

The Path to Net-Zero Buildings: 3-steps to turn sustainability ambition into action

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

Life Is On

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Explore Sustainability in Buildings

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The science is clear. So is the business case for net-zero buildings.

The Intergovernmental Panel on Climate Change (IPCC) warns we must limit human-caused global warming to 1.5 °C or risk catastrophic planetary impacts.¹ The impacts being felt today will increase dramatically without immediate and substantial greenhouse gas emissions reductions.

Climate change is now a top concern among government leaders and major corporations. Corporate strategies are evolving, driven by regulations and a growing understanding that environmental, social, and governance (ESG) issues impact financial performance and corporate value.

- ~140 countries have proposed or committed to net-zero 2050 goals.
- 80% of the top 100 companies per country now publicly report on their sustainability.²
- 63% of the 2022 Global Fortune 500 companies committed to delivering a significant climate milestone by 2050, a 12% increase in one year.³

Buildings account for 37% of global carbon emissions⁴, so adopting a net-zero building strategy is essential when striving to combat the climate crisis and be responsible corporate citizens.

The International Monetary Fund says, “Firms that align their business models with the transition to a net-zero world will reap handsome rewards. Those that fail to adapt will cease to exist.”⁵

In this climate crisis, organizations are not only threatened by environmental risks (e.g., property damage caused by wildfires and flooding) but also organizational impacts with threats to brand reputations, business models, and, ultimately, bottom lines.⁶

Adding increased financial urgency, the global energy crisis is causing massive gas shortages and energy price increases in Europe and beyond.

In this context, developing and executing a comprehensive net-zero buildings strategy is an efficient way to:

- Increase energy efficiency.
- Cut operating expenses (OpEx).
- Generate new revenue streams.⁷
- Satisfy investors and other key stakeholders.
- Stimulate organizational growth.⁸
- Grow industry influence, reputation, and brand.
- Hire and retain top talent.
- Boost building valuation.



#1 Most sustainable company in 2021 from Corporate Knights



#1 Microgrid provider in the U.S.

The technology and services to support this transformation are available today and this guide will walk you through the process.

Schneider Electric™ is a leading expert in sustainability and decarbonization solutions. We’re also a clean energy leader in microgrid systems and consulting on renewable energy purchasing. 40% of the Fortune 500 companies trust Schneider Electric to provide cost-effective, sustainable energy solutions, and services.

This three-step guide presents our proven, holistic strategy for decarbonizing buildings. Whatever types of buildings you own or operate, this guide will help you define, deploy, and sustain your decarbonization journey.

¹ “Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments,” IPCC, 2018

² “The time has come - KPMG Survey of Sustainability Reporting, 2020,” KPMG

³ “Big companies keep increasing their climate commitments — especially when governments tell them to,” Fortune, September 2022

⁴ 2021 Global Status Report for Buildings and Construction

⁵ “50 Shades of Green,” Mark Carney, December 2020

⁶ “Wildfires pushed PG&E into bankruptcy. Should other utilities be worried?,” UtilityDive, November 2020

⁷ “Towards net-zero buildings,” Schneider Electric Sustainability Research Institute, 2022

⁸ “Disclosing through CDP-The business benefits,” CDP, 2022



Your buildings can be the foundation of your journey to net-zero

Limiting the trajectory of global warming to 1.5°C by 2050 is only possible if a worldwide effort is made to decarbonize buildings.

A building on the path to net-zero carbon continuously reduces its annual operational carbon emissions (in line with the Science Based Targets initiative). Best-in-class models also take steps to manage embodied carbon for new construction and during retrofits.⁹

The technology and services for net-zero new builds and retrofits are **available today**

New buildings can be designed and constructed with technologies that create a low-carbon building from the ground up.

However, one of our greatest opportunities to reduce building-related carbon emissions lies in retrofitting existing building stock. In fact, about 50% of the buildings that exist today will still be in use in 2050¹⁰ – the date most organizations are targeting for net-zero.

Net-zero Buildings of the Future are a critical part of this retrofit solution. They are hyper-efficient, resilient, people-centric – they are good for the environment and for business.

Creating net-zero Buildings of the Future will be enabled by what Schneider Electric calls Electricity 4.0 – all-digital, all-electric buildings that use electrification to enable decarbonization through renewables and use digitalization to optimize energy and carbon performance.

However, knowing how to turn your sustainable ambition into actionable steps can seem overwhelming.

This is where Schneider Electric can help.



Carbon Neutral

Reaching zero operational carbon emissions without any limit on what percentage is balanced by carbon offsets¹¹

Net-Zero Carbon¹²

Reaching zero operational and embodied carbon emissions with limited reliance on carbon offsets



“Climate change is, at the end of the day, an energy challenge. An energy challenge that we can resolve. **A more electric and digital world is key to building a sustainable and resilient future.**”

– Jean-Pascal Tricoire, Chairman & CEO of Schneider Electric

⁹ Embodied carbon emissions relate to the building materials manufacturing, transport, installation, use, maintenance, and replacement/disposal. [“Bringing embodied carbon upfront” World Green Building Council, September 2019]

¹⁰ “Energy Technology Perspectives 2020.” IEA, September 2020

¹¹ Carbon offsets are carbon credits purchased to balance unavoidable greenhouse gas emissions. 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. [“Verified Carbon Standard.” Verra]

¹² “The Net Zero Carbon Buildings Commitment.” World Green Building Council



3 steps to net-zero

Most organizations already understand why decarbonization is important. We can help you move from ambition to action.

We are already helping thousands of companies on their journey to decarbonize their building operations – from hotels, retail, and hospitals to offices and more.

Our decades of experience in energy and sustainability consulting and technology is the foundation for this simple, 3-step process.

1. Strategize

Assess your current situation at both the portfolio and building levels and create a plan that will deliver measurable results.

2. Digitize

Create a single source of truth for your energy and resource usage to make data-driven decisions and report on progress towards your goals.

3. Decarbonize

Reduce your carbon footprint at scale across your portfolio and strengthen your business, leveraging the insights from steps 1 and 2.

