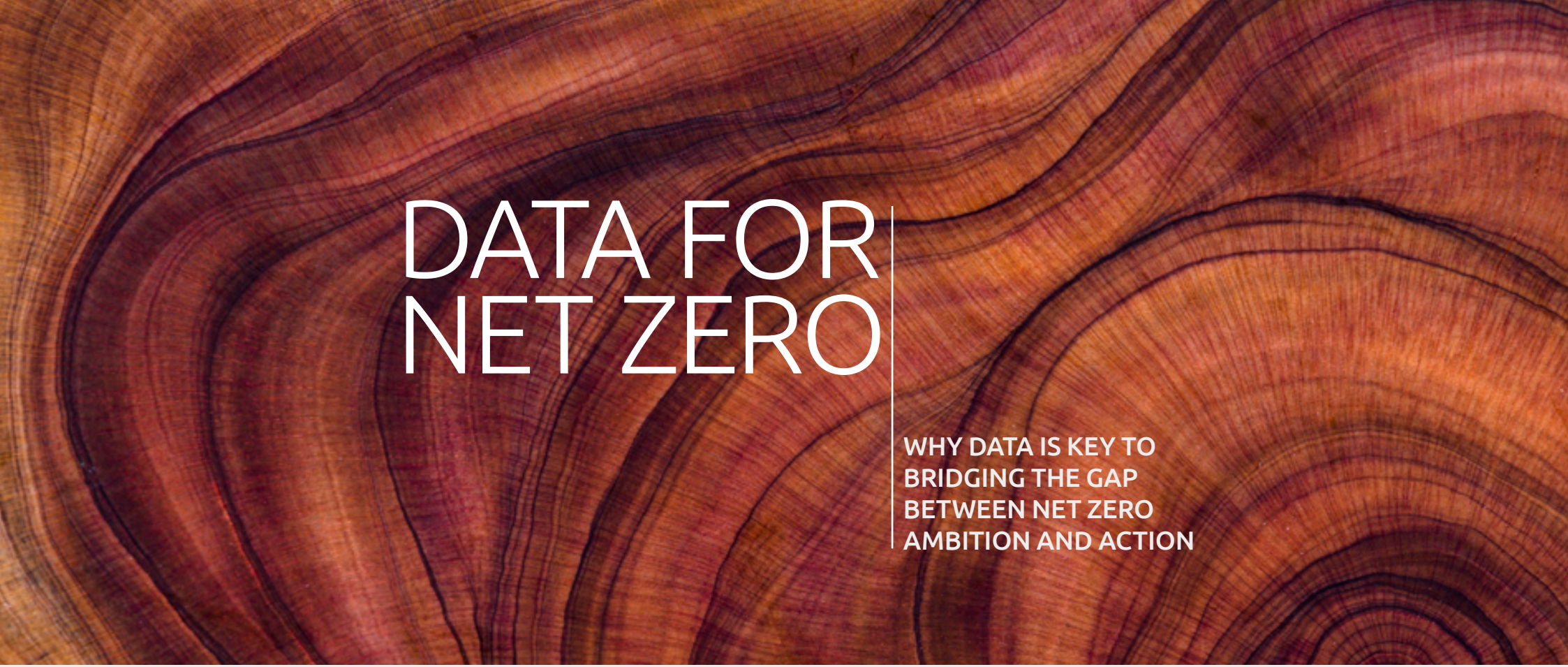


DATA FOR NET ZERO

WHY DATA IS KEY TO BRIDGING THE GAP BETWEEN NET ZERO AMBITION AND ACTION

#GetTheFutureYouWant

Capgemini RESEARCH INSTITUTE

Introduction

To avoid the worst impacts of climate change, global greenhouse gas (GHG) emissions must be halved by 2030 and lowered to net zero by 2050.[1] Growing recognition of the urgency of the situation has prompted a wave of net zero commitments in recent years: in 2019, net zero pledges covered 16% of the global economy; by 2021, this figure had risen to 68%.[2] In alignment with this, 68% of organizations in our survey of 900 organizations with net zero targets say that they have set their targets in the past two years (i.e., 2020 and onwards). Further, among organizations that set their targets before 2020, 25% have raised their ambitions in this period.

Against this backdrop, we wanted to explore the role of data in converting net zero ambitions into action. Data is essential to ensure that organizations are aligned with rapidly evolving regulations around climate disclosure. Data also provides organizations with the means to accelerate their journey to net zero by catalyzing organization-wide action on emissions reduction. Cynthia Cummis, Director of Private Sector Climate Mitigation for the World Resources Institute, highlights the criticality of data in the journey to net zero when she says: ***"You don't even know if you're on a path to net zero without better data."***[3]

68%

of organizations in our survey of 900 organizations with net zero targets say that they have set their targets in the past two years (i.e., 2020 and onwards)

Introduction

To explore the role of data in enabling the transition to net zero, we surveyed senior executives from 900 organizations globally that have set net zero targets, covering multiple sectors including automotive, energy and utilities, industrial and process manufacturing, consumer products, retail, telecom, life sciences, and financial services. We also interviewed 20 industry executives and experts (more details on the research methodology are available at the end of the report).

This report explores the following themes:

01

Data is a significant lever in accelerating the journey to net zero

02

Use of emissions data in decision-making is having a positive impact on organizations' progress towards net zero

03

While organizations recognize the value in emissions data, few are well-positioned to use it

04

Ways for organizations to develop the data management capabilities to accelerate the transition to net zero

Introduction

DEFINITIONS

Net zero: For an organization, being "net zero" means reducing emissions of GHG (CO_2, methane, nitrous oxide, etc.) to close to zero and extracting residual emissions from the atmosphere, within a specified period.[4]

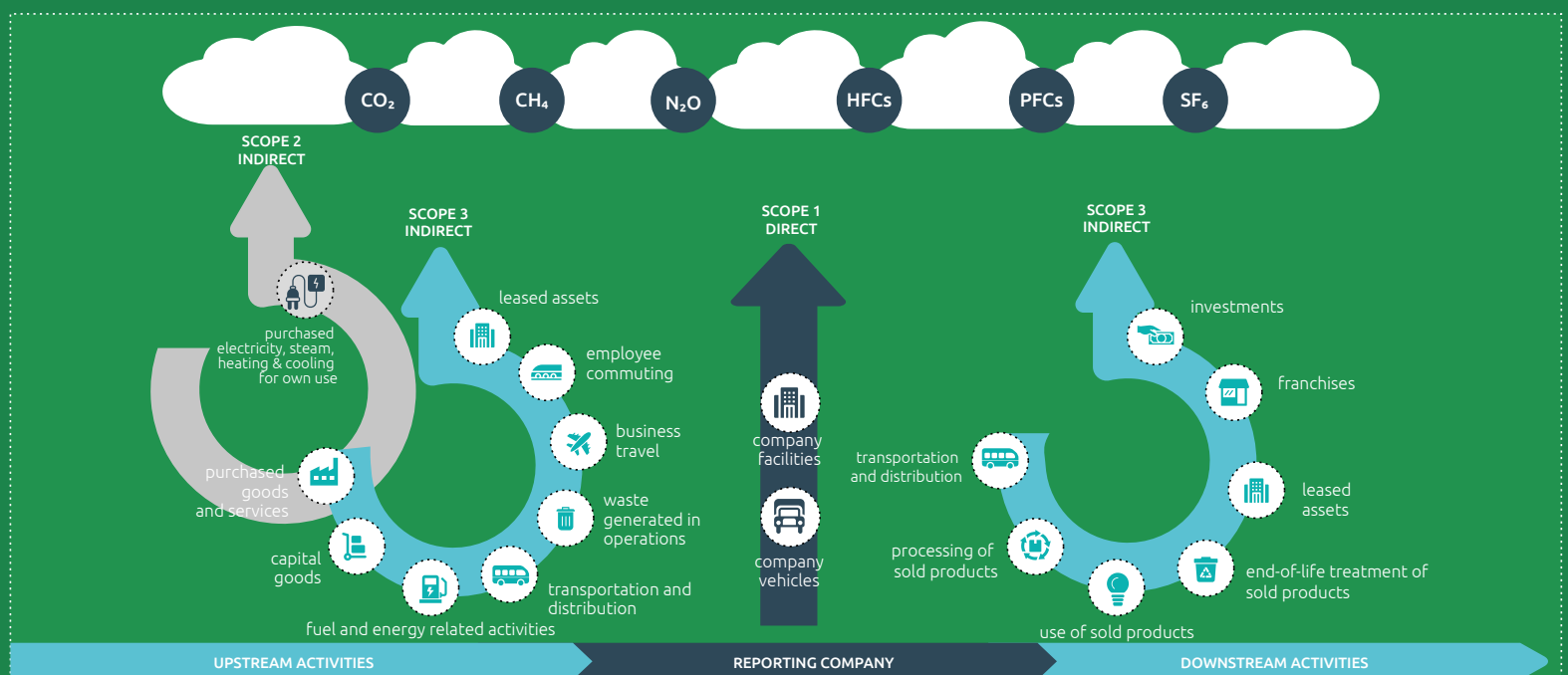
Emission scopes: A company's GHG emissions are classified into three "scopes" according to the GHG Protocol Corporate Standard:[5]

- **Scope 1.** Emissions that result from the direct activities of an organization, such as fuel combustion from facilities and vehicles owned or controlled by the organization.
- **Scope 2.** Indirect emissions that result from the generation of purchased electricity, steam, heating, and cooling.
- **Scope 3 – upstream emissions.** Emissions from other indirect sources in an organization's value chain, such as purchased goods and services, distribution, and transportation.
- **Scope 3 – downstream emissions.** Emissions from other indirect sources in an organization's value chain, such as the use of sold products, and end-of-life treatment of sold products.

Introduction

Fig.1

Overview of GHG Protocol scopes and emissions across the value chain



Source: The Greenhouse Gas Protocol.[6]

Introduction

The SBTi's "Corporate Net-Zero Standard"

In October 2021, the Science Based Targets Initiative (SBTi) launched the world's first net zero standard for corporates. The standard aims to provide guidance, criteria, and recommendations to support companies in setting net zero targets that are in line with the goal of limiting global temperature rise to 1.5°C. The standard lays down four key requirements for net zero targets:

- A focus on rapid, deep emission cuts covering a company's entire value chain emissions (i.e., scope 1, 2 and 3 emissions)
- Inclusion of near- as well as long-term targets – this means halving emissions by 2030, producing close to zero emissions by 2050 and neutralizing any residual emissions that cannot be eliminated
- Avoiding net zero claims until long-term targets are met
- Investments in deep emissions cuts not only within but also outside an organization's value chain.

In May 2022, the SBTi reported that there were 11 companies that had net zero targets approved in line with the standard, and more than 1,000 companies committed to aligning with the standard.[7]

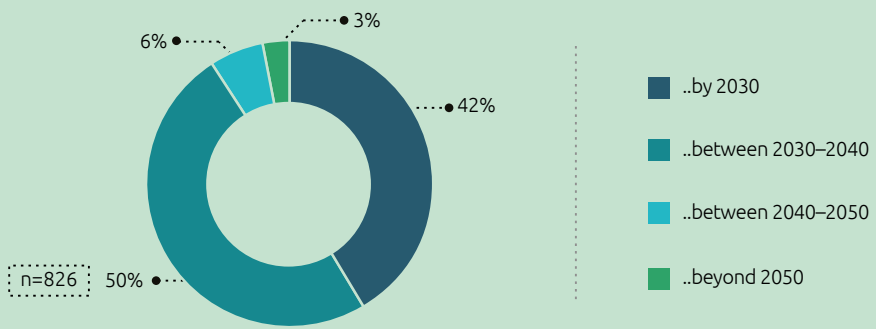
**For the purposes of our survey, we used the following definition of net zero based on the IPCC definition of the term: "For an organization, being "net zero" means reducing emissions of GHG (CO_2, methane, nitrous oxide, etc.) to close to zero and extracting residual emissions from the atmosphere, within a specified period." The 900 organizations in our survey have set net zero targets in a broad sense and these are not necessarily aligned with the SBTi's "Corporate Net-Zero Standard".*

Introduction

Exploring the current status of net zero ambitions

Timelines for achieving net zero

We plan to achieve our net zero targets..

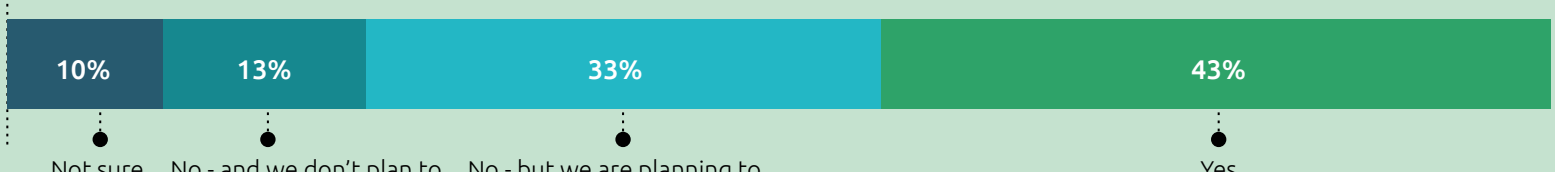


92%

Share of organizations that plan to achieve their net zero targets by 2040

Inclusion of short-term targets

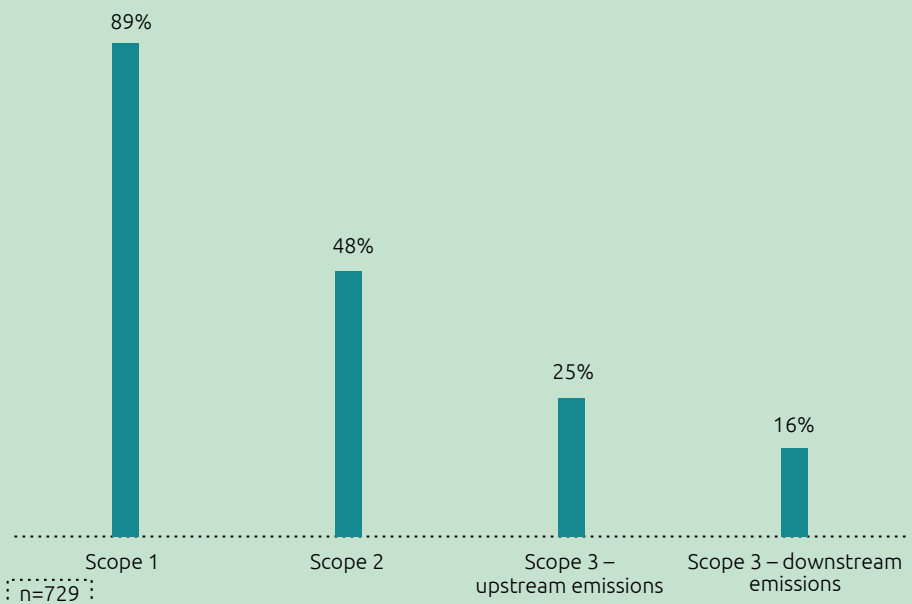
Has your organization set short-term/interim net zero targets in addition to its long-term net zero targets?



