



Guidehouse
INSIGHTS

White Paper

Destination: Net Zero

**Six Steps for Companies to Address Their Climate
Protection Goals for the Decisive Decade**

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Why Companies Are Moving on Climate Change

Increasingly, companies around the world are under pressure to respond to global climate change. 20 years of pressure from stakeholders across the environmental community and corporate best practice sharing has culminated in a turning point. Large institutional investors such as BlackRock and Vanguard—which control \$12 trillion in assets combined—argue that avoiding climate-related damages helps the economy and improves investor financial returns. The current US administration favors climate-friendly technologies to grow the post-COVID-19 economy. Meanwhile, millennial moms (a demographic of over 90 million people) are demanding action as they worry about the world their children will inhabit if climate change impacts go unchecked. In addition, the world is experiencing a rapid increase in extreme weather events ranging from hurricanes to off-cycle wildfires, to freak snowstorms, and devastating droughts. Together, these forces underscore the risks people will face if nothing is done to address global climate change.

The upside is that a growing number of key stakeholders including large utilities, municipalities, and private sector companies have set long-term clean energy and net-zero emissions targets over the past 2 years. However, a clear framework to help these companies set and track their net-zero targets has been lacking. As a result, critical stakeholders have often struggled to set greenhouse gas (GHG) abatement goals and determine the best way to implement programs to meet these ambitious climate mitigation targets.

The Science-Based Targets initiative (SBTi), which Guidehouse helps steer as a technical advisor, has driven 1,420 major brands to set GHG goals consistent with the Paris Agreement. This agreement created a global accounting framework for international corporations on net-zero climate mitigation outcomes. Over 1,400 companies with a combined market cap of well over \$10 trillion have committed to setting science-based targets (SBTs) to reduce their GHG emissions.

The majority of commercial and industrial (C&I) organizations lack the awareness or capability, or both, to move forward with SBTs today. They also do not have the budgets for major clean infrastructure upgrades. But the continued uncertainty over accounting or mitigation steps need not limit what any corporation might want to do today. Chief financial officers (CFOs) who often struggled with spending company resources on climate mitigation in the past are now considering new flexible business models that offer solutions that will not impact their companies' balance sheets.

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To understand how to address these issues, this white paper begins by outlining the key drivers for pursuing climate mitigation initiatives. Next, six steps to implement comprehensive climate change programs that curb emissions while providing a practical path to net zero are outlined. Finally, strategic partnerships with comprehensive solutions providers such as Ameresco are described as a path forward to break through the barriers being faced today through financing energy upgrades. This standardized approach has been missing from the conversation, so the step-by-step framework can help demystify how organizations can set their path to the destination of net zero.

Moving Forward on Climate Issues: Five Key Drivers

We are at a turning point for society on the topic of climate change. Momentum has been building since anchor partners such as Johnson & Johnson, IBM, Polaroid, and Nike launched Climate Savers in 1999 to pioneer best practices and set a standard in their respective sectors that other corporations could imitate. Business and society are coalescing around the reality that climate change is no longer a distant threat but a current and real enemy to prosperity.

Reversing decades-old business practices and financial accounting practices cannot occur overnight. Incremental steps can be made over time as better data and modeling allow for a more sophisticated view on what is possible and what additional steps can be taken over the longer term. This process is not a sprint but a marathon, yet marathons always have a finishing line. Knowing that destination is critical to map the most effective and direct path. Let us review the five major drivers that support the development of credible climate mitigation programs as of early 2021.

US Administration Betting on Climate Job Opportunity

The Biden administration has made climate change a major focus of new government spending programs. For example, the \$2 trillion American Jobs Plan proposal includes provisions promoting energy efficiency upgrades in buildings, domestic manufacturing of EVs, and grid modernization investments. The proposal also helps reduce the climate change threat by investing \$650 billion in the clean energy transition over the next decade. In comparison, the economic stimulus approved in the Obama administration included \$90 billion, much of it flowing to early rollouts of smart meters and related grid upgrades. The current administration recently set firm emissions reduction targets, including a 50% reduction in economy-wide net GHG pollution by 2030 and net-zero emissions economy-wide by no later than 2050.

Investment Industry Leaders Push Major Corporations to Action

The BlackRock Global Sustainability Survey conducted in September 2020 found that 425 institutional investors planned to double their portfolios of sustainable assets over the next 5 years.