It's important to note that these steps can happen in parallel and are, by nature, iterative. This is because as markets change and technologies advance, so must your decarbonization strategies and actions. This 3-step process naturally evolves with your strategy to maximize your benefit from these market shifts.

Whether your scope is managing a real estate portfolio, an individual building, or looking for sustainable retrofit opportunities, your steps remain the same.

When you finish this guide, you should understand:



The benefits of decarbonizing buildings

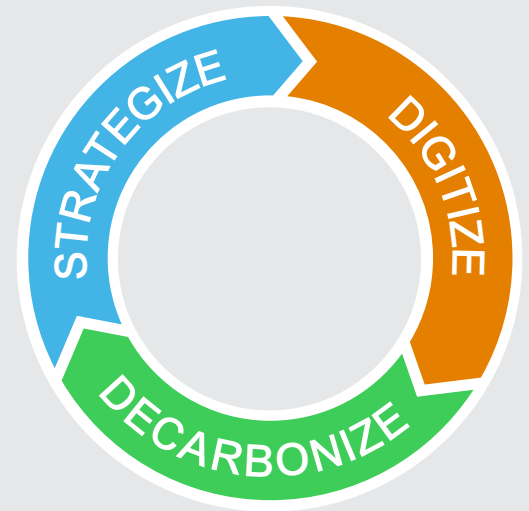


How to apply the 3-step process

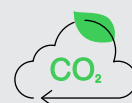


How Schneider Electric's solutions can help you

Let's get started.



A global leader in sustainability, Schneider Electric uses this 3-step process to meet its decarbonization goals, approved by Science Based Targets initiative (SBTi) targets:



Carbon neutral in our operations by 2025 (with CO₂ offsets)



Net-zero carbon in our operations by 2030



Net-zero carbon across our value chain by 2050



Step

1

Strategize

When beginning to transition your portfolio to net-zero carbon, leaders across your organization must align on not only the vision, but the strategy to achieve that vision. In this step, you'll build a strong foundation defining success and creating your path to net-zero.

Measure enterprise baseline

“You can't manage what you don't measure” is as true for decarbonization as any other metric. To begin developing a decarbonization strategy, you first need to understand your baseline – where are you starting?

This part can be easy once you've tracked down all your data sources. Services and software are available to:

- Consolidate data and calculate your carbon emissions baseline at a single site or across your portfolio.
- Assess existing building-level digital technology to identify gaps and inform the roadmap.

Once you've determined your greenhouse gas (GHG) emissions by volume and type, you can identify key emissions sources and benchmark performance across your portfolio.

Create decarbonization roadmap

Now you are ready to define the optimum solutions and appropriate timelines to suit your needs. When prioritizing, evaluate each action for its technical and economic feasibility relative to its decarbonization impact.

Explore your options

Investigate each of these actions at a portfolio level, informed by building-level insights:

- Deploy energy efficiency solutions.
- Electrify building operations and transportation.
- Replace energy sources with renewables.

To inform the actions you need to take, and when, remove any guesswork by modeling the impacts of projected business growth, grid decarbonization, and new build or retrofit scenarios.

A good roadmap also includes the right digital technology and a plan for improved connectivity to enable decarbonization and ensure you have the right data to measure and monitor performance.

Set your targets

Setting measurable targets and key performance indicators (KPIs) with a deployment timeline is a crucial step for the overall success of your decarbonization program. It is best practice to set targets that align with SBTi to ensure that your efforts:

- Meet potential regulatory requirements.
- Meaningfully impact climate change.
- Match or surpass the pace of your competitors.

Setting science-based targets put you on the path to net zero and communicates your ambition to stakeholders.



Structure program and governance

Identifying and engaging the right organizational stakeholders in your strategic planning is a critical step to gaining buy-in and setting expectations for the funding needed to implement your roadmap.

Organizations unaware of the scope and scale of decarbonization solutions, or those who are capital-constrained, often stumble at this step. Without expert guidance, they can be overwhelmed by the potential capital investment required and fail to convert good intentions into actions.

Most commercial buildings return sustainable retrofit investments in

10 years or less.¹³

When funding your initiatives, there are three key ways to reduce or restructure costs:

1. Free up money by optimizing your energy purchases:

- Manage global commodity risk.
- Source competitive energy resources.
- Manage energy contracts.
- Balance your energy portfolio and procure renewable energy (see details in the “[replace energy source](#)” section in the Decarbonize step).

As the largest and most experienced

energy management provider, Schneider Electric has the expert knowledge of global tariffs and regulatory trends for optimizing energy procurement.

2. Take advantage of all utility rebates and incentives to help reduce project costs and maximize ROIs.

We are helping Walmart® empower its supply chain to **avoid 1 billion tons of carbon emissions** through renewable energy purchasing.



3. Explore innovative financing options that require no upfront costs and are backed by performance-based agreements, which helps reduce exposure to energy market price volatility and potentially achieve long-term cost savings:

- [AlphaStruxure](#), a joint venture between Schneider Electric and the Carlyle Group designs, builds, owns, and operates next-generation Energy-as-a-service (EaaS) solutions for the commercial, industrial, and infrastructure sectors.
- [GreenStruxure](#), a joint venture between Schneider Electric and Huck Capital, delivers modular, standardized microgrids and EaaS solutions to medium-size commercial, industrial, and governmental buildings in the U.S.

