

A woman in a black dress is standing on a balcony of a modern glass building, looking at a tablet. The building has large glass windows reflecting the sky and trees. The background shows a lush green landscape with trees and a cloudy sky.

# Build it for Zero Carbon: A Roadmap to Realizing Decarbonization of Buildings

⦿ *An executive guide on achieving a zero carbon future*

Life Is On

**Schneider**  
Electric

Explore Sustainability in Buildings

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# Introduction

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The science is clear. So is the strategy.

Over 120 countries are now committing to Net Zero 2050 goals. It is no longer a “nice to have” but a “must-have” in order to remain compliant and competitive. In its 2020 Survey of Sustainability Reporting, KPMG found that 80% of companies worldwide now report on sustainability.<sup>1</sup>

During that time, Schneider Electric™ established itself as a leading expert in sustainability and decarbonization. We ourselves are recognized for our best practices in sustainability, earning the #1 position from Corporate Knights in 2021. We're also a clean energy leader: We're the #1 largest corporate consultant on renewable energy purchasing, with 60% market share in the U.S., the most active market to-date, and have advised on large-scale renewable energy contracts in 8 countries across 4 continents. We're also the #1 builder of microgrids in the world, with over 300 successful projects in North America alone. We were recognized for our efforts in 2020 when we earned The Climate Group's inaugural Clean Energy Trailblazer award. We've not only accelerated our own carbon neutrality goal by five years to a 2025 target, we've also helped thousands of companies on their own decarbonization journeys.

As a company, we have committed to be carbon neutral by 2025 and net zero in our operations by 2030, far surpassing the traditional 2050 target. We believe Buildings of the Future need to be sustainable, resilient, hyper-efficient, and people-centric. But there's no need to wait, the technology is available today.

This paper lays out our holistic, replicable strategy for organizational decarbonization. Our decades of experience in energy and sustainability consulting and technology spans across the realms of global commerce. It's this expertise that informs the four-stage process explored in this paper. With this proven roadmap, organizations of all kinds can define, set, deploy, and sustain decarbonization programs.

# #1

**most sustainable  
company in 2021** from  
Corporate Knights

# 60%

**U.S. market share of  
corporate renewable  
energy advisory services**

# #1

**builder of microgrids  
in the world**

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<sup>1</sup> KPMG Impact, "[The time has come, The KPMG Survey of Sustainability Reporting](#)", December 2020





# The need for rapid decarbonization

Buildings consume 30% of the world’s energy and are responsible for 40% of CO2 emissions. If we can collectively work together toward net-zero 2030 targets, then the trajectory of the temperature rise will stay within 1.5%, helping us to avoid a host of climate-change related impacts.

Once relegated to the domain of environmentalists, today, climate change is a top concern among business and government leaders. There’s also a growing recognition of the intersection between climate action and social justice. BIPOC (Black, Indigenous, and People of Color), low-income, and traditionally under-resourced and underrepresented communities have historically borne a greater burden from these impacts.

And although many of climate change’s impacts are already felt today, its severity will increase dramatically over the coming years without immediate and substantial emissions reductions.<sup>2</sup>

<sup>2</sup> Intergovernmental Panel on Climate Change, “[Special Report: Global Warming of 1.5 °C.](#)”



## CLIMATE CHANGE IMPACTS

The impacts of a warming planet include, but are not limited to:

- Increasingly chaotic and intense weather events resulting from rising water and land surface temperatures
- Increased drought, affecting food production, water security, and producing conditions that escalate wildfires, floods, conflict, and human migration
- Rising sea levels that can cause nuisance flooding and erode existing coastlines, and that are an existential threat to communities in low-lying areas and island nations
- Extended warm seasons which enable the propagation of allergens, mosquitos and other insects, and disease
- Acidification of the oceans, which results in loss of marine biodiversity, increased algae blooms and, eventually, loss of sea-based livelihoods





# Why organizations can and must act now

Much like the pandemic, climate change will increasingly pose challenges to business as usual. Organizations are not only threatened by environmental risks—wildfire-caused property damage, flooding, and disruption to natural resource availability—there are also organizational impacts, with threats to brand reputations, business models, and, ultimately, bottom lines.<sup>3</sup>

The COVID-19 pandemic has given us all a taste of how disruptive a global crisis can be; yet the impacts of climate change are anticipated to be even greater.<sup>4</sup> It therefore behooves organizations to take a proactive and rapid approach to decarbonizing their operations and supply chains in order to build resilience against these risks.