Introduction

Coverage of emission scopes

Which of the following emission scopes does your organization's net zero commitment cover?



Use of offsets

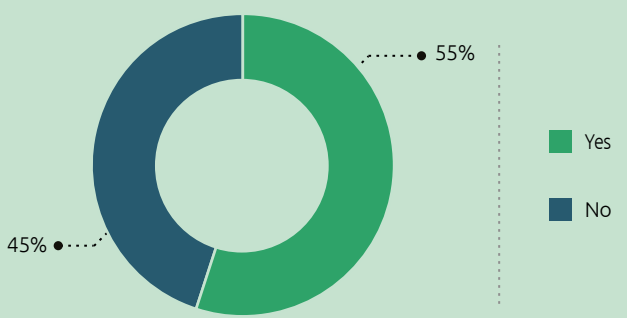
11.8%

Average share of baseline GHG emissions that will need to be offset to get to net zero

Introduction

Adoption of a data-driven approach to achieving net zero targets

Is your organization using emissions data for business decision making (i.e., using it for purposes beyond mandatory compliance and reporting)?



Organizations are not using data adequately to support their net zero ambitions

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations (unless otherwise specified) that have set net zero targets.

Introduction

As seen previously, the SBTi's "Corporate Net-Zero Standard" defines key requirements that net zero targets should fulfil in order to be aligned with the goal of limiting global temperature rise to 1.5°C. In light of this, the infographic above indicates that the net zero ambitions that organizations have set for themselves suffer from various inadequacies. Most, for instance, fail to cover all emissions scopes. The coverage of scope 3 emissions is especially low; given that these account for an estimated 65-95% of a company's carbon footprint,[8] this gives significant cause for concern. In addition, only 43% of organizations have set short-term targets to support their net zero ambitions – which is a critical omission given that short-term targets are key to maintaining momentum and accountability in the journey to net zero. Simon Fischweicher, head of corporations and supply chains for environmental nonprofit CDP North America, says: ***"We cannot wait to set ambitious targets that are only going to be achieved between 2040 and 2050, that'll be too late to make the changes we need."***[9]

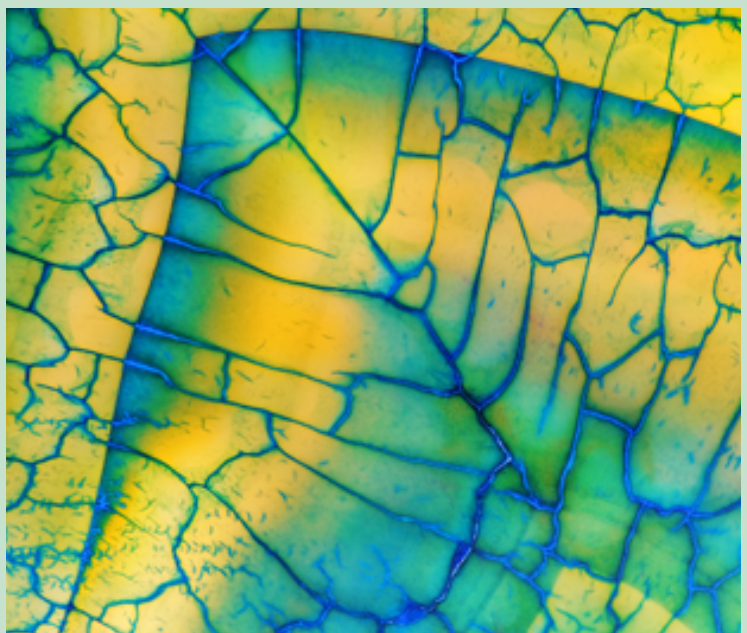
Crucially, our research shows that organizations are not adopting a data-powered approach to support their net zero ambitions. Doing so requires going beyond using emissions data only for mandatory reporting and compliance purposes and embedding emissions data in decision-making across the organization. However, 45% of organizations in our research say they use emissions data only for mandatory reporting and do not embed it in decision-making.

43%

of organizations have set short-term targets to support their net zero ambitions

Introduction

When assessing opportunities for emissions reduction in the journey towards net zero, it is also critical for organizations to bear in mind the impacts of their decisions on other environmental and social aspects of sustainability. The impacts must be considered holistically in order to avoid any unintended consequences of emissions reduction measures (e.g., reducing the use of air conditioning in order to increase energy efficiency in factories may put employee health at risk). It is critical therefore that organizations balance their emissions reduction measures with their overall ESG (i.e., environmental, social, and governance) goals.



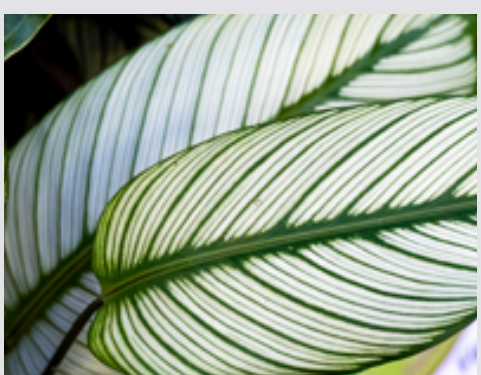
Executive Summary

1. Data is a significant lever in accelerating the journey to net zero.

- Emissions impact needs to be viewed as a critical factor in decision-making across procurement, product development, manufacturing, logistics, IT, and other areas across an organization's value chain. This is key to truly activating emissions data – i.e., transforming emissions data and insights into actions within an organization's processes and ways of working that help the organization take concrete steps towards reducing emissions.
- The use of emissions data can enhance organizational decision-making in three key ways: increasing visibility of baseline emissions levels and identifying emissions hotspots; improving existing business processes by streamlining carbon-intensive activities; and predicting and prescribing business outcomes to identify further emissions reduction opportunities.
- However, organizations are not adequately embedding emissions data in decision-making – 45% of organizations in our research use data only for mandatory reporting. Further, while 55% say they embed it in decision-making in some form, we found that they largely use emissions data to measure sustainability performance, and few use it to improve existing processes or to predict and prescribe opportunities for emissions reduction using forecasting and scenario analysis techniques.

45%

of organizations with net zero targets use emissions data only for mandatory reporting and do not embed it in decision-making



Executive Summary

2. Embedding emissions data in decision-making has a positive impact on progress towards net zero objectives.

- 53% of organizations that have embedded emissions data in decision-making have experienced an acceleration in their net zero journey; further, 53% have experienced an increase in transparency.
- On average, organizations have seen a 4.6% reduction in emissions annually due to their emissions measurement and analytics efforts.

3. Organizations recognize the value in emissions data, but are not well-positioned to use it.

- 85% of organizations recognize the business value that insights driven by emissions data can provide – for instance, by enabling organizations to explore sustainable business models, mitigate business risk, and reduce operational inefficiencies.
- However, most organizations are not well-positioned to use emissions data as they are not measuring emissions adequately, lack confidence in the accuracy of the data they do collect, and have not equipped their business teams to use emissions data for decision-making.
  i. While on average, 71% of organizations measure scope 1 emissions and 56% measure scope 2 emissions, scope 3 emissions are largely unmeasured. This is a significant cause for concern, given that they account for an estimated 65%-95% of a company's carbon footprint.[10] On average, only 22% of organizations measure scope 3 emissions.
  ii. Most organizations do not have visibility of emissions hot spots within their supply chains: less than a quarter (23%) report moderate or high levels of awareness of which suppliers account for most of their scope 3 emissions. An understanding of hotspots is crucial to driving action on emissions reduction, therefore the lack of visibility reported by organizations can significantly impede the journey to net zero.
  iii. In half of the organizations we surveyed, business teams are either not at all equipped or only slightly equipped to use emissions data to drive business decisions.

Executive Summary

4. Organizations need to develop the data management capabilities needed to accelerate their transition towards net zero.

This requires them to:

- **Establish strong leadership support, backed by a clear governance structure and data strategy.** To achieve net zero goals, it is critical that net zero initiatives have top management support. In addition, organizations need to set up a governing body or steering committee to oversee progress – however, only 13% have done so at scale. Organizations also need to develop a data strategy and roadmap to support their net zero goals.
- **Establish a robust foundation for emissions data management.** The lack of data completeness and reliability, high cost of data acquisition, and inability to measure emissions are among key challenges that are holding back progress on emissions management. To address such challenges, organizations will need to develop data platform capabilities to industrialize the ingestion, storage, and processing of emissions data, build emissions data analytics and visualization capabilities to activate emissions data, invest in a carbon management solution to facilitate carbon accounting and reporting, and extend data governance capabilities to emissions data management. However, few organizations have implemented such measures at scale. For instance, less than one in ten (7%) organizations have automated the collection of emissions data, only 11% have implemented an emissions data cockpit/control tower for emissions data visualization, and only 13% have adopted a carbon management solution at scale.
- **Drive usage of emissions data across business functions.** To ensure that business teams are equipped to use emissions data in business decisions, organizations should set up an internal carbon pricing system and invest in upskilling initiatives across the organizational hierarchy. However, most organizations are not taking such measures. For instance, only 7% are upskilling employees at scale on sustainability and climate change across levels (i.e., covering executive leadership, internal/operations teams, and new employees).
- **Establish mechanisms to ensure accountability for decarbonization across the organization.** Organizations

Executive Summary

will also need to define clear emissions targets and carbon KPIs for business teams to establish accountability for emissions reduction. However, most organizations have not established targets for internal teams/functions linked with their overall net zero targets, and only 20% say they regularly (i.e., often or always) evaluate the performance of internal functions based on carbon KPIs.

- **Collaborate with the wider ecosystem to expand access to reliable emissions data.** Collaboration will be critical to accessing reliable data – especially scope 3 data that lies outside the boundaries of an organization. Key actions that organizations should consider include collaborating with the wider ecosystem to develop common methodologies for emissions measurement, helping suppliers measure emissions by providing them with carbon accounting tools, training, and support, and participating in data ecosystem initiatives to share emissions data. However, most organizations are yet to take such actions. For instance, only 14% of organizations have scaled initiatives aimed at upskilling suppliers on carbon accounting, and less than a third (32%) are participating in data ecosystems initiatives to share emissions data.

14%

of organizations have scaled initiatives aimed at upskilling suppliers on carbon accounting

HOW DATA CAN HELP WITH REGULATORY COMPLIANCE

Regulatory action aimed at accelerating climate action has been steadily growing. For instance, the US recently passed the Inflation Reduction Act (IRA) – a landmark law to encourage investments in emissions reduction,[11] while EU countries reached a deal in 2021 on a wide-ranging climate law to guide EU policymaking in the coming decades, with new and tougher emissions reduction targets at the heart of it.[12]

In addition to introducing policy instruments to drive climate action, regulators across the world have also been steadily increasing pressure on organizations to disclose data around climate risks and emissions.

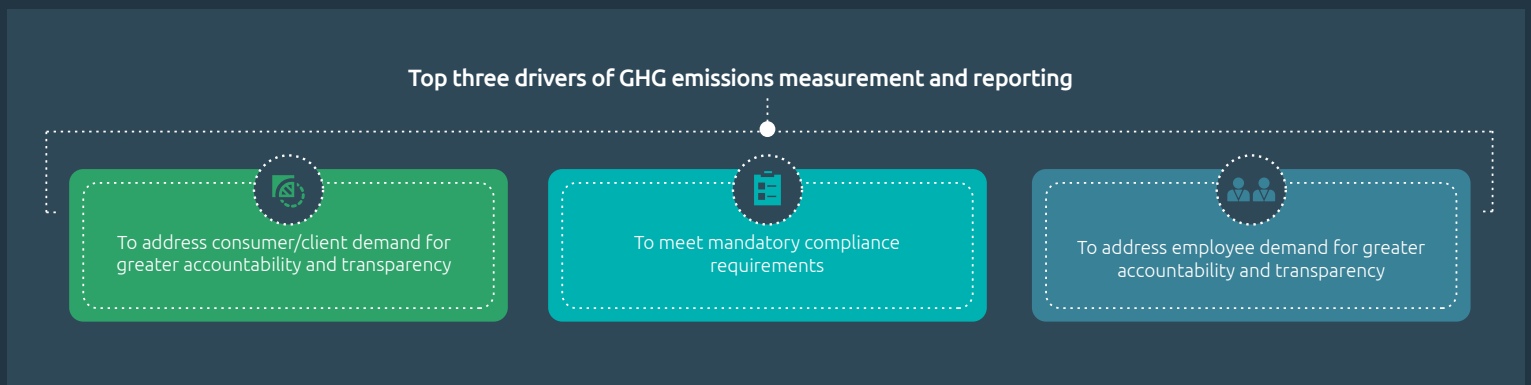
In April 2021, the European Commission adopted a proposal for a Corporate Sustainability Reporting Directive (CSRD) that introduces new and more stringent corporate sustainability reporting requirements, such as an EU-wide audit (assurance) requirement for sustainability information.[13] Further revisions to the proposal aim to cast a larger net for sustainability reporting – covering all large organizations (the EU proposal applies to an estimated 49,000 organizations functioning in the EU) – and making it mandatory for organizations to disclose scope 3 emissions.[14]

In March 2022, the US Securities and Exchange Commission (SEC) proposed rules that would require companies to disclose information on climate-related risks, including GHG emissions. The proposed rules require disclosure of scope 1 and 2 emissions, as well as scope 3 emissions, if material, or if the organization has set a GHG emissions target that includes scope 3 emissions.[15]

Various countries are working on regulations that aim to bring sustainability reporting in line with financial reporting. Owing to the complex, fast-evolving nature of the regulatory compliance environment, access to accurate, complete emissions data will be crucial. Our survey shows that meeting mandatory compliance requirements is one of the top drivers of emissions measurement and reporting. Further, lack of clarity regarding ESG reporting regulations, standards, and frameworks is a key challenge for more than half (53%) of organizations in our research. Fifty percent of organizations, for instance, say they face difficulties in aligning with EU Taxonomy requirements, while 46% say so regarding SEC's ESG disclosure requirements.