Engage ecosystem

For many organizations, the largest emissions source are indirect Scope 3 emissions,¹⁴ which lie outside their direct control. They need enterprise-level transformation to engage their entire value chain in their decarbonization efforts. At the building level, extending decarbonization initiatives to the full value chain must address embodied carbon and circularity.¹⁵

96%

of companies who have approved SBTi targets are including Scope 3 emissions, forcing engagement with a broader range of internal and external stakeholders.¹⁶

¹³ “Towards net-zero buildings.” Schneider Electric Sustainability Research Institute, 2022

¹⁴ Scope 3 emissions describes all indirect emissions that are not included in Scope 1 and 2, such as the emissions from the extraction and production of purchased materials, waste disposal, employee commuting, and an organization’s value chain activities. [“FAQ,” [Greenhouse Gas Protocol](#)]

¹⁵ Circular economy, or “circularity,” is an economic system in which resources are used, reused, and reintegrated in a closed loop, rather than being extracted, used, and discarded as waste. The goal of a circular economy is to minimize the use of virgin resources and the generation of waste while promoting the use of renewable energy and creating economic, social, and environmental benefits. [“Circular Economy Introduction,” [Ellen MacArthur Foundation](#)]

¹⁶ “SCIENCE-BASED NET-ZERO Scaling Urgent Corporate Climate Action Worldwide” SCIENCE BASED TARGETS INITIATIVE ANNUAL PROGRESS REPORT, 2021 V1.2



Enterprise-level value chain

Collaborating with suppliers to decarbonize your value chain can be as simple as requiring them to report on emissions or to have an emission reduction plan. Best-in-class programs go one step further and provide suppliers with the resources and guidance needed to take impactful decarbonization action.

“ A great example of enterprise-led supplier collaboration is Walmart’s Project Gigaton™,¹⁷ which aims to avoid one gigaton (one billion metric tons) of carbon dioxide from Walmart’s global value chain by 2030. The program is designed to educate Walmart suppliers about renewable energy purchases through Schneider Electric’s Zeigo Network™, a global collaboration platform and community of more than 300 corporate renewable energy purchasers and solution providers, and accelerate renewable energy adoption through aggregate power purchase agreements (PPAs). As of 2022, the program helped more than 250 Walmart suppliers to access useful education on renewable energy procurement and successfully convened the first cohort of suppliers to participate in an aggregated PPA relying on the renewable energy advisory expertise of Schneider Electric.

The pharmaceutical industry is also proving how impactful supplier collaboration can be when addressed across an entire industry.¹⁸ The Energize program drives system-level change by accelerating adoption of renewable energy within the pharmaceutical industry’s value chain. This collaborative effort, led by Schneider Electric’s renewable energy advisory expertise and 15 major pharmaceutical companies, has formed its first PPA buyers’ cohort to allow the participants to pursue renewable electricity together at scale.



Building-level value chain

At the buildings level, extending decarbonization initiatives to the entire value chain requires you to address embodied carbon.¹⁹ Organizations can:

- Purchase low-carbon or carbon-negative building products, materials, equipment, and supplies to reduce Scope 3 carbon emissions, such as Schneider Electric’s **Green Premium™** brand.
- Integrate **EcoStruxure™ Asset Advisor** services with technical experts to transform data from your electrical distribution assets into actionable insights to extend equipment life, delaying replacement, and avoiding the associated embodied carbon.
- Conduct a **circularity assessment** of major building equipment to develop strategies for purchasing, extending lifecycle, and disposal that reduce Scope 3 carbon emissions.

Communicate commitment

Use your sustainability strategy as leverage for your brand.

Your organization’s sustainability targets and timelines send a strong signal to stakeholders – investors, customers, non-governmental organizations, and employees – and significantly impact company reputation. Strong targets with an actionable plan to deliver a signal that your organization is stepping into a leadership position on decarbonization and sustainability.

PWC reported that “CEOs of companies that ranked highest on our customer trust index are significantly more likely to lead organizations that have made a net-zero commitment than the average company in our global sample.”²⁰

Companies with public commitments are more successful at securing funds and building business cases for their projects.²¹

Your brand and organization will benefit from credible communications about your targets and progress in third-party sustainability indices.

Communicating about your targets and progress is an ongoing process that starts with your initial baseline assessment and continues with ongoing management of your sustainability data in the Digitize step.

¹⁷ “Gigaton PPA: Walmart, Ørsted and Schneider Electric Announce First Cohort for Renewable Energy Supply Chain Program.” Walmart, 2022

¹⁸ “Energize Program Announces First Year Progress Including Formation of PPA Buyers’ Cohort for Climate Action.” Schneider Electric, 2022

¹⁹ Embodied carbon emissions relate to the building materials manufacturing, transport, installation, use, maintenance, and replacement / disposal. [“Bringing embodied carbon upfront” World Green Building Council, September 2019]

²⁰ “Reimagining the outcomes that matter (2022).” PwC’s 25th Annual Global CEO Survey



Digitize

Once your organization's strategy is in place, deploying digital solutions in your building is the next crucial step to achieving net-zero targets.

Digitalizing your portfolio makes the invisible visible and gives you access to brand-new building-specific data sets. With the Internet of Things (IoT), big data, and artificial intelligence (AI), you can digitalize and connect building data and systems along with power management systems for the information needed to make smarter decisions faster at the portfolio- and building-level.

Monitor resource usage and emissions

With your baseline measured and your roadmap created, you now need ongoing visibility of your energy consumption and carbon emissions to:

- Estimate and validate the impact of carbon reduction efforts.
- Identify performance anomalies.
- Ensure you are on track to achieve your goals.

Depending on your portfolio/building type and priorities, you will want to consider deploying a combination of technologies to capture data on utility usage, energy metering, and embodied carbon.

Utility data at the meter level

Each building will need its own carbon emission insights based on utility meter data and the appropriate location or market-based emissions factors. At the portfolio level, look for solutions like **EcoStruxure™ Resource Advisor**, which allow you to:

- Manage the complexity of data integrations from many sources, locations, and stakeholders and ensure data integrity.
- Track projects and their return on investment (ROI) to facilitate decisions and action.
- Enable enhanced collaboration to drive operational improvements.
- Create a central reporting system to automate the ongoing measurement of emissions data with processes that can scale to thousands of sites.

Power monitoring

Where utility data may not be easily accessible or more granular insights are needed, unlocking hidden energy and carbon data requires the right level of metering with easy-to-digest dashboards. Power meters and submeters can gather accurate real-time measurements of power and energy values at the circuit, load, floor, or building level. Metering systems then measure, transmit, display, and analyze energy data to provide visibility of major energy end-use equipment or systems in your building to understand usage patterns, identify anomalies, and enable better peak load management based on time of use.

