The digital energy transition

Eight strategic areas where oil and gas companies are transforming

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Key takeaways

Leading oil and gas firms are synthesizing sustainability and digitalization to drive their energy transition.

- To navigate an ever-changing energy landscape, oil and gas companies must accelerate transformation into digital energy companies.

  Top-performing organizations boldly pursue a low-carbon future, leveraging digital capabilities to operate assets more cleanly, safely, securely, and reliably.

- Leading firms approach sustainability as a transformation opportunity.

  They embrace data and technology to digitalize and decarbonize operations.

- Becoming a digital energy company of the future requires focus across eight strategic domains.

  Lessons from a subgroup of companies that are excelling in these areas offer a roadmap for success.

Navigating the intersection of the present and the future

Oil and gas companies are wrestling with a daunting sustainability challenge. Their products are deemed major factors in global warming, and their operations account for 15% of total energy-related greenhouse gas (GHG) emissions.[1]

Facing mounting pressure from the public and regulators to shift to renewable energy sources and clean up production, transport, and processing operations, these companies find themselves at a critical point. They must evolve into digital energy companies of the future—organizations that embrace energy transition and leverage data and digital technologies to operate their assets more cleanly, safely, securely, and reliably.

This transformative journey is no easy feat. Executives must weigh how they fulfill current energy demands using existing systems and processes while simultaneously envisioning and progressing toward a low-carbon future. As extensive new research from the IBM Institute for Business Value (IBM IBV) and SAP shows, most oil and gas companies are making strides in this direction. But our survey of 2,000 global oil and gas executives reveals there is also still work to be done (see "Study approach and methodology" on page 34). Only two in five of the organizations have even set a net-zero emissions target, and only 39% say they are effective at executing digital transformation.

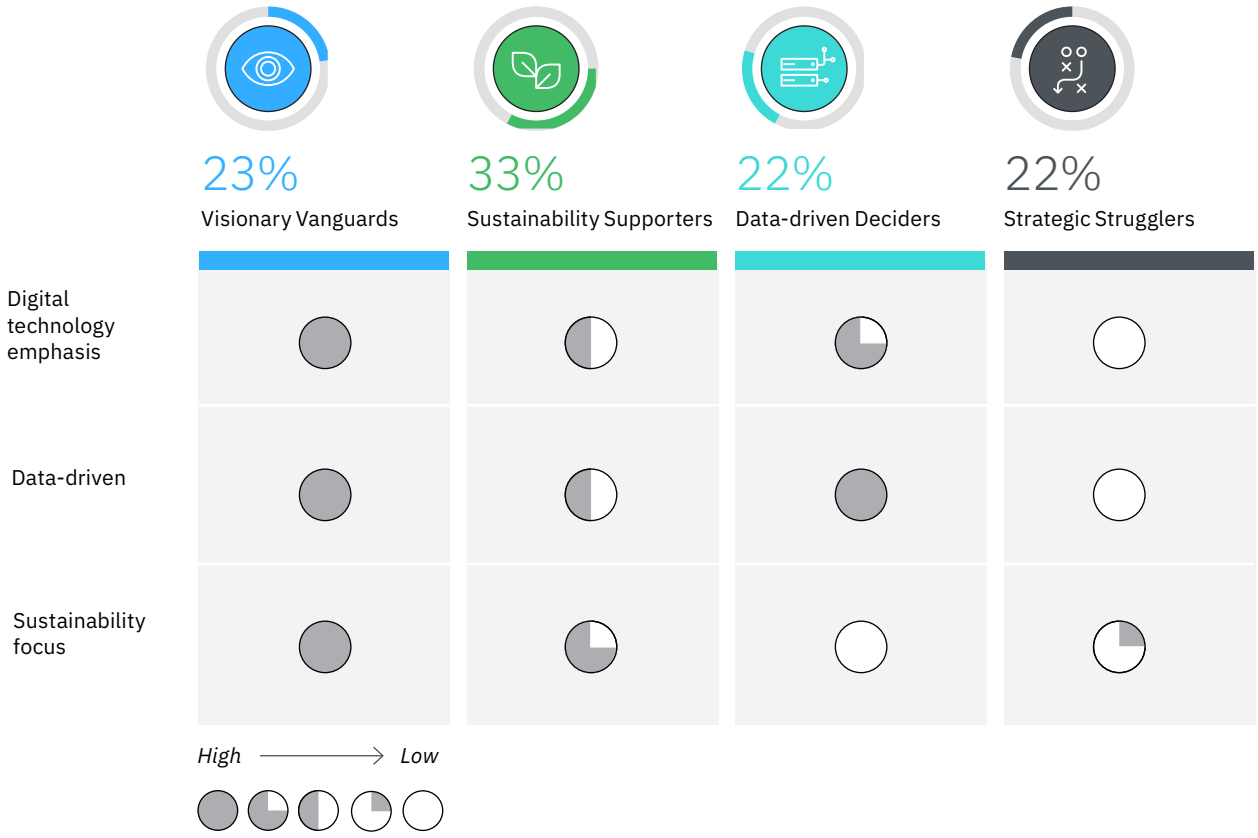
Based on our analysis of the survey data, we defined four distinct cohorts—including a segment of front-runners who offer a model for others to emulate as they move forward with their energy transition (see Figure 1). We call these leaders *Visionary Vanguards.* They approach sustainability as a transformation opportunity, aligning their sustainability and digital strategies to steer change and drive innovation. They also report superior business performance in revenue growth and profitability compared to competitors.

The other archetypes defined in our analysis share some strengths with the leaders but struggle in other areas:

- *Data-driven Deciders* have made progress on digital transformation and using data analysis to inform decisions, but they fall behind in incorporating a sustainable philosophy into their overall business and technology implementation.
- *Sustainability Supporters* are committed to going green, making sustainability investments in both core and non-core business areas and tying executive compensation to sustainability objectives. However, they have not integrated their sustainability efforts with digital transformation, nor have they progressed in data management.
- *Strategic Strugglers* lack a sustainability, data, and technology focus and operate business-as-usual.

FIGURE 1

Visionary Vanguards do not choose between digitalization and sustainability—they pursue both.



Source: IBM Institute for Business Value.
Note: Percentages show a cohort's representation within the total survey population.

Our data shows that to be future-ready, digital energy companies will focus across eight strategic domains (see Figure 2). This report explores each domain, offering specific examples as well as lessons from our Visionaries that are blazing the trail and creating industry-differentiating value. We conclude with an in-depth action guide that lays out a three-part plan and specific steps for oil and gas executives to consider, based on the archetype they align with most closely, to help them accelerate their journey.

FIGURE 2

A digital energy company of the future excels in orchestrating strategies across eight domains.

Source: IBM Institute for Business Value.

