Insights

2020 Corporate Energy and Sustainability Progress Report

Market Research and Advisory Firm

GreenBiz group

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A Special Message from the Authors

Welcome to the 3rd edition of our Energy & Sustainability Progress Report.

We gathered data from more than 260 energy & sustainability professionals at the end of 2019 to bring you compelling conclusions across the spectrum of energy and sustainability issues. Given that it's the turn of a decade, we've also included a retrospective look back at 2010 – 2020 and shared our best projections for what is yet to come.

However, what none of us could anticipate at the time we conducted the research was that the report's publication would overlap with the proliferation of the novel coronavirus (COVID-19). We recognize that this global crisis has impacted everyone, including energy and sustainability professionals, and that it will have far-ranging social and economic ramifications that we cannot fully predict. We also acknowledge that these impacts may ultimately change the energy and sustainability trajectory that so many companies were on only a few short months ago.

We have chosen to continue with the publication of the report despite these extraordinary circumstances. We recognize that as the world slowly begins to recover, the work of energy and sustainability professionals will be more important than ever. We hope that you find the conclusions useful as you navigate this unfamiliar landscape.

And please keep in touch. As the market evolves, our experts will be closely monitoring those changes. You can join us by visiting our *Perspectives Hub* and subscribing to our weekly digest for the latest.

We wish you the very best in these challenging times.

The Team at Schneider Electric

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Introduction

It's been more than a year since we published our last Energy & Sustainability Progress Report, and what a year it was.

Escalating concerns over geopolitics and economic downturn, resulting in part from the rapid spread of novel coronavirus (COVID-19). Extreme wildfires that drove home the significance of global warming's impact on energy and financial markets. Unprecedented momentum towards deeper decarbonization. These were only a few of the notable and impacting events of the past 15 months.

Early in the new decade, we find energy and sustainability at a pivotal moment. Corporate commitments to climate action are at an all-time high; so is renewable energy investment. Digitization and the rapid penetration of artificial intelligence are changing how every industry—including energy—operates. Growing concerns about grid and resource resilience and reliability—whether the result of aging infrastructure or extreme events like wildfires or COVID-19—are leading to shifts in energy and resource distribution networks and an influx of new technologies. And the likes of BlackRock and the Business Roundtable have declared that industry and economy must change if we are to move into an electrified, digital future without leaving anyone behind.

For any of us involved in energy or sustainability back in 2010, 2020 is hardly recognizable. The changes over the previous 10 years have been seismic. The decade was one of publicly announced sustainability goals that brought us the historic Paris Agreement. The frameworks that guide an increasing number of organizations on how to achieve energy and sustainability initiatives grew and matured, driving corporate action on efficiency, decarbonization, and circularity. Renewable energy costs fell dramatically, and deregulation of the global electrical grid has allowed renewables to become a leading, competitive energy source.

Knowing that 2020 is a milestone year for many organizations, we're using this year's report to examine the massive progress we have collectively made on energy and sustainability in the past 10 years, make sense of the current trends and what must transpire in 2020 to maintain momentum, and preview the changes that we believe are yet to come. We hope you'll join us on our journey, reminiscing about the past decade, learning more about the challenges and opportunities organizations face today, and staying tuned-in for a sneak peek at 2020 and beyond.

Steve Wilhite
Senior Vice President,
Schneider Electric

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Executive Summary

It is a watershed moment for energy and sustainability as we enter the "Decade of Action," so declared by the UN Secretary General, who has called for acceleration of sustainable solutions to the world's biggest challenges[i].

In this report, we examine the issues at hand and consider how the business community can and should act. Our findings build on the results of our two previous reports, providing deeper insights in some areas and highlighting new and emerging trends in others.

This year, we assessed how growing complexity is demanding greater strategy and innovation from traditional corporate energy managers. An overwhelming 87% of respondents agreed that the changes in energy markets have led energy management to rise in the ranks as a core business operation. From shop floor to top floor, energy managers have become more visible within their organizations and more critical to business success.

Companies finding success amidst this increasing energy market complexity are embracing digital data tools. The volume of, quality of, and inability to share data have been historic pain points for our respondents. In 2020, we learned that companies have increased the sophistication of their data management processes to ease these pains. The number of respondents using digital tools and IoT (such as remote meters, sensors and other smart assets) has doubled from our 2019 results. Further,

the companies that are embracing the digital transformation are more prepared to tackle the challenges and complexity that today's energy and sustainability teams face.

A new area of exploration for our 2020 report is the degree to which climate change, and the risks it carries, has become a leading concern. 58% of respondents told us they view climate change as a top risk to energy and resource supply. The World Economic Forum's 2020 Global Risks Report agrees; for the first time ever, the top five risks are environmental in nature. But there is not a unanimous consensus. In PricewaterhouseCoopers' annual CEO survey, climate change failed to rank among the top 10 business risks. The inconsistency in perception of the importance of climate risk has us asking: is there a disconnect in what organizations deem most risky?

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Executive Summary CONT.

We also found this year that ambitious goal setting can impact a company's confidence. While our initial finding was congruent with past research that companies are not moving fast enough to meet their energy and sustainability goals, a subset of this year's respondents who have taken steps to increase their original goals feel both more confident in their ability to meet those goals and that the goals will contribute positively to limiting global warming. Although counterintuitive, it stands to reason that the more ambitious goals are, the more likely an organization is to feel confident about them.

To achieve their goals, companies must invest in new projects and technologies. Access to funding is often perceived as a barrier to to achieving goals, but our research revealed that corporations with a higher project success rate typically have a financing mix beyond traditional CapEx. Our respondents say they are more likely to get project buy-in when they use innovative funding methods, such as energy-as-a-service. We also found a positive relationship between companies that use innovative funding and those that set more ambitious goals.

Respondents who have **increased their original goals** feel both **more confident** in their ability to meet those goals and that their goals will **contribute positively to limiting global warming.**

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About This Report

The purpose of this report is to provide high-level insights into global energy and sustainability trends with the goal of supporting organizations on their journey to Active Energy Management.

In partnership with GreenBiz, Schneider Electric surveyed the opinions of 265 global energy and sustainability professionals from corporations earning more than $250 million in annual revenue and spanning 17 different industry segments[1]. The respondents were primarily located in North America (69%), Europe (21%), and Asia (7%). Respondents to the survey ranged from individual contributors to C-level executives representing multinational businesses, most of which have operations on more than one continent.

1. In total, 562 professionals responded to the survey. However, for consistent results, we suppressed those answers that did not meet our threshold of $250M in revenue.
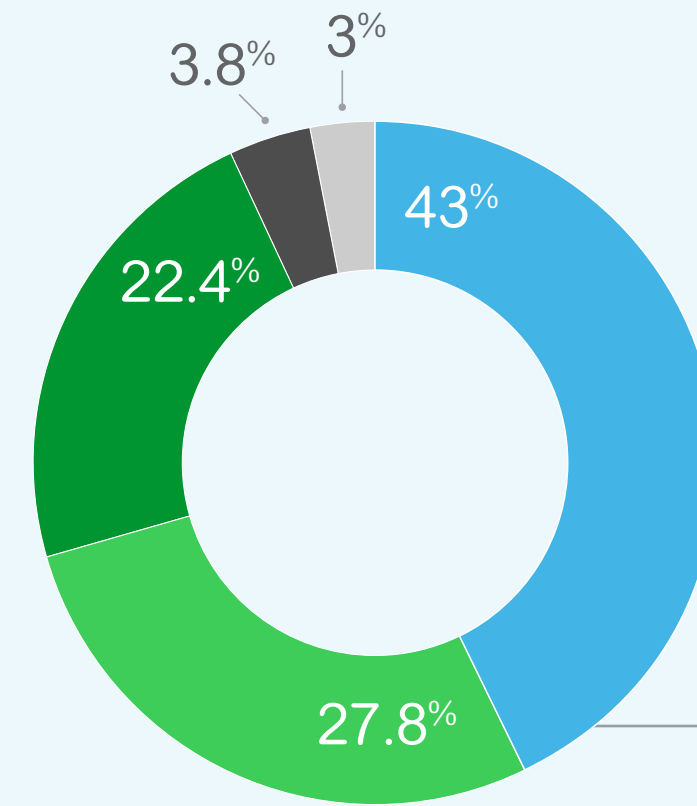
What is your role within your organization?

- Senior Manager/Manager — 43%
- Senior Director/Director — 27.8%
- Individual Contributor/Staff — 22.4%
- Senior Vice President/Vice President — 3.8%
- CEO/CXO/Board Member/President — 3%

Which of the following best describes your organization's industry?

- Manufacturing/industry — 26%
- Energy/renewables — 8.8%
- Technology/cloud/data/telecom — 8.8%
- Healthcare/biotech/pharma — 7.6%
- Transportation — 5.7%
- Commercial real estate — 5.3%
- Utilities/oil/gas — 5.3%
- Food + beverage — 5%
- Consumer goods — 5%
- Finance/banking — 5%
- Construction/building products — 4.6%
- Retail — 3.8%
- Professional services (e.g. consulting, legal) — 3.1%
- Hotel/hospitality/tourism — 2.3%
- Government — 1.9%
- University/school administration — 1.5%
- Media/communications — 0.4%

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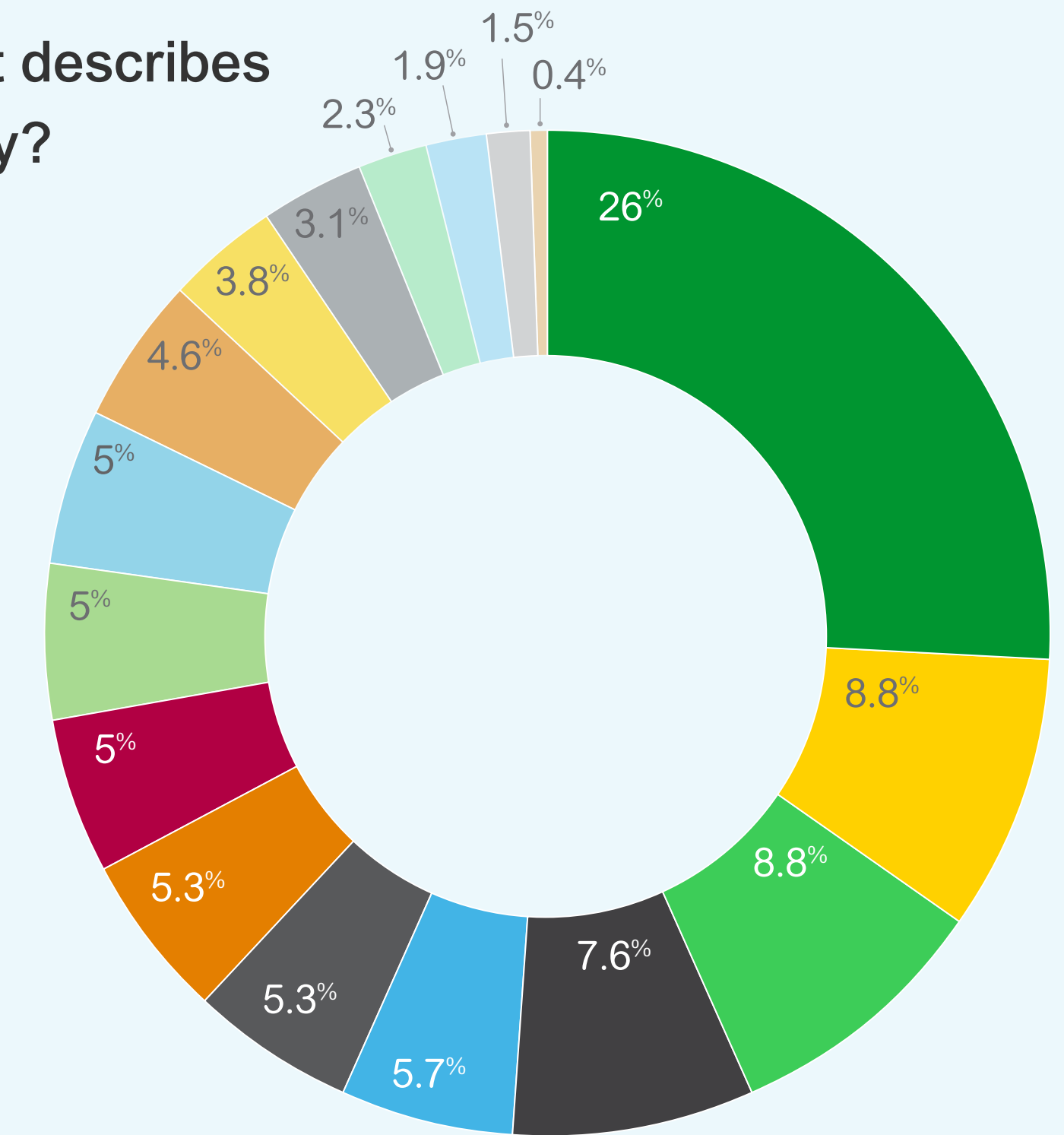
About this Report CONT.