Fig.2

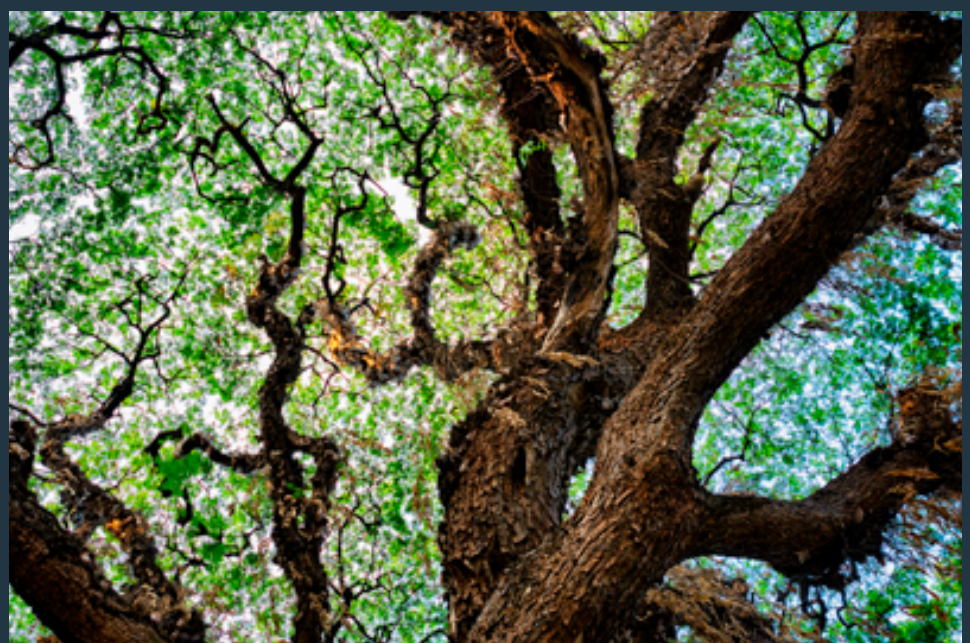
Meeting mandatory compliance requirements is a key driver of emissions measurement for organizations



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=691 organizations that have set net zero targets and responded to this question (excludes respondents who selected "not sure").

DOING MORE WITH EMISSIONS DATA

While emissions measurement is critical to regulatory compliance, to achieve net zero objectives, organizations will need to embed emissions data in decision-making across functions. Our research shows that organizations that have done this are benefiting from reduced emissions and accelerated progress towards their net zero goals. We look at these aspects in detail in the following sections.



01

DATA IS A SIGNIFICANT LEVER IN ACCELERATING THE JOURNEY TO NET ZERO

To really move the needle on emissions reduction, organizations need to embed emissions data in decision-making. Emissions impact needs to be viewed as a critical factor in decision-making across procurement, product development, manufacturing, logistics, IT, and other areas across an organization's value chain. In this section, we look at how the use of emissions data can enhance decision-making across organizational functions and offer an accelerated path to net zero.

Broadly, the use of emissions data can enhance organizational decision-making in three ways (denoted in Figure 3 as "Measure," "Improve," and "Anticipate"):

- Increasing the visibility of baseline emissions levels and enabling the identification of emissions hotspots – this is a critical first step towards mitigating emissions given that awareness is critical to action.
- Utilizing emissions data to improve existing business processes – for instance, selecting suppliers, redesigning products, or optimizing logistics with the goal of minimizing carbon-intense activities.
- Predicting and prescribing business outcomes that offer further opportunities for emissions reduction, using forecasting and scenario-analysis techniques.

"You don't even know if you're on a path to net zero without better data."[3]

Cynthia Cummis
Director of Private Sector Climate Mitigation for the World Resources Institute

Below, we look at emissions reduction opportunities that data-powered decision-making can open up across functions.

Procurement

Upstream scope 3 emissions – such as emissions resulting from purchased goods and services – can constitute a significant share of an organization's overall carbon footprint. Measurement of upstream scope 3 emissions data allows procurement teams to identify emissions hotspots within their supplier networks. Few organizations currently have this visibility of their supply chains. For instance, only 23% of organizations in our survey report being moderately or highly aware of which suppliers account for most of their scope 3 emissions, with the remainder reporting low or no visibility.

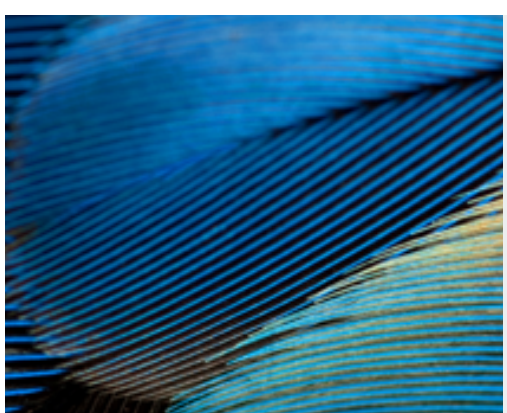
Visibility into emissions data enables procurement teams to take targeted actions to mitigate emissions. For instance, procurement teams can use emissions data to assign carbon scores to suppliers in order to facilitate the selection of suppliers with smaller emissions footprints. Sweden-based telco Telia, for instance, assigns a climate score to each of its suppliers based on the maturity of the supplier's climate action initiatives, and uses the score as a selection criterion (91% of Telia's emissions come from its supply chain, making this a crucial exercise).[16] Brazil-based commodities company Amaggi has integrated the use of geospatial tools and data into 100% of its

23%

of organizations report being moderately or highly aware of which suppliers account for most of their scope 3 emissions

purchasing decisions to evaluate suppliers based on their environmental impact. This is helping Amaggi ensure traceability across its supply chain, as well as monitor deforestation.[17] Tackling deforestation is key to achieving net zero – 11% of global GHG emissions are attributed to deforestation and the conversion of natural ecosystems.[18]

The application of predictive and prescriptive analytics and simulation modeling techniques provide further opportunities to reduce emissions in the upstream supply chain. To support its push for net zero, Japan-based trading company Marubeni Corporation (a Fortune Global 500 company with close to $60 billion in annual revenue)[19] conducted a proof of concept (PoC) in 2021 with the aim of reducing emissions related to the procurement of corrugated boxes. The PoC was aimed at building an emissions visualization and optimization platform that measures the GHG emissions of various corrugated box manufacturers, enables the visualization of emissions across the supply chain, and conducts simulations to optimize supplier selection based on multiple conditions such as environmental impact, product cost, and delivery distance.[20]



The integration of geospatial tools and data into purchasing decisions is helping Brazil-based commodities company Amaggi ensure traceability across its supply chain, as well as monitor deforestation (11% of global GHG emissions are attributed to deforestation and the conversion of natural ecosystems).

Product development / R&D

To meet net zero objectives, organizations will need to pay close attention to product design. An estimated 80% of the environmental impacts of a product are linked with decisions made at the design stage.[21] Moreover, carbon emissions generated across a product's lifecycle – from material acquisition and pre-processing, through production, distribution and storage, use, and end-of-life treatment – can account for a major share of organizations' overall emissions. For instance, emissions from the use of sold products account for the vast majority of emissions for global companies such as Unilever (70%),[22] Cisco (75%),[23] BMW (81%),[24] and Siemens (96%).[25]

To mitigate product emissions, organizations will need to measure emissions across the product lifecycle to identify emissions-intensive areas. However, our previous research has shown that few organizations conduct regular Life Cycle Assessments (LCAs) to measure the environmental impacts of their products across the product lifecycle.[26]

Conducting LCAs is a critical first step towards mitigating emissions through sustainable design strategies such as the selection of low-carbon raw materials and packaging components, or redesigning products to lower use-phase emissions.

Since 2019, L'Oréal has evaluated all products using its Sustainable Product Optimization Tool (SPOT), which quantifies

80%

of the environmental impacts of a product are linked with decisions made at the design stage.

the carbon footprint of L'Oréal products, in addition to other environmental and social impacts across the product lifecycle. The results of the impact assessment inform product design decisions. For instance, L'Oréal launched a solid shampoo that uses recycled cardboard packaging instead of plastic and also features an improved formula that lasts as long as two 250ml liquid shampoo bottles. Improvements such as these have resulted in a 30% reduction in GHG emissions across the product's lifecycle compared to a standard shampoo bottle.[27]

Further, with advanced analytics and simulation techniques, organizations can predict the impact of design decisions on a product's carbon footprint and identify design interventions (such as raw material alternatives that are less scarce and carbon-intensive) that can reduce emissions. For instance, Facebook's parent company Meta is developing an artificial intelligence (AI) model that optimizes concrete mixtures to reduce emissions from concrete without compromising effectiveness (cement used in concrete accounts for an estimated 8%

Since 2019, L'Oréal has evaluated all products based on their environmental and social impacts. The results of the impact assessment inform product design decisions. For instance, design improvements resulted in a 30% reduction in GHG emissions across the lifecycle of a solid shampoo line compared to a standard shampoo bottle.

of global GHG emissions). Early field test results have shown a 40% reduction in carbon emissions, while exceeding strength requirements. While this project is aimed at reducing Meta's emissions from its data center operations by reducing embodied carbon in data center buildings, it has applications in the wider construction industry. Manually optimizing the formula for concrete can be challenging as well as time-consuming – a process that can be made much more efficient using AI.[28] However, when using AI, organizations should also consider the emissions impact of AI itself, as the carbon cost of AI's compute resource requirements may outweigh the intended carbon savings.

Operations/manufacturing

To reduce emissions, organizations also need to place energy efficiency and emissions reduction at the core of decision-making within their operations and manufacturing processes. At Hyundai, for example, the reduction of GHG emissions is a key performance indicator for its domestic sites. Hyundai has set up a company-wide Greenhouse Gas Council to oversee reductions in its GHG emissions at all its domestic sites.[29] The company plans to make its factories carbon neutral by 2045. Data and advanced analytics will play a crucial role this. Hyundai plans to use AI and big data to optimize energy usage in production processes and reduce carbon emissions in its factories.[30]

At Hyundai, the reduction of GHG emissions is a key performance indicator for its domestic sites.

Bosch is similarly focused on improving energy efficiency and lowering emissions at its plants, and is relying on data and analytics to achieve this goal. At its plant in Homburg, Germany, for instance, Bosch has implemented an energy management platform that collects close to 10,000 data points from connected machinery, enabling operations teams to monitor machines and implement energy efficiency measures, such as turning off idle machines and redirecting waste heat to productive uses. This is helping the Homburg plant cut 5,000 tons of CO_2 emissions every year. As an additional benefit, it is also helping save about €2.4 million in costs annually.[31]

Data and advanced analytics will also play a key role in helping P&G cut its emissions.

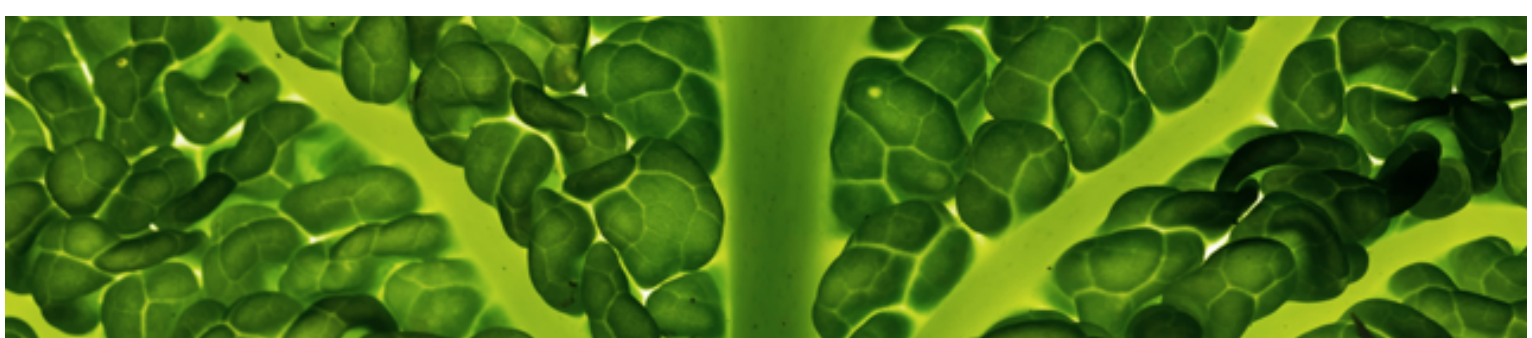
Vittorio Cretella, CIO at P&G, comments: ***"One use case that we will replicate across many plants is using machine learning to optimize energy and water consumption. That will reduce the carbon footprint and support our 2040 carbon neutrality goal."***[32]

Access to quality data also enables organizations to model the carbon impact of their operations and identify the key drivers of emissions reduction and increase. Models can further help organizations to implement new energy-saving measures in response to real-time conditions, gauge the effectiveness of such measures, as well as identify anomalies that can contribute to increased emissions (e.g., wastage in electricity use).

Logistics

Emissions data should also be a key consideration in organizations' logistics decisions. Logistics-related emissions can account for a significant share of an organization's scope 3 emissions. For instance, emissions from upstream and downstream transportation and distribution accounted for 20% of PepsiCo's emissions footprint in 2021. To meet its net zero goals, PepsiCo is mapping and quantifying its baseline emissions from third-party logistics and engaging with its logistics partners to identify opportunities for improvement.[33] PepsiCo is also conducting an internal carbon pricing pilot project to mitigate its emissions from transport and logistics.[34]

Data and insights are also playing a key role in driving Volvo Cars' push towards decarbonization. To measure emissions more accurately, Volvo Cars is capturing real-time data and has also set up a digital twin of its supply chain in order to model scenarios and identify improvement opportunities.[35] Logistics decisions are guided by carbon costs. The company introduced an internal carbon pricing system in 2021 to guide business decisions and reduce emissions including logistics-related emissions related to inbound parts shipments and outbound vehicle delivery. For instance, the company introduced an intermodal logistics solution in Europe based on using rail and sea freight that led to a 50% improvement in CO_2 emissions. Going forward, the company plans to rely more on rail and ocean freight, and less on air freight in order to reduce logistics-related emissions.[36]



Sales and marketing

In our 2021 consumer survey, 60% of respondents agreed that post-pandemic, sustainability will be even more important to them as consumers.[37] Embedding emissions data in sales and marketing decisions is key to offering customers more sustainable options. To do so, organizations will need to measure the emissions footprint of the products they offer and use this data to determine their selection of product offerings. For instance, in the food retail sector, switching from non-seasonal to seasonal produce and avoiding air-freighted produce can help reduce emissions.[38] German retail chain Lidl, for instance, has decided to stop stocking air-freighted fruit, vegetables and other food items at its stores in Sweden.[39]

60%

share of consumers who agreed that post-pandemic, sustainability will be even more important to them.