- **EcoStruxure Resource Advisor** captures interval meter and submeter data, so your energy and carbon data are consolidated in one place.
- **PowerLogic™** meters with remote monitoring through **EcoStruxure™ Power Monitoring Expert** allow you to know where to take action, identifying power quality issues and analyzing energy consumption by load type for critical and energy-intensive facilities.
- **PowerLogic™ PowerTag** sensors with remote monitoring through **EcoStruxure™ Energy Hub** provides visibility into energy usage by load type and power usage alerts for commercial buildings.
- **MasterPac™ MTZ** intelligent circuit breakers with built-in Class 1 accuracy active power and energy metering, enables remote energy monitoring at the circuit level.



Building information modeling

To minimize embodied carbon emissions, you need a tool to centralize and track the carbon inherently included in your building materials and equipment. Leading manufacturers are increasing transparency in their products to enable accurate tracking by end users.

To help select low-carbon products, building information modeling (BIM) can be included early in the design and specification phase for new construction and major renovations. To maximize benefits, work with architects, consulting engineers, and contractors who focus on sustainable building design and construction and use technology like [RIB BIM software](#).

Use BIM to capture carbon data and gain the visibility needed for total carbon reporting.

With RIB, you can calculate embodied carbon for a project and measure and report on the carbon and cost impact of design and construction decisions in real time throughout the project lifecycle.

Identify saving opportunities

The next stage is identifying specific areas for immediate improvement and quick wins. All the analysis and ambition in the world means nothing if not tied to action.

The European Commission notes that “today, roughly 75% of the EU building stock is energy inefficient. This means that a large part of the energy used goes to waste.”²²

Identifying these opportunities requires on-site or cloud-based applications with clear dashboards and analytic tools to help interpret the large amounts of data collected by your building management, power management, and energy management systems. If your team lacks the time or resources, it's best to take advantage of connected advisory services.

In addition to improved operations management, increased reliability, and optimized maintenance services, advisory services from Schneider Electric provide equipment-level energy and carbon savings insights:

- **EcoStruxure Resource Advisor** ranks and benchmarks facilities to identify improvement opportunities.
- **EcoStruxure Energy Hub** uses energy load data to uncover opportunities to reduce energy use, utility costs, and the associated carbon emissions.
- **EcoStruxure™ Building Advisor** uses fault detection and diagnostics to detect carbon savings opportunities, prioritize actions based on avoidable carbon emissions, and tracks identified and completed carbon savings opportunities.
- **EcoStruxure™ Power Advisor** for large and critical facilities analyzes real-time power and energy data to identify opportunities for increased energy efficiency and carbon savings.

Once you've discovered new energy and carbon savings potential or operational improvement opportunities, take immediate action with [Schneider Electric EcoCare services](#). For items that must be deferred, update your decarbonization roadmap accordingly and set aside budget for upcoming maintenance or upgrade projects to realize the associated energy and carbon savings.

²² Energy efficiency in buildings." European Commission, February 2020



Report and benchmark progress

Your digitalized building and energy management systems are now providing you with reports and quantifiable data demonstrating your progress toward net-zero. Leverage this data to boost your brand.

76% of organizations said **disclosing sustainability results** helps “boost their competitive advantage.”²³

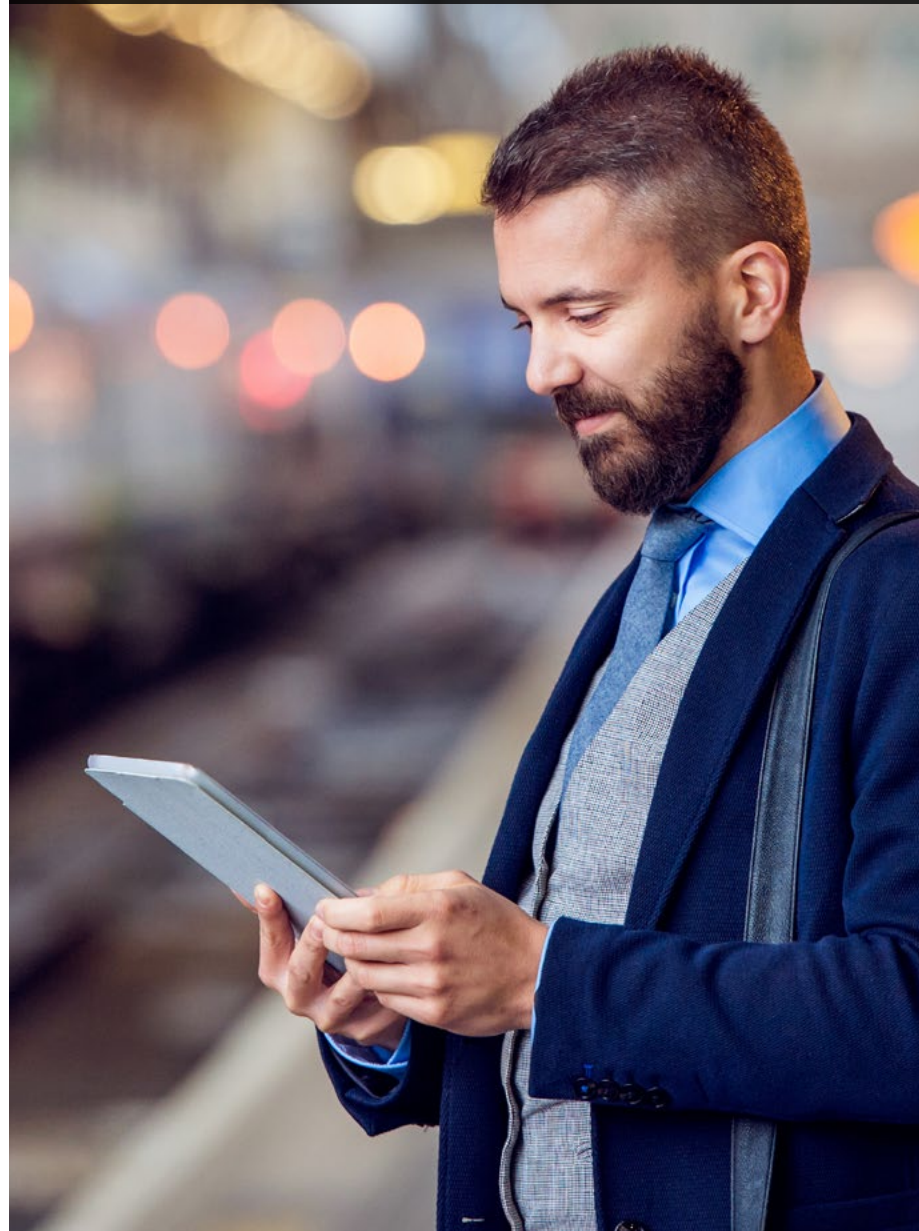
Publicizing your net-zero commitments and reporting on your progress helps:

- Attract investment.²⁴
- Grow industry influence, reputation, and brand.²⁵
- Hire and retain top talent.²⁶

Green building certifications are an excellent way to promote your building’s sustainability and occupant well-being. Schneider Electric experts can help you understand specific certifications and how to earn points toward green building certifications, such as LEED, BREEAM, and more.

Successfully progressing toward decarbonization goals should also be considered a new performance benchmark that is shared internally to inspire engagement and guide action in buildings across your portfolio.

The early achievements you have made in efficiency and sustainability through digitalization will **inform your strategy moving forward**, feeding a continuous cycle of improvement as you progress with your decarbonization efforts.



²³ “Disclosing through CDP-The business benefits,” CDP, 2022

²⁴ “The ESG Imperative: 7 Factors for Finance Leaders to Consider,” Gartner, June 2021

²⁵ “Disclosing through CDP-The business benefits,” CDP, 2022

²⁶ “How sustainable business practices foster great talent attraction and retention,” Ciphir, July 2022



Step

3

Decarbonize

This final step is where everything comes together to deliver results.

In the first two steps you've been strategizing and gaining insights that enable action. Now use what you've learned and take action – reduce emissions, drive resource efficiency and resiliency, and boost your bottom line.

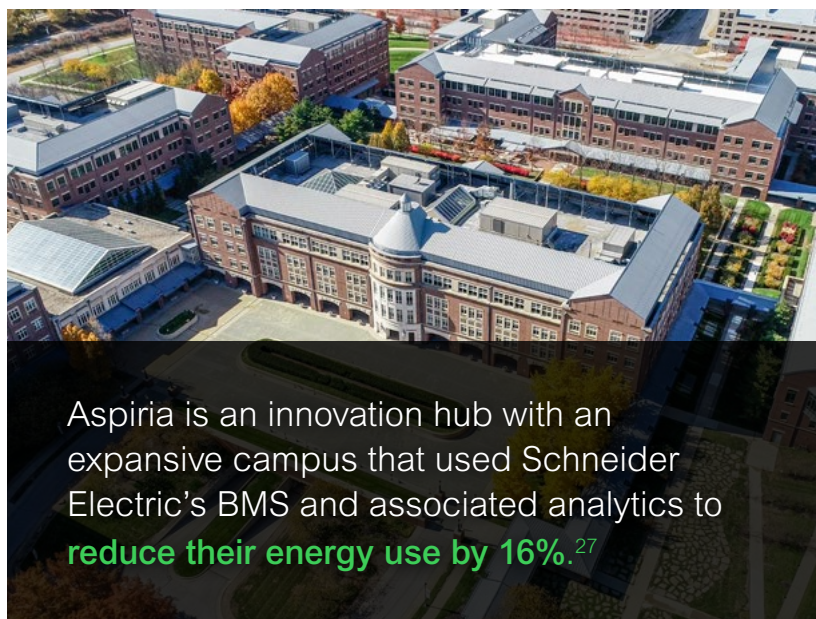
Reduce energy use

There are many new ways to optimize energy use and reduce carbon emissions by integrating modern building, power, and energy management systems with connected IoT devices.

Efficient building operations

Many building digitalization technologies not only uncover savings opportunities but automatically act to reduce emissions and help you optimize equipment performance.

An open, intelligent building management system (BMS) provides simple integration, visibility, and actionable data from all systems and subsystems, including third-party systems. These once-siloed systems now integrate to manage HVAC, power, lighting, security, fire safety, microgrids, electric vehicle (EV) charging stations, and renewable energy sources.



Aspiria is an innovation hub with an expansive campus that used Schneider Electric's BMS and associated analytics to **reduce their energy use by 16%.**²⁷

Acting as the central hub, a modern BMS connects all disparate building systems to drive integrated intelligence and efficient control.

For example, Schneider Electric's **EcoStruxure Building Operation** can:

- Conserve energy and reduce carbon emissions through advanced scheduling and control sequences for equipment and systems.
- Maintain equipment performance within desired parameters using alarms and event management.
- Visualize trend-logs and historical data, allowing you to easily uncover savings opportunities.
- Integrate with key decarbonization infrastructure to create a single pane of glass across power monitoring, on-site generation, EV charging, and peak demand management programs.

Also, think about optimizing equipment performance through predictive maintenance to help prevent performance degradation. For example, Schneider Electric's **EcoStruxure Building Advisor** can:

- Identify faults and proactively provide key insights into HVAC equipment and system inefficiencies.
- Prioritize issues to remedy based on energy, comfort, and equipment impact.
- Detect critical issues before they escalate to failures via condition-based monitoring.

²⁷ "Building a campus of the future, today," Schneider Electric, 2022



Access space utilization data

There are also significant opportunities to decarbonize and enrich the building occupant experience by improving efficiency at the room level.

Smart sensors and other IoT-connected devices capture precise insights on space use at the room level, which can be leveraged by systems like [Planon Workplace Insights](#) and [Connected Room Solutions](#) to maximize energy and carbon savings and ensure occupant well-being.