Domain 1:
Next-gen energy

Focus on developing, delivering, and optimizing cleaner fuels and power sources

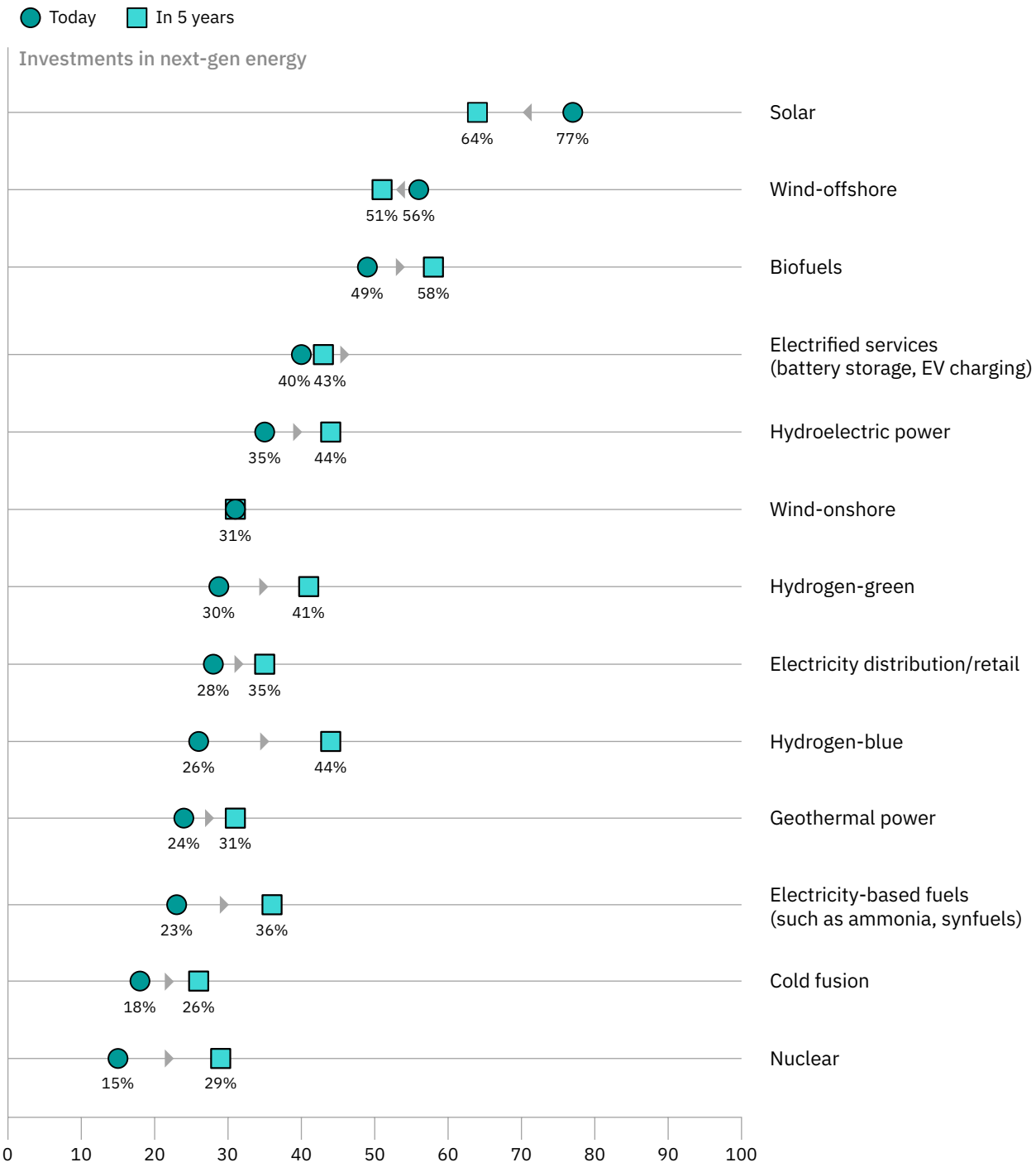
Digital energy companies of the future are focused on cutting GHG emissions and reducing their environmental footprint, which requires a transition to next-gen energy, such as solar, nuclear, hydrogen, and biofuels. Nearly all respondents are betting on a broad set of power sources in their product portfolios, which can then also be applied to their own operations (see Figure 3). For example, cleaner fuels such as hydrogen can be used to power assets including processing plants, refineries, and multiple modes of transport.

Those companies leading the way—the Visionary Vanguards and Sustainability Supporters—are dedicating 8% to 9% of their overall investments toward next-gen energy. Much of that comes through mergers and acquisitions; bp acquired a 40.5% equity stake in the Asian Renewable Energy Hub (AREH), for example, and it could become one of the largest renewables and green hydrogen hubs in the world.[2]

But some firms are making more direct investments. ADNOC, the state-owned energy company of the United Arab Emirates, has begun construction on the Middle East's first high-speed hydrogen refueling station to create clean hydrogen from water, using an electrolyzer powered by clean grid electricity.[3] Saudi Aramco has multiple plans in place, from solar photovoltaic (PV) and wind projects to carbon capture efforts.[4]

FIGURE 3

Investments in next-gen energy are focused on solar and offshore wind today, but other types are expected to grow in five years.



Q. In which of the following areas has your organization made investments or plans to make investments?

Case study

Neste creates a flexible supply chain to produce more renewable fuels[5]

As a downstream operator, Neste's biggest impact on sustainability comes from its sourcing strategy: where it gets the resource inputs that feed its refining operations. Neste is distinguished by its focus on renewable fuels, which are created from renewable feedstocks, including a broad range of waste residues such as those used in restaurant cooking oil and animal fat.

Neste implemented an ERP system that enables:

- Tracking of inbound feedstock inventories with a high degree of granularity for efficient production optimization
- Tracking of input flow from the restaurant to the refinery and beyond to help the company achieve and maintain the coveted "renewable" designation on its products.

The end-to-end visibility provided by the ERP system has positioned Neste to increase its renewables production capacity to 6.8 million tons by the end of 2026. Currently more than 90% of its total renewable raw material inputs originate from waste and residue products.

Domain 2:
Zero GHG and zero waste

Embracing circular economy principles

Digital energy companies of the future build on their transition to next-gen energy in pursuit of zero GHG emissions and zero waste in operations. In our survey data, we see that across all archetypes, companies are divesting in hydrocarbons, a tactic adopted by nearly two-thirds (62%) of respondents today. More than half (58%) say they plan to repurpose/retrofit hydrocarbon assets to produce other products in five years.

