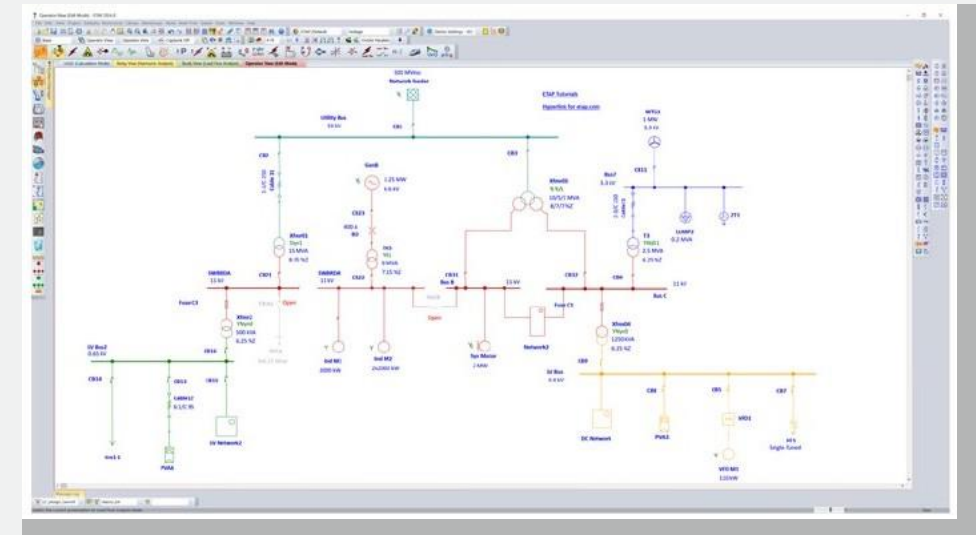
- Reduce energy-related carbon emissions through accurate sizing and optimized electrical systems designs

Co-benefits include:

- Enable high performance building design by leveraging modern workflows, unlocking efficiencies and optimizing designs to reduce waste
- Simplify microgrid and electrical system design with renewable energy modeling including solar, wind, energy storage & control devices from design to operations
- Leverage ETAP Load and Generation Forecasting to predict data center load demand and generation availability to participate in energy arbitrage

Operational Carbon

15%	Reduce
25%	Electrify
25%	Replace
5%	Offset



To learn about the full value of the offers, explore these links:
[ETAP](#) and [BIM Electric](#).



Replace Energy Sources with Renewables

Onsite renewable energy and storage solutions

Schneider Electric offers a wide-range of onsite renewable energy solutions including advisory services and the Zeigo Network, as well as the design, installation, and operation of microgrid solutions

Decarbonization benefits include:

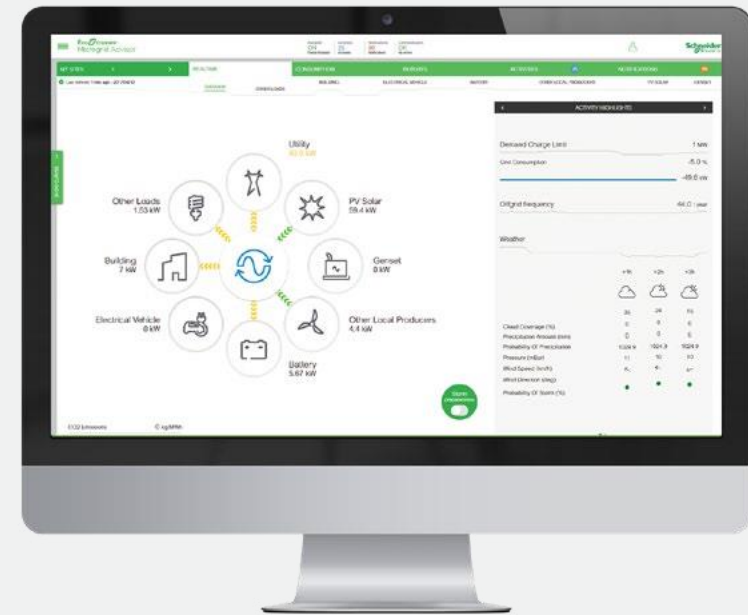
- Provide operational carbon-free electricity to the building
- Intelligently operate between grid consumption, storage, and on-site generation with the ability to manage peak loads and optimize for lowest energy cost and maximize usage of on-site renewables
- Help accelerate grid decarbonization by reducing peak loads and the associated carbon emissions

Co-benefits include:

- Provides local and resilient power sources with the ability to island from the grid
- On-site generation with optimization management provides future-proofing for volatile energy prices

Operational Carbon

15%	Reduce
25%	Electrify
25%	Replace
5%	Offset



To learn about the full value of the offers, explore these links:
[Microgrids](#) and [Ziego Network](#).



Limit Embodied Carbon

Extend equipment life through better life-cycle maintenance

EcoCare Service Memberships using experts from the Connected Service Hub and technology insights from **EcoStruxure Asset Advisor** can extend equipment life through condition-based maintenance, delaying equipment replacement and avoiding the associated embodied carbon emissions

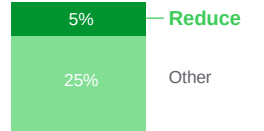
Decarbonization benefits include:

- Proactive approach to electrical distribution and critical data center asset maintenance, combining IoT and cloud-based technologies with Schneider Electric's experts, technology, and services to manage equipment health
- Prevent performance degradation with predictive maintenance service specialists to avoid increased energy consumption and the associated carbon

Co-benefits include:

- Anticipate and address issues before they become critical incidents and expensive maintenance interventions
- Mitigate safety risks, and help to avoid unplanned downtime, operational losses

Embodied Carbon



To learn about the full value of the offers, explore these links:
[EcoStruxure Asset Advisor](#) and [EcoCare](#).



Limit Embodied Carbon

Green Premium products

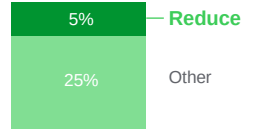
The **Green Premium™** label is Schneider Electric's answer to help you reduce your energy and carbon footprints, optimize the total cost of ownership of your assets through IoT solutions and circular services, and better protect people from chemical substance risks.

Today, more than 75% of Schneider's product sales come from Green Premium offers that provide superior transparency and environmental stewardship, with ~300 Environmental Product Declarations (EPDs) published on the PEP Ecopassport Database.

Schneider Electric products receive the Green Premium label by meeting a number of pre-defined conditions:

- Compliance with the most ambitious standards globally
- Superior sustainability performance that goes beyond compliance, across resource use, circularity, and well-being
- Validation by leading third-party labels and building certifications

Embodied Carbon





Delivered by:

Digital Energy
Decarbonization Office