

ABOUND



Take Your Building Portfolio to Net Zero

A roadmap to creating a smarter decarbonization strategy



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Energy Regulations Turn Up the Heat for Building Operations

Energy management is certainly not a new concept in building operations. But today, the global push for decarbonization is accelerating the urgency to act. New regulations, shifting tenant expectations, and financial pressures are driving the need for more strategic, portfolio-wide approaches.

However, decarbonization comes with competing priorities—balancing aging infrastructure, budget constraints, and shifting occupancy trends—all while navigating a regulatory landscape where efficiency mandates and emissions targets vary widely by region.

These factors make it difficult to prioritize investments and develop a strategy that works across an entire portfolio. Yet for those willing to navigate these complexities, the benefits go beyond compliance to deliver real business value.

This ebook drAWS on the expertise of Carrier and Amazon Web Services (AWS) to outline practical strategies for navigating the complexities of decarbonization. From understanding emissions to implementing phased solutions and using technology like Carrier Abound, it provides a clear roadmap to achieving progress on your net zero goals.

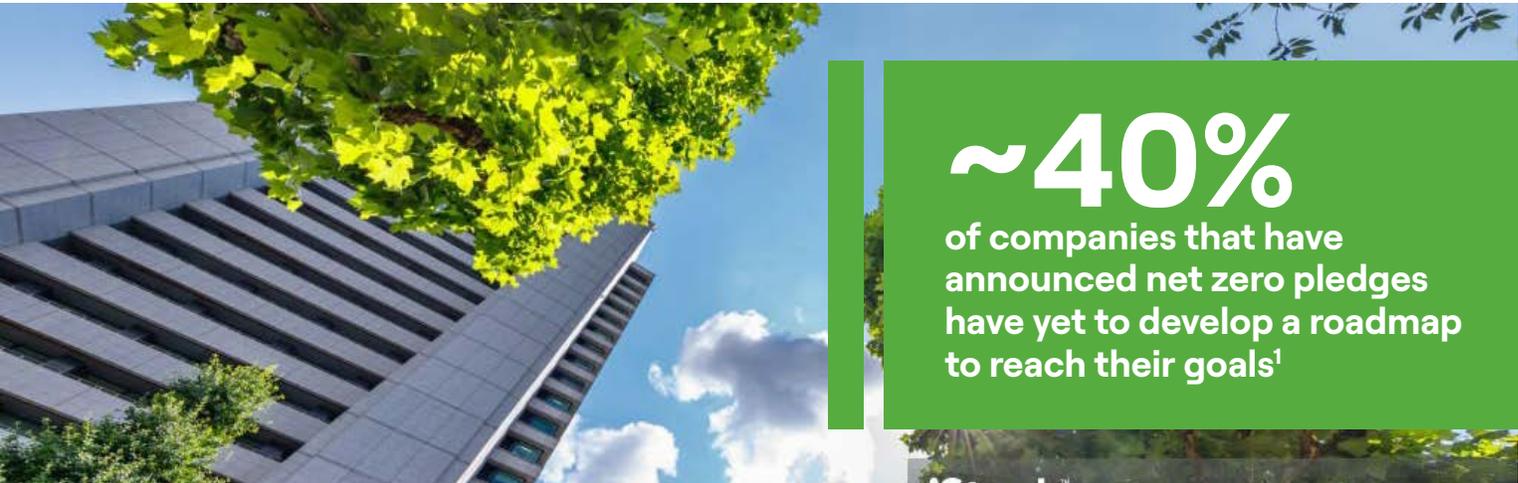
A patchwork of building emissions regulations

New York's Local Law 97 – Requires buildings over 25,000 sq. ft. to cut emissions by 40% by 2030 and 80% by 2050.

Boston BERDO 2.0 – Imposes gradual emissions reductions for buildings over 20,000 sq. ft., with annual reporting requirements.

France's Tertiary Decree – Mandates energy consumption reductions of 40% by 2030, 50% by 2040, and 60% by 2050.

Sydney's NABERS Rating – Requires energy efficiency ratings for buildings over 1,000 sq. m to meet minimum standards.



~40%

of companies that have announced net zero pledges have yet to develop a roadmap to reach their goals¹

¹International Energy Agency (IEA), Net Zero by 2050: A Roadmap for the Energy Sector, 10/21.