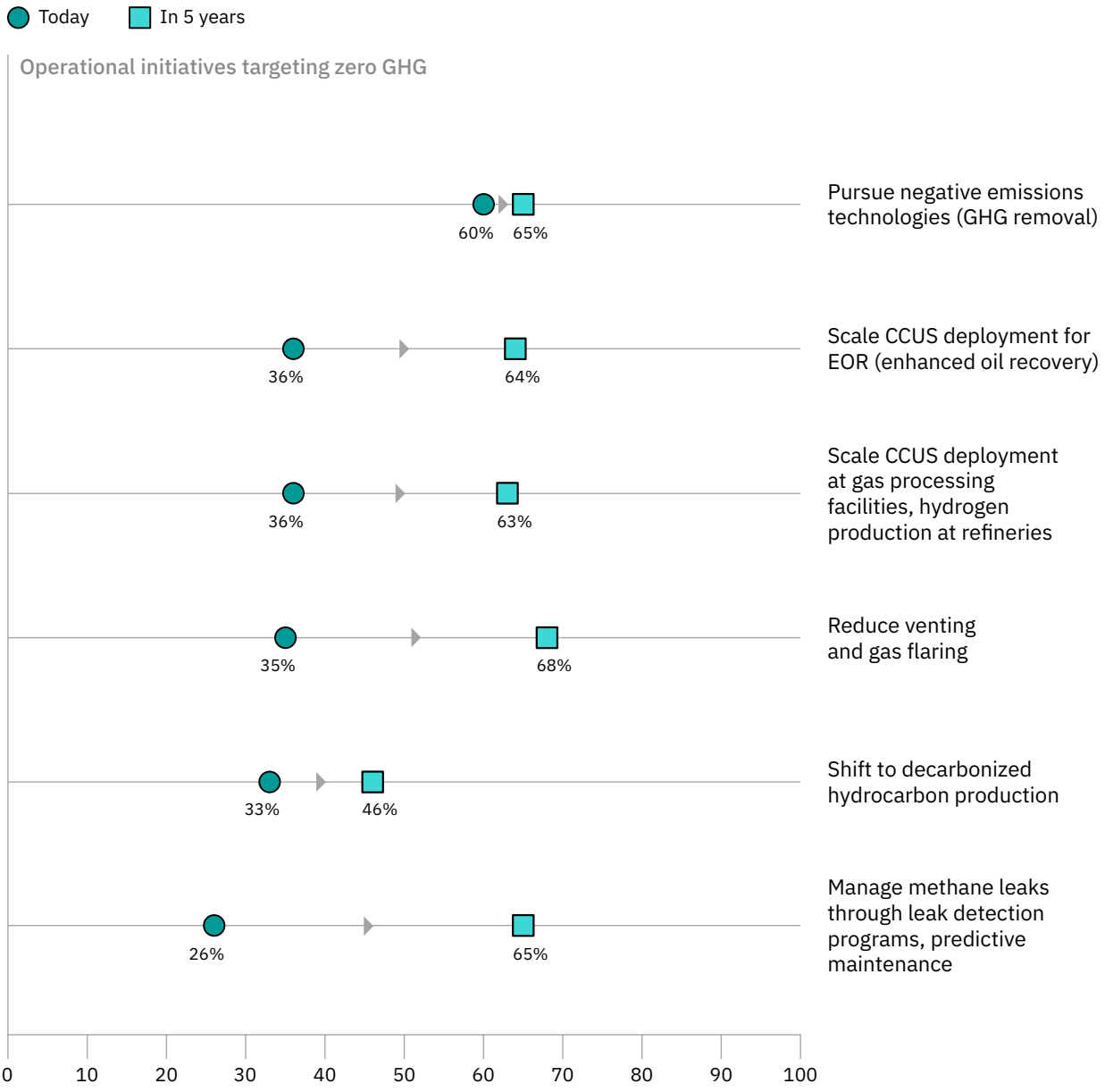
Executives cite negative emissions technologies as the leading tool supporting zero GHG in operations today, and other less-adopted approaches are expected to nearly double in use over the next five years (see Figure 4). That includes more emphasis on decreasing extraction, flaring, and fugitive emissions in the upstream area; midstream initiatives focused on transport; and downstream efforts to scale carbon capture, utilization, and storage (CCUS) deployment at gas processing facilities and to increase hydrogen production at refineries.

Similarly, companies are tackling emissions in energy and transport using cleaner fuels in transportation and in plants and refineries, transitioning their fleets to electric vehicles, and generating their own energy using renewables.

Challenges around zero waste are reflected in our results. Only around one-third of respondents are emphasizing zero-waste initiatives today. Technical limitations, costs, and lack of regulatory incentives likely play a role. Over the next five years, however, organizations expect to increase oil recycling and eco-design for reuse of waste material.

FIGURE 4

Oil and gas executives project most operational initiatives to reduce GHG emissions will nearly double in usage over the next five years.



Q. What sustainable product and service strategies has your organization undertaken or will it undertake? Q. What environmental sustainability initiatives has your organization undertaken or will it undertake in its operations?

Case study

Petrobras advances CCUS[6]

Brazil's Petrobras operates the world's largest CCUS program, allowing the separation and later reinjection of carbon back into the reservoir where it is stored. This program was developed to produce oil in the pre-salt arena with a low carbon emission rate. Accomplishments and goals include:

- Reinjected 8.7 million tons of CO_2 in 2021, representing 24% of CCUS projects globally, with a goal for a total volume of 40 million tons of CO_2 by 2025
- Plans to invest $2.8 billion to reduce and mitigate emissions in the next five years, including $248 million to create a decarbonization fund to develop solutions, perform studies, and implement projects.

Domain 3: Trusted and secure technology and data

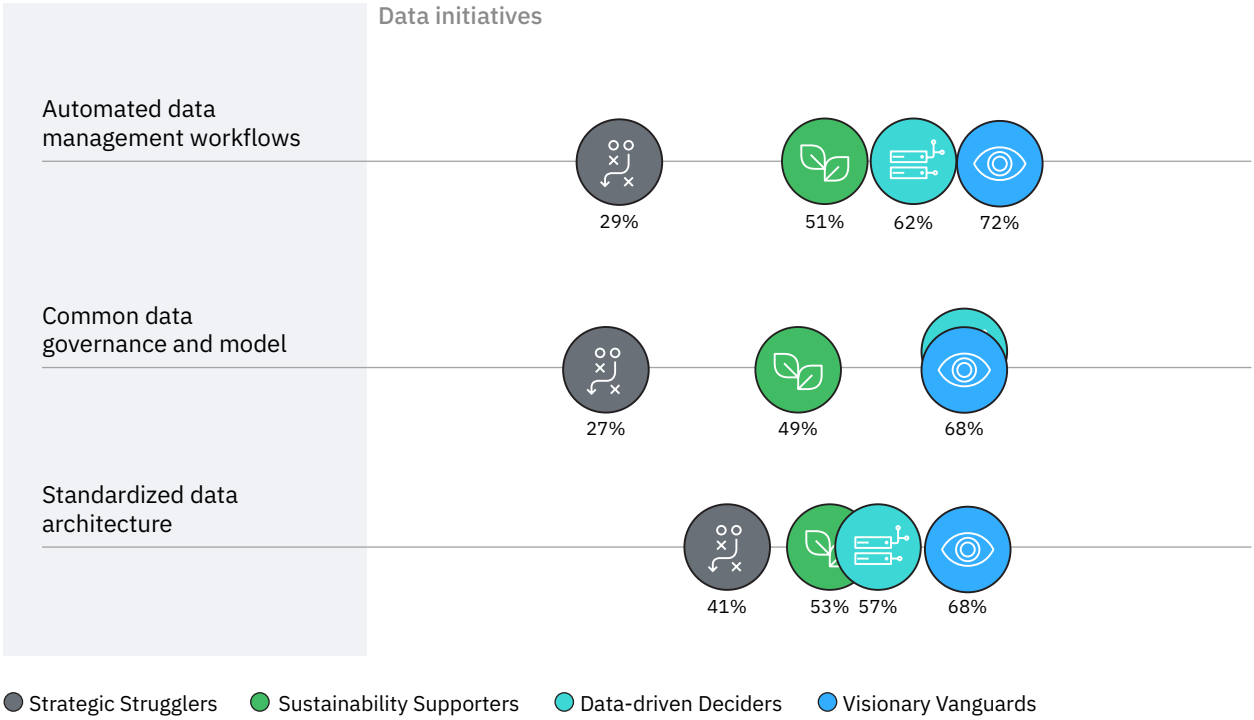
Capture, clean, and deploy business-ready data