The approach we describe in this report helps organizations achieve the full spectrum of decarbonization's benefits. Decarbonization is not only about limiting GHG emissions and conserving natural resources; it's increasingly just good business.

Through our work, we've seen how decarbonization helps organizations:

- Conserve resources and boost bottom lines
- Satisfy investors and other key stakeholders
- Ignite innovation and technological progress
- Stimulate organizational growth
- Grow industry influence, reputation, and brand
- Hire and retain top talent
- Boost building valuation and rent rates
- Remain competitive by attracting tenants



In the EU, the transition to a low-carbon economy is estimated to create **1.2 million additional jobs by 2030.**<sup>5</sup>

Decarbonization via mass electrification could create as many as **25 million jobs by 2035, in the US alone**<sup>6</sup>

<sup>3</sup> Consider Pacific Gas & Electric (PG&E) Company, the utility held legally responsible for California's deadliest wildfires, in which 129 people lost their lives. The company has been fined multiple billions of dollars and declared bankruptcy in June 2020.

<sup>4</sup> International Federation of Red Cross and Red Crescent Societies, "2020 World Disaster Report."

<sup>5</sup> European Commission, "Employment and Social Developments in Europe", 2019

<sup>6</sup> Rewiring America, "Mobilizing for a Zero-Carbon America."



# Gaining momentum toward a low-carbon future

Increasingly, institutional investors, boards, and leaders see the value in decarbonization. Pressure is mounting for organizations to respond. A few examples:

- Institutional investors ranging from BlackRock to Blackstone are beginning to mandate sustainability as a method of managing climate risk.
- Activity in the investor space has led to growing strength in environment, society, and governance (ESG) indices, which have outperformed other asset classes during the COVID-19 pandemic.<sup>7</sup>
- Today, 191 countries and the European Union have committed to the Paris Agreement and its guidelines to substantially reduce global greenhouse emissions and contain the temperature rise to 1.5 degrees Celcius.<sup>8</sup>
- The European Commission, the European Parliament and EU leaders have agreed on a groundbreaking COVID-19 recovery plan, which includes €750 billion in funds aimed at catalyzing a sustainable, resilient recovery in Europe.
- CEOs from the world's largest economies, including China, India, U.S. Brazil, Italy, Japan, and Germany believe that climate action will lead to new product and service opportunities.<sup>9</sup>

Despite this momentum, organizations have still been slow to act on climate change and decarbonization. As of early 2020, only 23% of the Fortune 500 had set meaningful commitments to carbon neutrality, climate action, or both.<sup>10</sup> Progress in European-headquartered Fortune Global 500 companies has been slightly more promising, with 42% taking action or publicly committed.<sup>11</sup>

We must do better, but to do so, we must first understand the roadblocks.

Most organizations already understand **why** decarbonization is important. The key is to help them understand **how** to move from ambition to action.

<sup>7</sup> S&P Global, "ESG funds outperform S&P 500 amid COVID-19, helped by tech stock boom."

<sup>8</sup> United Nations, <https://www.un.org/en/climatechange/paris-agreement>

<sup>9</sup> PwC, "Australia's CEOs on climate change: How it impacts business"

<sup>10</sup> Fast Company, "What will it take for the 75% of companies that don't have climate commitments to step up?"

<sup>11</sup> Natural Capital Partners, "Deeds Not Words: The Growth of Climate Action in the Corporate World", September 2019





# A trusted partner on your decarbonization journey

Schneider Electric offers a comprehensive, step-by-step approach to deliver net-zero buildings – from strategy and implementation, to operation, optimization, and green building certification. With our services, software, and solutions, organizations can increase building valuation, exceed investor and consumer expectations, and meet net-zero targets, all while contributing to a healthier planet for us all. Our four-stage, holistic, and iterative process described in this paper can help any organization to progressively move towards their ambitions.