Companies are voluntarily stepping up to meet and even exceed targets that were considered impractical just a few years ago due to external pressure from investors, partners, suppliers, and customers. In terms of the broader environmental, social, and governance (ESG) issues that are driving corporate social responsibility programs and products and guiding investment decisions, BlackRock highlights that climate change is the largest factor. The environmental piece is the area with sufficient data to track and measure, making it the most important data-driven portion of ESG activities today. Serving as evidence backing up BlackRock's revised investment strategy, the

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Generational and Cultural Changes Push Climate to the Forefront

People born between 1981 and 1996 have been branded as millennials, and their values deviate significantly from the generations that came before and after them. Millennials now represent the largest segment of the global population, and they have been tuned into climate change since the age of 5. Many millennials realize that they and their children could inhabit a world where cities may recede from coastlines due to rising sea levels, traditional crops may disappear from farming operations, and other long-standing businesses may collapse due to changing climatic conditions. Millennial parents are postponing having children in light of worries about what kind of world they may grow up in. Organizations such as BirthStrike in the UK and Conceivable Future in the US are made up of individuals who have vowed not to have children until something serious is done about climate change. Also, on March 15, 2019, more than 1.4 million young people in over 120 countries and 300 cities skipped school and took part in street demonstrations demanding stronger climate policies in the public and private sectors.

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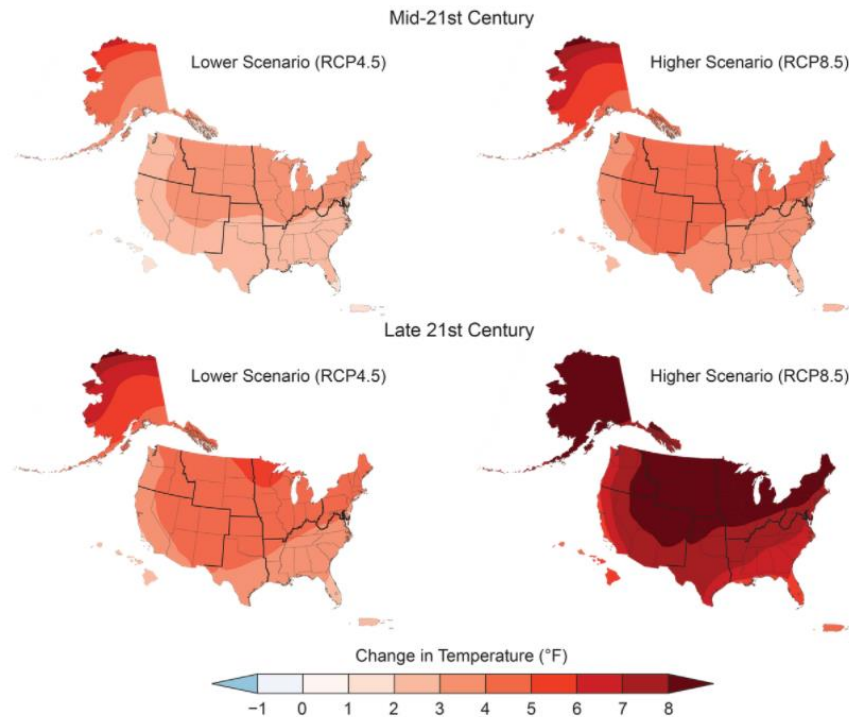
Rapid Technology Advances in the Clean Energy Space

Boosting energy efficiency is always a no-brainer: creating unnecessary waste is uneconomic. Thanks to substantial public and private investment, rapid technology advancements over the past few decades keep accelerating. These investments can also create new “green” jobs that are highly valued in a modern, digital economy. The costs of solar PV and wind continue to decline, making these leading renewable energy options more attractive for C&I customers whose primary focus is always on cost reductions. Battery technologies such as lithium ion are also advancing rapidly and declining in cost due to investments in plug-in EVs by the auto industry. Along with these supply side resources and buffering systems such as lithium ion batteries, there have been tremendous advances in the digital technologies needed to coordinate and optimize distributed energy resources (DER) such as solar PV, utility-scale wind turbines and batteries, and EVs. With the right supporting infrastructure, DER can not only offer clean energy but also serve as a grid resiliency resource.