Data is the new oil for a digital energy company of the future. With reservoirs of high-quality data on hand, companies can make better decisions and uncover actionable insights to boost operational efficiency and drive the adoption of cleaner technologies and processes. Looking across our four cohorts, the top-performing Visionary Vanguards and Data-driven Deciders are well ahead of their peers in cultivating a data-driven culture (see Figure 5).

Data fuels companies' use of AI to reveal underexploited "experience" within existing assets. For example, Woodside Energy employees use AI systems to source answers from millions of reports and the advice of thousands of engineers in a contextually relevant manner.[7] This capability can be further enhanced as generative AI becomes more widely adopted (see Perspective, "Elevating business performance with generative AI").

FIGURE 5

Data initiatives make it easier to access, integrate, and use data to implement targeted strategies.



Q. To what extent has your organization implemented the following data initiatives? Percentages show responses of 4 and 5 on a 5-point scale where 1=not at all and 5=to a very large extent.

Perspective

Elevating business performance with generative AI

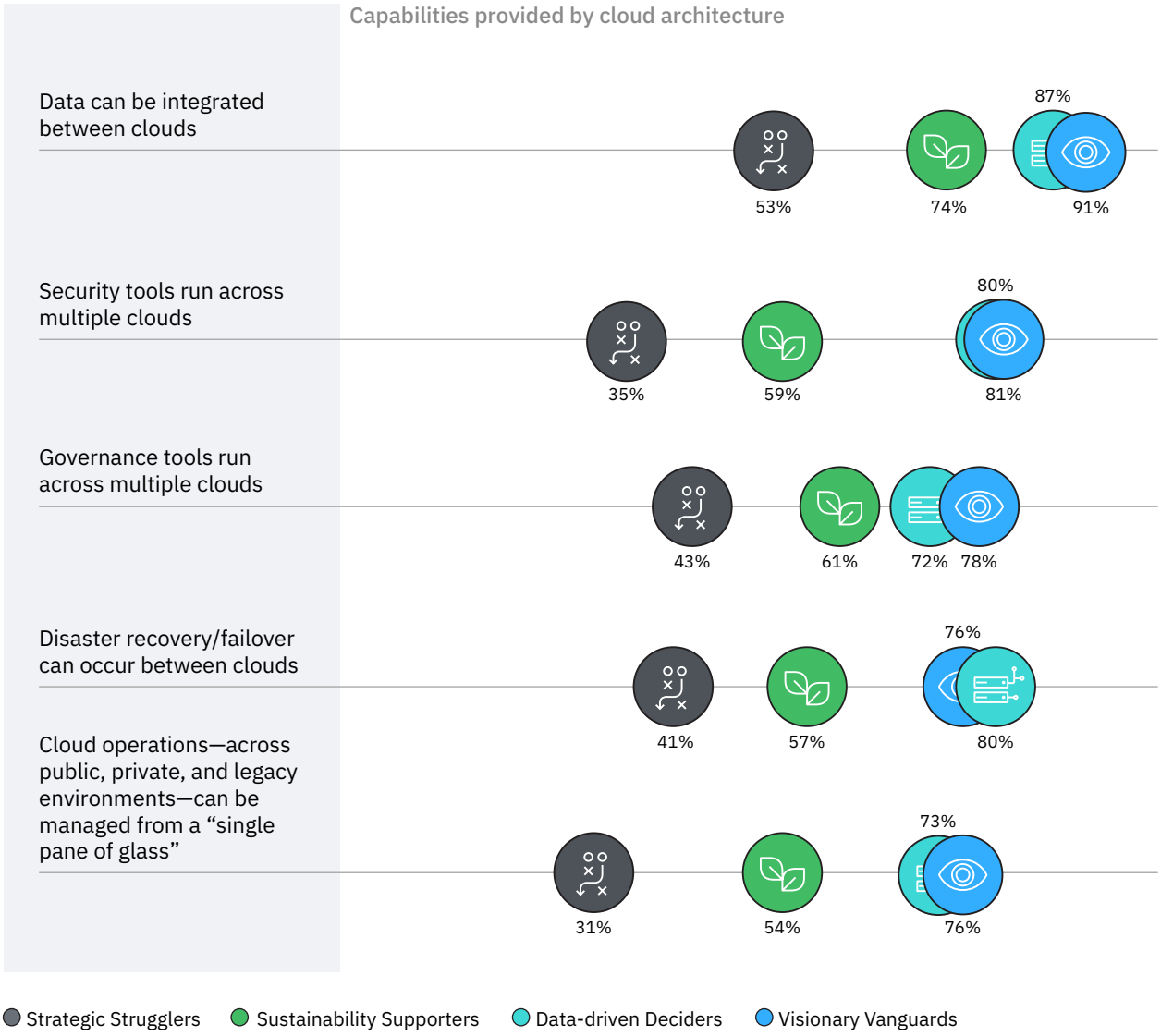
New technologies such as generative AI can unleash transformational business performance improvements. For example, generative AI can be used in:

- Talent to improve decisions and expedite outcomes. For instance, a workforce advisor can tap into AI-synthesized resources to improve safety and efficiency of field service workers. Workforce training and certification could combine augmented reality and AI to train employees and subcontractors based on job roles and equipment-specific requirements.
- Customer support to enhance experiences. Generative AI can analyze call records and customer data to optimize virtual and human agent interactions, personalize offers, anticipate issues, and answer questions regarding billing, service appointments, and disconnects.
- Application modernization to help reduce IT costs and boost business continuity at scale. Generative AI can automate code generation and reduce cycle time for modernizing applications based on requirements and business rules.

Enabling the data foundation requires investment in an open, scalable IT infrastructure. Hybrid clouds deliver interconnectivity, allowing organizations to integrate data across platforms and systems residing in multivendor cloud environments. With a cloud infrastructure, real-time data collected from sensors, devices, and machines in exploration, production, and plants can be used by other assets, as well as shared across components in the enterprise software stack, including ERP and other business management software. Visionaries and Data-driven Deciders are experiencing the advantages of cloud more so than their peers (see Figure 6).