The use of data and analytics also enables effective demand forecasting and inventory optimization that leads to reduced waste and emissions. For instance, emissions associated with food loss and waste account for roughly 8% of global GHG emissions.[40] To tackle this problem, retailer Metro AG has incorporated food waste data into its existing carbon accounting tools and processes. The retailer has partnered with Wholesurplus, a Turkish foodtech startup, to enable Turkish stores to quantify and monitor food waste in real time, using data analytics.[41] Metro has also partnered with Wasteless, an Israel-based tech startup that offers an AI-based dynamic pricing engine. The engine automatically adjusts the prices of perishable food items as they near expiry, making them more attractive as cost-saving options for consumers, and enabling

grocery retailers to reduce food waste by an estimated 40%.[42]

The use of emissions data in sales and marketing decisions can also help organizations manage emissions due to unsold or returned items. Estimates indicate that, in the US alone, consumers returned merchandise worth $761 billion in 2021. This has a significant environmental impact. Every year, returns generate an estimated 16 million metric tons of carbon emissions and up to 5.8 billion pounds of landfill waste in the US alone.[43] The high percentage of returns is linked to consumers' tendency to buy multiple versions of the same product (apparel or footwear in multiple sizes or colors, for instance) online, with the intention of returning unsuitable items – a practice referred to as "bracketing." Quantifying emissions related to unsold and returned products is key to understanding the magnitude of the problem. Data and analytics are also key to reducing waste and associated emissions by matching customer preferences more accurately. For instance, Denmark-based sportswear brand Saysky partnered with Easysize (an AI-focused tech startup) to reduce the environmental impact of product returns. Nicolas Fenger, CMO at Saysky, says, ***"We partnered with Easysize to help our customers as much as possible in the buying decision, by minimizing uncertainty around sizing, which in turn also meant fewer customer service questions, increased conversions and reduced return rates."***[44]

IT

Data is also key to reducing the carbon footprint of an organization's IT infrastructure – a growing challenge as technology adoption accelerates, especially after the pandemic. Organizations will need to quantify the carbon footprint of their IT infrastructure to identify carbon-intensive areas and adopt measures to reduce emissions. Schneider Electric, for instance, has launched a "Green IT" initiative aimed at measuring and optimizing the environmental footprint of the company's IT systems. As part of the initiative, Schneider Electric has updated its IT asset management policy to prioritize sustainability across the lifecycle of its IT assets. Carbon footprint reduction is a key criterion in the selection of IT vendors. As a result, new PCs procured by Schneider Electric are more energy efficient and have a 50% lower carbon footprint than the ones they replace.[45]

The use of data and analytics can also help organizations optimize data center utilization and improve cooling solutions (data centers account for nearly 1% of the world's energy demand[46]). To reduce emissions from its data center operations, Google, for instance, uses AI to regulate data center cooling more efficiently. This has helped Google reduce the amount of energy used for cooling by 15%.[47]

Dilek Mutlu-Kowalski, global head of category development IT procurement at Siemens, comments: ***"At Siemens, we raise employee awareness of CO_2 emissions from IT hardware as early as the procurement decision stage by making the carbon footprint data of products transparent to employees. We also offer Fairphone as an option for mobile devices to our employees to take further steps toward a circular economy."***

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Dilek Mutlu-Kowalski
Global head
of category development
IT procurement
at Siemens

Risk/Finance and CSR

The involvement of the risk, finance and CSR teams is key to the achievement of net zero targets. The use of emissions data should be a critical input to assessing the viability and health of a business, and mitigating exposure to climate-related risks. For instance, if the cost of operating a facility exceeds the revenue generated due to climate-related risks or regulatory penalties, the value of operating it could be negative. Better emissions data is crucial to understanding such risks and costs.

PepsiCo, for instance, has identified climate change as a business risk and is taking steps to identify risk indicators and develop a mitigation plan. The company conducted a climate scenario analysis covering its wholly owned assets (such as manufacturing plants, warehouses,

R&D centers, and offices), third party manufacturing assets (under franchise and joint venture arrangements), as well as its agricultural supply chain locations, to identify climate risks and opportunities. The company models its climate risks to gauge the impact of various temperature scenarios on its business, identify hotspots and improve resiliency planning.[48]

At Volvo Cars, emissions data is a key input to gauging the profitability of projects. The company conducts a "sustainability sense-check" for every car project, where it applies a carbon cost on every anticipated ton of carbon emissions across the lifecycle of a car. This is aimed at ensuring that each car model is profitable even under a strict carbon pricing regime and that project decisions are guided by sustainability considerations.[49] Björn Annwall, chief financial officer at Volvo Cars, comments: ***"A global and fair price on CO_2 is critical for the world to meet its climate ambitions, and we all need to do more. We strongly believe progressive companies should take the lead by setting an internal carbon price. By evaluating future cars on their CO_2-adjusted profitability, we expect to accelerate actions that will help us identify and reduce carbon emissions already today."***[50]

The use of emissions data is also enabling Microsoft to mainstream the cost of carbon within its corporate balance sheet. The company has implemented a three-step process to do so. First, Microsoft tracks and accounts for emissions across all scopes, from each department. Second, Microsoft's central finance and corporate affairs teams work together to charge each department a carbon fee based on its share of the organization's overall emissions (Microsoft has established an internal carbon pricing system to enable this). Third, the fee collected as a result is added to a central carbon fund, which is used to fund carbon reduction and removal projects as part of Microsoft's ambition to become a carbon negative company. Elizabeth Willmott, who leads Microsoft's carbon program, comments: ***"The funding for carbon reduction and removal projects helps to not only meet our carbon-negative commitment but also help to jump-start critical decarbonization markets."***[51]

Fig.3

Applications of emissions data in decision-making across an organization's value chain

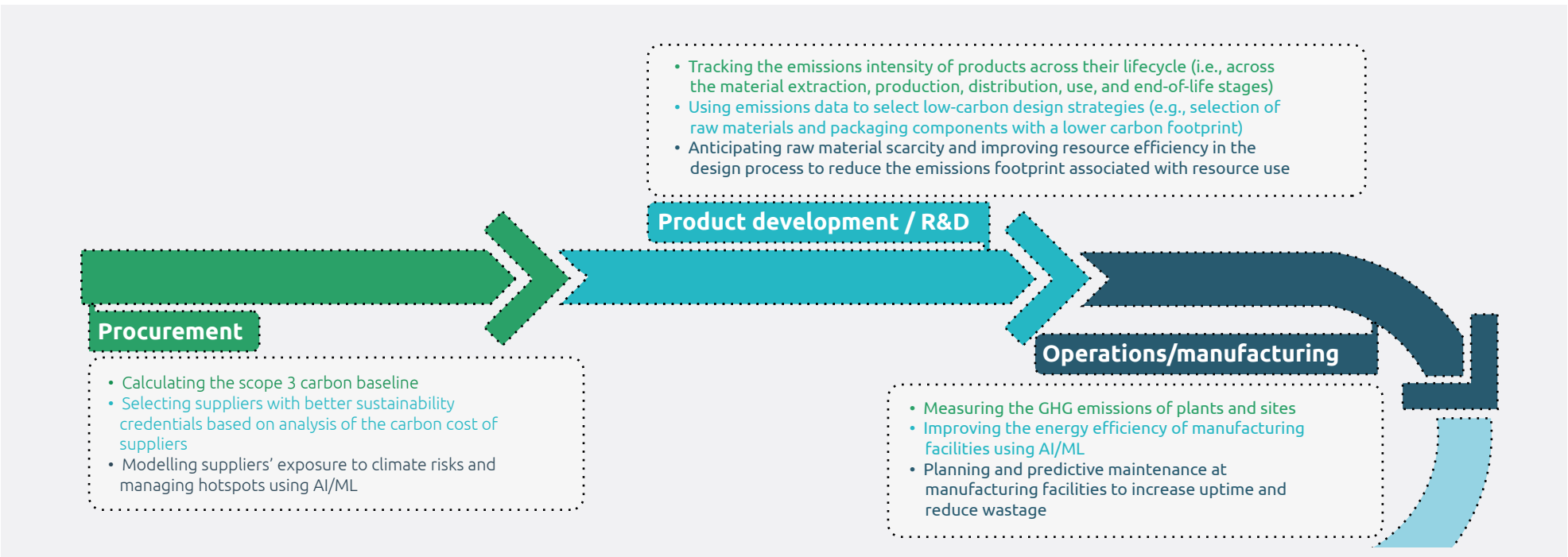


Fig.3

Applications of emissions data in decision-making across an organization's value chain

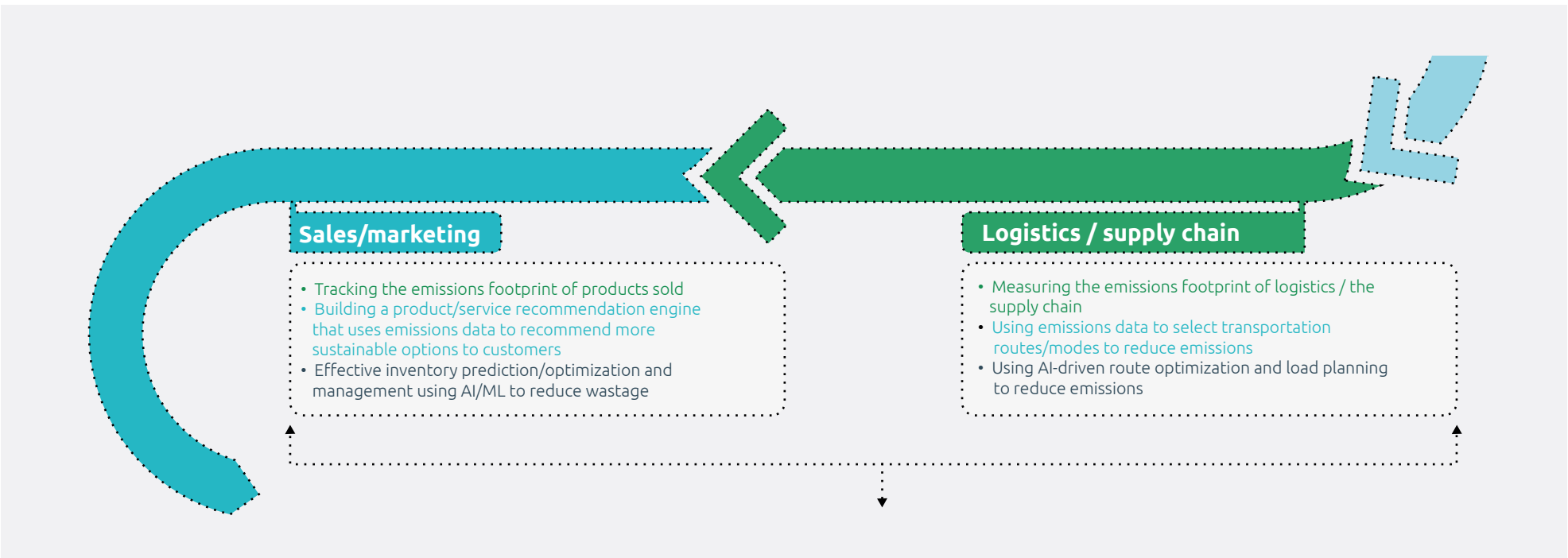
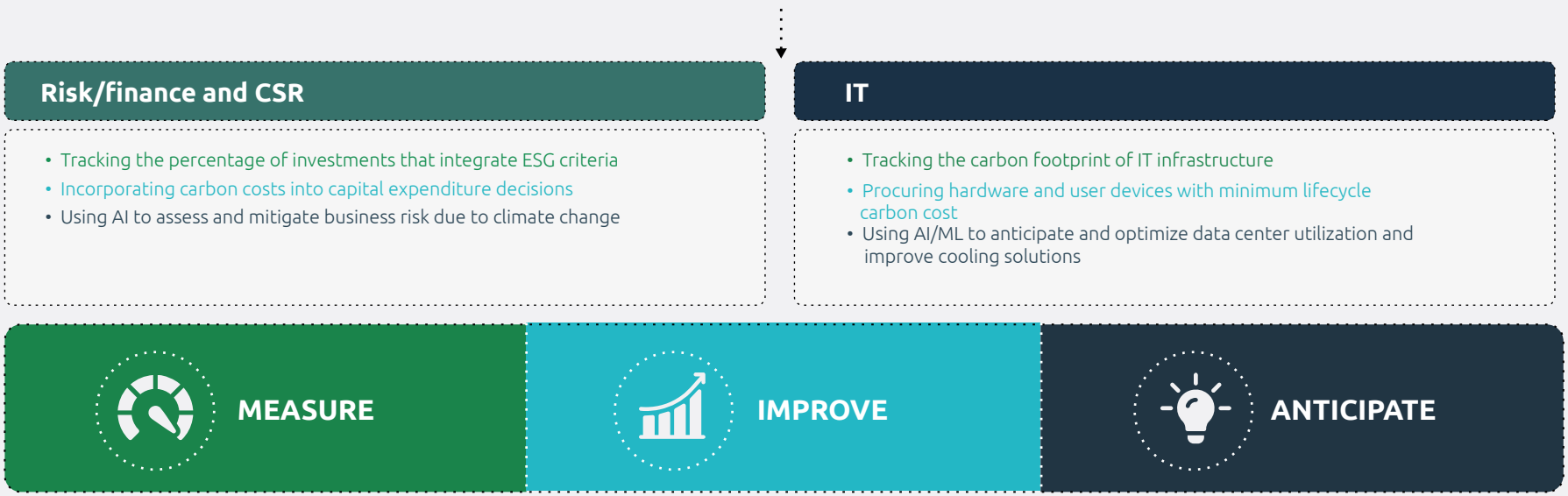


Fig.3

Applications of emissions data in decision-making across an organization's value chain