Where respondents report operational sites

82.5%
North America

53.6%
Latin & South America

69.6%
Europe

39.5%
Middle East & Africa

60.8%
Asia

44.1%
Australia

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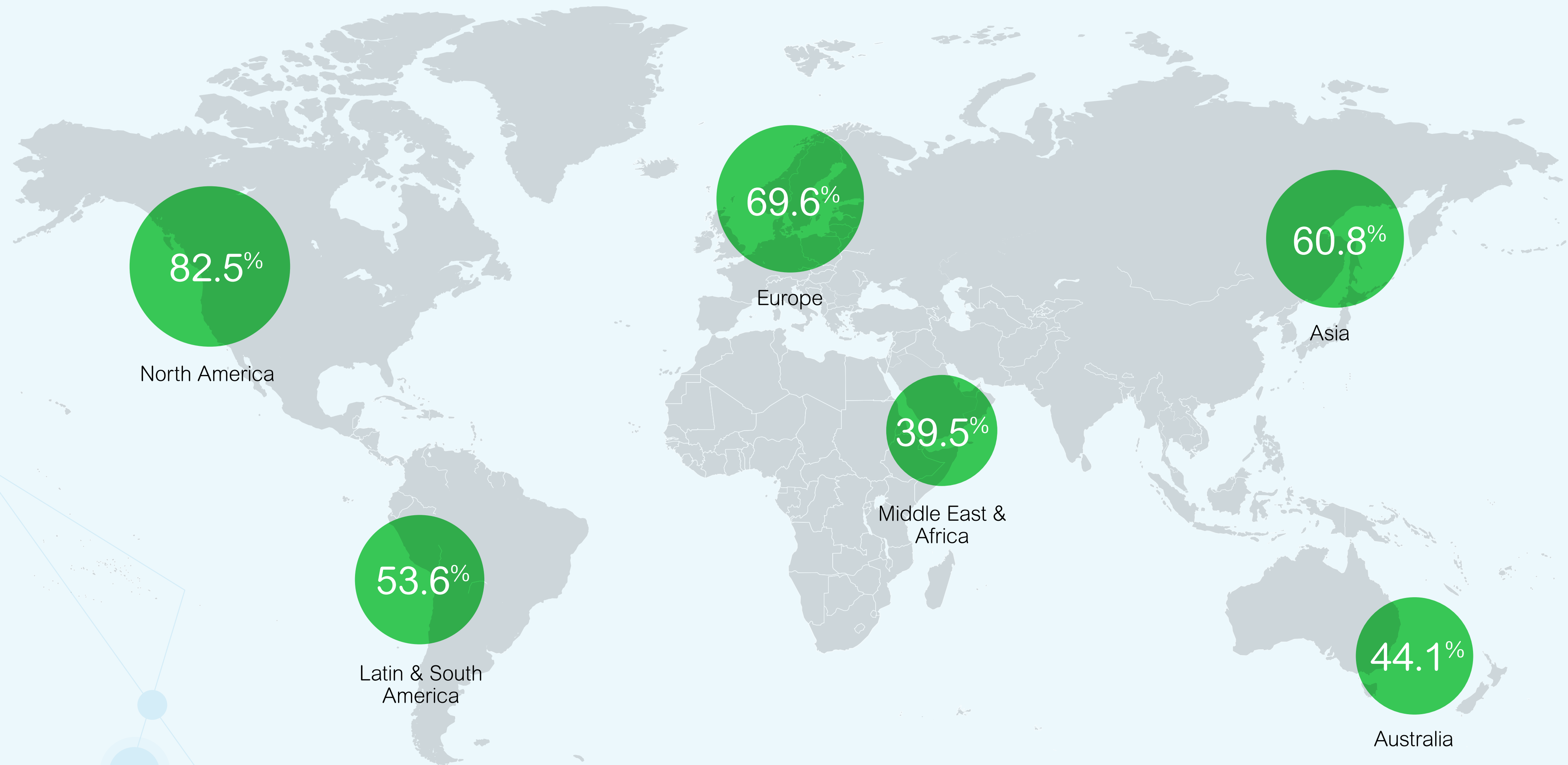
2010 – 2020: Significant Change and Complexity

Ten years ago, the global economy was in the middle of the worst recession since the Great Depression and many of the advancements made in the past decade were in their infancy.

Today, amid concerns of economic downturn driven by COVID-19, the energy and sustainability evolutions of the past decade have become the new norm. Fueled by massive growth in globalization, digitization, and population, these changes have made the energy and sustainability landscape of 10 years ago nearly unrecognizable.

Let's recap what happened.

The grid transformation begins

The most dramatic shift over the past decade has been in energy management. At the onset of the decade, the typical energy manager spent her or his day interacting with the local utility company to ensure service and costs were being managed effectively. Few organizations were using renewable energy; in total in 2010, renewables only made up about 20% of the global grid, and the majority came from large-scale hydropower[ii]. Most electricity could not be stored, meaning it had to be generated and delivered precisely when needed. Utilities were struggling to accommodate distributed energy resources and a "smart" future. Microgrids were picking up steam, but there were only 1.2 gigawatts (GW) of installed capacity globally at the time[iii].

As global energy consumption surged to over 600 quadrillion BTUs[iv], identifying gaps in current electrical infrastructure and technologies and pointing energy-dependent organizations towards resilient alternatives became imperative.

In 2010, battery technology was limited, and traditional power generation facilities dominated the market. Renewable technologies were becoming more effective, but because the batteries of the time were not able to efficiently store the energy, it was impossible to guarantee that the electricity would be generated when needed. By the end of the decade, distributed energy technologies evolved, resulting in exponential growth in battery adoption (with a corresponding precipitous decline in price[v]) and the rise of virtual power plants and microgrids.

> "When I think back over time and see how much things have changed, it's sometimes hard to even envision what things will look like 10 years from now. Our engineering group, our sustainability team, all of us…we keep our ears to the ground to look for opportunities." **GLOBAL FOOD PRODUCER**

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2010 – 2020: Significant Change and Complexity CONT.

[vii]

At the same time, renewable technologies continued to advance, further reducing the price of wind and solar. Over the coming decade, renewables would begin to reach, and in many markets surpass, price parity with conventional fossil fuel-fired generation. By the end of 2018 (the most recent available figure), renewables accounted for one-third of installed global generation. But most impressive has been the growth in non-hydropower renewables, which made up a fraction of generating capacity in 2010 and now accounts for around half of the more than 2,500 GW total[vi]. Renewables are projected to surpass coal as the primary source of global electricity by 2025[vii].

The journey to price parity was the result of years of investment in clean technologies, but also owes its success to voluntary actions. Governments and corporations began realizing the impacts of energy, sustainability, and global warming on their bottom line, reputation, and the environment. This awareness, and the momentum it created, eventually led to the Paris Agreement in 2015.

While some have argued that the accord will not effectively halt warming, it was the first global agreement to give rise to more ambitious programs, like the European Union's 2019 Green Deal[viii].

The grid of today looks very different than the grid of a decade ago. Massive growth in renewables, the global shale gas boom, and unfavorable social positions on nuclear generation have radically accelerated the retirement of coal assets and substantially changed the energy mix[2]. Further grid challenges such as the rise of non-commodity costs, deregulation, aging infrastructure, and growing volatility due to the penetration of renewables has created a need for more decentralized solutions such as onsite generation, battery storage, and microgrids. The result is a grid comprised of more networked, more digital, and more distributed assets than ever before.

2. For instance, the U.S. National Grid average for coal, as published by the Environmental Protection Agency's eGRID program, has declined more than 23% from published data for 2010 to 2018, with many markets seeing even more pronounced drops.

Worldwide share of net electricity generation from wind and solar[vii]
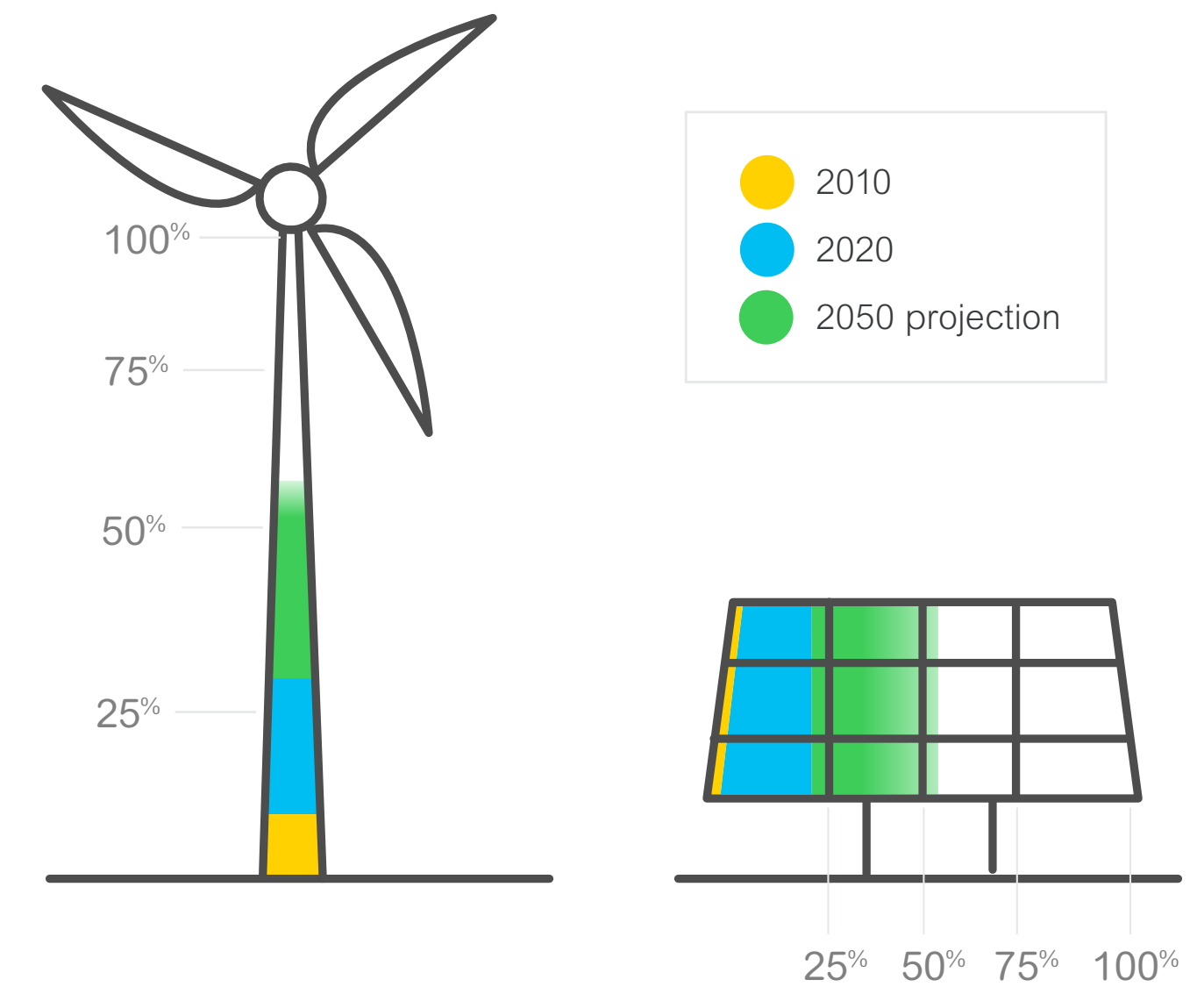
- 2010
- 2020
- 2050 projection

100%
75%
50%
25%

25% 50% 75% 100%

Renewables are projected to surpass coal as the primary source of global electricity by 2025.
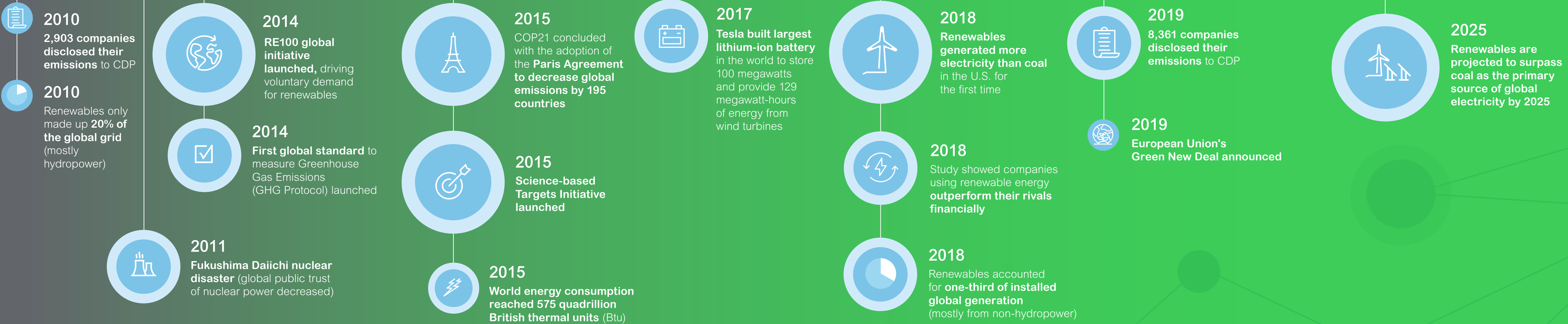
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Grid transition

As the grid transition of the last decade has progressed, many milestones, large and small, have contributed to the acceleration of a cleaner, more digital, and more decentralized grid.

2010

2015

2020

2025

2010
2,903 companies disclosed their emissions to CDP

2010
Renewables only made up **20% of the global grid** (mostly hydropower)

2014
RE100 global initiative launched, driving voluntary demand for renewables

2014
First global standard to measure Greenhouse Gas Emissions (GHG Protocol) launched

2011
Fukushima Daiichi nuclear disaster (global public trust of nuclear power decreased)

2015
COP21 concluded with the adoption of the **Paris Agreement to decrease global emissions by 195 countries**

2015
Science-based Targets Initiative launched

2015
World energy consumption reached 575 quadrillion British thermal units (Btu)

2017
Tesla built largest lithium-ion battery in the world to store 100 megawatts and provide 129 megawatt-hours of energy from wind turbines

2018
Renewables generated more electricity than coal in the U.S. for the first time

2018
Study showed companies using renewable energy **outperform their rivals financially**

2018
Renewables accounted for **one-third of installed global generation** (mostly from non-hydropower)

2019
8,361 companies disclosed their emissions to CDP

2019
European Union's Green New Deal announced

2025
Renewables are projected to surpass coal as the primary source of global electricity by 2025

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Corporate goal setting and sustainability takes off

The environmental movement began in 1970 with the first Earth Day celebration, but it matured in the decade between 2010 and 2020 when corporate sustainability practices began to proliferate.