Pursuing Net Zero Pays Off

Net zero isn't just a sustainability goal—it's a business opportunity. Organizations taking steps toward decarbonization are already seeing the results.



Attracting tenants and commanding premium rent rates

83% of consumers believe companies should actively shape ESG best practices, and modern, energy-efficient spaces are becoming a competitive advantage.²



Reducing building costs

On average, energy accounts for one-third of a commercial building's operating budget, making efficiency improvements a direct path to savings.³



Promoting a positive brand perception

Sharing ESG progress outperforms reviews, advertisements, and other communication efforts when it comes to shaping a brand's reputation.⁴



Positioning the business as attractive to ESG-focused investors

33% of total U.S. assets under management are now tied to sustainable investing—a trend that rewards organizations prioritizing decarbonization.⁵



Protecting assets against energy price increases

The levelized costs of low-carbon electricity generation are increasingly outpacing fossil fuel prices, insulating organizations from volatile energy markets.⁶

But with so many competing priorities, it's hard to know where to start. A clear, tailored strategy helps you break the journey into manageable phases, so you can prioritize investments that deliver the greatest impact. It allows you to answer questions like:

- ❓ Which buildings or upgrades should we focus on first?
- ❓ How do we meet regional requirements while balancing budgets?
- ❓ What steps will deliver the most meaningful ROI over time?

² PWC, *Beyond compliance: Consumers and employees want business to do more on ESG*, 4/23.

³ Energy Star, *Commercial Real Estate: An Overview of Energy Use and Energy Efficiency Opportunities*, 4/23.

⁴ Danielle Stringer, Kambeo, *Does ESG Reporting Strengthen Brand Perception?*, 08/22.

⁵ Deborah Nason, CNBC, *'Sustainable investing' is surging, accounting for 33% of total U.S. assets under management*, 12/20.

⁶ International Energy Agency (IEA), *Projected Costs of Generating Electricity 2020, Low-carbon generation is becoming cost competitive*, 12/20.

The Role of Data in Decarbonization: Laying the Foundation

The journey to net zero begins with understanding where you stand today. But for many organizations, it's difficult to get a clear picture of energy use and emissions across a building portfolio. While energy data often exists, it's spread across systems that don't communicate. For example, utility bill systems capture energy consumption but lack detail or timeliness. Sub-meters track usage within individual buildings but operate in silos, while spreadsheets fall short for real-time, scalable analysis. This fragmented data slows decision-making and complicates compliance reporting.

The solution: A unified, actionable view

To move forward, organizations need to consolidate and transform their data into insights they can act on. This means:

Centralizing energy data

Bringing together information from utility bills, sub-meters, building management systems, and more into a single platform eliminates silos and provides a complete picture of energy use.

Normalizing performance

Energy use varies based on weather, building age, and occupancy patterns. Normalizing the data to account for these differences helps to compare buildings on a level playing field.

Benchmarking across the portfolio

Benchmarks are essential to understanding performance. By comparing energy use across a portfolio, you can identify underperforming buildings and prioritize upgrades where they'll have the greatest impact.

Protocols for measuring and reporting

Reducing emissions starts with knowing what to measure. Emissions are categorized into three scopes, each representing a different part of the carbon footprint:

- Scope 1** Direct emissions from owned or controlled sources

- Scope 2** Indirect emissions generated from purchased energy

- Scope 3** All other indirect emissions such as transportation, production of materials and fuels, and employee travel



Turning Data into Action: A Phased Approach

Data is the foundation, but insights alone don't drive progress. Once you've identified your portfolio's biggest energy and emissions challenges, the next step is taking targeted action. A phased approach breaks the process into clear, manageable steps—allowing you to prioritize the actions that deliver the greatest impact before moving into deeper decarbonization efforts.

PHASE 1: Start with energy efficiency

The quickest wins come from addressing waste, and energy efficiency measures often deliver the best return with the lowest investment. Focus on:

Low-cost upgrades

Switch to LED lighting, improve insulation, and optimize building controls.

Operational improvements

Fine-tune heating, cooling, and lighting schedules to reduce unnecessary energy use.

Benchmarking and monitoring

Use your data to identify and fix additional inefficiencies across buildings.