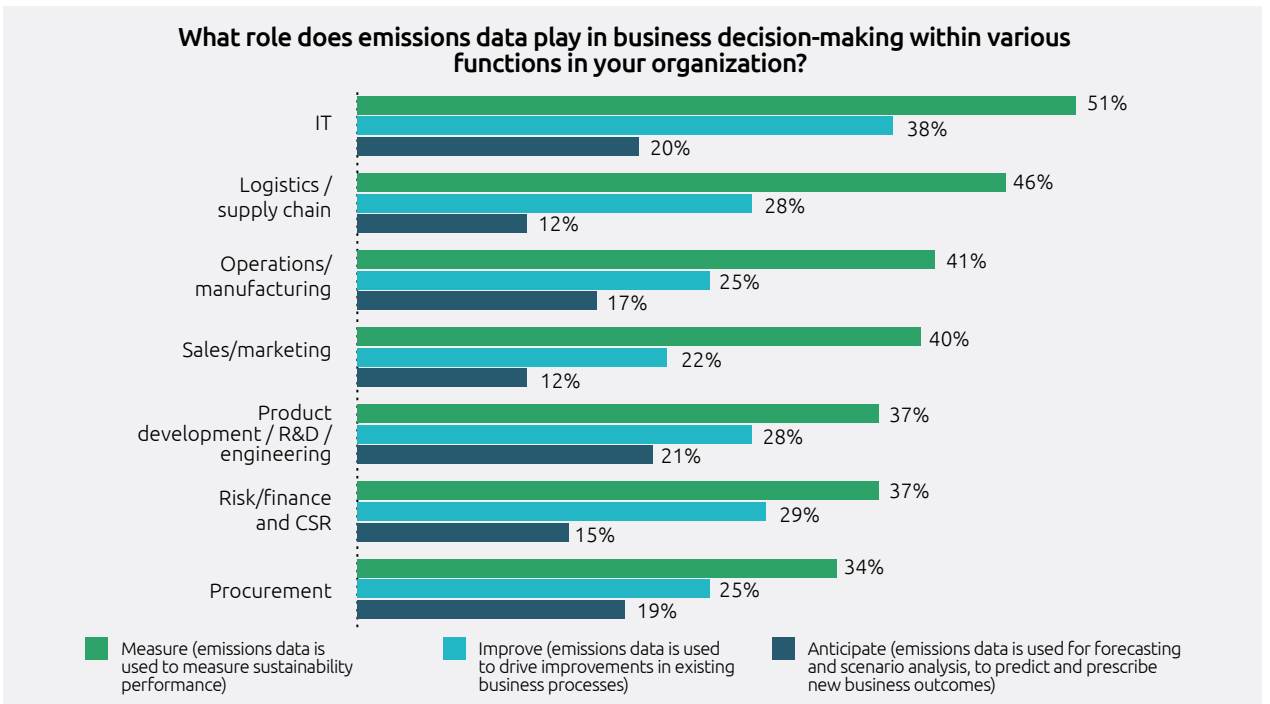
Source: Capgemini Research Institute analysis.

Fig.4

Emissions data offers numerous opportunities to enhance decision-making across business functions and steer an organization towards net zero – however, organizations are not leveraging these opportunities adequately

Organizations are not adequately embedding emissions data in decision-making

Achieving emissions reductions hinges on using emissions data to drive decision-making. However, as we saw previously, only 55% of organizations say they embed data in their decision-making processes, with the remaining 45% saying they use it only for mandatory reporting. Further, when we looked into the application of data for decision-making across functions, we found that organizations largely use emissions data to measure sustainability performance, rather than to improve existing processes or predict and prescribe new business outcomes (see Figure 4).



*Respondents could select multiple options for each applicable function.

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=461 organizations that have set net zero targets and use emissions data for business decision-making (i.e., using it for purposes beyond mandatory compliance and reporting). Not inclusive of companies from the financial services sector. For financial services firms, please see Figure 5.

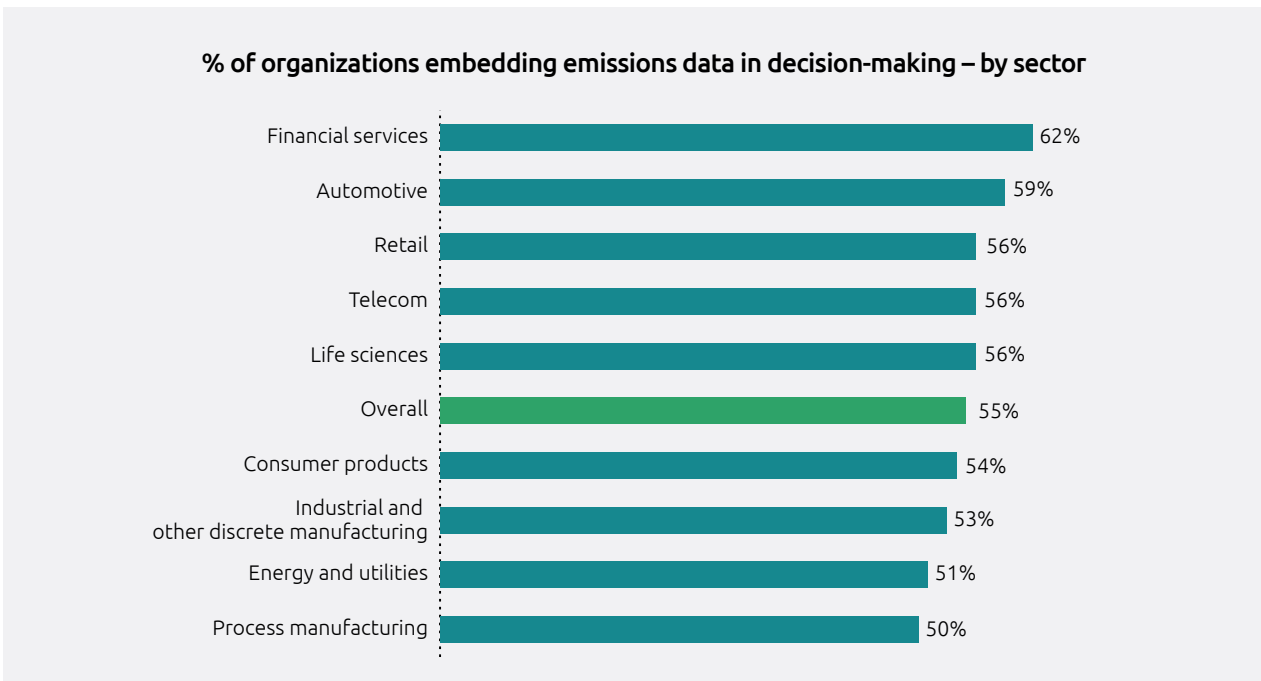
On examining sector-wise differences in the use of emissions data for decision-making, we found that the financial services and automotive sectors are embedding emissions data in decision-making to a relatively greater degree than the energy and utilities and process manufacturing sectors (see Figure 5).

55%

of organizations say they embed emissions data in their decision-making processes

Fig.5

The financial services and automotive sectors are embedding emissions data in decision-making to a relatively greater degree



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

In addition, in a separate survey focused on public sector organizations (i.e., government entities, such as city councils, ministries, and agencies) that have set net zero targets, we found that almost three-fourths (74%) use emissions data for decision-making (please refer to the research methodology at the end of the report).[51]

THE FINANCIAL SERVICES SECTOR AS AN ENABLER OF THE GLOBAL TRANSITION TO NET ZERO

The financial services sector plays a unique role in the global transition towards net zero by enabling the channeling of funding towards sustainability initiatives. The financial services sector is waking up to this new responsibility. For instance, the Glasgow Financial Alliance for Net Zero (GFANZ) brings together 160 financial services firms with combined assets under management (AUM) of more than $70 trillion to mobilize assets to build a net zero economy.[53] In the insurance industry, more than twenty insurers, representing more than 11% of premium volume globally, have formed the Net-Zero Insurance Alliance (NZIA). NZIA members have committed to transitioning their portfolios to net zero GHG emissions by 2050.[54]

To meet their goals, it is critical for financial services organizations to embed emissions data in decision-making, both for their own operations and via their portfolios. For instance, Morgan Stanley plans to focus on emission reduction targets for the most emission-intensive sectors in its corporate lending portfolio. To achieve this, Morgan Stanley uses various measures, including the emissions data of borrowers as publicly reported by the client or according to data sourced from exchanges and data aggregation services.[55] Meanwhile, UBS is analyzing emissions from its financed entities to identify climate-related opportunities that require capital, and to improve its sustainable product range.[56]

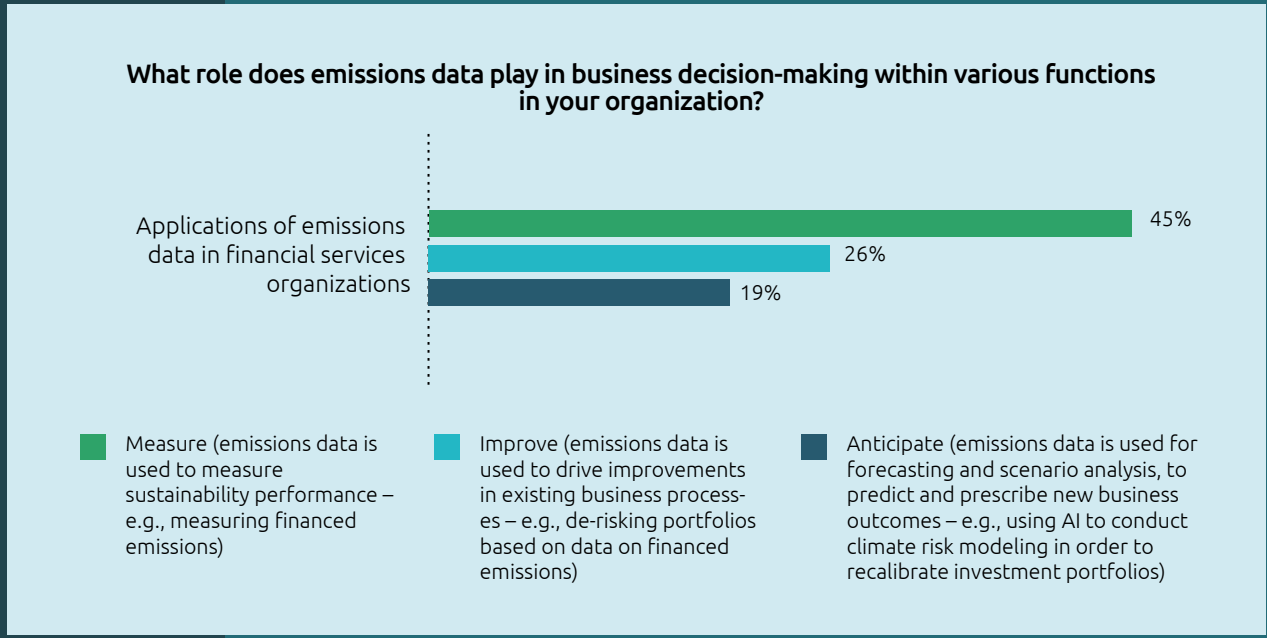
160

financial services firms with combined assets under management (AUM) of more than $70 trillion to mobilize assets to build a net zero economy.

However, our research shows that there is considerable ground to cover in the financial services sector's use of emissions data to drive decision-making (see Figure 6). Among financial services firms that are embedding emissions data in decision-making, 45% are using emissions data to measure their sustainability performance (e.g., to measure financed emissions). The share of organizations falls to around one-quarter (26%) for those who use data to improve business processes, and fewer than one in five (19%) use emissions data for forecasting and scenario analysis (e.g., to conduct climate risk modeling to recalibrate investment portfolios).

Fig.6

Financial services firms must harness emissions data for decision-making



*Respondents could select multiple options

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=31 financial services organizations that have set net zero targets and use emissions data for business decision-making (i.e., using it for purposes beyond mandatory compliance and reporting).

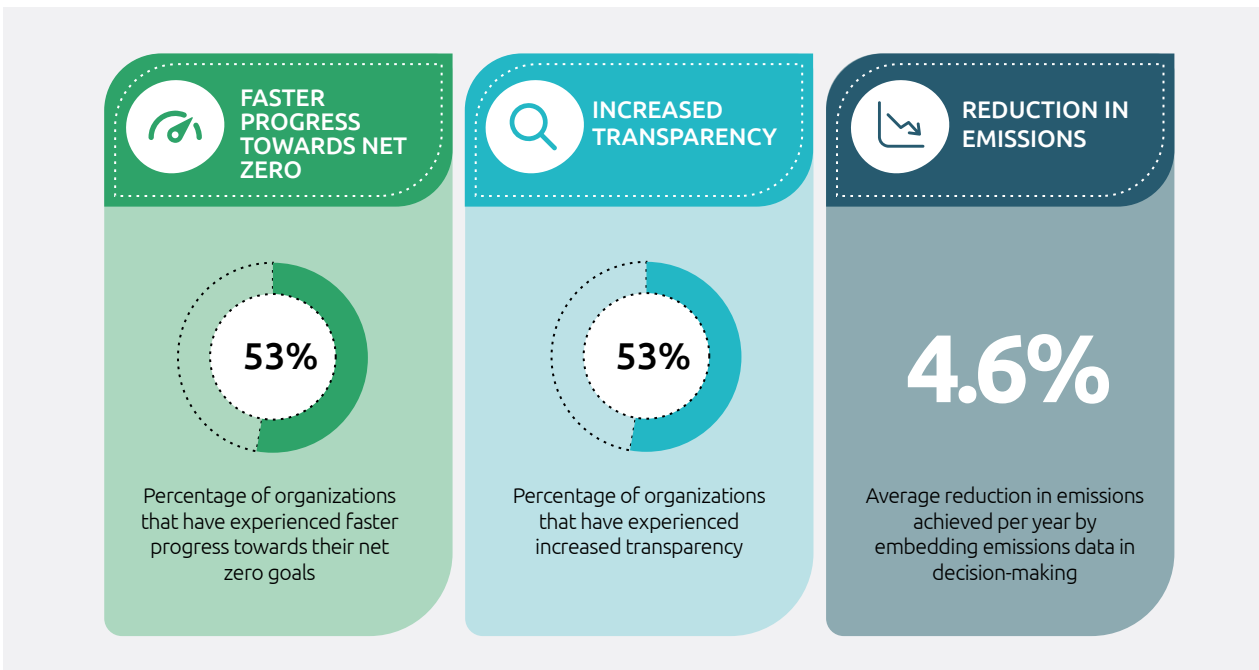
02

DECISION-MAKING BASED ON EMISSIONS DATA HAS A POSITIVE IMPACT ON PROGRESS TOWARDS NET ZERO

Our research shows that organizations that embed emissions data in decision-making are realizing reductions in emissions, an increase in transparency, and an overall accelerated progress towards net zero goals (see Figure 7). We look at each of these aspects in this section.