While a handful of companies had been tracking and disclosing impact data through agencies like CDP and GRI since the early 2000s, one of many signals of changing mindsets came in 2009 when Walmart (the largest company in the world at the time) first released its Sustainability Index. The program catalyzed the marketplace and rapid adoption of impact goals. By 2010, there was new vigor around corporate sustainability, ranging from decarbonization to product responsibility.

This movement would only grow through the successive decade. In 2010, 2,903 companies disclosed their emissions to CDP; by 2019 that number had jumped to 8,361[ix]. CDP also launched both its water and forestry disclosure programs in the past decade.

A multitude of global regulatory frameworks and non-governmental organizations also arose and matured. These include WRI's definitive greenhouse gas reporting standards; The Climate Group's RE100, EP100, and EV100 programs; Rocky Mountain Institute's Business Renewables Center (BRC); the We Mean Business Coalition; the Science-Based Targets Initiative (SBTi); the Ellen MacArthur Foundation and the CE100 for circularity; the Task Force on Climate Related Financial Disclosures (TCFD); the B Corporation; and the continued growth of existing standards like the UN Sustainable Development Goals, USGBC, GRESB, and BREEAM, among others.

Today, organizations are considered laggards if they have not set goals around energy and sustainability (and, in fact, 90% of the respondents to our survey say they have). To remain among the league of climate leaders, those goals must become progressively more ambitious and comprehensive.

> "Customers and investors are definitely a primary driver for our goal-setting. Our customers have very advanced sustainability programs already. We're a tier one supplier—a critical supply chain partner to those businesses and their initiatives. Their interest is that we are a reliable supply chain partner to them."
>
> **MULTINATIONAL PHARMACEUTICAL CORPORATION**

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The rise of data and the service economy

While data and service businesses were nothing new in 2010, the scale that they both achieved in the past decade—and their impact on energy and sustainability today—was unprecedented.

In 2010, organizations were just beginning to tackle energy and sustainability data. Most energy data could be gleaned from utility bills and sustainability data managed on spreadsheets. However, as both energy and sustainability management grew in their reach and complexity, new needs for data management systems emerged. Some of these needs were met through corporate portals designed for supplier data entry, while others began the rapid adoption of resource management software.

As internet of things (IoT) technology began to develop, organizations started implementing control software, hardware, and smart meters, allowing additional customization and analysis of energy usage and operations. The combination of smart tools and access to robust data paved the way for intelligent systems that would give professionals new insights and the means to manage the complexities of data. Today's technological edge is machine learning, with increasing numbers of companies using artificial intelligence to deliver efficiency and accuracy in their day-to-day management of assets and processes.

Data, intelligent connectivity, and software also formed the backbone of the growing service, or gig, economy. These new sharing, short-term, and self-employment ventures were enabled by technology and ushered in a new era of organizations using data to more effectively optimize human and equipment capital improvements and efficiency.

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A period of significant change and complexity

While each decade brings its own surprises and challenges, 2010-2020 was unprecedented for energy and sustainability professionals. Today's leaders must increasingly concern themselves not only with resource cost, consumption, and management, but also with the exponential impacts of public perception, risk and crisis management, and long-term planning and investment decisions. In the past decade, we've seen the roles of corporate energy and sustainability converging, as many now work cross-functionally to reduce their organizations' carbon footprints and improve their energy resilience.

As a result of this convergence, organizations today no longer consider energy, water, and other natural resources simply commodities that must be purchased and managed effectively. Rather, these resources are instead seen as strategic assets that should be leveraged to achieve financial and environmental goals. We call this holistic integration of data, energy, and sustainability *Active Energy Management*.

"Over the last two years, we've developed a much more structured approach in terms of energy. We've done energy audits at all 35 sites across the globe in the last 18 months. Now we're asking, 'What is the opportunity for the future?'"

MULTINATIONAL
PHARMACEUTICAL CORPORATION

Active Energy Management is when enterprise efficiency, energy procurement, sustainability, and data management come together to increase performance and return on investment through integrated decision-making and initiatives.

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Making Sense of the Moment:
Our 2020 Research Results

FINDING 1
Energy management rises in the ranks

FINDING 2
Digital innovations ease market complexity

FINDING 3
Climate change tops the corporate agenda – or does it?

FINDING 4
With commitments comes confidence

FINDING 5
Fresh funding mechanisms unlock opportunities

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What our research reveals about the new decade

Without a doubt, the past 10 years has been a time of momentous change in energy and sustainability, exceeding even what was predicted. Now, in 2020, we find businesses at a crossroads, facing both challenges and opportunities across their resource portfolios.

For many companies, 2020 is a landmark year, the first milestone in their journey towards a larger goal. For others, the turn of the decade may only be the beginning. And for all of us, the impacts of the COVID-19 virus are yet to be fully understood.

In our third year of partnering with GreenBiz to conduct research on global corporate energy and sustainability trends, we found that the prevailing opinion of the organizations we surveyed reflects a new reality. Companies are moving faster, and in more diverse ways, towards Active Energy Management than ever before. They are driven by the need for urgent action in an increasingly complex and volatile environment.

In this section of the report, we'll explore the five dominating factors influencing energy and sustainability today.

1. Energy management rises in the ranks

   ACTION STEP 1: Engage executives for buy-in and financial support

2. Digital innovations ease market complexity

   ACTION STEP 2: Upgrade your data

3. Climate change tops the corporate agenda—or does it?

   ACTION STEP 3: Managing "tweet risk" in the era of climate uncertainty

4. With commitments comes confidence

   ACTION STEP 4: Determine the best goals for your organization

5. Fresh funding mechanisms unlock opportunities

   ACTION STEP 5: Understand innovative funding methodologies

"We've had a sustainability strategy within the organization in a proper, structured approach for probably the last two years. Energy is a big one for us and is our main focus." **MULTINATIONAL PHARMACEUTICAL CORPORATION**

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FINDING 1

Energy management rises in the ranks

Energy management once meant coordinating a utility program with a local provider and submitting a monthly bill for invoicing. However, as the energy market has continued to deregulate and demand for decarbonization has increased, energy professionals find themselves playing a much more strategic and influential role. Today's energy management is ever increasing in its complexity. Regulation, distributed assets, globalization, new technologies, and market and price volatility make energy management key to any business's budget, risk, and sustainability strategy.

"We have a very wide and unique footprint, so our approach is to focus on making meaningful changes in the areas in which we operate by putting net new renewable energy on the grid [in those areas] to support our operations."

INTERNET CLOUD COMPUTING COMPANY

The result is that in 2020, energy managers find themselves core to business operations, with expanding responsibilities and regular interface with the C-suite. 87% of the respondents agreed or strongly agreed with the statement, "*energy procurement is increasing in its scope and complexity, leading to changes in the way our organization approaches energy management*" and 56% report that their organization has full-time, dedicated energy management staff.

These numbers are reflective of the growing value of energy management as a budgeting and risk management tool. In our previous year's report, we found that only 29% of responding companies cited strategic energy sourcing as a top initiative for cost savings. Yet, this year, 46.5% of respondents noted that timing and pricing volatility is the single biggest challenge for energy and sustainability managers today. In a market subject to rapid fluctuations driven by extreme temperature changes and geopolitical and trade tensions, the difference between the right energy purchase and the wrong one could translate into millions of dollars.

What are the top challenges facing energy and sustainability professionals today?

Timing and pricing volatility
46.5%

Access to timely information, resources, or support
32.9%

Global portfolio management
30.5%

Resource instability or scarcity
24.4%

* Top results. Other answers include renewable penetration (23%); global risk exposure (22.5%); other DER considerations, like storage, EVs, and microgrid (16.4%) and retaining strong talent (14.6%).

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Energy managers are valuable for their ability to predict and address the risks associated with commodity volatility, but they also play an increasingly important role in mitigating both financial exposure and greenhouse gas emissions. Respondents to our survey are using renewables as one way to manage volatility; the majority are considering onsite or offsite renewables as a purchasing strategy in the next three years. Of those who report price volatility as their top challenge, 30% are deploying renewables as part of their portfolio. The result is more certain pricing combined with virtually carbon-free electricity.

Energy management is sure to remain a growing consideration for companies, particularly as market connectivity and globalization increase corporate exposure to new risks. Global portfolio and risk management will not be the only concerns of the energy manager in the coming decade; access to timely resources, grid reliability and resilience, and cybersecurity also rank high in our respondents' lists of challenges and concerns.

It's noteworthy to mention that 46.5% of our respondents say their organization is prepared to respond to greater innovations in energy management, like autonomous grids. This demonstrates yet another evolution of the energy manager: the need to forecast and respond to megatrends like electrification and digitization. Combined, these two trends are revolutionizing energy management and sustainability, leading to what we call the new electric world. As the energy evolution continues, organizations with dedicated energy management roles will be able to capitalize on both the growth of new technologies as well as the increased convergence between conventional and renewable resources.

The difference between the right energy purchase and the wrong one could translate into millions of dollars.

What technologies/strategies is your organization considering in the next 3 years?

- Energy and resource efficiency measures — 17.2%
- Offsite renewable energy — 14.4%
- Onsite renewable energy — 13.1%
- Energy attribute certificates — 10.2%
- Electric vehicles — 8.7%
- Carbon offsets — 8%
- Other* — 28.4%
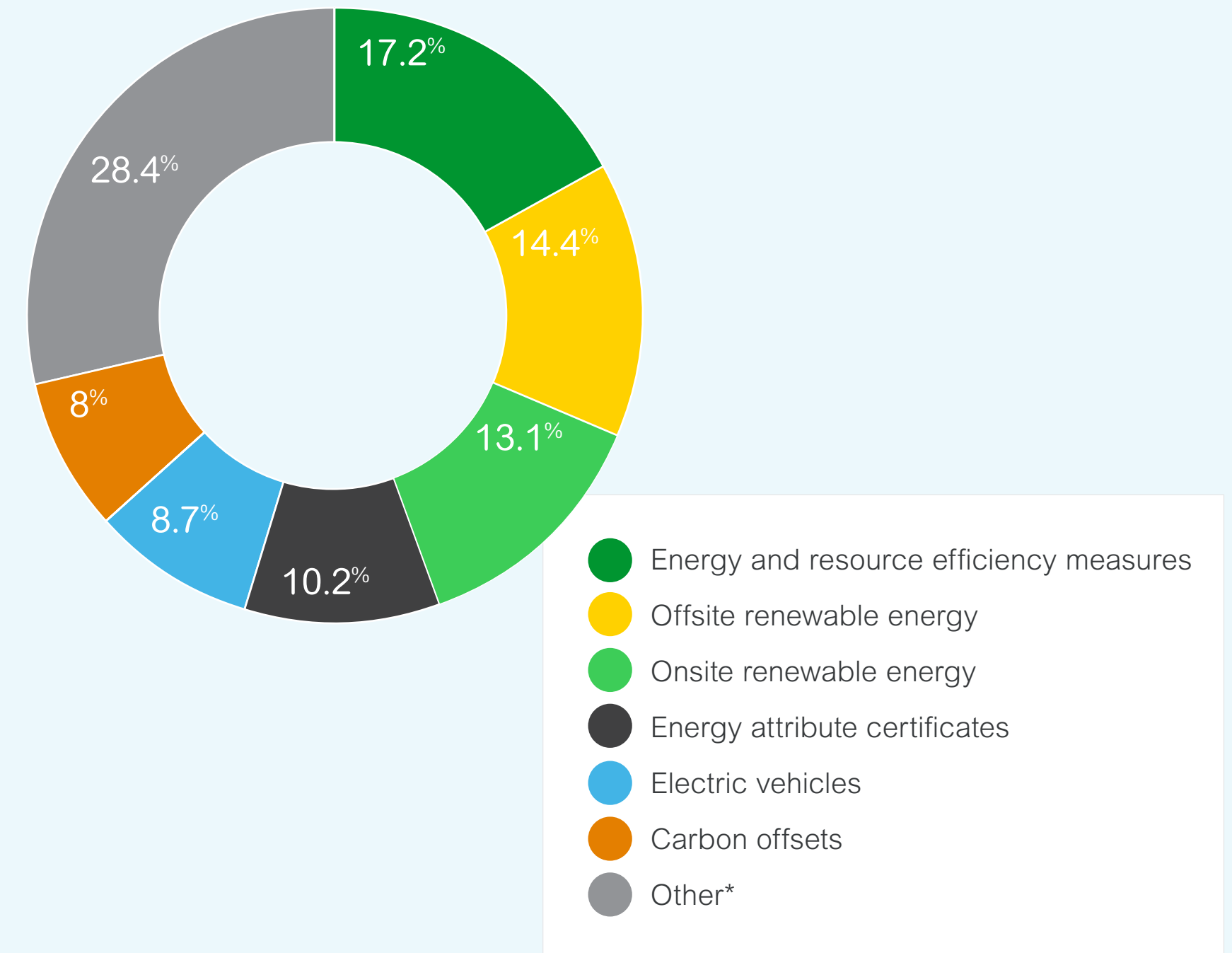
Top results. Other answers include combined heat + power (7.6%), demand response (7.6%), battery storage/fuel cells (6.5%), microgrids (4.2%), and renewable thermal power (2.5%). Results filtered by those who report price volatility as their top challenge.