FIGURE 6

Hybrid cloud allows organizations to tap into more data for more sustainable, more resilient operations.



Q. To what extent does your cloud architecture provide these capabilities today? Percentages show responses of 4 and 5 on a 5-point scale where 1=not at all and 5=to a very great extent.

Case study

Shell leverages data to improve operations and sustainability[8]

Shell is increasing efficiency across its operations by facilitating better use of data company-wide through its Shell.ai platform. The platform empowers engineers, scientists, and analysts to collaborate by democratizing data analytics and AI, helping accelerate the firm's transition to greener ways of working.

For example, data can be used to enable design process changes using advanced simulation and computational science. More specifically, Shell used its unified data analytics to cut the CO_2 emissions equivalent of 57,000 European vehicles from its liquefied natural gas (LNG) trains.

Domain 4: Automated, safe, secure operations

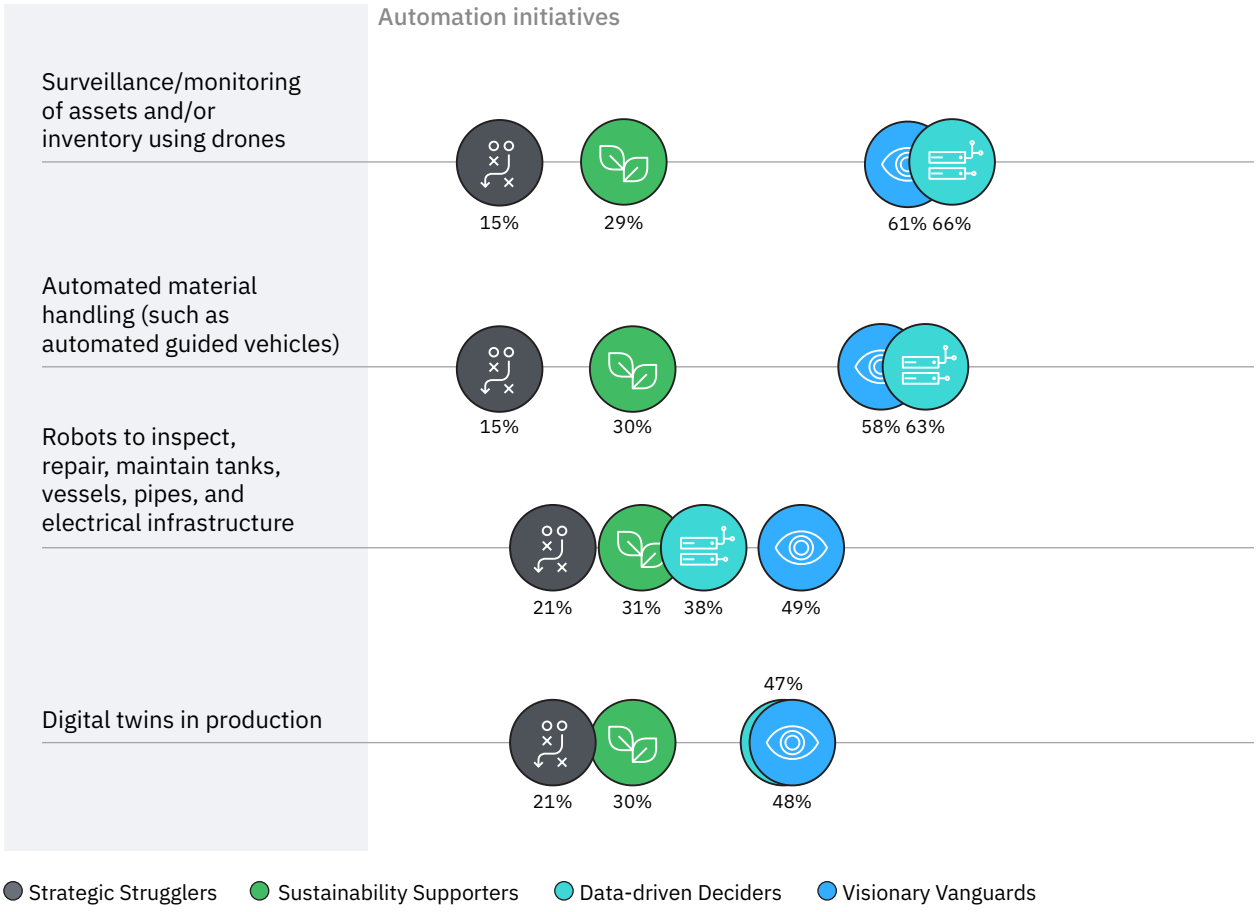
Leverage the power of automation

With the hybrid cloud infrastructure and data integration in place, the digital energy company of the future is positioned to leverage automation for greater operational efficiencies. Building on their data strengths, Visionary Vanguards and Data-driven Deciders are ahead of their peers in this domain (see Figure 7).

Leaders also deploy robots to avoid placing their workforce in perilous positions in remote operations and maintenance functions deployed on and offshore. In recent years, ExxonMobil, Chevron, Aramco, Equinor, Total Energies, Shell, and bp have all increased their investments in robotics to enhance operations and protect workers.[9]

FIGURE 7

Automation offers operational efficiencies that can ultimately deliver sustainability advantages.



Q. To what extent has your organization implemented the following? Percentages show responses of 4 and 5 on a 5-point scale where 1=not at all and 5=to a very large extent.

For oil and gas companies, operational technology (OT) security is critical to protecting OT assets and processes, including digitized shop-floor assets and control systems. Offshore infrastructure also faces significant cybersecurity risks.[10] In fact, the energy industry (including oil and gas) is the fourth most attacked industry with an average total cost of a breach at $4.78 million.[11] Visionaries and Data-driven Deciders are striving to stay ahead of the attackers, donning cybersecurity cloaks to repel attacks, enhance threat detection, and vanquish inbound breaches (see Figure 8). AI and automation in cybersecurity strengthen their defenses, while monitoring OT in concert with IT enables quicker reaction times to cyber threats, internal or external.

FIGURE 8

Achieving cyber resilience requires initiatives that address protection, detection, containment, and remediation.

Q. To what extent has your organization made progress toward the following? Percentages show responses of 4 and 5 on a 5-point scale where 1=not at all and 5=to a very great extent.

Case study

Cairn Oil & Gas manages transmission lines with drones[12]

Sustained oil production depends on uninterrupted power supply. However, managing transmission lines is a high-cost, resource-intensive task. Cairn Oil & Gas is responsible for 250 km of power lines spread across 3,111 sq km.

To reduce operational costs, the company decided to use drones. The images captured by the drones are run through an AI image-recognition system, which analyzes potential damage to power lines, predicts possible failure points, and suggests preventive measures. Using data-driven decision-making instead of operator-based judgment, the company has increased the mean time between failure from 92 to 182 days, which has reduced oil loss to 2,277 barrels per year and led to cost savings worth approximately $1.45 million.