Extreme Weather Events Reinforce Message That Climate Change Is Real

We now live in a world where extreme weather events linked to climate change occur with increased frequency and intensity. Across all generations, growing numbers of citizens believe that the wild weather patterns over recent decades will only grow more intense unless society makes significant changes in energy use. Though models predicting global climate change date back decades and are always dealing with uncertainty, data now seems to support modeled scenarios forecasting more dire impacts (see Figure 1)

Figure 1 Four National Climate Assessment Scenarios for the US



(Source: US Global Change Research Program)

Climate change is expected to increase the frequency and duration of extreme weather events, leading to more power outages and stress on energy infrastructure. Consider the economic impacts by reviewing recent extreme weather events over the past 2 decades as compiled by the National Oceanic and Atmospheric Administration’s National Climatic Data Center. The most expensive disaster was Hurricane Katrina in August 2005 when 1,833 people died with costs reaching an estimated \$170 billion.¹

¹ “Billion-Dollar Weather and Climate Disasters: Events,” National Centers for Environmental Information, National Oceanic and Atmospheric Administration, 2021, <https://www.ncdc.noaa.gov/billions/events>.

The Practical Path to Net Zero: A Six-Step Approach

The drivers for climate protection are intensifying, and the time to address climate protection through a practical net-zero approach is now. Each commercial, industrial, or institutional customer has their own GHG footprint challenges. That is why a customized approach is necessary. Some organizations have already installed onsite supply side resources; others have chosen to focus more on renewable energy options offered by their utility, purchased offsets, or renewable energy credits. Others still have been solely focused on energy efficiency and may be bewildered by the array of choices before them as they step up to enact a destination net zero comprehensive retrofit program.

There is a methodological way to evaluate each company's options, building upon existing strengths and maximizing sustainability initiatives already underway while uncovering hidden strengths that can be leveraged through internal restructuring and external strategic partnerships. Net-zero planning requires teamwork; implementation requires a customized approach aligned with each company's history, ongoing activities, and appetite for transformative change. Next, this white paper outlines the following process to take each organization on its respective journey toward the end destination of net-zero emissions.

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Step One: Reflect on the Journey to Date to Identify Opportunities & Goals

Holy Cross Energy, a rural cooperative in Colorado, established a goal of sourcing 100% of the electricity used to serve customers with renewable resources by 2030. The company entered into a power purchase agreement that allowed for its strategic partner, Ameresco, to design, build, operate, and maintain 5 MW of solar PV and 15 MWh of battery energy storage.

Before plotting the journey to reaching this 100% renewable energy goal by 2030, Holy Cross Energy needed a better understanding of the status of the sustainability initiatives that it had enacted to date. Here is an actionable checklist that CFOs and leaders at any company or institution should consider before moving forward with a net-zero program:

- Examine how the company performed in the past in relation to the environmental impact metrics that regulators rely upon to measure compliance.
- Identify existing and potential voluntary initiatives gaining increased attention from investors or that could gain investors' attention.
- Seek quick wins that the company can achieve with the lowest financial investments then earmark activities that will require a longer, more sustained effort.
- Identify what level of cost savings would ideally be met for each possible upgrade and how these savings will be calculated. Determine how payback periods will be calculated.
- List all feasible GHG reduction options then develop a ranking system that incorporates payback period, aggregate cost savings, and other ancillary benefits.

Step Two: Establish Baseline Values for Energy and Emissions

To measure success, baseline values of performance are needed. This measurement requires initial baseline assessments on the company's current operations, a process that helps identify near-term steps to take on the journey to net zero. Importantly, this assessment establishes confidence in project economics by setting a meaningful foundation:

- Assess baseline energy load by collecting data, performing site surveys, and analyzing electric and water utility bills. Then evaluate a comprehensive menu of energy conservation measures to explore. Always start with energy efficiency upgrades since they often have the best paybacks and make CFOs happy at the start of this journey.
- Assess the potential for renewable and DER systems that can be installed onsite or accessed through local utilities or other providers.

Case Study: Wellesley College

Wellesley College was able to set its sustainability goals by taking baseline measurements of its GHG emissions. This inventory process allowed the college to set a realistic goal to reduce GHG emissions by 37%. Upgrades to an aging combined heat and power (CHP) plant allowed the college to reduce natural gas consumption and utility electricity costs due to peak shaving with onsite electricity generation.