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ACTION STEP 1

Engage Executives for Buy-in and Financial Support

Our previous years' research found that energy and sustainability professionals were more successful at achieving their goals when they had a compelling business case and demonstrated ROI.
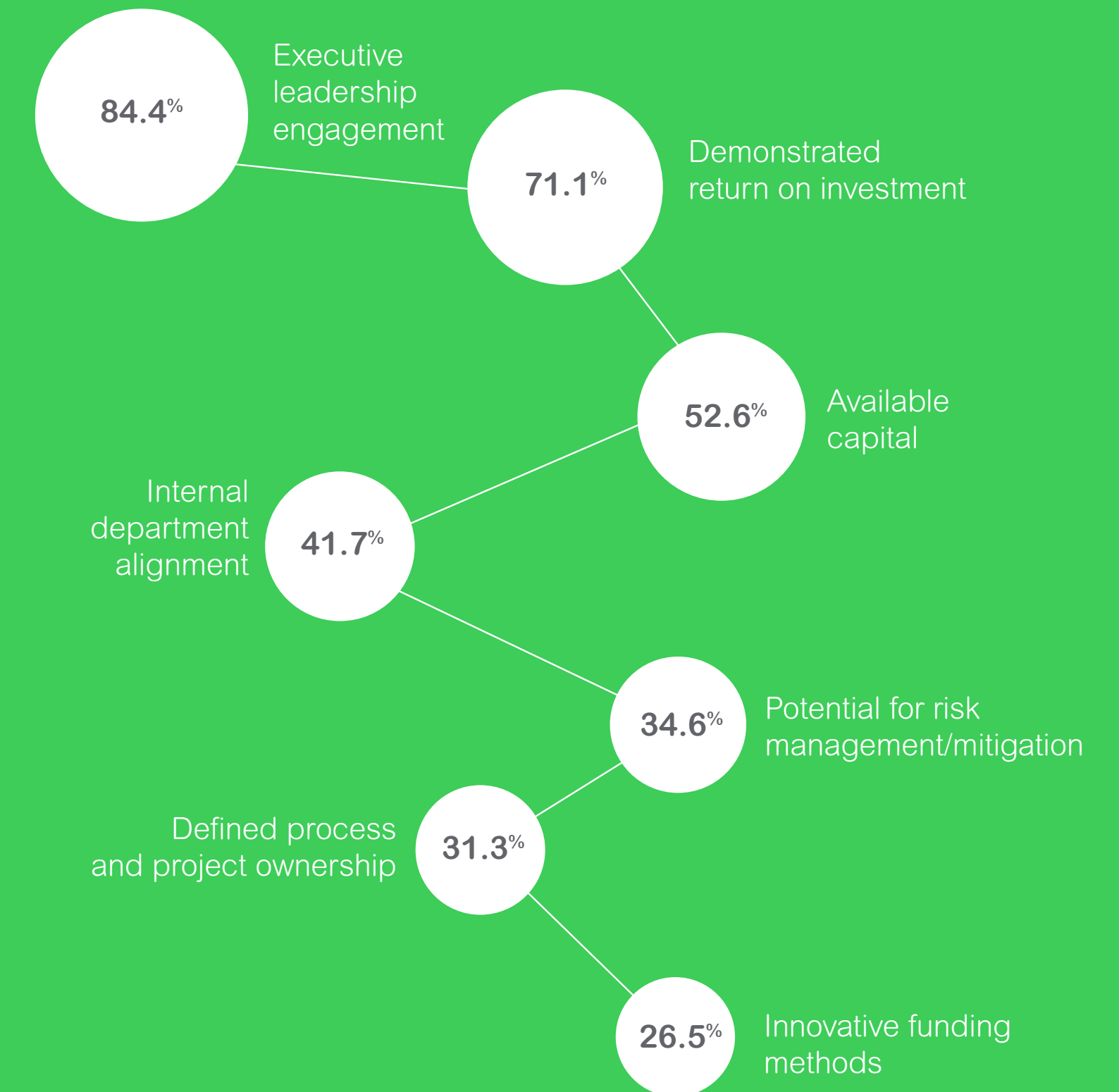
This year's results reinforce this finding, with 84% of respondents reporting that executive buy-in was the most important driver for getting new energy and sustainability programs approved and funded.

And yet, a disconnect may exist between executives and their energy functions. When asked if energy procurement was increasing in scope and complexity, 12.5% of C-level respondents and 20% of senior vice presidents **strongly disagreed**, compared to only 2% of individual contributors.

This points to potential misalignment among energy managers and their leaders about the realities of today's energy marketplace. It may also mean that energy professionals can lose executive engagement if they don't fully communicate the value of active energy management in addressing risk and resilience.

What contributes most to energy and sustainability programs getting approved?
(% of respondents selecting the below categories)

84.4% Executive leadership engagement

71.1% Demonstrated return on investment

52.6% Available capital

41.7% Internal department alignment

34.6% Potential for risk management/mitigation

31.3% Defined process and project ownership

26.5% Innovative funding methods

TAKE THE LEAD

Executives want to take ambitious, proactive steps towards competitive advantage and reputation. Energy and sustainability professionals can engage leaders by developing a compelling business case that clearly outlines the risks and rewards of each initiative and how innovative approaches to funding can accelerate success. Visit our **blog**.

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Digital innovations ease market complexity

Complexity is driven, in part, by the mountains of energy and sustainability data that our survey respondents say they must manage. 86% of those that took the survey agreed with the statement, *"the high volume of data and increase in use of digital technologies are impacting the way my organization manages energy and sustainability programs."*

The good news is that our research respondents also said that using advanced data management solutions and connected devices makes it easier to manage complexity. Even though 54% of respondents report that they are still using spreadsheets to manage their energy and sustainability inputs, the number of respondents

using IoT devices, such as meters, sensors, and other smart assets, has doubled over last year's survey results, jumping from just 18% in our 2019 report to nearly 37% in 2020.

Interestingly, our results also demonstrate that organizations proactively collecting resource data with tools like energy management systems or IoT devices also report higher confidence that they are prepared to respond for innovations in energy and resource management. On average, 63% of the respondents in this category felt positive about their readiness, compared to the 44% of those still using spreadsheets. This may be because having more data—when you can derive the right insights from it—drives decision-making, transparency, and peace of mind.

These results are consistent with research from Bloomberg New Energy Finance[x] and others, who have identified that energy is not immune from digitization—nor should it be. Digitization and automation of the energy ecosystem increases efficiency, which in turn improves reliability, safety, and sustainability.

" "We're seeing a rapid uptake in digital tools to manage our energy. Right now, we're introducing smart factory technology at one of our plants."

AMERICAN MANUFACTURER

The number of respondents using IoT devices has doubled to 37% in 2020.

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By itself, though, data does not drive outcomes. How readily and how quickly organizations can use their data is what increasingly matters. When paired with human intelligence, data derived from connected and emerging technologies can radically impact resource management. Data automation results in faster and more accurate collection, processing, and analysis, allowing savvy energy and sustainability professionals to harvest immediate results across their resource portfolio, resulting in real-time decision-making.

Our survey respondents recognize this growing power. 48% report that they are adapting their energy or sustainability data management programs based on growth in connected devices and 24% say the same when it comes to growth in artificial intelligence.

What is less clear to our respondents is how growing digital trends may impact energy and sustainability management in the future. While confidence is generally high that our respondents are prepared for resource innovations, such as smart demand response and self-driving vehicles (46.5%), 35% of respondents said their organization is not prepared, and a further 18% said they were unsure. Changes in digital fluency may also have an impact, as evolving population demographics and expectations drive a fluctuating resource landscape and workforce.

48% report that they are adapting their energy or sustainability data management programs based on growth in connected devices.

"The technologies have evolved; a lot more data and information is available to us. I can see artificial intelligence becoming part of that effort, where our refrigeration systems are smart enough to run themselves. A more automated control system makes those systems run more efficiently and provides us with more data that we can feed back into our operations and use to become more efficient going forward." GLOBAL FOOD PRODUCER

Key drivers for energy and sustainability data management program adaptation

Driver	Percentage
Stakeholder expectations for energy and/or sustainability transparency	58.8%
Greater need for data and analytics	52.7%
Growth in connected devices	47.8%
Growth in digital service offers	25.3%
Growth in artificial intelligence	23.6%
New purchasing models	20.9%
Globalized, collegial work networks	12.1%
Larger transitions in energy, such as autonomous grids	9.9%

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Upgrade Your Data

54% of our respondents say they are still using spreadsheets to track energy and sustainability data—a number that hasn't changed from our 2019 report.

While spreadsheets may forever be a tool in the resource manager's toolbox, an enterprise-level, AI-enabled software can deliver superior results to improve data management and decision-making.

Our best-in-class EcoStruxure™ Resource Advisor software simplifies data collection, analysis, and interpretation, reducing errors and providing real-time insights to energy and sustainability managers across multiple domains.

TAKE THE LEAD

Learn more about how our client Whirlpool Corporation has used Resource Advisor to achieve its goals.

Watch this **video**:

"In the early '90s it was all about persuading senior management that environmental sustainability was critical and that we needed to set these goals. Over time, sustainability has finally become—or, is now—resonating in the C-suite; senior management is now demanding this."

GLOBAL BEAUTY PRODUCTS COMPANY

Life Is On | Schneider Electric

FINDING 3
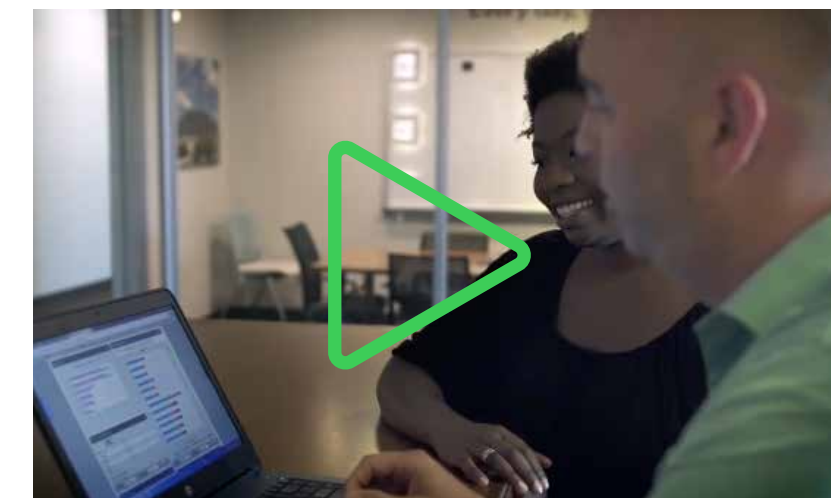
Climate change tops the corporate agenda—or does it?

The influence of voices ranging from activists to investors was prevalent in 2019 when it came to sustainability, expressly around global warming and the call for urgent climate action. Increasingly, all categories of stakeholders are pushing organizations to lead when it comes to climate-related risks, grid reliability and resilience, decarbonization, circularity, and a host of other initiatives.
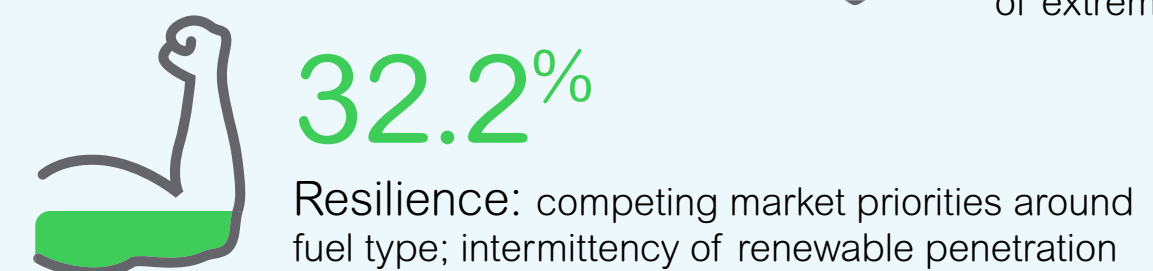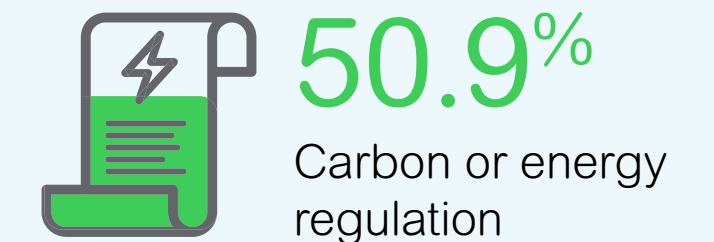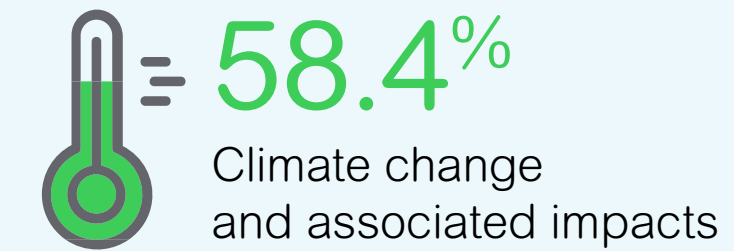
Perhaps most telling was the commitment taken by the 181 Business Roundtable signatories to amend the Statement on the Purpose of a Corporation. The decision redefined business as an entity that "promotes an economy that serves all [Americans],"[xi] a move away from shareholder primacy in favor of socially and environmentally

responsible business. The announcement rocked the corporate community and launched a global conversation on whether social and environmental programs are the domain of business or not.