Best-in-class solutions are conveniently managed through a single mobile-enabled control center where the information can be accessed, standardized, analyzed, and secured for AI and data-driven, carbon-reducing decisions. Look for solutions which let you:

- Fine-tune system performance based on occupant and space needs.
- Implement demand-driven temperature and ventilation control schemes based on real-time data.
- Continuously optimize performance through automated work order management to turn [EcoStruxure Building Advisor](#) insights into action.

Occupancy data visualization, analysis, and forecasts can inform future real estate portfolio decisions and space planning, allowing organizations to reconfigure and right-size footprints based on actual usage to drive greater carbon reductions.

Electrify operations

By 2040, 63% of electricity will be generated by wind and solar.²⁸ This will automatically impact operational carbon emissions, and an easy way to gain additional benefit from this trend is to swap out fossil fuel-powered technology for newer electric options.

Electrifying operations on the path to net zero accounts for 30% of global abatement.²⁹



Having already completed your carbon emissions baseline, you know your biggest sources of direct carbon emissions (Scope 1). To reduce these emissions, upgrade to more efficient technology and processes and replace fossil fuel burning technology with renewable or electric-powered options, such as replacing gas heating systems with electric heat pump systems. In most parts of the world, electric heat pumps are both cheaper to operate and have a significantly lower carbon footprint for commercial buildings.³⁰

Modernize building infrastructure

As more building loads are electrified, electrical infrastructure upgrades may be required.

Modernizing older electrical distribution equipment is an effective way to improve energy efficiency and reduce greenhouse gas emissions. Optimizing electrical designs with advanced software like [BIM Electric](#) and [ETAP](#)[®] also helps reduce emissions through accurate equipment sizing.

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

- [Easy Altivar 610](#) variable speed drives are specially designed for better control 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 GHG.
- [Galaxy Uninterrupted Power Supply \(UPS\)](#) delivers up to 99% efficiency and up to 66% energy and carbon savings.³¹
- [PowerLogic AccuSine™ EVC Plus](#) 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.

²⁸ "World Energy Outlook," IEA, October 2021

²⁹ "Back to 2050," Schneider Electric Sustainability Research Institute, 2021

³⁰ "Building Heat Decarbonization," Schneider Electric Sustainability Research Institute, 2021

³¹ Compared to legacy 94% efficiency standard UPS [Per Schneider Electric's internal data]



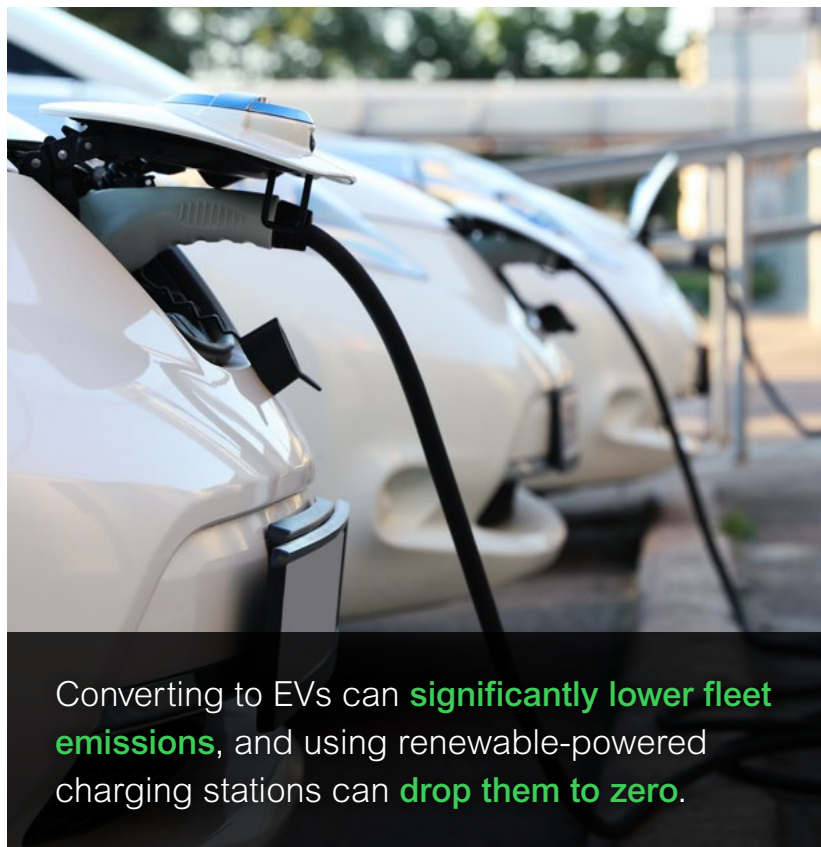
Electric vehicles

Electrification of operations can also include adding EV charging infrastructure for fleet vehicles and providing charging as an amenity to building occupants and visitors.

When addressing this demand for EV charging, building owners should prepare for up to a 45% increase in electricity consumption. To minimize the impact of these additional electrical loads, dynamically managing EV charging and building loads together can minimize peak demand charges and mitigate the need for electrical infrastructure upgrades.

Look for holistic solutions like **EcoStruxure™ for eMobility** which bring together:

- 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**.
- Remote monitoring and control of 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 **EVIlink Pro AC**, a reliable, sustainable, and smart charger.



Converting to EVs can **significantly lower fleet emissions**, and using renewable-powered charging stations can **drop them to zero**.

Replace energy source

This is often one of the first and most impactful actions organizations take to reduce their carbon footprint.

With energy supply comprising 45% of the decarbonization potential for buildings,³² it's nearly impossible to reach net-zero carbon targets without integrating renewable energy sources which produce no operational carbon emissions.

On-site power generation and storage

Microgrid systems are integrated into a facility to optimize energy between what is generated on-site from renewables, stored using onsite batteries, and consumed alongside the grid. They can also be designed to accommodate growing electrification needs of buildings, including EV chargers and fleet electrification.