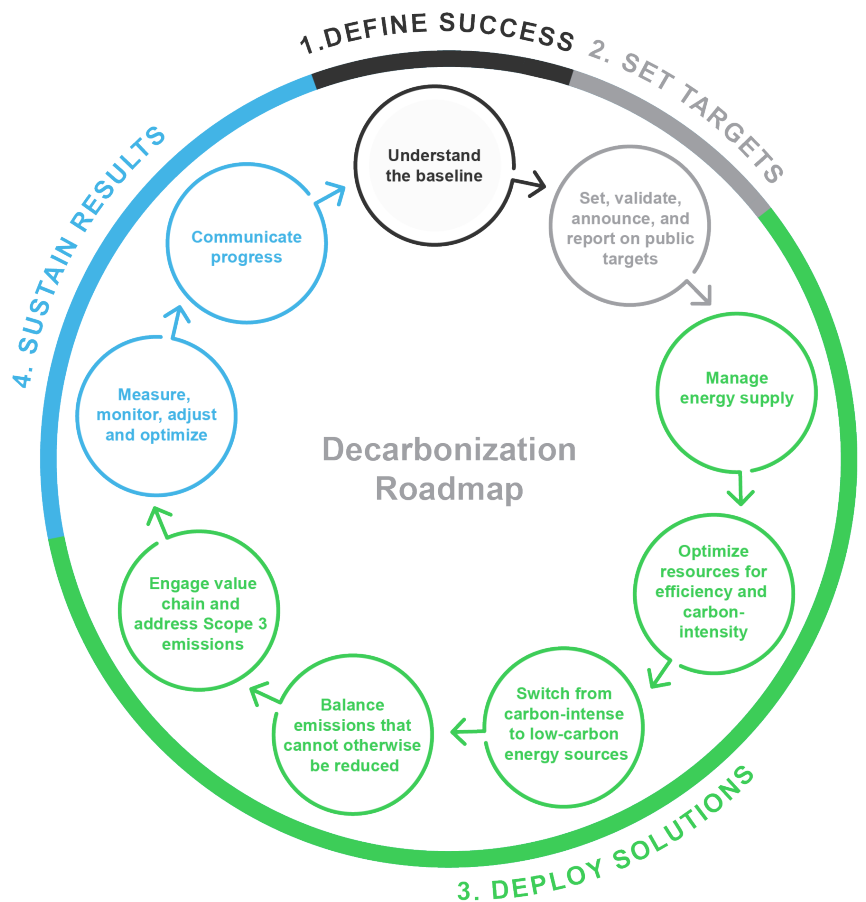


# The decarbonization roadmap: a four-stage process

Decarbonization takes a relatively straightforward path. That’s not to say it’s easy; each step in the path can pose significant challenges and requires technological, financial, organizational, and governance capacity. Fortunately, new solutions and financing models make decarbonized technologies more accessible, effective, and affordable than ever.

It’s important to note that the steps can happen in parallel at any given point, and are, by nature, iterative. Fluctuations in organizational resource demands can result in changes that impact decarbonization goals and timelines; the pathway isn’t linear, it’s circular. There are always greater steps organizations can take to help themselves or others become more efficient or decarbonized.<sup>12</sup>

Whether you are setting portfolio level targets, designing a new building, or looking for sustainable retrofit opportunities, the steps you take remain the same. Let us help you along the way.



## TIGHT BUDGETS? NO WORRIES.

With the Energy as a Service financing model, organizations can purchase clean energy microgrids for zero upfront costs. We work with our partners to finance, build, operate, and maintain microgrids, and we charge clients a fixed monthly rate for green, resilient energy.

<sup>12</sup> For example, the Microsoft corporation, who, after committing to operational net zero, [set goals to make itself "carbon negative"](#) through the offsetting of historical emissions from its founding in 1975.