The momentum in 2019 was undeniable. A record number of companies made or accelerated commitments to sustainability or climate action, ranging from Amazon's goal to purchase 100,000 trucks from U.S. electric vehicle manufacturer Rivian to Microsoft's moonshot announcement in early 2020 that the company would not only achieve carbon negativity by 2030, but that it would remove all the carbon the company has emitted since it was founded in 1975, by 2050.

> " "We do have a CEO mandate, but [setting energy and sustainability goals] is just the right thing to do. We are in a climate crisis and we have to set aggressive goals and work very diligently, with creativity and ingenuity, to come up with big solutions to the big problems we face as a society." **AMERICAN MANUFACTURER**

The top 5 risks to energy and resource supply, according to respondents

58.4%
Climate change and associated impacts

50.9%
Carbon or energy regulation

48.6%
Cost/risk management in the face of volatility

40.7%
Reliability: grid disruption in the form of extreme events or utility destabilization

32.2%
Resilience: competing market priorities around fuel type; intermittency of renewable penetration

* Other answers include cybersecurity breach (27.6%), water scarcity (23.4%), and scarcity of other raw materials (17.8%).

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During Climate Week 2019, more than 85 global organizations announced plans to align their business with actions scientists deem necessary to limit a global temperature rise to 1.5 degrees Celsius.

In our survey, respondents rated environmental concerns as the top driver for energy and sustainability initiatives (51.5%) and climate change as the top risk to energy and resource supply (58%). These results had a consistent distribution across our respondents, regardless of organizational seniority. From the data in our survey and the qualitative evidence, climate change appears to have cemented its place at the top of the corporate agenda.

But has it?

The results of the annual Global CEO Survey from PricewaterhouseCoopers (PwC)[xii] appears to contradict this finding. Released in tandem with the World Economic Forum (WEF) event in Davos, Switzerland, the 2020 report made global headlines because, for the second year in a row, climate change/environmental issues did not rate in the top 10 business risks according to chief executives.

Even more interesting: When the WEF itself released its annual long-term risks report[xiii] only a few days later, for the first time in the report's 14-year history, the top five considerations were all climate change-related.

58% Respondents rated climate change as the **top risk** to energy and resource supply.

Why the incongruity? In the PwC report, 24% of global CEOs still report that they are "extremely concerned" about climate change, an increase over 2019's results. CEOs also responded positively to climate action opportunities in the report, such as reputational advantage with stakeholders, new products and services, and the potential to benefit from environmental investing.

Still, the PwC report may point to an underlying skepticism and reluctance among executives when it comes to the benefits of climate action. One potential explanation for the discrepancy is short- versus long-term risk analysis. CEOs are confronted with a myriad of challenges, including trade conflicts, uncertain economic growth, and cyber threats. In the face of these near-term headwinds, it's possible that climate change has been deprioritized from the CEO agenda, while remaining a long-term threat to future energy and resource supply.

During Climate Week 2019, more than **85 global organizations** announced plans to align their business with actions scientists deem necessary to **limit a global temperature rise to 1.5 degrees Celsius.**

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The underlying question is: can any business afford to be shortsighted when it comes to climate change risk? Pressure is on the rise; the heat is particularly intense for companies in the Food & Beverage, Technology, Healthcare, and Consumer Goods segments, who cited stakeholder pressure as one of their top drivers for sustainability initiatives.

Public perception is also a top motive for action. Behind environmental concerns, our survey respondents reported that brand/reputation (50%) and competitive advantage (47%) are the second and third top drivers for energy and sustainability initiatives at their companies. This suggests the need to take decisive action on these issues in order to maintain market share and protect the organization from reputational risks.

The good news is that the discrepancy doesn't appear to be slowing any companies down. 70% of this year's respondents report that they have set energy or sustainability targets and announced them publicly, compared to just 57% in the prior year, and 75% of respondents say that they have increased goals over those previously set. Only 3.5% of respondents say they are not considering reducing carbon at all currently.
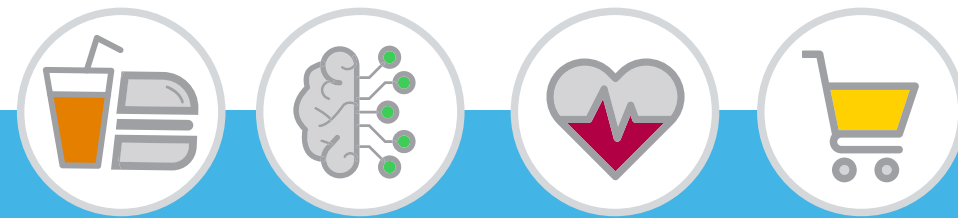
Stakeholder pressure is a top driver for sustainability initiatives in several industry segments. Food and Beverage, Technology, Healthcare, and Consumer Goods are the **top industries that care about stakeholder pressure**.

70% of this year's respondents report that they have set energy or sustainability targets and announced them publicly, compared to just 57% in the prior year.

2019
57%

2020
70%

75%
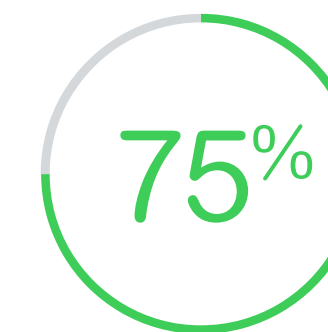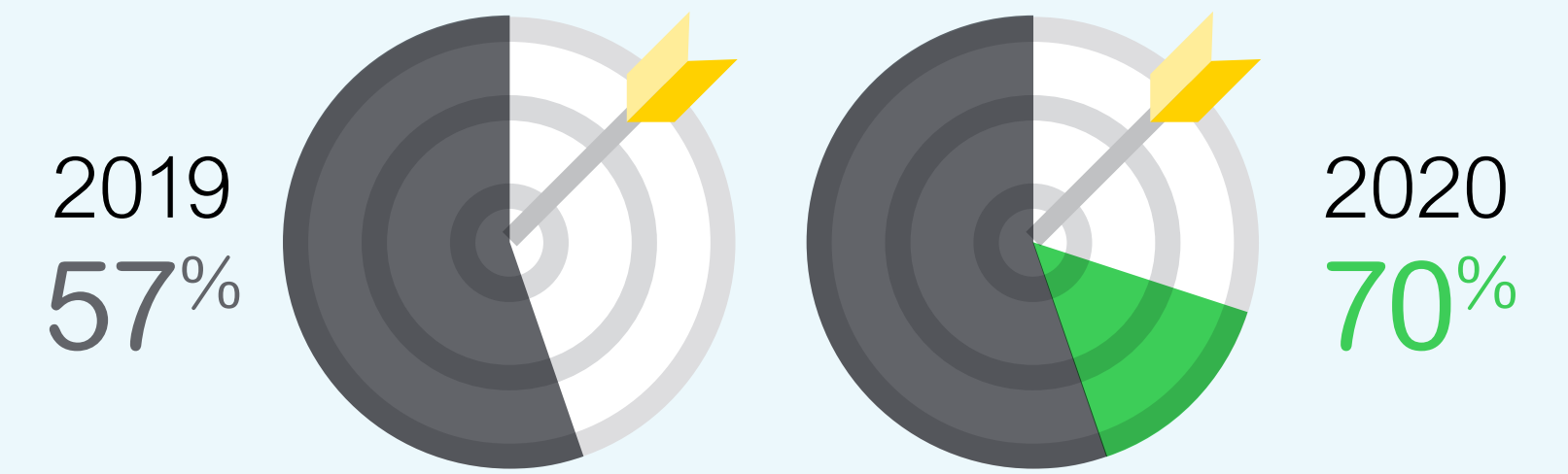
75% of respondents have **increased goals** over those previously set.

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ACTION STEP 3

Managing "Tweet Risk" in the Era of Climate Uncertainty

We were surprised to see reputation and competitive advantage take cardinal positions in our results as top drivers of energy and sustainability initiatives. It was also curious to see reputation make a significant jump in the PwC report, with 30% of responding CEOs indicating that they strongly agree that their organization's response to climate change will be advantageous to their business.

More than ever, companies are learning that what they are doing to decarbonize (or worse, what they aren't) can result in a tangible positive or negative when it comes to public perception. Whether it's getting the attention of progressive investors or avoiding the negative press that comes with employee climate actions (like those at Amazon in 2019), missteps on environmental issues are a hot button.

These concerns led one of our clients to coin the term "Tweet risk"—a pervasive fear that executive officers may make public comments or commitments (positive or negative, purposely or inadvertently)—that result in downstream impacts for their business.

Tweet risk: The pervasive fear that executive officers may make public comments or commitments that result in downstream impacts for their business.

TAKE THE LEAD

In this high-stakes game, it's important that energy and sustainability professionals connect with their communications team on a regular basis to exchange information and leverage reputation-building activities, such as public commitment announcements, or the achievement of energy or sustainability initiatives and milestones. While these functions may not have overlapped before, the role of sustainability marketing is a growing one. Get our top tips for fueling your sustainability communications here.

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# Meeting the Challenge of Carbon Reduction

As carbon reduction commitments have grown over the past 10 years, companies have struggled to get it right, particularly when the need to maintain energy reliability, security, and price may compete with environmental efforts.

Today, there are a limited number of levers that organizations can pull to achieve their reduction goals, and applicable actions depend on emission source.

Each company must decide for itself how to prioritize carbon reductions. Focus on low-hanging fruit first, or tackle big changes all at once? In our work with clients, we often find that a waterfall approach works best, with changes in one operational area leading to impacts in another. However, there is no "one-size-fits-all" when it comes to decarbonization. The important thing is to start and to maintain regular—and increasingly ambitious—momentum.

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$$CH_4 \quad PFCs \quad HFCs$$
$$CO_2 \qquad N_2O \quad SF_6$$

Meeting the Challenge of Carbon Reduction CONT.
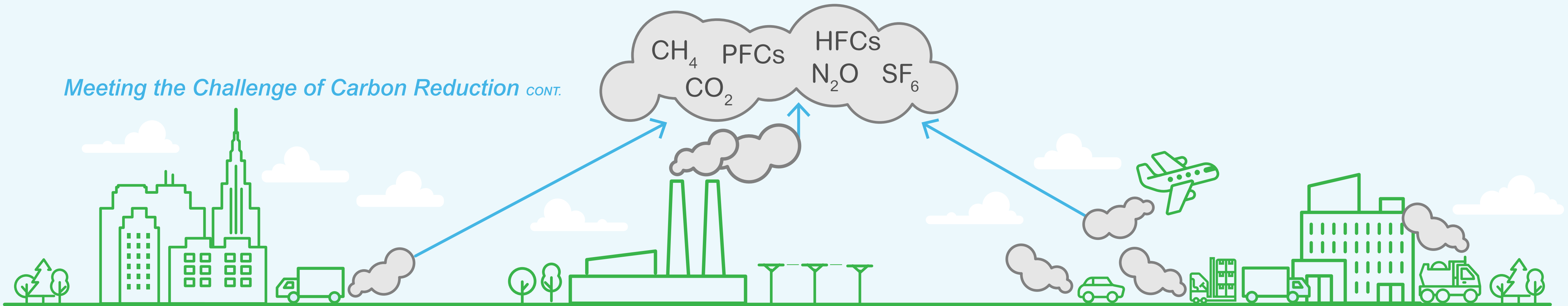
SCOPE 1
DIRECT EMISSIONS

EMISSION SOURCE: All direct emissions within the operational control of an organization.

Companies are getting creative when it comes to the emissions that are in their direct control. Efficiency remains at the heart of approaches to Scope 1 emissions, as reduced demand means less need for intervention. Organizations are also committing to reduce emissions through technologies like fuel switching, electric vehicle adoption, and remote sensing, while others are exploring process redesign or using carbon offsets.

SCOPE 2
INDIRECT EMISSIONS

EMISSION SOURCE: Indirect emissions generated from purchased electricity, heat, steam or cooling.

Organizations have made monumental progress on Scope 2 reductions, primarily through direct contracting for renewable energy supply via offsite power purchase agreement (PPA). However, only a small minority of companies worldwide are using PPAs. While others are exploring onsite generation or using Energy Attribute Certificates, such as Guarantees of Origin or I-RECs, to address their Scope 2 footprint (especially in markets where PPAs are unavailable or expensive), offsite PPAs remain a valuable option for companies to explore given their ability to neutralize Scope 2 emissions at scale.

The grid itself is certain to green over time as more coal is retired in favor of natural gas or renewables. The challenge for utilities will be maintaining reliability in the era of pressure to rapidly decarbonize.

SCOPE 3
INDIRECT EMISSIONS

EMISSION SOURCE: All other indirect emissions from sources such as business travel, waste management, and the value chain.

Deep decarbonization efforts may feel out of reach when it comes to those indirect emissions categorized as Scope 3. Many vanguards are mobilizing reductions in their supply chains through education, benchmarking, and corporate-led initiatives on efficiency and renewable energy adoption. Others are exploring investments in circularity or waste-reduction technologies. For most companies, tackling Scope 3 becomes difficult without some amount of carbon offsets used to address any remaining emissions. Innovative thinking is needed when it comes to helping organizations find new solutions for tricky Scope 3.

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🔍 FINDING 4

With commitments comes confidence

Setting energy and sustainability goals is nothing new; many companies have been doing so for more than a decade. What does appear to have changed in the past year is how ambitious goals are becoming and how confident respondents to our survey are that they will achieve their goals.

This year, we asked respondents to disclose whether they had set goals or not, and how confident they felt that their organization would reach its goals. We also asked whether respondents felt they goals were ambitious enough to limit global warming to the recommended 1.5-degree threshold.