Step Three: Develop a Roadmap with Milestones and Audit Demand Side and Supply Side Solutions

In 2021, Wells Fargo announced its commitment to a low carbon economy by setting a goal of net zero GHG emissions—including its financed emissions—by 2050.² Building upon its climate neutrality net zero roadmap, Wells Fargo is shifting the strategy for meeting its 100% renewable energy goals. The company had been meeting 100% of its global electricity requirements with renewable energy since 2017, initially through the purchase of renewable energy credits. It will be shifting its compliance strategy with the help of Ameresco to support the development of net new sources of renewable energy in locations where its energy needs are greatest. One example will be working with a strategic partner to implement almost 100 solar arrays representing 30 MW of installed capacity across six states: Arizona, California, Connecticut, Iowa, New Jersey, and Texas.

What Wells Fargo did was follow the next step in the journey to a destination of net zero: develop a roadmap with milestones to guide the process of achieving the goals curated during the first two assessment actions outlined in step two. Notably, this roadmap needs to vet aspirations with practical realities on budget and timelines. For each milestone along the way, consider the financial options available to support solutions and meet goals. For example, an energy as a service (EaaS) procurement model often eliminates any need for upfront capital and places the risk of performance on the solutions provider. A trusted energy partner can help select the optimum mix of technologies to deliver the proposed outcomes.

² Wells Fargo Press Release, "Wells Fargo Sets Goal to Achieve Net Zero Greenhouse Gas Emissions by 2050," March 8, 2021, <https://newsroom.wf.com/English/news-releases/news-release-details/2021/Wells-Fargo-Sets-Goal-to-Achieve-Net-Zero-Greenhouse-Gas-Emissions-by-2050/default.aspx>.

Once your roadmap has been developed, start to break down the strategy in a more granular manner, distilling to the following three milestones for action:

- **Near-term — Include supply, conservation, and efficiency GHG reduction measures:** Focus on strategies for each of the Scope 1 and 2 GHG emissions with an emphasis on supply side and demand side strategies; review the major components of the assessment's proposed solution set. Emissions scopes are defined as follows:
 - **Scope 1:** Emissions from sources directly owned or controlled by a company.
 - **Scope 2:** Indirect emissions linked to energy purchases.
 - **Scope 3:** All other emissions associated with a company's activities, including its supply chain.
- **Mid-term — Target dramatic reduction of Scope 1 and 2 GHG emissions:** Evaluate CHP opportunities; implement deep demand side measures related to optimizing building systems to take advantage of new digital technologies; generate renewable energy supply (e.g., PV, solar thermal, wind) both onsite and offsite; establish management protocols across the solution spectrum; champion supplemental behavioral programs; prepare to participate in anticipated carbon pricing programs, depending upon the jurisdiction where the facilities are located.
- **Long-term — Largely focus on reducing and offsetting GHG emissions related to remaining building energy consumption and Scope 3 supply chain activities:** Expand onsite or offsite projects to offset emissions; deploy commuting and vehicle reduction strategies; implement strategies to offset or sequester remaining carbon and so forth.

Case Study: BMW

To help offset energy demand from the local utility that offers electricity with a higher GHG footprint than desired at a Spartanburg, South Carolina manufacturing facility, BMW maintains its own 11 MW power station onsite. The station is powered by four turbines fueled by reclaimed methane gas piped in from the nearby Palmetto Landfill. This onsite generation source meets 50% of the facility's energy needs while reducing GHG emissions by 92,000 T annually. It also creates thermal energy needed at the manufacturing facility.

For each of these milestones, seek out synergies between the demand side and supply side solutions. These parts cannot be viewed in silos; rather, they need to be seen as intricate parts of the whole. Within each phase, collaborate with an energy partner to evaluate and establish the following: a complete list of projects and initiatives; quantitative carbon reduction targets; capital budget requirements, and bottom-line financial impact. These actions set the foundation for the actual implementation phase of each key roadmap component and milestone.

Detailed analysis is critical for both the comprehensive project and each incremental technical solution. This analysis will identify guaranteed energy savings and costs to build the business case while simultaneously ensuring alignment with the previously identified metrics to meet each milestone and goal. Make sure each component of the near-, mid-, and long-term milestones can be justified on economic and carbon disclosure terms.