Stage

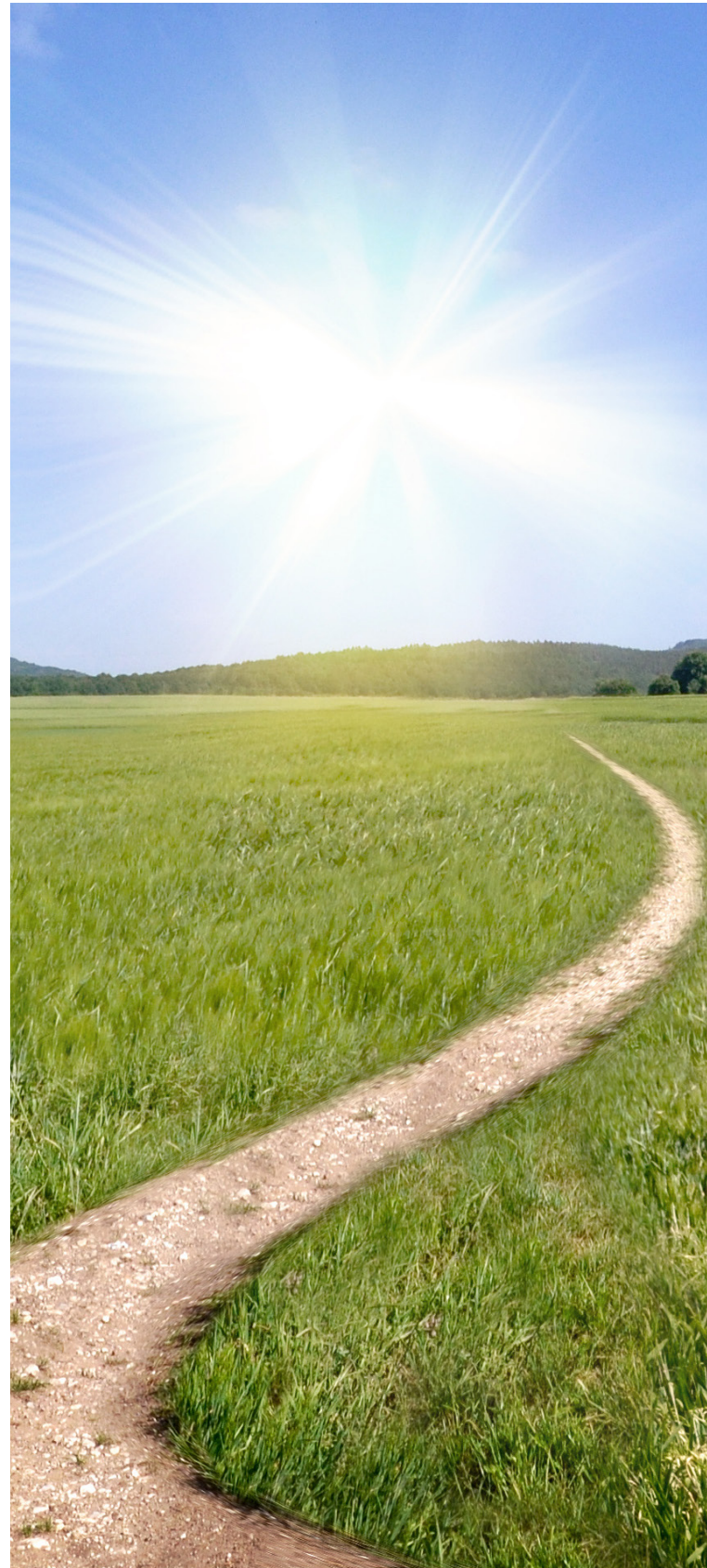
1

# Define success

The expression, “You can’t manage what you don’t measure” is as true for decarbonization as any other organizational metric. Organizations must understand, from the beginning, where they are today on the decarbonization pathway and what it is they aspire to achieve. Leaders across an organization must align on the vision and the strategy to achieve that vision. This is a foundational element to any program of change.

## How Schneider helps clients define success

- **Market intelligence and trends:** Schneider can perform in-depth market research to help organizations understand the competitive landscape of their industry and the available opportunities, anywhere in the world.
- **Benchmarking and footprint assessment:** We help organizations measure their baseline emissions and develop an understanding of the volume and type of emissions by source. Through the ongoing measurement of emissions data, we give clients a central system of record that enables a single source of reporting truth, even across thousands of sites.
- **Stakeholder engagement and journey mapping:** We work with our clients to identify and engage the right organizational stakeholders in a strategic discussion, aligning desired outcomes with the organization’s commitments.
- **Digital solutions:** EcoStruxure for Buildings offers digital solutions, from device-level connected products, to edge control software for building, power, and microgrid management, to digital services, apps, and analytics to help continually optimize throughout the lifecycle of your building.