The results were mixed. In general, most respondents that have set goals feel confident (50%), very confident (17%), or extremely confident (15%) they will meet them. However, for many, that confidence didn't translate into optimism that their goals were ambitious enough to affect global warming. 34% of respondents said they were less than confident that their goals would be effective against the 1.5-degree threshold and 14% said they were not at all confident.

This finding indicates that while most companies have set goals, or even increased their goals, these efforts may still not be enough to reach a common global threshold. This result is consistent with one of our original research hypotheses, which was that companies are not moving fast enough on climate action.

However, we also uncovered a thought-provoking relationship among some responses. Those respondents who shared that their organizations have increased their goals feel both more confident that they will meet their goals, and more confident that those goals will contribute to meeting the 1.5-degree threshold. These results were amplified even further if respondents had announced their goals publicly.

82.5% of respondents are confident that they are on track to achieve their energy and sustainability goals

Confident
50.4%

Very confident
17.4%

Less than confident
14.3%

Not at all confident
3.1%

Extremely confident
14.7%

> " "We want to be able to set targets that can help us solve for this crisis. But we also don't want to set something that we can't potentially hit, so we are looking at it from a strategy perspective. Science-based targets are very much in the cards for our future strategy." **INTERNET CLOUD COMPUTING COMPANY**

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This result is surprising, given the difficulty of achieving very ambitious goals. While it is unclear without further research whether it is the very nature of these ambitious goals that is driving confidence levels, or whether feeling confident leads to more ambitious goals, our conclusion based on these results is that commitment level and confidence are dependent on one another. This implies that the more ambitious the energy and sustainability goals, the more confident professionals across the organization are about meeting them.

Another relationship emerged when we compared respondents' confidence levels about achieving their goals against their confidence that they are prepared to respond to greater innovations in energy and resource management. We found that respondents who are more confident about reaching their goals, as well as those who are confident that their goals will be effective in meeting the 1.5-degree threshold, also believe their organization is better prepared to respond to and adopt energy and resource innovations. As a specific example, those organizations using microgrids reported greater confidence than others about meeting their goals.

"In 2008, we set a goal of net zero by 2035. That goal applied to Scope 1 and Scope 2. We're now in the process of expanding that goal, looking at a lifecycle goal that includes not only our own operational footprint, but also that of our suppliers, our customers' use of our products, and finally, end of life." **AMERICAN MANUFACTURER**

To learn more about the commitments to and progress on sustainability that Schneider Electric has made, visit our sustainability report Executive Summary.
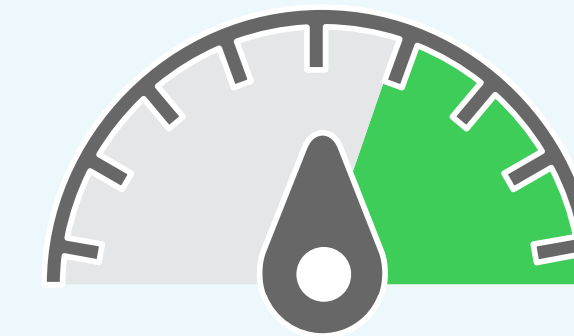
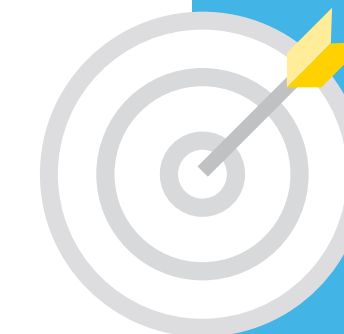## Respondents who have increased their goals feel more confident their goals will help limit global warming
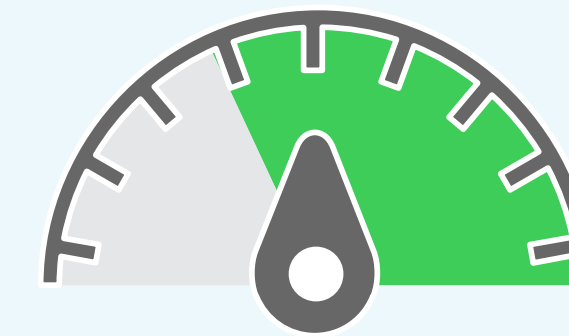
63.4%
feel confident,
with increased public goals
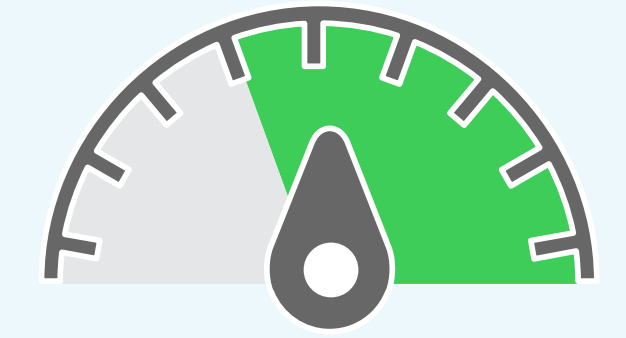
60.7%
feel confident,
with increased internal goals

38.9%
feel confident,
with no increase in goals

The more ambitious the energy and sustainability goals, the more confident professionals are about meeting them.

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The inverse also appears to be true. We found that respondents from organizations that have not set energy or sustainability goals feel ill-prepared to respond to greater innovations in energy and resource management by a significant degree (only 12.5% said yes).

These observations have important implications:

- **First,** if an organization has goals, it should consider making them more ambitious. Based on our findings, companies who increased their goals have not seen a decrease in confidence that they can be met.

- **Second,** if a company has goals, but has not announced them publicly, it should consider doing so.

- **Third,** those companies that do feel confident that they will be able to realize their ambitions should proactively consider emerging technologies and other innovations to drive even further progress.

- **Finally,** organizations that have not yet set energy or sustainability goals should do so, as our research suggests that it is beneficial for both decarbonization and for future preparedness.

Setting goals can help organizations feel more prepared for energy and resource innovations like autonomous energy grids, self-driving vehicles, and smart demand response.
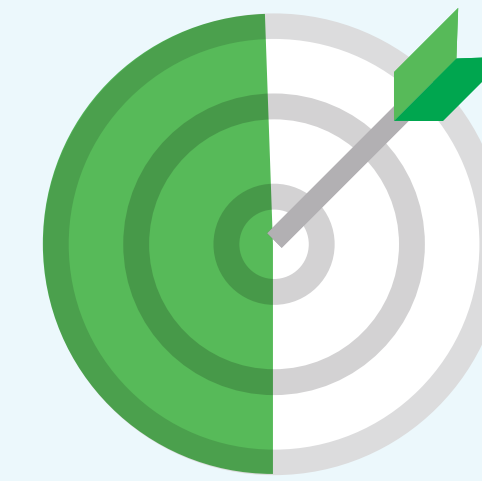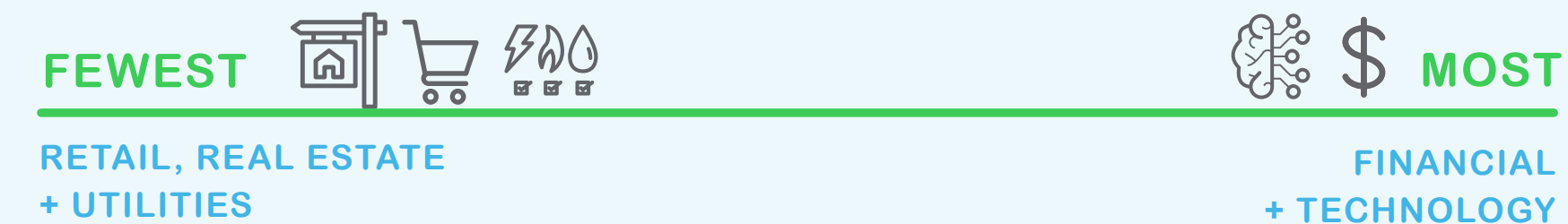
49.6%
feel prepared,
with public goals
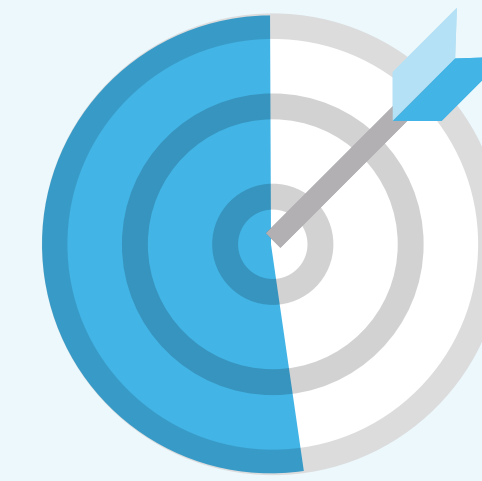
52.4%
feel prepared,
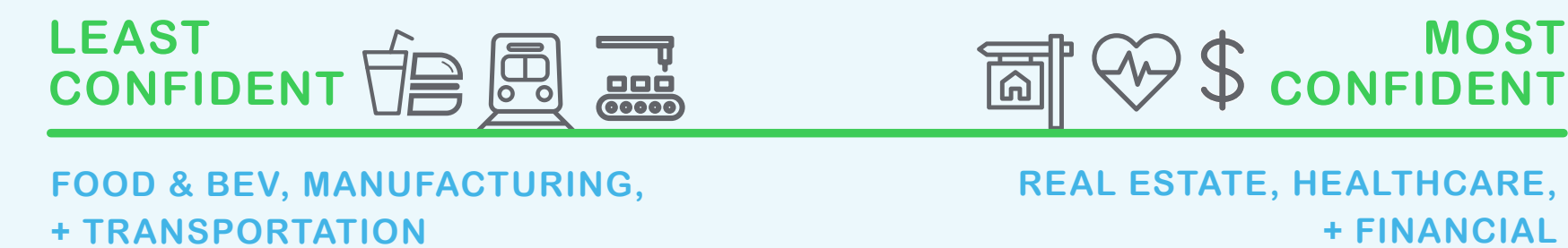with internal goals

12.5%
feel prepared,
no goals

Progress on goals by segment

What industries have respondents who have set goals?

FEWEST   **MOST**

RETAIL, REAL ESTATE
+ UTILITIES   FINANCIAL
+ TECHNOLOGY

Finance, construction/buildings, and real estate lead the way when it comes to increasing goals

Who is most confident, both to meet their own goals and to impact global warming?

LEAST CONFIDENT   **MOST CONFIDENT**

FOOD & BEV, MANUFACTURING,
+ TRANSPORTATION   REAL ESTATE, HEALTHCARE,
+ FINANCIAL

C-level respondents are the most confident they will meet their goals

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ACTION STEP 4

Determine the Best Goals for Your Organization

Given the valuable role that goal-setting plays in accelerating energy and sustainability progress, and future preparedness, it makes sense for companies to take their goals seriously.

How do companies get started, with so many different options to choose from? We've gathered the data on seven top standards in our **Goal-Setting Guide**.

TAKE THE LEAD

Setting goals may not be enough. By publicly sharing goals, organizations see advantages, including benefits to their brand and reputation. Learn how with our **interactive infographic**.

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FINDING 5

Fresh funding mechanisms unlock opportunities

Setting and meeting goals is only one potential result when it comes to the value of confidence. We also found that respondents with higher confidence in meeting their goals are more likely to have innovative mechanisms among the ways they typically fund energy and sustainability projects, alongside more traditional methods. This may mean that their ability to get energy and sustainability projects done will be higher, too.
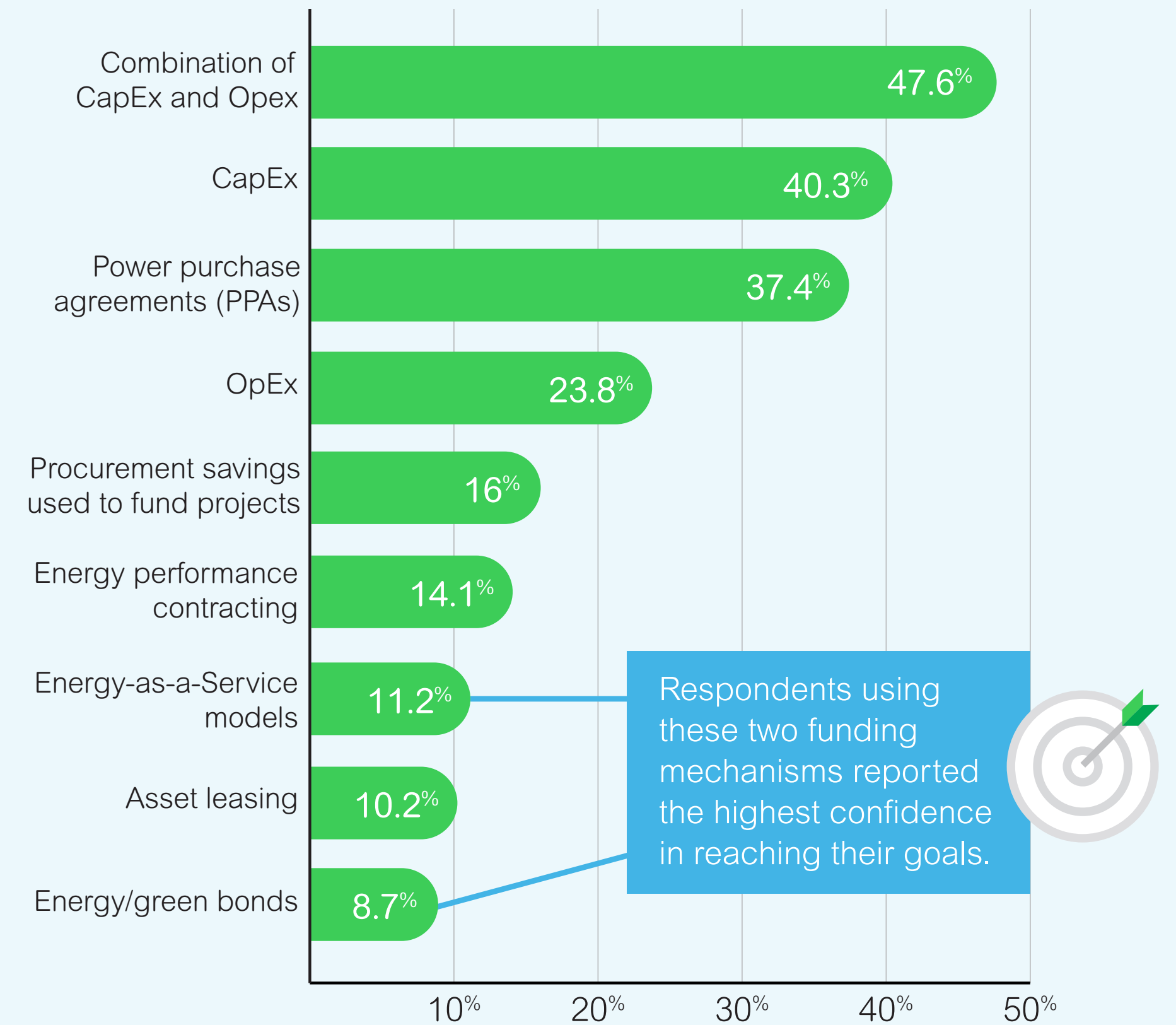
Organizations have typically relied on CapEx, OpEx, or a combination of the two to finance energy and sustainability projects. In our previous years' report, 57% of respondents indicated that they would rely on CapEx in the coming year.