Step Four: Build and Commission

When it is time to move to full-scale implementation, organizing work crews, identifying and hiring subcontractors, and establishing clear lines of communication are keys to success in smooth project delivery. Working with an experienced partner lets a company focus on its own business operations while the strategic partner takes care of the details of implementation, such as:

- Developing detailed project timeline and work plans to optimize the scheduling of large projects so that they can be coordinated in a way to meet key milestones
- Minimizing impacts to facility patrons, staff, and critical mission requirements by coordinating work schedules with facility personnel
- Proactively collaborating and regularly communicating to complete the project on schedule and on budget with high quality deliverables and above all, in accordance with the safety plan

Case Study: John Paul II Catholic Secondary School

Expanding upon several phases of work with the London District Catholic School Board in Ontario, Natural Resources Canada, and Ameresco helped transform the John Paul II Catholic Secondary School into Canada's first school retrofitted as carbon neutral. Following a successful feasibility study, the EaaS contract allows the school—which shares attributes akin to a C&I campus setting—to generate its own energy entirely with onsite renewable sources. The project will include advanced geothermal heating and cooling, 2,706 solar panels as covered carports, two EV charging stations, and a 1.1 MW/2.2 MWh battery energy storage system all integrated into a microgrid that is also integrated with building controls. The climate protection project will reduce GHG emissions from 277 tonnes each year to near 0 tonnes annually while offering resiliency services in the event of extreme weather-related power outages.

Step Five: Measure, Verify, and Report

Once the project has been installed, the reward of delivering value to the company, its customers, and greater society begins. Paramount to enhancing long-term equipment life and minimizing downtime are proactive monitoring and ongoing maintenance, both of which should be tailored to the organization's needs. A particularly attractive business model has emerged whose value can be fully realized during this step: EaaS. Thanks to the EaaS contract structure, your energy partner would be responsible for efficiently operating and maintaining energy assets while reporting the results, all while you reap the benefits. For example, the BMW facility described previously anticipates additional climate protection by mitigating risks of price volatility in energy markets and allowing the site to further reduce emissions over time as new technology options emerge.

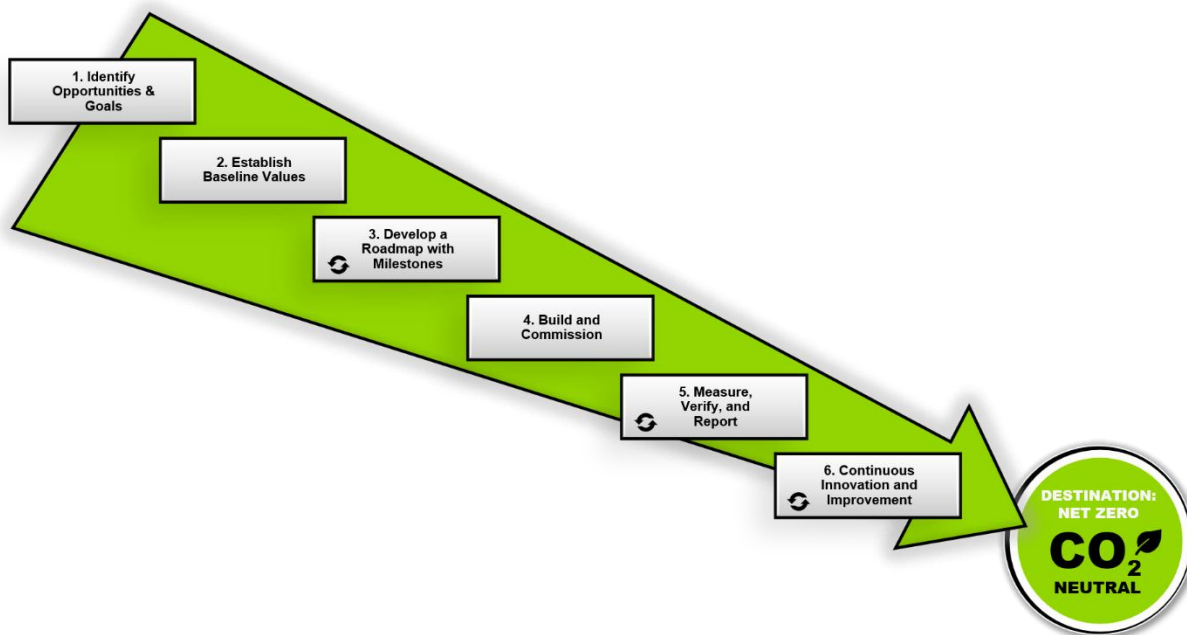
Step Six: Continuous Innovation and Improvement