Stage

2

## Set targets

The type of decarbonization target(s) an organization sets, and the timeline to achieve those targets, is crucial to the overall success of any decarbonization program. Although it was once in vogue to set a generic reduction target, based on either overall (i.e. absolute) emissions or the emissions profile of an organization's products or services (i.e. intensity), today, the most ambitious targets are aligned with prevailing climate science.

The Intergovernmental Panel on Climate Change (IPCC) recommendation is to limit human-caused global warming to 1.5 °C or less. Warming above this threshold has the potential to result in catastrophic planetary impacts.

Research by Schneider Electric and GreenBiz Group<sup>13</sup> has also found that it's essential for organizations to publicly announce their decarbonization and energy targets.

### Publicly-announced targets are likelier to:



Seek more ambitious reductions



Move organizations faster toward their goals



Result in greater overall confidence that the organization will achieve its goals

### How Schneider helps clients set targets

- **Analyzing risks and opportunities:** Alongside our clients, we assess and predict the potential upsides and downsides of decarbonization to help them set ambitious, yet achievable, goals.
- **Emissions roadmap development and design:** We develop and map decarbonization programs by identifying and validating target scenarios, key performance indicators, and funding opportunities.
- **Amplifying and validating public target setting:** We also partner with our clients to help them publicly announce their targets and to validate and report on their progress through leading indices, such as the Science-based Targets Initiative, SASB / TCFD / GRESB, CDP Climate Questionnaire, and the Global Reporting Initiative (GRI).

<sup>13</sup> Visit [insights.se.com](https://insights.se.com) for more information and to view the full report(s).





Stage

3

# Deploy solutions

Once an organization understands where it is and where it's going, the essential next stage is to deploy solutions that will help achieve your goals. All the analysis and ambition in the world mean nothing if they are not tied to action.

Schneider manages

# \$30B

in energy spend on behalf of our clients annually

It's in the solution deployment stage where organizations take the bulk of the decarbonization pathway steps. These steps not only reduce emissions, but they also drive resource efficiency, resiliency, and innovation, thereby boosting positive bottom-line impact.

## Optimize procurement

For most organizations, energy is one of their most significant and most volatile<sup>14</sup> operational expenses. Managing these resources proactively is essential. As the largest and most experienced global energy manager, we support our clients in procuring, managing, and balancing their energy and carbon portfolios, including:

- Global commodity risk and analytics advisory services
- Competitive sourcing of energy resources and contract management
- Tracking and supervising energy performance and billing; invoice and rebate reconciliation
- Expert knowledge of global tariffs and regulatory trends for optimizing energy procurement

## Reduce energy through digitalization and operational efficiency

Take action with integrated solutions that save money and energy, while fortifying resilience and sustainability across the lifecycle of your assets. We can help you create smart, digital, and efficient buildings with the following building and power management solutions:

### • BIM and digital twin

- Utilize a cloud-based digital twin and a linked data platform to optimize and manage property operations and manage your property portfolio's digital representation
- Leverage our partnerships with RIB, IGE\_XAO and ETAP to reduce risk management and manage time to market.
- Plan for and reduce embodied carbon
- Reduce material waste and change orders

### • Connected products that serve data up to the Cloud

- Leverage connected space controllers, meters, sensors, valves, actuators and other devices that enable data transmission from the connected equipment for greater optimization of building systems.
- Gain access to accurate and continuous electricity usage monitoring and power diagnostics across all areas of a building's electrical distribution system from incoming power to final loads.
- Reduce carbon emissions and energy consumption by defining where and when to use energy, and through improved water and energy metering, and enhanced commissioning.
- Power meters enable knowing where and when to take action to reduce energy usage and supports 20-40% energy reduction.

# 34%

average energy reduction and up to 15 points toward LEED certification from smart, connected room control solutions

<sup>14</sup> U.S. Energy Information Administration, "What is Price Volatility?"