Fig.7

Impact of data-powered decision-making on the achievement of net zero goals



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=391 organizations that have set net zero targets, embedded emissions data in decision making and responded to the question on faster progress towards net zero; N=489 organizations that responded to the question on increased transparency; N=269 organizations that responded to the question on reduction in emissions (211 respondents said it is too early to quantify the reduction in emissions).

Accelerated progress towards net zero

Emissions data is a vital tool for organizations when gauging progress on their net zero journeys, helping them both to correct course as necessary and accelerate. As Figure 7 shows, our survey reveals that more than half of organizations (53%) that have embedded emissions data in decision-making have achieved an overall acceleration in progress towards net zero targets. Additionally, our survey of public sector organizations showed that three-fourths (75%) of public sector organizations have achieved faster progress towards net zero by embedding emissions data in decision-making.[56]

Increased transparency

We saw earlier that compliance is an important area of focus for organizations that measure emissions data. Apart from ensuring that organizations are compliant with reporting and compliance obligations, embedding emissions data in decision-making can help organizations achieve greater transparency (53% of organizations report this) with various stakeholders, leading to increased trust. Among public sector organizations, we found that 86% have experienced increased transparency.[67]

Emissions reductions

Moving beyond emissions measurement for compliance and reporting and using this data for decision-making is key to achieving emissions reductions. With the help of granular data, organizations can make more informed decisions on their primary sources of emissions and focus efforts more efficiently, ensuring the best use of limited resources. We asked organizations about the overall reduction in emissions they had experienced by embedding emissions data in decision-making. Based on the year in which they had set their net zero target, we found that, on average, organizations have achieved a 4.6% annual reduction through these actions.

This is a significant reduction when seen in the context of the annual emissions reductions that organizations are reporting. Below we look at examples of annual emissions reductions reported by a selection of companies. The reductions can be attributed to various measures and are not solely linked to the use of emissions data. However, the examples suggest that a 4.6% annual reduction aided by emissions measurement and analytics can be a significant contribution to an organization's overall emissions reduction goals:

- Danone reported a 3% reduction in CO_2 volume across the full scope of its emissions in 2021.[59]

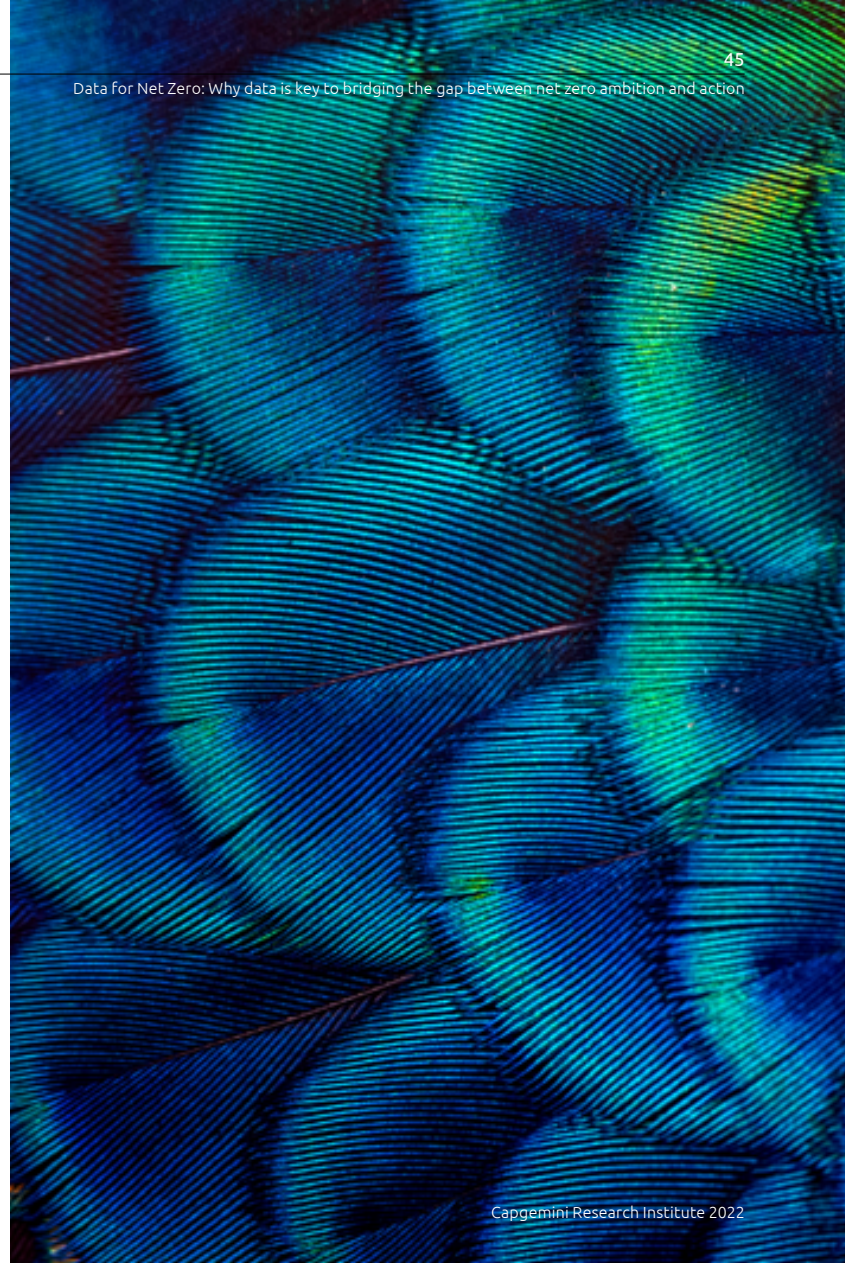
- Bayer reported a 5% reduction in emissions across all 3 scopes in 2021.[60]
- Siemens reported an 8% reduction in emissions across all 3 scopes in 2021.[61]
- Verizon reported a 7% reduction in emissions across all 3 scopes in 2021.[62]

Further, our survey of public sector organizations shows that public sector organizations have realized an average reduction in emissions per year of 10% as a result of emissions measurement and analytics.[63]

Unlocking the potential of emissions data with AI

As seen previously, most organizations that use emissions data for decision-making use it primarily to measure sustainability performance. Fewer organizations are using emissions data to drive improvements in existing processes, and an even smaller share are using it to predict and prescribe new business outcomes using advanced analytics techniques. Despite this, organizations have achieved a reduction of approximately 4.6% annually using emissions data. This suggests that the measurement of emissions data itself is a significant lever in emissions reduction. In conjunction with more advanced uses of data, the impact of data-powered decision-making is likely to be even more significant. Our previous research on the topic ***"Climate AI: How artificial intelligence can power your climate action strategy,"*** for instance, found that AI had helped organizations reduce emissions by 12.9% in the two years to 2019 (a reduction of approximately 6.5% per year).[64]

However, organizations need to be mindful of the climate impact of AI and design efficient and sustainable AI applications. In addition, systems for emissions data measurement, storage, and processing should be designed to generate a minimal carbon impact themselves.



03

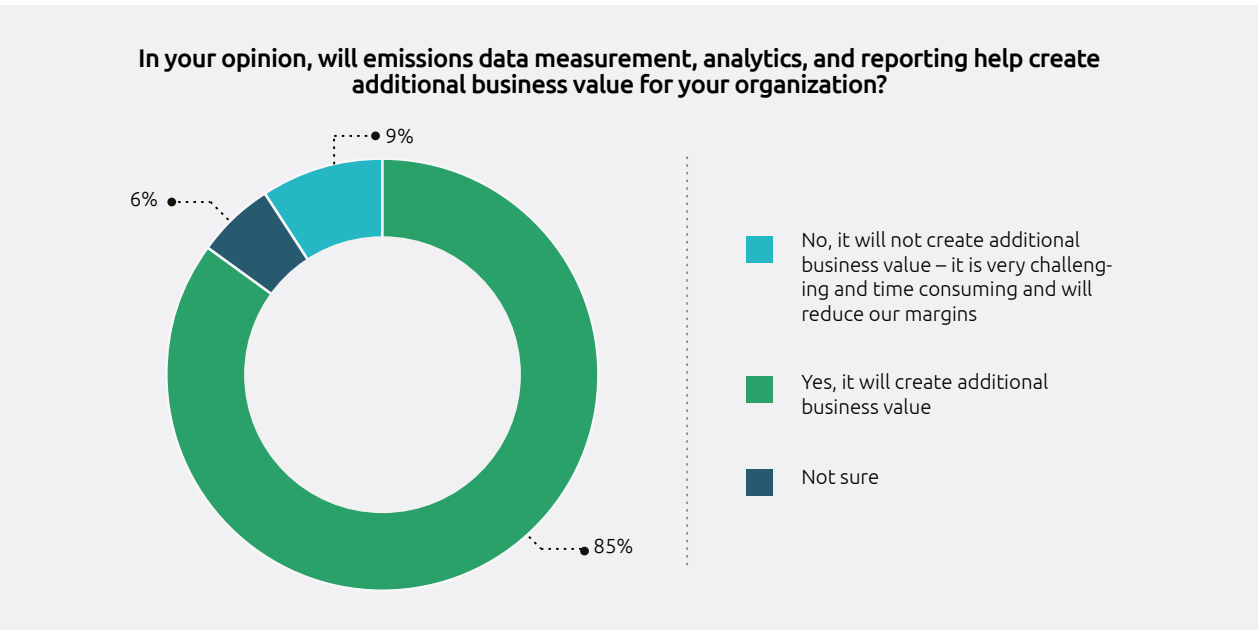
ORGANIZATIONS SEE THE VALUE IN EMISSIONS DATA, BUT ARE NOT WELL-POSITIONED TO USE IT

Most organizations believe that emissions data measurement and analytics will deliver business value and accelerate their sustainability transformations

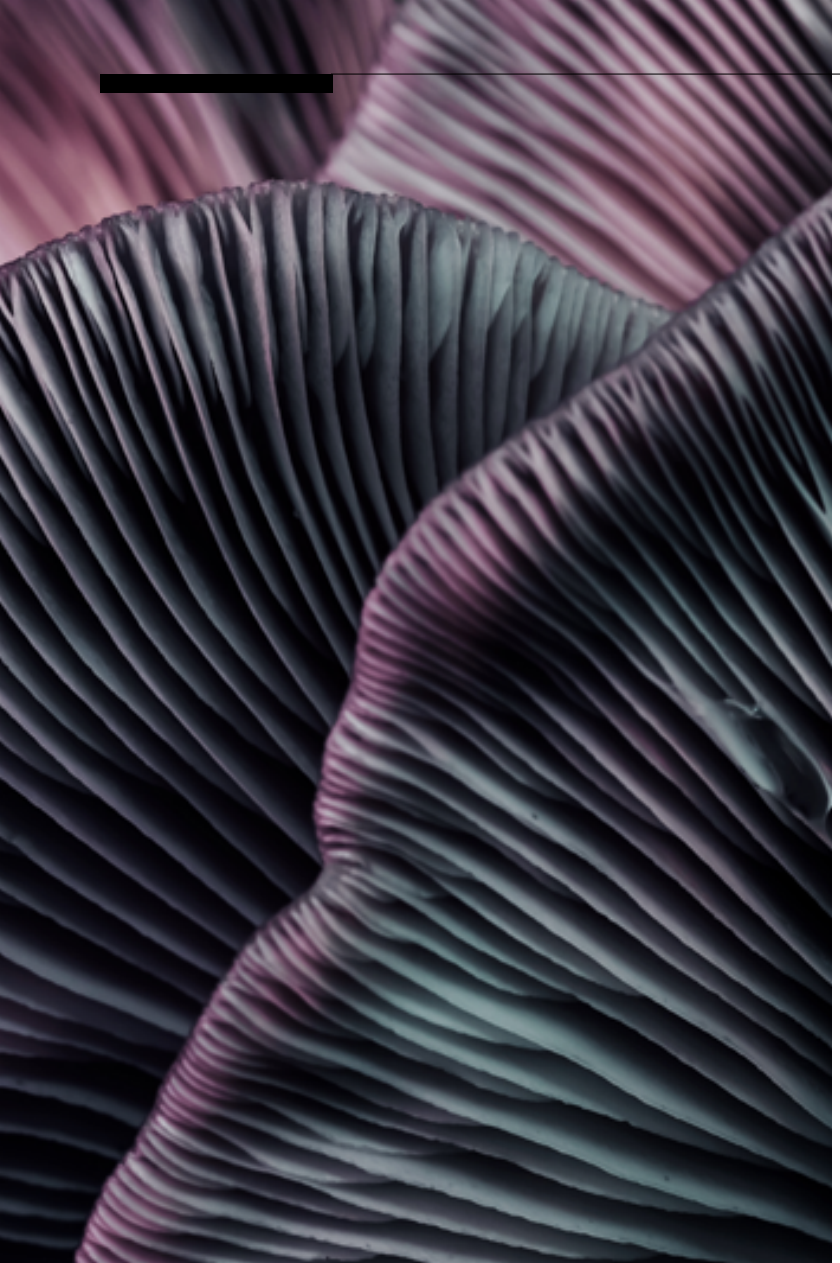
Our research shows that the vast majority (85%) of organizations recognize the business value that emissions data provides (see Figure 8) – for instance, by enabling organizations to explore sustainable business models, mitigate financial and non-financial risk, and reduce operational inefficiencies. In addition, more than three-quarters (76%) of organizations believe emissions data measurement, analytics, and reporting will contribute to accelerating their sustainability journey. However, as we see in this section, most organizations are not well-positioned to use emissions data as they are not measuring emissions adequately and lack confidence in the accuracy of the data they do collect. In addition, most organizations have not equipped business teams with the skills and resources needed to apply emissions data to decision-making – which is key to achieving emissions reductions.

Fig.8

Across industry sectors, organizations overwhelmingly believe in the business value of using emissions data



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.



Scope 3 emissions are largely unmeasured, which gives significant cause for concern

Our research also indicates that organizations are not measuring emissions holistically across scopes – a key step towards mitigating emissions. While on average, 71% of organizations measure scope 1 emissions (across the two categories of emissions from company facilities and emissions from company vehicles), and 56% measure scope 2 emissions, a much smaller share of organizations say they are measuring scope 3 emissions. On average, only 22% of organizations measure scope 3 emissions.