The journey to Destination: Net Zero requires ongoing opportunity analysis and continuous measurement against milestone goals. This journey is a work in progress. Goals can be updated as better metrics and opportunities present themselves. New technologies can be integrated into the solutions portfolio and be evaluated on a regular basis as projects progress through near-, mid-, and long-term milestones. These processes entail the following initiatives:

- Continuously measure progress against carbon reduction milestones and targets and communicate the results to the full spectrum of stakeholders.
- Perform a needs analysis to execute and revise mid-term and long-term strategies if necessary.
- Leverage new GHG neutral or negative technologies and adjust the roadmap where necessary to incorporate these technologies, new regulations or incentives, and the skills and solutions offered by strategic partners.

Each of the case studies presented here has the potential to incorporate this six-step path (outlined in **Error! Reference source not found.**) for continually improving performance and investigating new options to economically reach net zero. The last example, BMW, is particularly relevant since it is anchored in the concept of EaaS, which is emerging as the preferred path for many C&I and institutional customers to reach their net-zero goals. The primary innovations in EaaS offerings today are with C&I customers and higher education facilities. Even though these organizations typically have available capital, they are risk averse, and their primary focus is always on their business operations.

Figure 2 The Six Steps to Achieve Destination: Net Zero



(Source: Guidehouse Insights, Ameresco)

Measuring Progress and Addressing Barriers

Each company, university, and institution’s journey toward Destination: Net Zero will be different depending upon the sector, geography, policy environment, and maturity of any previous sustainability initiatives. With the added scrutiny of investors now taking ESG

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commitments to the next level, the stakes have never been higher. Companies that trust a strategic partner to reach these ambitious goals with an agnostic approach to problem solving are likely to be successful. Integrators that do not manufacture products themselves but instead focus on choosing the right best-in-class technology and business model to get the job done on time and on budget will likely be highly valued in the drive toward a destination of net zero.

In a trend-setting report titled *The 3% Solution: Driving Profits Through Carbon Reductions*, the World Wildlife Fund and Carbon Disclosure Project revealed three principal barriers to companies moving forward with climate protection initiatives:

- **Lack of expertise:** Energy management is a complex array of technologies made up of hardware and software and an ever-shifting landscape filled with large and small firms, well-known brands, and promising startups. Sifting through this complexity and deciding how to move forward—and with which partners—can be difficult for many organizations.
- **Access to capital:** Though businesses and institutions often have far better access to capital than other market sectors, these larger clients also experience intense pressure to perform. Energy and environmental upgrades are often beyond organizations’ scope of expertise. If carbon reductions require sizeable upfront capital expenses, many of these potential contributors to carbon reductions will balk and delay. EaaS offerings are increasing in scope and popularity, shifting risk away from the client and onto experts who know best how to design, install, and maintain such energy infrastructure upgrades.
- **Lack of management attention:** With COVID-19 and other pressing issues affecting bottom lines, upper management has a hard time focusing on longer-term goals such as net-zero emissions. As CFOs learn the economics of climate protection and embedded long-term value in sustainability practices, they can become the agents of change within a corporation or large institution.