- Edge control building and power management software
  - Leverage an open, secure, and centralized platform for real-time control and management across multiple buildings, including HVAC control, lighting control, energy & power management, and occupancy monitoring.
  - Includes HVAC control, lighting control, energy & power management, fire safety, security & access control, and workplace management systems.
- Predictive analytics and digital services for improved asset performance
  - Gain key insights into your building operations by monitoring systems and identifying faults to proactively address building inefficiencies.
  - Achieve traceability, efficiency, and resiliency with alarm and condition monitoring, tenant optimization, and site health reporting.

**0.13**  
**kWh/sq ft**  
average energy savings  
with advanced building  
analytics







**CASE STUDY**

Existing office space gets a major update to meet sustainability targets

# Technopole Office Building

Grenoble, France



**The Challenge:**

- No sustainability credentials
- Difficult to add new technology and no data visibility
- Unattractive old buildings spread over different sites.

**The Solution:**

- Achieve Net Zero Carbon operation and highest LEED certification in France
- Data driven design and build via BIM modelling and energy simulation
- Reduce sites and incorporate smart technologies to foster collaboration, improve workplace and attract talent

**The Outcome:**

- 43kWh per sqm per year (Target 45kWh)
- Platinum LEED in Operations certified (91 points)
- Platinum LEED Design Build + Construction (83 points)
- Smart grid and solar ready
- Space and meeting room management to increase safety and efficiency

*“Our 91 points LEED certification in operations rating fully confirms how Schneider Electric technologies along with collaboration with our partners can differentiate and achieve unique energy performance.”*

**Pascal Positello,**  
Site Director Technopole



### Leverage electrification to replace carbon-intensive energy

Organizations can achieve significant carbon reductions—and potential budgetary savings and stability—through fuel switching or low-carbon replacement.

**50%**

**average reduction of CO2 emissions with renewable energy generation**

This replacement can take a variety of forms, including renewable energy, alternative fuel sources, and electrification.

We're the world's leading advisor to organizations on renewable energy

purchasing.<sup>15</sup> We also walk the walk; we've committed to 100% electric fleet vehicles and 100% renewable electricity through The Climate Group's EV100 and RE100 programs. Our portfolio of electrification solutions includes:

- Renewable energy, onsite microgrid, and eMobility
  - Acquire and deploy clean and distributed technologies, including combined heat and power (CHP), renewable gas, renewable thermal heat, fuel cells, biofuels/biomass, green hydrogen, and battery storage
  - Provide tenants with EV charging and eMobility solutions including fleet electrification and Fleet as a Service
  - Proactively and efficiently manages your site's energy production including renewables and demand.
  - Protect critical loads during outages or abnormal grid conditions with onsite energy.
  - Provide energy to cover increased electricity load due to EV charging.

**20%**

**average savings on energy costs through cost predictability**

### Finance your sustainability initiatives

- AlphaStruxure, a joint venture between Schneider Electric and the Carlyle Group, that designs, builds, owns, and operates next-generation Energy as a Service systems.<sup>16</sup> These systems are for the commercial, industrial, and infrastructure sectors and backed by performance-based energy service agreements that require no upfront costs.
- GreenStruxure, a joint venture between Schneider Electric and Huck Capital, that delivers modular, standardized microgrids and Energy as a Service solutions to medium-size commercial, industrial, and governmental buildings in the U.S.

### Connect with other trusted sustainability partners and experts

- Unique in its industry, the EcoXpert™ Partner Program represents a worldwide ecosystem of more than 4K partners and solution providers – each trained and certified by Schneider Electric on our EcoStruxure™ architecture and platform. Equipped with a cross-expertise skill set that spans building & residential automation, power distribution & management, and digital services, EcoXperts have a deep understanding of the criticalities that their customers face and have the highly-sought-after knowledge to deliver best-in-class automation and digital solutions that drive efficiency and sustainability in their buildings. We are proud to say that EcoXpert partners are the implementation arms of EcoStruxure all over the world.



<sup>15</sup> To date, Schneider Electric has advised on the global procurement of more than 8.5 gigawatts of renewable electricity by non-utility organizations.