PHASE 2: Transition to electrification

Electrification prepares your buildings for a cleaner energy grid while delivering long-term operational savings. Upgrades include:

Replacing gas-fired systems with electric heat pumps.

Upgrading HVAC systems to high-efficiency, electric-driven models.

Transitioning vehicle fleets or equipment to electric alternatives.

PHASE 3: Integrate renewable energy

The final step is to offset remaining emissions with renewable energy solutions, achieving true net zero. Options include:

On-site renewables

Install solar PV, wind turbines, or geothermal systems to generate clean energy.

Off-site solutions

Purchase clean power through Power Purchase Agreements (PPAs) or Renewable Energy Certificates (RECs).

Battery storage

Pair renewables with storage to optimize energy use and improve resilience.

Addressing Electrification and Grid Limitations

Electrification is essential for decarbonization, but it comes with challenges. Without proper planning, portfolio-wide electrification can lead to higher energy costs and reliability concerns.

Some utilities lack the capacity to support full electrification without significant infrastructure upgrades. Even when the grid can handle the transition, peak demand charges can drive up costs if electricity use isn't optimized. And as buildings become more dependent on electricity, grid reliability becomes a greater risk, especially during extreme weather events or outages.

Strategies for a smoother transition



Optimize first

Reducing energy demand through efficiency upgrades ensures electrification is cost-effective.



Manage demand

Thermal storage and smart load balancing shift electricity use away from peak hours.



Leverage on-site energy

Microgrids, district energy, and battery storage reduce grid dependence.



Phase the transition

Start with low-barrier upgrades, replacing fossil fuel systems over time.

With the right strategy, electrification can improve efficiency, reduce long-term costs, and enhance resilience. Next, we'll explore financing options to make these upgrades feasible.



Funding the Path to Net Zero

The long-term value of decarbonization is clear, but upfront costs can be a major barrier—especially for large portfolios navigating electrification and infrastructure upgrades. Fortunately, organizations have access to a variety of financial tools and incentives to balance near-term expenses with future savings.

ESCOs and performance-based financing

Energy Service Companies (ESCOs) help fund efficiency and electrification projects through Energy Savings Performance Contracts (ESPCs), where upgrades are paid for using future energy cost savings. This model eliminates upfront capital requirements. For a more operational approach, Energy-as-a-Service (EaaS) allows companies to access energy-efficient equipment, renewable power, or battery storage through a subscription-like model, shifting costs from CapEx to OpEx.

Power Purchase Agreements (PPAs)

PPAs offer renewable energy at a fixed, predictable rate. With on-site PPAs, developers cover the cost of installing and maintaining systems like solar PV. For off-site projects, virtual PPAs (VPPAs) offer financial credits that offset emissions and stabilize long-term energy costs.

Renewable Energy Certificates (RECs)

For organizations not yet ready for on-site renewables, RECs offer a practical way to claim environmental benefits while planning for future projects. Each REC represents one megawatt-hour of renewable energy added to the grid. For credibility, prioritize Green-e Certified RECs to ensure verified clean energy sourcing.

Incentives and rebates

Federal, state, and local programs can make net zero upgrades more affordable. The Investment Tax Credit (ITC), part of the Inflation Reduction Act in the US, covers up to 30% of renewable energy project costs like solar PV systems. Many utilities and state agencies offer rebates or grants for upgrades, such as heat pumps and lighting retrofits. Programs like PACE financing allow repayment through property taxes, spreading costs over time. In regions like Texas, New Jersey, and Colorado, strong incentives and favorable energy rates make renewables an even smarter investment.



Aligning Your Net Zero Roadmap with ASHRAE 90.1

To ensure long-term success, your decarbonization efforts need to align with a recognized standard that supports compliance while optimizing energy performance. That's where ASHRAE 90.1 comes in.

ASHRAE 90.1 isn't just a regulatory requirement—it's a structured framework for making energy-efficient upgrades in a way that balances cost, compliance, and long-term ROI. This standard provides multiple pathways to improving building performance, so organizations can prioritize the right investments for their portfolio while meeting evolving energy codes.

How ASHRAE 90.1 Supports a Phased Approach to Net Zero

ASHRAE 90.1 is designed to guide energy efficiency improvements at every stage of the net zero journey.