These numbers remained high in 2020, with 40% of respondents reporting typical use of CapEx, 24% reporting typical use of OpEx, and 48% reporting a combination of the two.

However, we found that responding companies that report using innovative funding mechanisms—such as energy-as-a-service and energy/green bonds—demonstrated both the highest degree of extreme confidence as well as the most general confidence overall when it came to achieving energy and sustainability goals. Further, those respondents that are investing in the use of energy/green bonds are also increasing their goals more than any other group.

> "Most people think financial barriers are the biggest hurdle to get a project started. And that can be true, but often the bigger hurdles are with time and risk. The financial problem really comes down to competing priorities for capital and balancing the opportunity cost."[xiv] **SPARKFUND**

How do you typically fund energy and sustainability projects?

Funding mechanism	%
Combination of CapEx and Opex	47.6%
CapEx	40.3%
Power purchase agreements (PPAs)	37.4%
OpEx	23.8%
Procurement savings used to fund projects	16%
Energy performance contracting	14.1%
Energy-as-a-Service models	11.2%
Asset leasing	10.2%
Energy/green bonds	8.7%

Respondents using these two funding mechanisms reported the highest confidence in reaching their goals.

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Yet, these funding mechanisms have relatively low adoption rates, with only 26.5% of respondents agreeing that innovative funding contributes most to their energy and sustainability programs getting funded and approved. The top driver for success was executive buy-in, at 84%, a finding consistent with our 2019 results, which found that available capital may in fact be a false barrier when compared to the role that demonstrated ROI and a compelling business case play in convincing executives to invest.

Why do innovative funding mechanisms see lower adoption rates given these circumstances? We suspect that companies with greater expertise may also be those that are pursuing creative financing, and that it may be this expertise, rather than the funding mechanism itself, that translates into higher confidence.
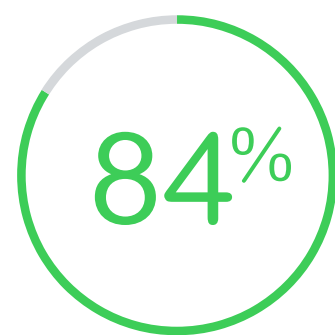
84% At 84%, executive buy-in is the top driver for energy and sustainability success.

However, it is a compelling result that deserves deeper consideration. Alternative solutions like energy-as-a-service are available now, and like other early financing tools, such as power purchase agreements (PPAs), they likely have significant growth ahead. Innovative approaches have the potential to unlock funding sources outside of traditional CapEx/OpEx, which is, by definition, limited. Could more organizations rapidly advance their energy and sustainability targets by investigating and implementing non-traditional funding?

Our belief is yes. On top of the higher confidence reported by respondents, in-depth qualitative interviews we conducted revealed that companies that consider innovative funding mechanisms up front are seeing higher funding success in their organizations. Respondents that agree that the energy landscape is rapidly changing more frequently use or consider using shared savings mechanisms, rebates/incentives, and energy service agreements to overcome financial hurdles. By contrast, organizations that are not using innovative funding report that they feel less prepared for the future.

Only 26.5% of respondents agree that innovative funding helps their projects get approved. Yet those using innovative means report higher success and future preparedness.
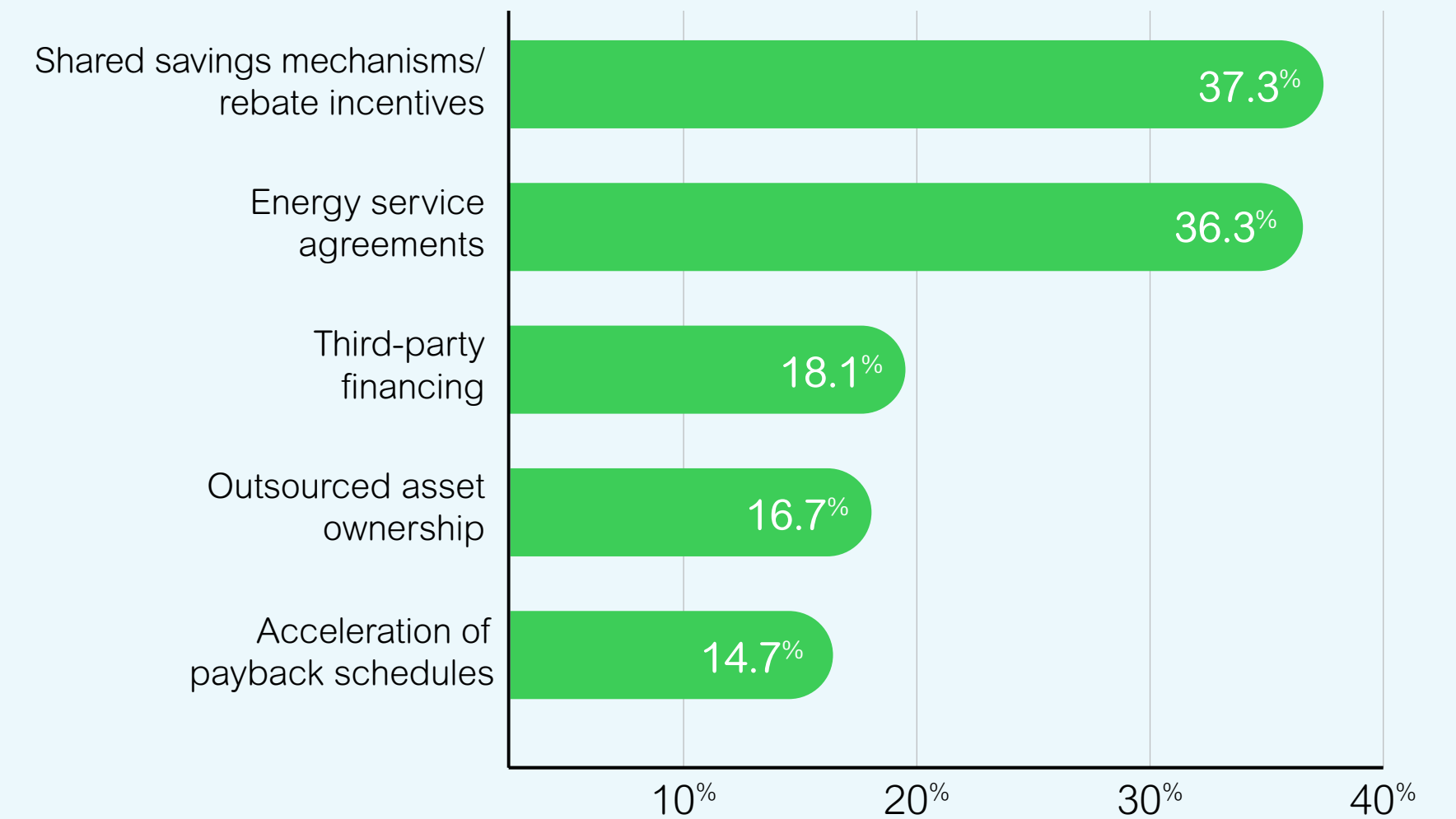
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Our suspicion is that tried-and-true traditional funding models likely impede energy and sustainability progress because they inhibit the ability or desire to unlock new financial means. A growing list of business priorities competing for finite pools of money can also make it difficult to get executive approval.

It's also probable that many energy and sustainability professionals are simply unaware of the alternatives to the traditional CapEx/OpEx models. 36% of our respondents reported that they didn't know if their organization used or are considering using methodologies like outsourced asset ownership and concession agreements to overcome financial hurdles. There is an opportunity for organizations to explore these new alternatives with the potential upside of increased success, outsourced burden of ownership, and accelerated achievement of goals.

" "We run event buildings. And they're going to be powered down when they're not occupied, which means that it can be hard to get some technologies to pencil out financially. I think a better approach is if one of our buildings is part of a larger network or campus. It could take advantage of a microgrid or a district heating and cooling system like that." **WORLDWIDE ENTERTAINMENT GROUP**

The top strategies organizations use, or are considering using, to overcome financial hurdles to energy and sustainability

Strategy	Percentage
Shared savings mechanisms/ rebate incentives	37.3%
Energy service agreements	36.3%
Third-party financing	18.1%
Outsourced asset ownership	16.7%
Acceleration of payback schedules	14.7%

36% of respondents don't know if their organization is using these methodologies today.

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ACTION STEP 5

Understand Innovative Funding Methodologies

A single project can often be achieved by using more than one innovative funding model. Selecting the right model depends on the unique financial and operational requirements of the organization, and the goals of the project.

Here's a quick-start guide to how 5 top innovative funding models work:

1

Energy Service Agreements allow your company to upgrade equipment and improve asset performance with third-party financiers providing upfront capital and assuming asset ownership.

KEY FEATURES

- Protects cash flow
- Removes project execution risk
- Transitions from CapEx to OpEx
- Guaranteed financial performance
- Defers or removes ownership

2

Shared Savings Agreements use a portion of energy savings to reinvest in more energy efficiency projects.

KEY FEATURES

- Protects cash flow
- Transitions CapEx to OpEx
- Immediate cost savings

3

Power Purchase Agreements secure energy without ownership of infrastructure, with developers providing upfront capital and assuming market risk.

KEY FEATURES

- Protects cash flow
- Removes project execution risk
- Reduced price volatility
- Removes balance sheet exposure

4

Performance Contracting funds projects with cash flow from guaranteed savings, and with third-party financiers providing upfront capital.

KEY FEATURES

- Protects cash flow
- Removes project execution risk
- Financial performance guaranteed

5

Concession Agreements modernize infrastructure with third-party financiers providing upfront capital and assuming ownership of entire operation.

KEY FEATURES

- Transitions CapEx to OpEx
- Immediate cash flow recovery
- Removes asset ownership and performance risk
- Financial and operational outcomes assured

TAKE THE LEAD

Read case studies of how these tools have been successfully applied by companies in our **interactive toolkit**.

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Beyond 2020: What the Next Decade Holds

We pivot now to predict what is next to come.[3]

As we've explored, the energy and sustainability sectors experienced more rapid change between 2010 and 2020 than they had in the previous 50 years. In the new decade, this global transformation shows no signs of slowing.

2020 is a landmark year for many companies on their journey to Active Energy Management. For many of these same organizations, 2030 is the next big milestone. What progress, disruptions, and opportunities can they expect in the coming 10 years and beyond?

The emergence of an identity economy

In the late 1990's, authors at the Harvard Business Review introduced the concept of an experience economy[xv], formed by the progression of economic value from the extraction of commodities to the making of goods to the deliverance of services to the staging of experiences. This new economic model would reshape the way companies serve evolving customer preferences and find a competitive edge.

The evidence of the experience economy exists in many facets of how businesses operate today— from the use of social media by influencer-inspired brands to the way phones have become essential daily mobile devices. But the economic evolution hasn't stopped; it is entering a new phase: the identity economy.

Incoming generations of consumers increasingly place value on the identity of a brand when they make purchasing decisions. They are influenced by, buy from, and align with brands not only based on the goods and services that brand produces, but also on that company's legacy of good. The identity economy is characterized by companies that not only create experiences, but also embrace sustainability and transparency as core pillars of their business. The organizations paving the way for the identity economy embed social and environmental responsibility in their DNA.

Companies of the future will need to consider how, and if, their corporate purpose should realign with the new mission of business as a social enterprise. Companies that ignore the implications of the identity economy may very well lose the license to operate in this emerging business landscape.

3. The production of this report was finalized just as COVID-19 was declared a pandemic. We recognize that COVID-19 will have far-reaching implications for the economy and energy/resources, many of which may not yet be felt. We encourage readers to follow our real-time thought leadership updates at perspectives.se.com where we will share the latest information on COVID-19's impacts as long as the situation continues.

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Beyond 2020: What the Next Decade Holds CONT.