<sup>16</sup> In 2019, Schneider Electric was ranked as the #1 worldwide provider of Energy as a Service by Guidehouse (formerly Navigant Research). Guidehouse Insights, "[Guidehouse Insights Leaderboard: Energy as a Service Solutions Providers.](#)"





## CASE STUDY

New net-zero building sets the bar high for sustainability

# IntenCity Office Building

Grenoble, France

### The Challenge:

- Be the most efficient building in the world.

### The Solution:

- All electric and microgrid ready
- Green energy sources onsite: 4000m<sup>2</sup> photovoltaic, 2 wind turbines, 300kW battery storage
- Data driven design and build via BIM modelling and energy simulation
- Real-time communication supporting energy monitoring, security, flexible workspace management and occupant services

### The Outcome:

- Net-zero carbon emissions
- 37kWh per sqm per year – 10X more efficient than existing European buildings
- Platinum LEED in progress: 103 points
- 970MWh from onsite renewable energy sources – enough to power 200 homes
- Space and meeting room management to increase safety and efficiency
- Real-time occupancy-adjusted energy consumption



*“This exemplary building with a low carbon footprint showcases our ability to innovate and offer solutions in line with current environmental challenges. It is a full-scale example of what a smart and efficient building is today.”*

**Christel Heydemann,**  
EVP Europe Operations

### Balance unavoidable emissions that cannot be reduced

Despite the best technological advances to date, some emission sources do not yet have a means to achieve carbon reduction through replacement or electrification. For example, jet fuel cannot be replaced with low-carbon fuel at scale, and aviation remains a highly carbon-intensive industry. Any organizations that use air travel as part of their operations are then accountable for the emissions generated through that activity. The responsible organization must address these emissions through balancing mechanisms like carbon offsets. We provide clients with:

- Best-in-class sourcing and management of global energy attribute certificates (EACs), green electricity, and green tariffs for use by commercial, industrial, and institutional organizations, and by LEED®-certified building projects
- A global portfolio of highly-credible, verified emission reduction projects (carbon offsets) using technologies ranging from forestry to landfill gas capture and flare

### Supply and value chain initiatives

For many organizations, the largest emissions source lies within their supply and value chains—outside their direct control. Leading organizations know that true carbon neutrality can only be achieved by engaging, encouraging, and empowering their suppliers and partners to reduce emissions within their own organizational scope. We provide a variety of services to our clients to measure and reduce value chain emissions, including:

- Emission reduction programs via renewable energy procurement and electrification
- Sustainable procurement practices based on Schneider Electric's own best-in-class program
- Other value chain initiatives, including lifecycle assessments and circular business practices



We're helping Walmart empower its supply chain to avoid 1 billion—yes, billion with a “B”—tons of carbon emissions through renewable energy purchasing.



Stage

4

## Sustain results

Emission-reduction programs, once set into motion, require consistent attention to ensure they are performing as expected. Market forces, legislation, regulation, technological advancements, organizational growth or contraction, and financial changes can impact these programs.

Organizations must consistently monitor, measure, adjust, and optimize to sustain their decarbonization efforts. Doing so allows a company to communicate progress confidently to internal and external stakeholders, advancing its reputation and influencing others in its ecosystem.

### How Schneider helps clients sustain results

- **Performance tracking and analytics:** Our portfolio of EcoStruxure Advisor software monitors real-time performance of solutions and resources, allowing organizations to make optimal decarbonization and energy-related decisions
- **Operational performance services:** We track the performance of renewable and cleantech assets to ensure they're operating as expected across both energy generation and financial metrics
- **Internal and external reporting and communications:** Our reporting, marketing, and communications services enable client engagement with stakeholders and elevate and amplify organizational progress and success
- **Green building certification:** Our experts can help you understand specific areas of certification and how our solutions can help you achieve points toward LEED certification.





# The decade of decarbonization

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The United Nations has declared the period from 2020 – 2030 as the decade of action. To avoid the most severe human, planetary, and economic impacts of climate change, organizations must urgently act. Our comprehensive portfolio of strategic and tactical solutions for decarbonization makes us an unparalleled partner for any organization.

Will you join us in our commitment to a zero carbon future?  
We can help get you there.

[Discover more.](#)



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