Domain 5:
Next-wave mobility

Capitalize on emerging technologies

The digital energy company of the future is prepared to use other advanced technologies such as augmented and virtual reality (AR/VR) and 5G connectivity. Private 5G networks offer ultra-high speed, low-latency communication, enabling real-time exchanges of data both within plants and refineries as well as between drilling sites, vessels, and offshore platforms. 5G investments position companies to pursue remote operations where they leverage multiple technologies, including AR/VR and advanced robotics, to work faster, more effectively, and more safely.

For example, AR/VR enables workers to operate plants offsite, execute complex maintenance tasks, and take simulation-based training. Visionary Vanguards and Data-driven Deciders use AR/VR more than their peers, but none of the cohorts have widely adopted 5G yet: only one-quarter of respondents are using it within facilities, and only one in 10 use it to monitor activity inside a rig. As 5G technology matures, implementation costs decrease, and awareness increases, companies' use of private 5G networks should become more widespread.

Domain 6:
Trained human capital

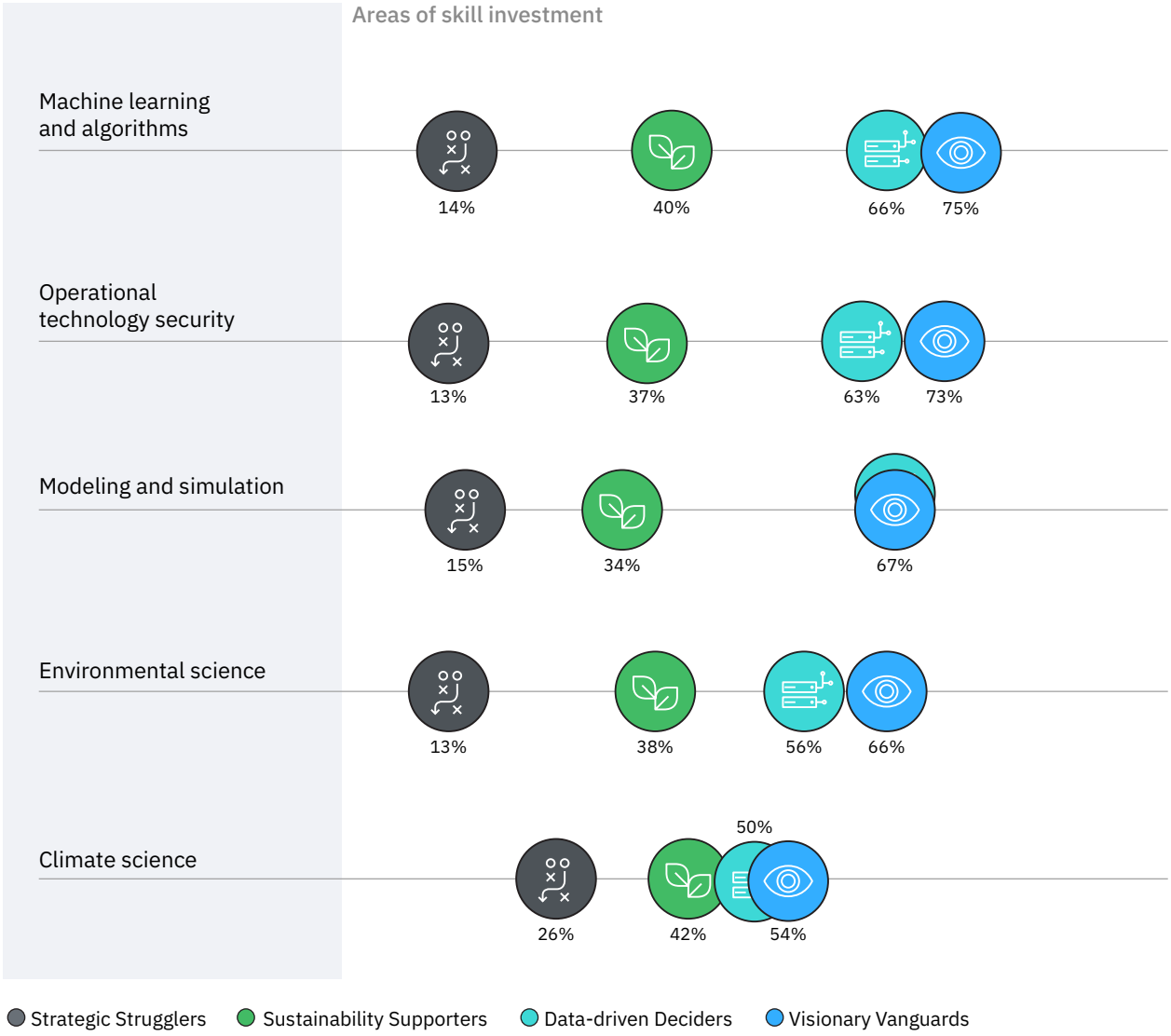
Invest in diverse skills

To adapt to the rapidly evolving technology landscape and meet innovation demands, the workforce of the digital energy company of the future must excel in a diverse set of skills—from data analytics to AI to cybersecurity to renewable energy and more. The leading Visionary Vanguards as well as the Data-driven Deciders cohort model a commitment to educating their workforce, investing in skills ranging from technology to climate science (see Figure 9). These "new collar" skills are essential to not only running next-generation facilities, but also to designing, building, and maintaining them.

How employees work is equally important. Our survey shows that today's top-performing oil and gas companies have embraced agile working more so than their peers. Agile principles position the workforce to collaborate, problem-solve in real time, continuously improve, and focus on value creation—ultimately enhancing effectiveness and innovation.

FIGURE 9

Oil and gas leaders are preparing their workforce for the future by investing in technology, sustainability, and data analysis skills.



Q. To what extent has your organization invested in the following skills? Percentages show responses of 4 and 5 on a 5-point scale where 1=not at all and 5=to a very great extent.

Domain 7:
New business models

Experiment beyond legacy operations

The organizational structure of the digital energy company of the future enables it to balance its legacy core hydrocarbon business with new products. Leading oil and gas companies recognize this, with 69% of Visionary Vanguards and 62% of Data-driven Deciders installing a corporate structure for green-energy/low-carbon business.

Our respondents are pursuing a variety of new green business models and anticipate most areas will grow over the next five years (see Figure 10). LNG is a bigger part of the portfolio, involving processing, storage, and transportation capabilities. Electrification is core to future residential, commercial, and industrial power generation, while EV charging is expected to become common at retail sites and filling stations.

FIGURE 10

Diversified new business models shield companies from the volatility of the hydrocarbon business while supporting carbon reduction.

Q. Where is your organization pursuing new business models?

Case study

Petronas creates a new entity focused on clean energy[13]

Malaysia's national oil and gas company, Petronas, created a new entity, Gentari, to accelerate the adoption and commercialization of clean energy. Independent from Petronas, the organization can focus on clean energy solutions, while seeking financing to grow the business faster to meet existing demands and explore emerging energy technologies.