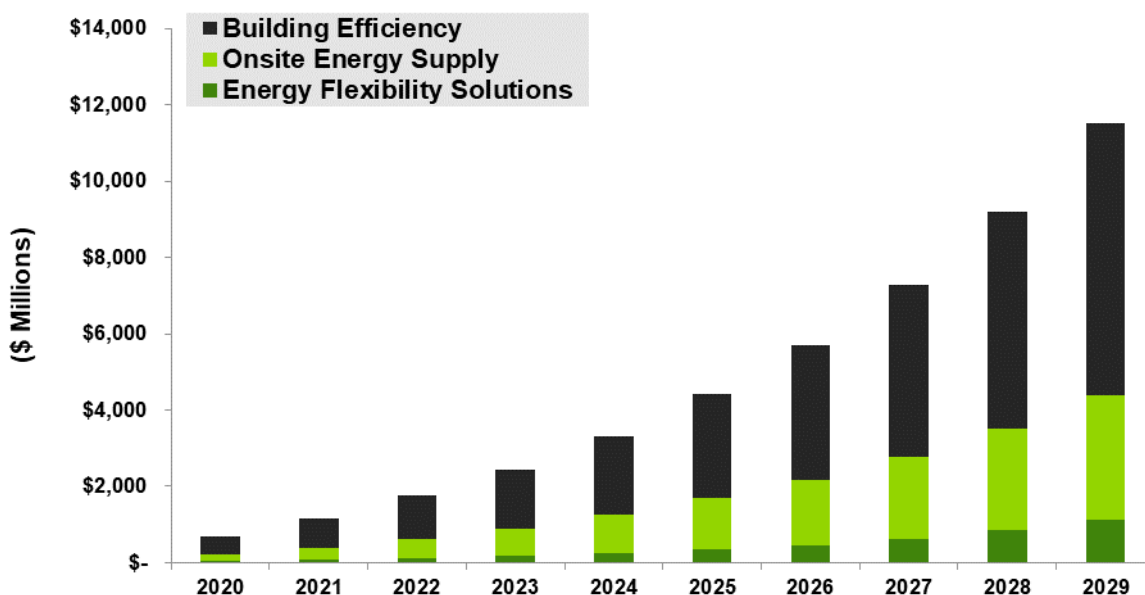
EaaS offerings are increasing in scope and popularity, shifting risks away from the client onto the experts who know best how to design, install and maintain such energy infrastructure upgrades.

In working with strategic partners, companies can overcome these barriers and cross the finish line of Destination: Net Zero by following the six steps outlined in this white paper. Getting the “E” in ESG right will move companies closer to meeting outcomes that shareholders, society, and Earth itself are demanding.

However, a majority of organizations seeking more sustainable solutions often do not have the internal budgets to implement substantial changes in energy systems’ design, technologies, and operations. An emerging trend in energy markets responds to this dilemma: EaaS. Under an EaaS business model, a company outsources the complexity of this process and works hand in hand with a solutions provider to develop a net-zero and resiliency strategy. The strategic partner owns and operates any required assets and takes on the risk for performance. The approach is often tailored to meet the unique needs of each company.

To understand the scope of the EaaS market for North America, consider the three technology groups in a recent Guidehouse Insights market forecast: building efficiency, onsite supply, and energy flexibility solutions, with the latter including platforms such as microgrids and demand response. Building efficiency is the largest portion of this market over the entire 10-year market forecast. This segment is where most companies begin the journey to net zero and where the greatest ROI can be realized.

Chart 1 EaaS Financing by Technology Group, North America: 2020-2029



(Source: Guidehouse Insights)

With the help of the EaaS business model, CFOs and other internal advocates are more likely to get the attention of the rest of upper management. Why would a company or institution not upgrade infrastructure that responds to climate change while benefiting from long-term cost savings and risk reductions? The technology and financing structures are now available to make net zero feasible, all while improving performance and addressing stakeholder concerns, including the bottom line.

Acronym and Abbreviation List

CFO	Chief Financial Officer
CHP	Combined Heat and Power
C&I	Commercial and Industrial
DER	Distributed Energy Resources
EaaS	Energy as a Service
ESG	Environmental, Social, and Governance
EV	Electric Vehicle
GHG	Greenhouse Gas
MW	Megawatt
MWh	Megawatt-Hour
PV	Photovoltaics
ROI	Return on Investment
SBT	Science-Based Target
SBTi	Science-Based Targets Initiative
T	Ton
UK	United Kingdom
US	United States

Table of Contents

Why Companies Are Moving on Climate Change.....	1
Moving Forward on Climate Issues: Five Key Drivers	2
The Practical Path to Net Zero: A Six-Step Approach.....	5
Measuring Progress and Addressing Barriers	10
Acronym and Abbreviation List.....	12
Table of Contents	13
Scope of Study	14

Scope of Study

Guidehouse Insights has prepared this white paper, commissioned by Ameresco, to provide a step-by-step process for C&I customers to address growing concerns from the investment community, broader society, and other stakeholders about the near-term need to address global climate change. This white paper highlights the barriers to comprehensive GHG reduction programs in the past, but its focus is on how customized solutions leveraging new, creative financing business models can address traditional internal obstacles to planning and implementing net zero programs that target the needs of CFOs.

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