Microgrids are designed to intelligently achieve sustainability, efficiency, and resilience.

When on-site generation pairs with a battery energy storage system, renewable energy can be strategically stored for use during power outages and during times of high peak demand from the grid. This is far more sustainable and cost-effective than traditional backup generators.

³² "Back to 2050," Schneider Electric Sustainability Research Institute, 2021



To help meet sustainability targets and improve resilience, microgrid solutions like **EcoStruxure™ Microgrid Operation** and **EcoStruxure™ Microgrid Advisor** work together to:

- Maximize operational control and optimize the renewable energy produced on-site
- Use advanced predictive algorithms to optimize power usage based on operational needs, cost optimization, and the sustainability goals of a building.
- Monitor and report energy consumed from on-site sources and the grid
- Report sustainability impact from CO₂ savings

Power purchase agreements

Another way organizations can replace carbon-based energy and take control of their energy costs is to purchase renewable energy using PPAs.

PPAs can help eliminate your Scope 2 emissions.

PPAs enable companies to meet their sustainability and carbon reduction targets effectively and efficiently because:

- Costs of utility-scale renewable energy in many markets is below conventional electric rates.³³
- Long-term price stability is assured over several years or even decades – something impossible in volatile fossil fuel markets.

When exploring PPAs, consider both virtual and on-site options.

Virtual PPAs allow you to purchase renewable energy from other geographic areas to ensure lowest cost. An organization can also pool its electricity demand, giving them greater buying power and leverage.



PPAs can be used for onsite generation as well. Often developers own the equipment and take on the upfront CapEx, ongoing operations and maintenance expenses, and ongoing performance risks. Examples of on-site PPA developers include [AlphaStruxure](#) and [GreenStruxure](#).

Guidehouse ranked Schneider Electric the #1 PPA Marketplace Solution Provider in 2022.³⁴

Finding the right renewable energy purchasing options to meet your sustainability targets, budget, and contract length can be challenging. Look for advisors with comprehensive solutions like Schneider Electric’s **Zeigo™ Network** and **Zeigo™ Power platforms**, which simplify the cleantech buying process by connecting members to trusted experts, viable projects and technologies, and exclusive market intelligence to enable and accelerate transaction decisions.

³³ “Accelerate Your Energy Strategy With Power Purchase Agreements.” Schneider Electric, May 2020

³⁴ “Schneider Electric Ranked No. 1 PPA Marketplace Solution Provider,” Schneider Electric 2022



Energy Attribute Certificates

Energy Attribute Certificates (EACs), also known as Renewable Energy Credits (RECs) or Guarantees of Origin (GOs) are used by organizations worldwide to achieve renewable energy goals and Scope 2 emissions reduction targets. EACs serve as the “proof” that renewable energy has been generated and delivered to the power grid and they are the standard method for tracking and trading renewable electricity globally. EACs may be the best option for some organizations to purchase renewable energy where onsite generation or long-term PPA contracts are not feasible.

EACs come at an added expense to the purchase of energy delivered to the site without a direct financial payback. The costs of EACs should be incorporated into the financial analysis for other decarbonization solutions, such as incremental efficiency improvements, which help to reduce the ongoing cost of purchasing EACs. This additional “price of carbon” can often swing the overall financial picture in favor of efficiency.

Schneider Electric’s renewable energy experts have extensive experience, global reach, and transparent processes to help you find the best cleantech products to reach your goals, and at the best price.

Offset residual emissions

Carbon offsets are a balancing mechanism for organizations to address their Scope 1 and 3 emissions that cannot otherwise be reduced or avoided. Carbon offsets, or verified emission reductions (VERs), can be purchased to provide financial support to projects that remove GHG emissions from the environment (sequestration) or keep them from being initially emitted (avoidance). Examples of projects funded through carbon offsets include nature-based solutions such as forest management and conservation (afforestation), fuel-switching projects, or projects that capture methane gas from landfills or agriculture.

Carbon offsets should be purchased through third-party certified sources so they are evaluated for credibility and emissions reductions are verified to occur as claimed. Similarly to EACs, carbon offsets come at an added expense without a direct financial payback. Offset purchases should typically be minimized overtime with investment in onsite decarbonization efforts taking precedence.



Net-zero buildings are good for the world and for business, and **Schneider Electric is ready to help your organization accelerate your net-zero journey.**



A trusted partner on your decarbonization journey

Schneider Electric is a recognized leader in sustainability.

Our solutions and services help create all-digital, all-electric Buildings of the Future that are sustainable, resilient, hyper-efficient, and people-centric. We're helping all types of businesses and buildings – commercial offices, healthcare facilities, hotels, and more – achieve their net-zero goals.

Let's look at how our proven, comprehensive, step-by-step approach — from strategy to execution — is already helping organizations like yours to design, build, operate, and maintain net-zero buildings.





CASE STUDY

One of the largest net-zero commercial buildings in the U.S.

United Therapeutics

United States



The challenge:

- Provide a smart building with the ability to produce more energy than it consumes.
- Integrate multiple vendors, including solar, lighting, and window/shade into a single front end.
- Provide analytics depicting the building’s energy utilization, including the validation of net-zero status.

The solution:

- **Digitize:**
EcoStruxure Power Monitoring Expert for power meter and BTU meter monitoring.
- **Reduce energy use:**
EcoStruxure for Buildings (EcoStruxure Building Operation) to ensure smart energy usage. Further smart integration of operable window and lighting control, and plant optimization software was performed. Minimized cooling energy with electrochromic glass, Earth labyrinth cooling, and chilled beam cooling.
- **Electrify and replace energy source:**
Incorporation of cutting-edge technology, including photovoltaic energy harvesting and geothermal heat recovery.