- Phase 1: Efficiency upgrades**
It sets minimum performance requirements for HVAC, lighting, and insulation, helping organizations maximize early energy savings.
- Phase 2: Electrification**
It establishes Total System Performance Ratio (TSPR) metrics to ensure whole-building efficiency, making it easier to justify and optimize electric system investments.
- Phase 3: Renewable integration**
Newer versions of ASHRAE 90.1 introduce renewable energy adoption requirements, ensuring clean energy solutions align with broader efficiency goals.

Key features of ASHRAE 90.1 include:



Stricter efficiency requirements – Covers HVAC, lighting, insulation, and whole-building performance.



Energy Credit System – Allows building owners to customize compliance strategies based on business priorities.



Flexible compliance pathways – Choose between prescriptive upgrades or performance-based modeling.



TSPR metric – Encourages a systems-based approach to HVAC electrification and efficiency.

Embracing Technology for Continuous Optimization

Aligning with ASHRAE 90.1 provides a strong foundation for energy efficiency, but compliance alone isn't enough. Realizing the full benefits of decarbonization requires ongoing monitoring, adaptation, and optimization. Modern digital platforms leverage advanced analytics, machine learning, and IoT integrations to provide real-time insights into building performance—helping organizations move beyond static compliance checklists and continuously improve efficiency. Instead of relying on manual processes or outdated tools, organizations can use technology to stay ahead:



Identify inefficiencies in real time

Advanced analytics detect energy waste as it happens, helping teams take immediate action to reduce consumption and costs.



Optimize building operations

Machine learning algorithms automatically adjust systems—like HVAC, lighting, and ventilation—to respond to factors like weather, occupancy, and energy pricing.



Simplify compliance reporting

By consolidating emissions and energy data into a single platform, technology transforms complex reporting requirements into actionable insights for faster, easier compliance.



Automate tasks and attract new talent

Automation reduces the burden on teams managing large building portfolios, helping to bridge gaps caused by an aging workforce. At the same time, innovative tools attract early-career professionals eager to work with data-driven, cutting-edge technology.

By turning real-time insights into smarter decisions, digital platforms help organizations adapt to evolving regulations, tenant demands, and market conditions without losing momentum.

20%
of energy usage
can be reduced
with integrated
smart building
systems⁷

⁷ Suruchi Dhringra, *Transforma Insights*, *The use of smart building solutions can reduce total global energy consumption by 3-5%*, 10/22.

How Carrier Enables the Net Zero Journey

With Carrier Abound, you can visualize and act on data from across your building portfolio on a cloud-native, secure platform that is built on AWS and packed with decades of expertise from Carrier. Carrier Abound integrates utility bills, sub-meter analytics, and weather data to create a centralized view of energy use across portfolios.



Visualize and act on data from across your building portfolio

Manage diverse building systems in one place with an interconnected solution.

Carrier Abound provides a single source of truth to help you optimize costs, streamline operations, and improve decision-making. You can continue to evolve as AI and ML become critical to building management.

Unite building system data on an open and secure platform

Accelerate your time to value with a cloud-native SaaS solution built on AWS.

Carrier Abound simplifies integration with existing building systems to eliminate data silos—without custom coding. Built-in analytics templates, data security controls, and open APIs enable enterprise-wide insights from your data.

Drive digital transformation and global sustainability goals

Help your organization meet key objectives around digital transformation and sustainability.

Carrier Abound brings disparate building management systems together in the cloud. Its analytics capabilities help enhance operational efficiency while contributing to the health and well-being of building occupants.

Carrier and AWS: A Proven Cloud Platform

Built on the AWS Well-Architected Framework, Carrier Abound delivers a trusted, cloud-native solution with robust security from AWS and Carrier. By aggregating data sources, Abound simplifies deployment, reduces manual effort, and accelerates insights with comprehensive building metrics. Easily deploy through AWS Marketplace to get up and running quickly while drawing down your AWS commitment. Plus, extend Carrier Abound's data into other applications and AWS services to enhance decision-making.

Modernize and Transform Your Approach to Building Management

Connect with a Carrier representative today to learn how Abound can help you take control of your building performance.

[Talk to an Expert](#)

About Carrier

Carrier has a legacy of sustainable leadership and supporting customers to reach their energy management goals. We understand your unique business challenges and offer customized solutions to meet your needs. As your partner, we can help you along your net zero journey. Together, we will inspire confidence in a better, more sustainable future.

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