Gentari aims to deliver a suite of renewable energy, hydrogen, and green mobility solutions that are safe, responsible, cost-optimized, and emissions-abated. Goals include:

- By 2030, build a renewable energy capacity of 30 to 40 gigawatts, specifically in solar with added opportunities in wind and battery storage
- Supply up to 1.2 million tons per annum of hydrogen
- Become a preferred green mobility solutions provider, supporting the electric vehicle (EV) ecosystem by capturing 10% market share across key markets in Asia Pacific.

Domain 8:
Ecosystem partnerships

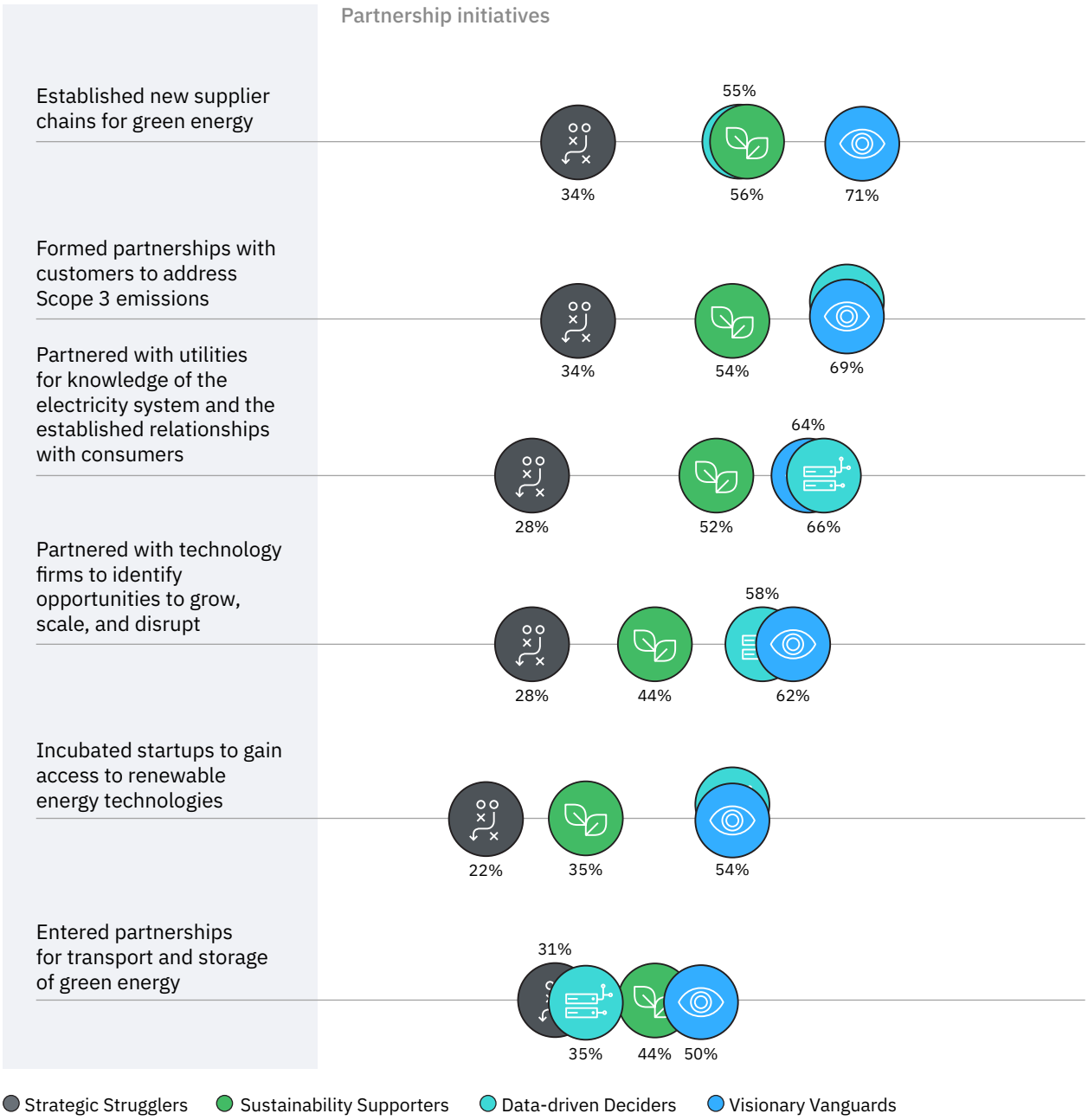
Extend goals beyond the enterprise

Establishing an ecosystem of green partners helps a digital energy company of the future advance their sustainability goals within operations and across the supply chain. Most respondents (73%) recognize the value of aligning sustainability performance measurement across their ecosystem, giving them visibility into each participant's environmental impact.

But the relationships must be about more than tracking. Partners can leverage data to identify opportunities to optimize the supply chain and ultimately cut carbon emissions. Visionary Vanguards lead in adoption of different types of partnerships that can drive progress toward net-zero emissions (see Figure 11).

FIGURE 11

Symbiotic partnerships and cross-industry ecosystems can generate innovative sustainability solutions.



Q. To what extent has your organization implemented the following?

Action guide

Accelerating the transformation to digital energy companies

Transforming into a digital energy company of the future requires a significant shift in mindset and strategy. Trailblazers like the Visionary Vanguards illustrate the value of a business model where lean, intelligent processes intertwine with automated, safe, and secure functions—brought to life by a highly skilled workforce and a synergistic web of partners. This combination empowers companies to usher in a new era of eco-friendly operations and groundbreaking products that propel the world toward a low-carbon future.

To help companies transition to digital energy companies of the future, we've created a three-step guide that reflects concerted action across the enterprise, factoring in both strategic and operational implications.

Action guide

Step one

Assess yourself

Your steps forward depend on your sustainability focus and your data and technology maturity.

Begin by making an honest appraisal of your organization's current state:

- Have you embedded digital technologies throughout the energy value chain?
- What data initiatives are in place to take advantage of your vast reserves of data?
- Have you built a winning decarbonization strategy? And have you pivoted to sustainable energy as a mix of your portfolio and to reduce the carbon footprint of your carbon-intensive assets?
- How are you working with other organizations to meet production, profitability, and safety targets?

Use your answers to these questions to determine your organizational archetype and your existing progress toward transitioning to digital energy.

Step two

Set your framework

Wherever your organization may be in its journey to become a digital energy company of the future, some basic practices and plans need to be in place. These priorities apply to everyone.

- Align sustainable products and service strategies to support your direction: decarbonization, low-carbon production, continued emphasis on hydrocarbons, divestiture.
- Continue to evaluate next-gen energy options and make sustainability bets to create options for future investment; consider that each investment area has different risks/returns, capital requirements, and needed assets.
- Evaluate new business opportunities and create options for future investments.
- Actively build and engage ecosystems to advance shared sustainability objectives.
- Leverage ecosystem partnerships to extend capabilities, knowledge, and skills to support selected sustainable strategies (renewable energy, GHG emission reduction, access to new technologies, new businesses).
- Align targets with ecosystem partners.
- Evaluate GHG reduction and zero-waste options to support the sustainability strategies.