71%

of organizations say they are measuring scope 1 emissions

56%

of organizations say they are measuring scope 2 emissions

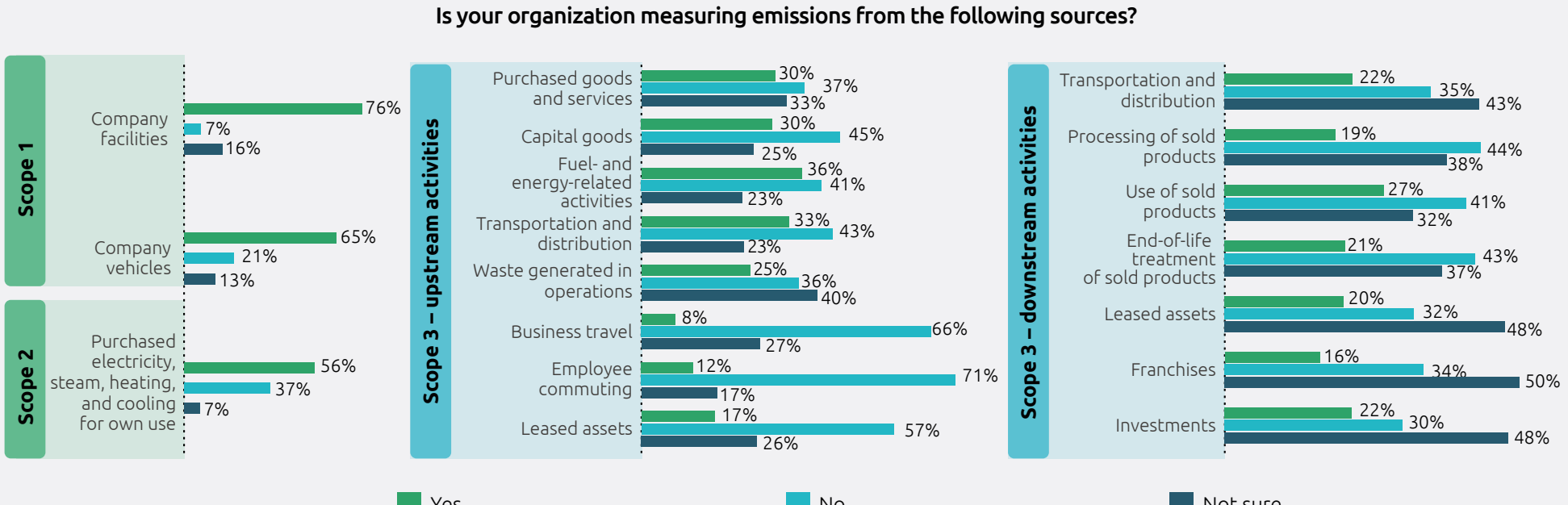
22%

of organizations say they are measuring scope 3 emissions

The lack of measurement of scope 3 emissions gives significant cause for concern, as they often account for a major share of an organization's total emissions. Scope 3 emissions are estimated to account for 65%-95% of a company's carbon footprint.[65] Angel Hsu, an environmental data expert who worked on the GHG Protocol, stresses the need to measure scope 3 emissions: ***"If companies are not reporting Scope 3 they are missing a huge part."***[66]

Fig.9

Only 30% of organizations measure emissions from purchased goods and services and only 27% from the use of sold products



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=561 to 843 organizations for the various emissions sources.

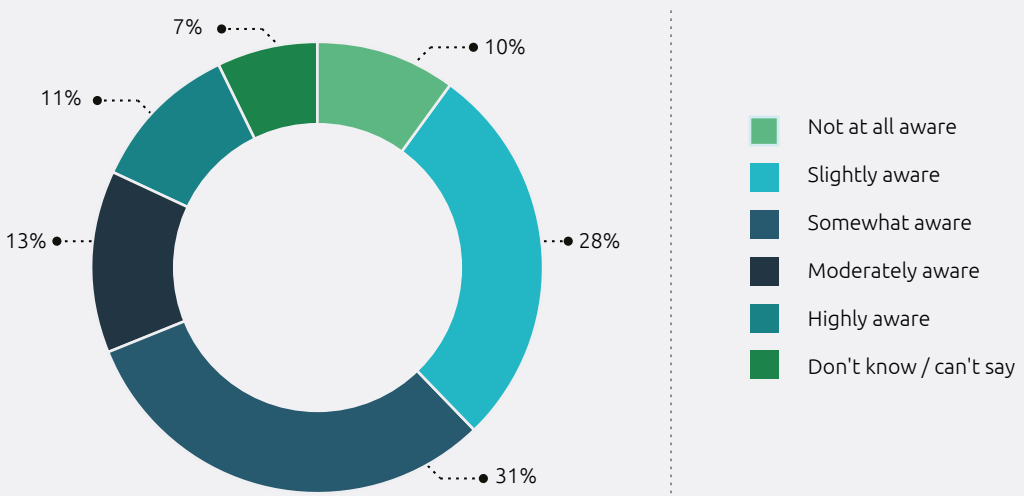
Fig.10

The vast majority of organizations lack awareness of their suppliers' contributions to their emissions footprint

Organizations lack visibility of supplier emissions

Addressing supply chain emissions will be key to achieving net zero goals. Given the size and complexity of supply chains, organizations need to identify emissions hot spots in order to focus their emissions reduction efforts. Denmark-based wind turbine manufacturer Vestas, for instance, is partnering with 50 strategic suppliers – representing half of Vestas' material spend – to formalize carbon reduction targets in line with Vestas' scope 3 emissions reduction targets (99% of Vestas' emissions are attributed to supplier operations).[67] However, most organizations do not have visibility of emissions hot spots within their supply chain. Less than one-quarter (23%) of organizations in our survey reported moderate or high levels of awareness of which suppliers account for most of their scope 3 emissions (see Figure 10).

To what extent is your organization aware of the suppliers that contribute the most to its scope 3 emissions?



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

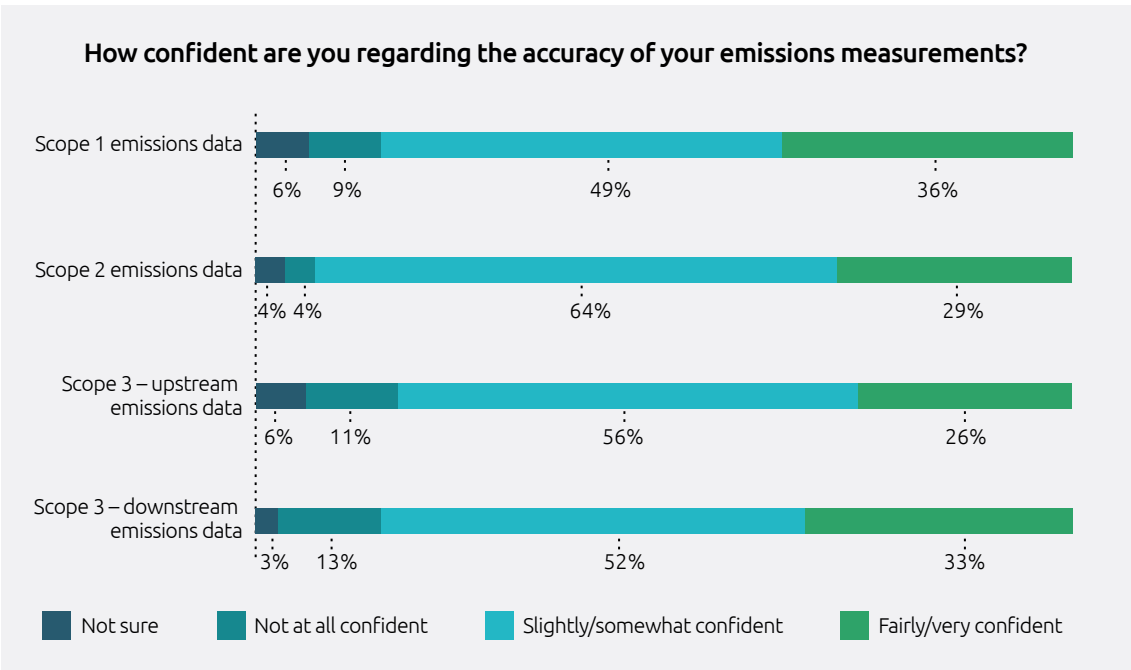
Organizations lack confidence in the accuracy of their emissions data

In addition to not measuring emissions adequately, organizations lack confidence in the accuracy of the emissions data they do collect. For instance, only about one-third (36%) of respondents say they are fairly or very confident of the accuracy of their organization's scope 1 emissions data. Confidence in the accuracy of upstream scope 3 emissions data is even lower at 26% (see Figure 11).

Due to challenges involved in collecting primary emissions data,[68] emissions data measurements often rely on estimates, which impacts data accuracy. To address this issue, US energy companies NextDecade and Chesapeake Energy, for instance, partnered with Project Canary – a US-based climate tech startup – to run pilot projects aimed at monitoring emissions from the production of Liquified Natural Gas (LNG) in real time. This is achieved by gathering data using a system of field-based methane-leak detection sensors.[69]

Fig.11

Most organizations lack confidence in the accuracy of their emissions data measurements



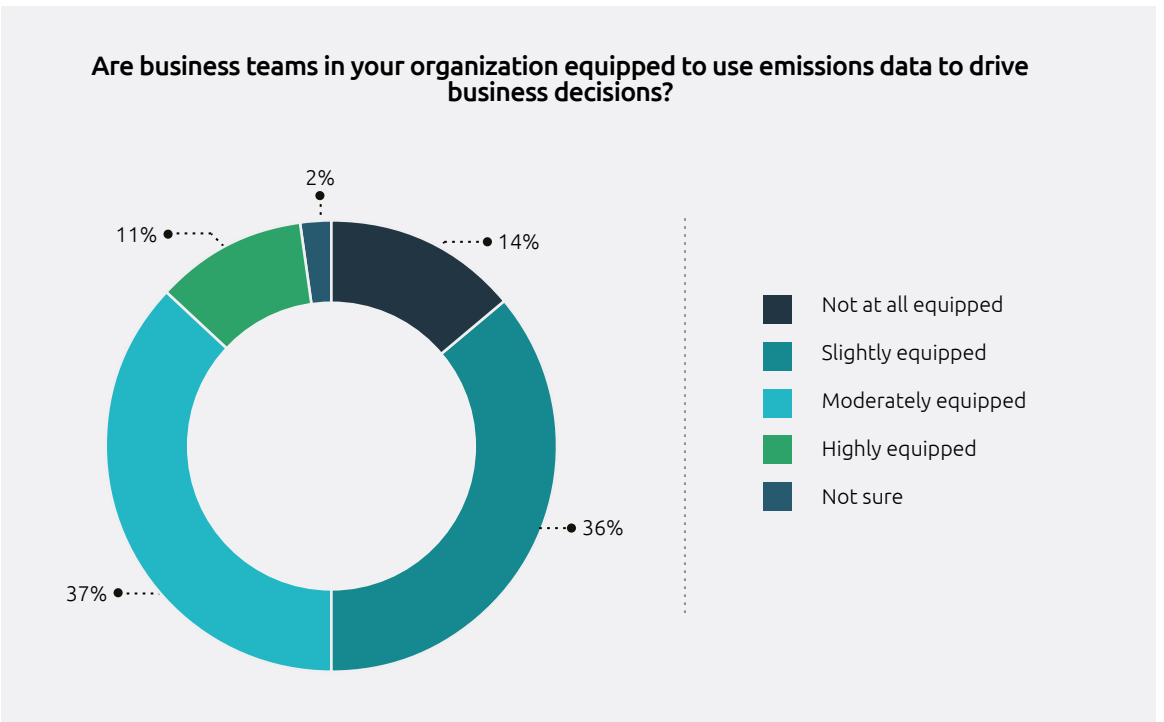
Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=588 organizations for scope 1 emissions data, N=360 for scope 2 emissions data, N=608 for scope 3 – upstream emissions data, and N=580 for scope 3 – downstream emissions data (the N values indicate the number of organizations who are measuring emissions from the indicated scope).

In most organizations, business teams are not equipped to use emissions data to drive decision-making

In addition to measuring emissions holistically, getting to net zero hinges on equipping business teams to apply emissions data to decision-making. However, most organizations are lacking in this area as well. In half of the organizations we surveyed, business teams are either not at all equipped or only slightly equipped to use emissions data to drive business decisions – i.e., they lack the skills needed to analyze and apply emissions data to decision-making. Only 11% of respondents say their business teams are "highly equipped" – while 37% say they are "moderately equipped" (see Figure 12).

Fig.12

Business teams are not adequately equipped to use emissions data to drive decisions



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

50%

share of organizations that say that their business teams are either not at all equipped or only slightly equipped to use emissions data to drive business decisions

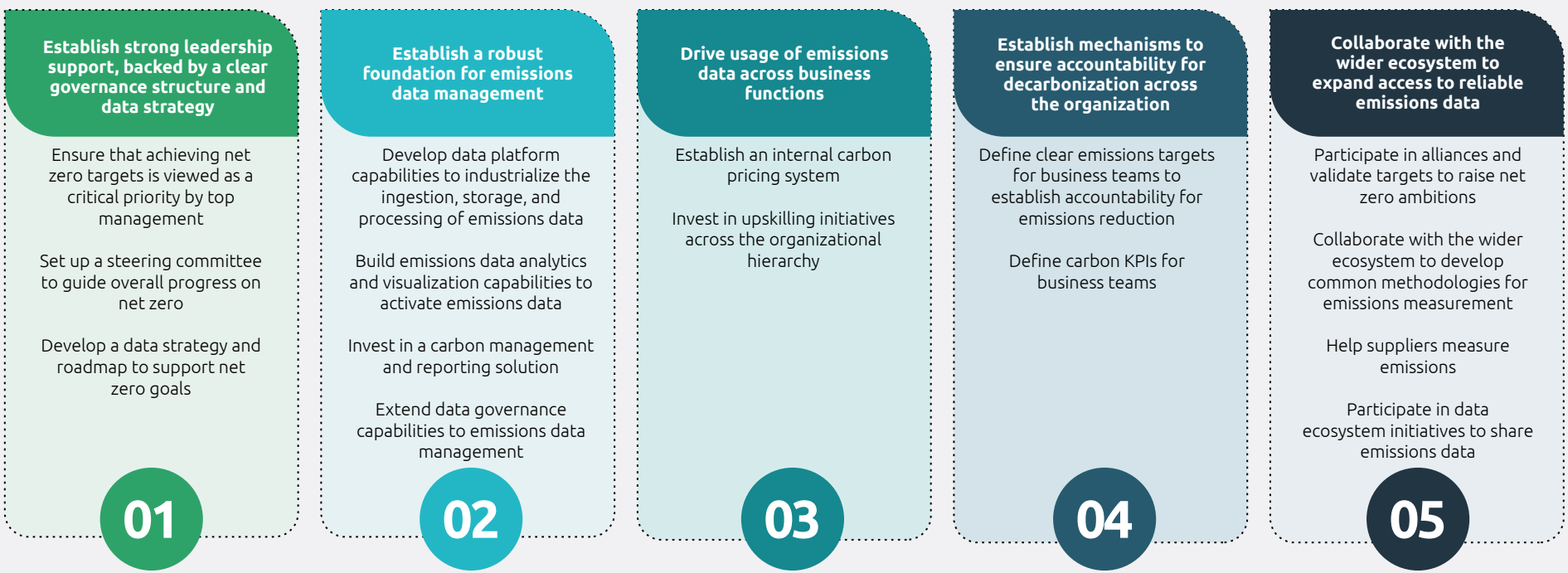
04

RECOMMENDATIONS

In this section, we look at how organizations can develop the data management capabilities needed to accelerate their transitions to net zero.