By its nature, this evolving mission will demand new business models. Companies that choose to disrupt and reinvent themselves will capture market share and become true agents of change. Those that boldly reinvent their business to accommodate sustainable and digital outcomes are predicted to see 2x higher revenue growth[xvi] than companies that stick to business as usual.

Sustainability is the disruption that will come to define this decade. In the identity economy, energy and sustainability initiatives will contribute to and accelerate business profitability, strategic direction, risk and financial management, and continuity. In the next 10 years, it will be the job of energy and sustainability professionals to align their actions with the market-disrupting agendas of their CEOs to seize the opportunities presented by this changing world.

Reimagining the energy grid

Alongside the embedding of sustainability as a core business value, the grid is transforming in ways that will challenge conventional energy management. Chief among these is that renewable generation and distributed energy resources will (very soon) overtake traditional fossil fuel-fired generation.

In most global markets, renewable energy is already beginning to rival, or has surpassed, even the cheapest fossil fuel-generated sources on price, driving more and more renewables onto the grid, and leapfrogging technologies in emerging markets. The International Energy Agency recently predicted[xvii] the global offshore wind industry could be worth a trillion U.S. dollars in the next two decades, despite being only a fraction of current capacity.

"Disruption is unavoidable, and companies need to react. Those that respond boldly, at scale, and in a way that is fully embedded in their corporate strategy will be positioned to steal revenue and profits from the laggards and emerge from disruption with higher trajectories in both areas."[xviii] **MCKINSEY & CO**

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Beyond 2020: What the Next Decade Holds CONT.

As the price continues to drop, cheap renewable energy will fundamentally reshape the electricity system. Bloomberg New Energy Finance believes[xix] that wind and solar will supply 50% of the world's electricity by 2050. And once battery storage becomes more cost effective, it will revolutionize the potential of these renewable sources, helping wind and solar reach 80% penetration in some markets.

Although most large-scale energy storage options are not yet commercially viable, it would be short-sighted to assume that they will still be expensive by 2030. By mitigating the intermittency and baseload issues that renewable power sources face, storage will help remove the barriers that have historically prevented greater adoption of wind and solar resources.

Other forms of distributed energy resources (DERs) will also play a role in the grid of the future. Modular infrastructure and decentralized capacity from sources like onsite solar generation, electric vehicles, and microgrids, among others, will lead to increased flexibility and resilience. Similarly, artificial intelligence-enabled control frameworks, such as virtual power plants, will allow for the real-time optimization and monetization of these connected DERs, thereby leveraging these assets in the most efficient manner possible while simultaneously driving down cost and enhancing system reliability.

Microgrids show great promise in this new ecosystem by connecting a combination of clean technologies that help organizations operate autonomously from the traditional grid. As solution providers evolve to serve the needs of modern customers, more organizations will consider microgrids as options to provide low cost, reliable energy to power their operations. More microgrids coming into operation will accelerate the transition away from large, inflexible, and centralized systems of energy generation and delivery, to a modern, responsive, reliable mini-grid. This transition will help organizations adopt renewables while addressing intermittency, infrastructure decay, and other energy management costs and concerns.

" "The next big thing on the scene is going to be affordable battery storage of electricity; I think it will solve a lot of our problems. That's the big movement we'll see in the next five years: batteries become affordable and a dispersed storage platform on a mega scale."

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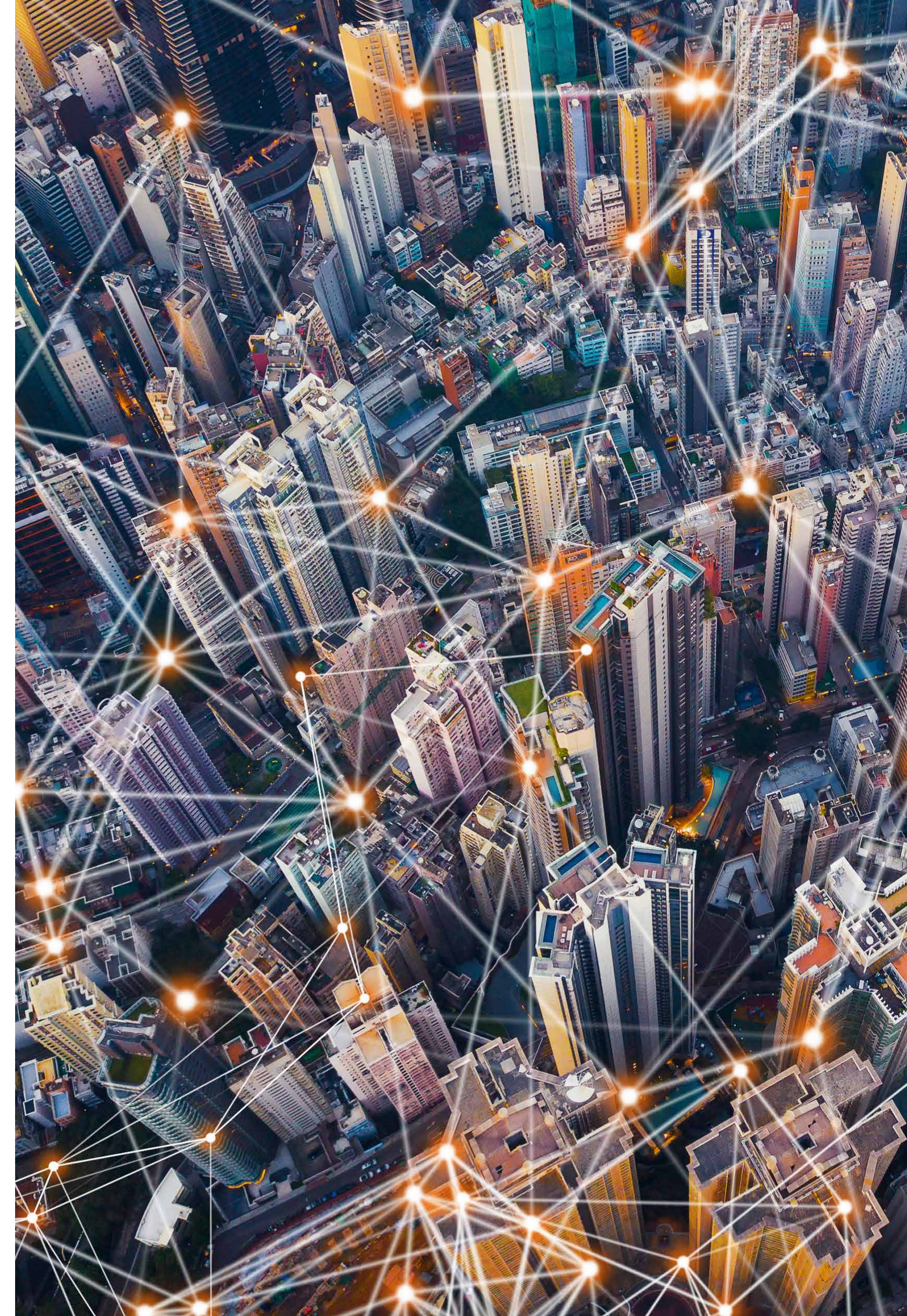## *Beyond 2020: What the Next Decade Holds* CONT.

Autonomous resources will drive the growth of the Meshgrid

The way energy is managed, monitored, and flows is also changing. The grid is moving away from the historic linear system of generation-to-transmission-to-distribution-to-dispatch, to a more clustered and decentralized system, often described as peer-to-peer. The proliferation of renewables and other DERs has begun to test many of the long-standing assumptions underpinning today's power systems and is driving innovation, as prosumers[4] seek to monetize the flexibility of their DERs using bi-directional power flows.

In the future, countless DERs of all sizes and varieties will create new market opportunities for prosumers to optimize and monetize their energy resources. When plugged into a charger, even a smart phone can act as a DER—charging when there is a grid surplus or uploading spare electricity back to the grid when there is a shortage—and in the process, potentially reducing charging costs.

Today, the term "microgrid" typically applies to a specific set of onsite DERs that can be orchestrated in a unified fashion and islanded from the broader grid. But from a theoretical perspective, the term microgrid is an arbitrary ringfence. In theory, any electrically connected asset with onboard communications and computational capability could respond to a command signal in a way that could support the overall operation, balance, and cost equation of the grid ecosystem.

4. Producing-consumer, a term coined by Alvin Toffler in 1980.

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Beyond 2020: What the Next Decade Holds CONT.

This level of interconnection may sound futuristic, but it is at the very heart of the IoT revolution that is driving innovation in virtually every global industry. Thanks to low-cost, communications-enabled microchips embedded in everything from home appliances to electric vehicles to smart light bulbs, the ability to create a demand response in any number of highly-distributed assets exists today. With grid operators already offering incentives to control smart thermostats, how much harder is it to imagine a grid control signal being sent to a smart lightbulb in a home?

We are rapidly approaching a time when every company will be an energy company. In this complex landscape, no organization can afford not to manage their energy strategically. The future of electricity is not as a cost center, but as an asset to be optimized and monetized. While perhaps a future state, the burgeoning grid superorganism we refer to as the MeshGrid[xx] is coming sooner than any expect. This new world of hyper-localized, virtual, and autonomous energy assets has the potential to disrupt energy as we know it, and evokes provocative questions such as:

- How will companies manage a portfolio with diversified and disparate assets when they are already struggling with the energy management complexity they face today?

- How will organizations recover transmission and operational costs on a grid where there are fewer consumers, since charges today are consumption-based?

- What is the value of energy efficiency if the marginal cost of power is zero?

When combined with site-level machine uptime, process efficiency, automation, and collaborative intelligence (our term for the marriage of machine learning with human domain expertise), the possibilities for the grid of the future are nearly endless.

> " "We are both a generator and a consumer of renewable energy."
>
> **GLOBAL FOOD PRODUCER**

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Conclusion: Our 3 Key Takeaways

It is an exciting, challenging, opportunistic time for energy and sustainability professionals, as the results of both our market and original research demonstrate. The hurdles they face today may well be the initiatives in the dustbin of tomorrow, and significant factors, including the looming effects of global warming, could lead to course corrections for us all.

As we conclude this year's report, we leave you with our final takeaways.

1. Businesses ignore growing market factors at their peril.

Whether it is investor action on climate change, the developing identity economy, or the greatest transfer of wealth in history[xxi], now is a time for organizations to proactively manage energy and sustainability and the environmental, social, and reputational implications of both. Companies that ignore or underplay the market factors at work in the coming decade jeopardize the long-term stability of their organizations. Now is the time to accelerate.

2. Flexibility and resilience are the new names of the game.

The days of simplicity in energy and sustainability management are gone. Today's professionals must advance their own skills while identifying and predicting points of convergence and market trends. The ability to rapidly respond to these forces will require elastic thinking that rewards innovative behavior. Companies that can proactively anticipate change will find themselves in a position of leadership and longevity, while those that cannot move with flexibility will fail.

3. Change happens faster than expected and should not be underestimated.

Technology can change more rapidly than anyone can predict. Thought leader Tony Seba[xxii] is fond of using the example of mobile phones as an analogy in his talks on the energy revolution. In 1985, McKinsey gave AT&T a prediction that there would be fewer than one million mobile phones by 2000; the actual number was upwards of 100 million. Technology also begets technology, and at no time in human history has the pace of technological evolution been greater than it is today. This is a cautionary tale; we ignore history at our own expense. Companies should be prepared to embrace change even faster than predicted when it comes to energy and sustainability.

To learn more about how Schneider Electric can support your organization's Active Energy Management journey, please contact us.

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Endnotes

i https://www.un.org/sustainabledevelopment/decade-of-action/

ii https://www.renewableenergyworld.com/2011/09/29/renewables-bounced-back-in-2010-finds-ren21-global-report/#gref

iii https://www.fastcompany.com/1678448/impatient-for-the-smart-grid-microgrids-establish-their-own-power-systems

iv https://www.eia.gov/outlooks/ieo/pdf/ieo2019.pdf

v https://www.utilitydive.com/news/battery-prices-fall-nearly-50-in-3-years-spurring-more-electrification-b/568363/

vi https://www.irena.org/newsroom/pressreleases/2019/Apr/Renewable-Energy-Now-Accounts-for-a-Third-of-Global-Power-Capacity

vii https://www.eia.gov/outlooks/ieo/pdf/ieo2019.pdf

viii https://perspectives.se.com/latest-perspectives/eu-green-deal

ix https://www.cdp.net/en/companies/companies-scores

x https://www.facebook.com/SchneiderElectricESS/videos/711693609276158/

xi https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans

xii https://www.pwc.com/us/en/library/ceo-agenda/ceo-survey.html

xiii https://www.weforum.org/agenda/2020/01/top-global-risks-report-climate-change-cyberattacks-economic-political/

xiv https://perspectives.se.com/sustainable-strategy/a-subscription-for-efficiency-projects

xv https://hbr.org/1998/07/welcome-to-the-experience-economy

xvi https://www.mckinsey.com/mgi/overview/in-the-news/the-right-response-to-digital-disruption

xvii https://iea.blob.core.windows.net/assets/1f6bf453-3317-4799-ae7b-9cc6429c81d8/English-WEO-2019-ES.pdf

xviii https://www.mckinsey.com/mgi/overview/in-the-news/the-right-response-to-digital-disruption

xix https://bnef.turtl.co/story/neo2019/?teaser=true

xx https://perspectives.se.com/blog/the-meshgrid-ecosystem-intelligent-electricity

xxi https://www.forbes.com/sites/markhall/2019/11/11/the-greatest-wealth-transfer-in-history-whats-happening-and-what-are-the-implications/#279a68c74090

xxii https://www.youtube.com/user/tonyseba

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