The outcome:

- Complete building integration using EcoStruxure for Buildings to allow for all smart connections within the building to be localized to a single source of truth to validate and maintain net-zero status.
- Energy Dashboard to explore the building’s energy systems, predictive models and history to drive sustainable change and awareness with occupants.
- When in ventilation mode, the entire building consumes as much energy as a typical American suburban home.
- **Certified LEED Platinum.**



We had this really clear mission to minimize our impact on the environment. Schneider was one of the early partners we brought to the team to help us do that. Without that focus on building controls and system integration, I do not think we would have achieved our goal of building a net-zero energy building.



Thomas Kaufman

Senior Director, Corporate Real Estate,
United Therapeutics Corporation

Learn more:



Watch the video

[Unisphere by United Therapeutics](#)



CASE STUDY

New, multi-use city center and shopping mall in Finland

Citycon

Finland



The challenge:

- Minimize operational and energy costs.
- Partner with an integrated solution provider for building automation and smart energy systems.
- Achieve “Zero Energy Building” status and LEED Gold Excellence certification.
- Be the most environmentally responsible and eco-friendly urban center in Europe.

The solution:

- **Strategize:**
Schneider Electric became a digital technology and sustainability partner for the entire lifecycle, and helped secure EU stimulus funding for microgrid software-as-a-service (SaaS).
- **Digitize:**
Jointly created digital user interface for BMS and microgrid.

The outcome:

- **15% savings reduction in energy use.**
- CO₂ reduction: 335k tCO₂/year.
- On-site storage capacity 1500kWh.
- Payback period for Smart Energy Systems by Schneider Electric: Approximately 4 years.



We are aiming to be zero carbon in terms of energy use. It's one huge ecosystem, with integrated intelligent energy management. The entire Lippulaiva center utilizes renewable energy, such as geothermal and solar.

The common goal of Schneider Electric and us is to ensure that future generations can breathe clean air.



Risto Seppo

Property Development Director, Citycon

Learn more:



Watch the video

[Europe's Most Environmentally Responsible City Center](#)



eBrochure

[Citycon Use Case](#)



CASE STUDY

Building a campus of the future today, in Kansas (U.S.)

Aspiria

United States



The challenge:

Maintain low energy costs, identify and prevent energy waste, and maximize operational efficiency.

The solution:

Aspiria is an innovation campus of world-class workplaces, facilities, and public spaces. Implemented by C&C Group, a master-level BMS EcoXpert partner, it aimed to improve the comfort, quality, and cost of its campus.

- **Reduce for efficiency:** Schneider Electric and C&C Group provided sustainability, efficiency, and reliability by modernizing the existing BMS to EcoStruxure Building Operation and utilizing EcoStruxure Building Advisor and EcoStruxure Power Monitoring Expert.

The outcome:

- **Less than 2-year ROI.**
- **16% reduction in annual energy consumption.**
- 36% reduction in carbon footprint.
- \$1.5 million annual energy cost savings.
- From 2019 to 2022: \$700k annual labor cost savings.
- 0% downtime for any major building equipment.

Learn more, watch our videos:



Customer Success Perspective:

[Building a Campus of the Future with EcoStruxure Solutions for Aspiria | Schneider Electric](#)



EcoXpert Success Perspective:

[C&C Group Connects Profitability and Operational Efficiency with EcoStruxure | Schneider Electric](#)



Read the case study:

[Aspiria – Kansas](#)



CASE STUDY

Existing office space in Grenoble, France gets a major update to meet sustainability targets

Technopole

France



The challenge:

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

The solution:

- **Digitize:**
Data-driven design and build via BIM and energy simulation.
- **Reduce for efficiency:**
Space and meeting room management to increase safety and efficiency.

The outcome:

- **Achieved net-zero carbon operation and highest LEED certification in France.**
- 43kWh per square meter per year (target 45kWh).
- Platinum LEED in Operations certified: 91 points.
- Platinum LEED Design Build + Construction: 83 points.

Learn more:



Read the case study:
[Technopole – Grenoble](#)



CASE STUDY

Net-zero building sets the bar high for sustainability

IntenCity

France



The challenge:

- Be the most efficient building in the world.

The solution:

• **Electrify and replace energy sources:**

All electric and microgrid ready, with green energy sources on-site: 4000m² photovoltaic, 2 wind turbines, 300kW battery storage.

• **Digitize:**

Data-driven design and build via BIM and energy simulation. Real-time communication supporting energy monitoring, security, flexible workspace management, and occupant services.

The outcome:

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

Learn more:



Watch the video

[IntenCity - Grenoble, France](#)



Read the case study:

[IntenCity – Grenoble](#)



CASE STUDY

A successful journey to a net-zero building

Le Hive

France



The challenge:

Soon after beginning a new lease, the Schneider Electric facility team identified that the HVAC system in their new 35,000 m² Paris headquarters was wasting energy. They wanted to reduce energy and achieve a payback within the lease period, reduce CO₂ emission, improve power reliability, and improve productivity while complying with cybersecurity standards and supporting sustainability certifications. The work also needed to be carried out in a way that was non-disruptive to occupants and visitors.

The solution:

- **Reduce through efficiency:**
An intelligent network of connected products and software was used to focus first on actions that would bring quick payback. These included: automated adjustment of ambient temperature, management of cold and hot production, and integration with the [EcoStruxure Building Operation](#) system to have better visibility into HVAC operations and optimize performance.
- **Replace energy sources:**
Efforts focused on integrating renewable energy sources like geothermal or photovoltaic.

The outcome:

- Achieved a 50% reduction in energy consumption, becoming three times more energy efficient within only a couple of years.
- Reduced CO₂ emissions by 76%.
- **The building also gained LEED and BREEM certifications.**

Learn more:



[The Hive Case Study](#)



The decade of decarbonization

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

Schneider Electric can support your decarbonization journey from strategy to execution and ongoing optimization with our Sustainable Business Consulting Services and our EcoStruxure for Buildings offers. We can put you on your best path to net zero that improves your building efficiency, attracts and retains top talent and occupants, exceeds consumer and investor expectations, and reduces operating expenses, all while contributing to a better planet for us all.

[Discover more.](#)

Resources:

["Retrofit for sustainability: A facility manager's guide for Net-Zero Buildings"](#)



Life Is On