Action guide

Step three

Optimize your efforts

The unique structure of each organization dictates the possibilities, resources, and tools available. Here are impact-focused guidelines for each of the four archetypes based on their strengths and weaknesses.

Visionary Vanguards

Maintain progress and accelerate ambitions:

- Continue to drive digital transformation and make sustainability bets.
- Embed environmental sustainability throughout the enterprise using carbon accounting.
- Broaden upstream investments in AI and automation to include midstream, downstream, and retail; evaluate the potential of generative AI to support talent, customer care, and application modernization.
- Continue to cultivate a data-driven culture through enhanced data skills, automation of discovery, improved semantic enrichment and understanding of business-ready data, and use of a robust data foundation to support high-priority initiatives.
- Actively engage employees in development and execution of sustainability initiatives.
- Migrate application workloads to cloud to enable deployment of digital technologies from the industrial edge to public cloud.
- Enhance hybrid cloud architecture to support successful execution of operations.

Sustainability Supporters

Double-down on digital transformation and agile principles:

- Align sustainability and digital strategies.
- Invest in hybrid cloud to enhance scalability, optimize agility, and accelerate data-driven insight.
- Implement data management and governance.
- Address data deficiencies through investment in hybrid cloud infrastructure, skills, and data initiatives.
- Enhance all segments (upstream, midstream, downstream) with AI and automation, including generative AI.
- Add automation in operations.
- Enhance OT/IT security.
- Invest in data science, environmental science, and OT security skills.
- Create a center of excellence for analytics.
- Shift to an agile way of working.
- Consider corporate structure options for sustainable business.

Action guide

Data-driven Deciders

View sustainability as a revenue enabler:

- Reframe sustainability as an opportunity rather than a cost to avoid and support it with performance management.
- Embed sustainability into your corporate culture, secure board commitment, and tie executive compensation to sustainability goals.
- Build on digital strengths and align sustainability goals with digital capabilities.
- Enhance all segments (upstream, midstream, downstream) with generative AI capabilities and automation.
- Migrate application workloads to cloud to enable integration.
- Enhance hybrid cloud architecture to support successful execution of operations.

Strategic Strugglers

Gain traction starting with a heightened strategic focus:

- Clearly articulate your sustainability and digital vision and tie executive compensation to goals.
- Begin developing the workforce skills necessary to achieve future sustainability objectives; add data, digital and environmental skills.
- Add automation in operations.
- Enhance OT/IT security.
- Create a hybrid cloud foundation.
- Implement data management and governance.
- Consider corporate structure options for sustainable business.

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Ash focuses on working with client CDOs, CIOs, and CMOs to help on their journeys to leveraging clean energy for their manufacturing and enterprise needs. He has served clients exclusively in oil and gas over the last 26 years in a variety of domains spanning the entire oil and gas value chain, with a focus on downstream and chemicals. Ash is currently working across a variety of industries to bring best practices for sustainability (reduced carbon footprint, net-zero emissions, circularity, and alignment with United Nations' Sustainability Development Goals) back to his clients in oil and gas.

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Daniela joined SAP Austria in January 2013 starting in Communications and CSR before transitioning into Key Account Sales in Vienna, Dublin, the US, and eventually in SAP HQ in Walldorf, Germany. After eight years in various sales and presales manager roles, Daniela took over responsibility for the Oil, Gas, and Energy as well as the Utilities industries globally. In this role she and her team define the Energy and Utilities strategy, solution management, and global go-to-market tactics. Daniela also serves as board member for SAP at bwcon e.V. and as a member of the executive committee at ESMIG. She is a mentor, business coach, and advocate for diversity and inclusion, driving and supporting various initiatives.

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As an industry global research leader, Spencer is responsible for market insights, thought leadership development, competitive intelligence, and primary research on industry agendas and trends. He has more than 25 years of experience in financial management and strategy consulting.

Study approach and methodology

In cooperation with Oxford Economics, the IBM Institute for Business Value and SAP surveyed 2,000 oil and gas executives in 25 countries from April to July 2023. Responses were collected from Chief Executive Officers, Chief Operating Officers, Chief Innovation Officers or Heads of Innovation, Chief Sustainability Officers, Chief Information Officers, and Chief Technology Officers. These executives come from different segments and organizations of diverse sizes. All data is self-reported.

In terms of data analysis, we clustered organizations surveyed based on their capabilities in three dimensions:

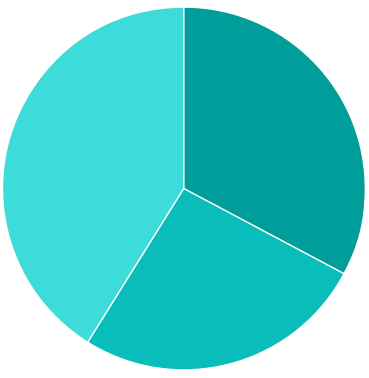
- Digital technology emphasis: staff education on working with intelligent machines/devices, hybrid multicloud environments to advance business strategy, and use of machine learning/AI to enhance security
- Data-driven: data science skills, center of excellence for analytics/AI
- Sustainability focus: environmental sustainability outperformance relative to peers, sustainability targets as important as financial performance.

This yielded four archetypes:

- Visionary Vanguards stand out in their capabilities across the three dimensions.
- Sustainability Supporters are focused on advancing their sustainability agenda and have extended capabilities in digital and data, albeit far less than the Visionary Vanguards.
- Data-driven Deciders are far along with digital and data capabilities but have not made progress on sustainability.
- Strategic Strugglers have achieved some success with sustainability but lag the other archetypes in digital and data.

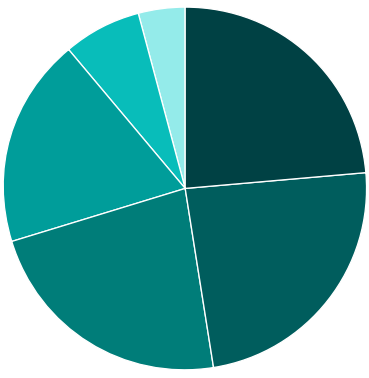
By comparing the performance and practices of the archetypes, we were able to identify the activities that distinguish each group. These findings help to ascertain the pillars of progress needed for each archetype.

Oil and gas segments



- 33% Upstream
- 26% Midstream
- 41% Downstream

Enterprise annual revenue



- 24% $25 million to $249 million
- 24% $250 million to $500 million
- 23% $500+ million to $1 billion
- 19% $1+ billion to $5 billion
- 7% $5+ billion to $20 billion
- 4% More than $20 billion

Note: Currencies are in US dollars.
Percentages do not equal 100% due to rounding.

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