Fig.13

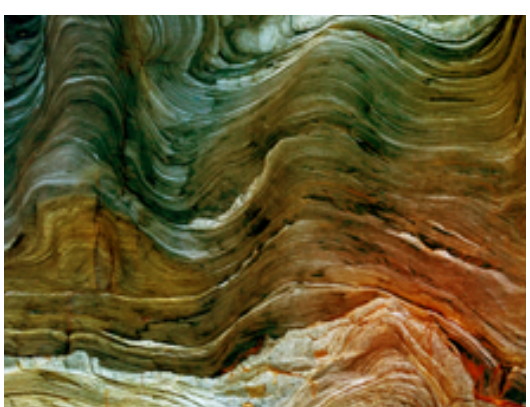
Key actions for organizations



Source: Capgemini Research Institute analysis.

Establish strong leadership support, backed by a clear governance structure and data strategy

As we saw earlier, to meet their net zero goals, organizations will need to ensure that data on emissions underpins business decisions across functions such as procurement, product development, manufacturing, logistics and supply chain, sales and marketing, risk/finance, and IT. Vance Merolla, Worldwide Director, Global Sustainability, Colgate-Palmolive, highlights the need to prioritize carbon reduction across the organization: ***"In 2020 we launched Colgate's 2025 Sustainability & Social Impact Strategy, with three ambitions and 11 actions, including one to "Accelerate Action on Climate Change." This is embedded in our overall business strategy and spans our entire value chain - across supply, operations and products to reduce, replace and remove emissions over time. Most importantly, we are working to build a mindset which includes decarbonization as a lens to view all business activities and decisions."***[70]



To achieve this, strong leadership support, backed by a clear governance structure and data strategy, will be crucial. We look at each of these aspects below:

- **Ensure that achieving net zero targets is viewed as a critical priority by top management.** For net zero initiatives to receive adequate management attention and funding, it is critical that they are viewed as a top priority by the C-suite. In addition, this is a necessary step towards instilling a sense of urgency across the organization regarding the need to meet net zero targets, and to drive action across organizational silos. Wulf-Peter Schmidt, director of sustainability, advanced regulations and product conformity, Europe at Ford, comments: ***"A top-down approach is very important because with that you automatically have key departments like product development, purchasing, and manufacturing on board. And it's even better if the top-down approach is supported by the whole leadership team as a joint objective. For us, there is a clear push from our leadership team towards sustainability, including carbon neutrality and that has really helped us in defining challenging goals."***
- **Set up a steering committee.** Organizations will also need to set up a steering committee or task force to oversee progress towards net zero. However, only 13% of organizations in our research say they have done so at scale across the organization, while 33% are establishing them only in selected business units or regions – indicating an urgent need to ramp up efforts.

- **Develop a data strategy and roadmap to support net zero goals.** As they embark on their net zero journey, organizations will also need to develop a data strategy that supports their net zero goals by defining a path towards activating emissions data. Key components of a data strategy include:
  - A vision of where an organization stands on its net zero journey, where it needs to go, and how data will be used to support its net zero ambitions
  - Short- and long-term priorities for emissions reduction (i.e., emission scopes and business use cases where efforts will need to be focused in the short and long term)
  - An assessment of gaps in the availability and quality of emissions data
  - Internal and external data sources required to measure emissions with adequate levels of coverage, granularity, and accuracy
  - Technology architecture and solutions needed to collect, process and compute emissions data
  - Governance mechanisms to manage issues such as emissions data auditability and traceability
  - Operating model to manage emissions data collection, align stakeholders and operations teams on emissions data activation, and drive close collaboration around emissions management
  - Partner ecosystem to support emissions data management
  - Roadmap of actions including resource and budget requirements

"A top-down approach is very important because with that you automatically have key departments like product development, purchasing, and manufacturing on board. And it's even better if the top-down approach is supported by the whole leadership team as a joint objective."

Wulf-Peter Schmidt
Director
of sustainability,
advanced regulations and
product conformity,
Europe at Ford

Establish a robust foundation for emissions data management

Having established leadership support and governance structures for net zero, and defined a data strategy, organizations will need to ensure they have a robust data management foundation that enables them to collect, analyze, and utilize emissions data for reporting and decision-making at scale. This will entail extending existing data management platforms and processes to cover emissions data management. At the same time, organizations should bear in mind that effective emissions data management (and more broadly, ESG/sustainability data management) is a dedicated IT domain that requires its own solution and data capabilities. Below we look at the key actions that organizations need to take in order to develop robust emissions data management capabilities:

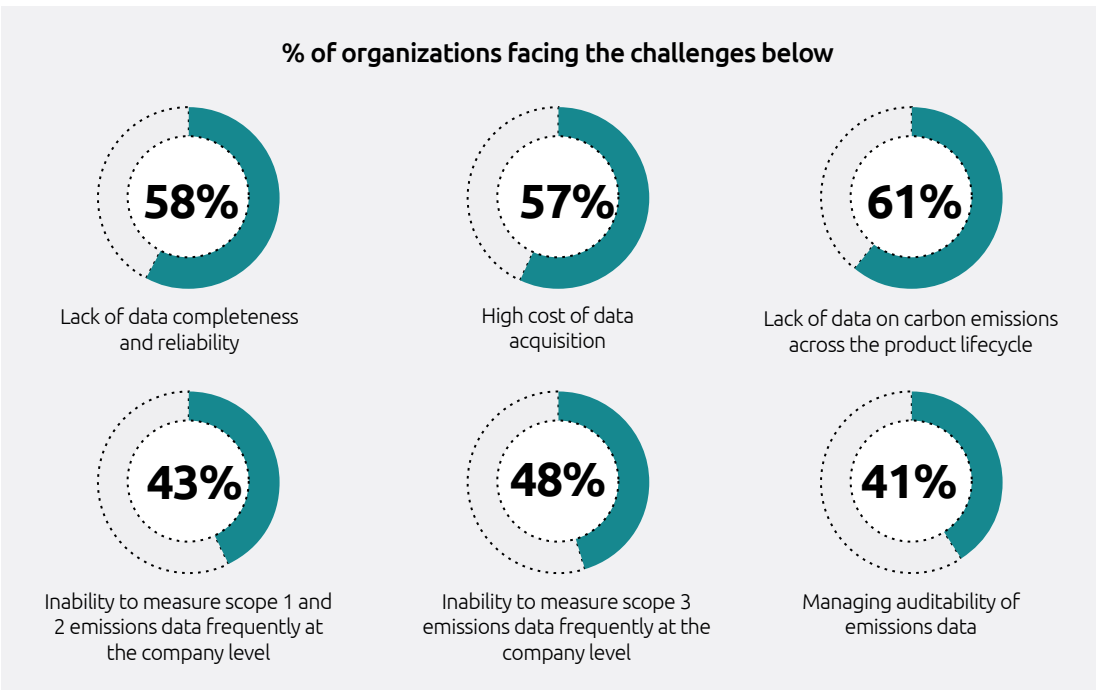
- **Develop data platform capabilities to industrialize the ingestion, storage, and processing of emissions data.** The lack of data completeness and reliability, high cost of data acquisition, and the inability to measure emissions frequently are among key challenges that are holding back progress on emissions monitoring and management (see Figure 14). Public sector organizations also face similar challenges. For instance, 55% of public sector organizations cite the lack of data completeness and reliability as a key issue.[69]

58%

of organizations with net zero targets cite the lack of data completeness and reliability as a key challenge

Fig.14

Key emissions measurement challenges



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

To address these challenges, organizations will need to industrialize the ingestion, storage, and processing of emissions data. This is a critical step towards laying the groundwork for activating emissions data. To enhance data coverage, granularity and accuracy, organizations should automate the ingestion of emissions data from multiple external (emissions factor databases, ESG data providers, LCA databases, supplier data, etc.) and internal (ERP systems, IoT, sensors, facility management systems, etc.) sources and avoid manual, spreadsheet-based data collection that is largely the norm today. However, fewer than one in ten (7%) organizations in our survey say that they have automated the collection of emissions data at scale – i.e., shifted from one-off batch-collection processes to recurring or continuous integration processes, while 33% say they are currently automating emissions data collection in some regions or business units (see Figure 15).

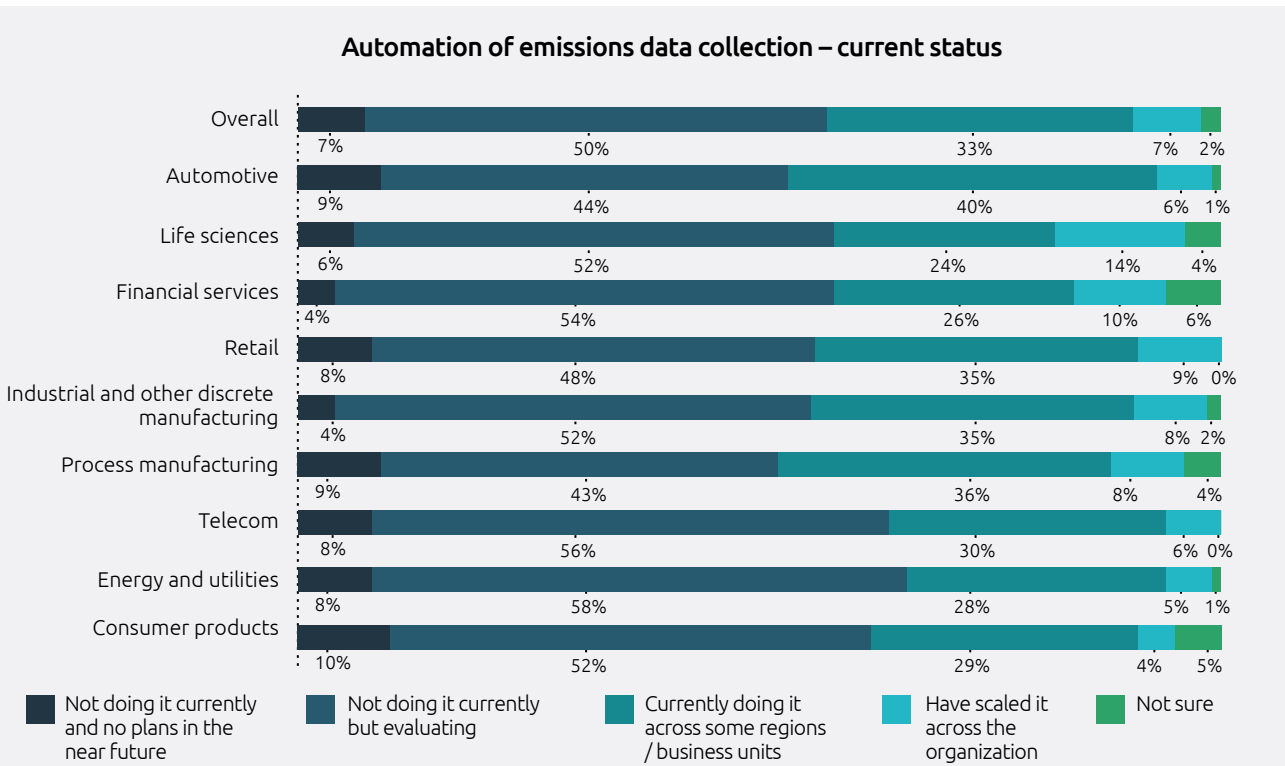
Ingested data will then need to feed into a single data platform to provide a single source of truth for emissions data. Organizations currently lack a consolidated view of their emissions data with three-fifths of organizations (60%) citing the lack of a data platform that consolidates emissions data from multiple sources as a key challenge.

60%

of organizations cite the lack of a data platform that consolidates emissions data from multiple sources as a key challenge

Fig.15

Few organizations have automated the collection of emissions data at scale



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

- **Build emissions data analytics and visualization capabilities to activate emissions data.** Industrializing emissions data ingestion, storage and processing lays the groundwork for the next step in emissions data activation – which is developing emissions data analytics and visualization capabilities, in order to enable stakeholders across an organization to make use of the data and derived insights. Organizations will need to automate the calculation of emissions footprints and the generation of predictive insights, as well as implement a data cockpit / control tower for emissions data visualization at scale. However, most organizations are yet to do so. For instance, only 11% have implemented an emissions data cockpit / control tower at scale (see Figure 16).

"To understand energy consumption, it is not always advisable to collect data from energy bills because they may not accurately reflect the volume of energy consumed. To collect such data, we have installed sensors at our sites to measure energy consumption automatically."

© Didier Cocatrix

Marie-Luce Godinot
Executive Vice President for Digital Transformation, Innovation, CSR and Information Systems at Bouygues Construction

Fig.16

Few organizations have built emissions data analytics and visualization capabilities at scale

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

- **Invest in a carbon management and reporting solution.** Organizations should also consider investing in a dedicated carbon management solution to facilitate carbon accounting and reporting. The lack of such a solution can add significantly to the cost and time involved in emissions data management, in addition to creating difficulties in maintaining an audit trail for emissions data, especially when organizations rely on spreadsheets to manage emissions data. This is also reflected in our survey with nearly two-thirds (63%) of organizations citing the lack of a dedicated carbon management tool as a key challenge. In recent years, a number of startups (e.g., Persefoni, Sweep), large cloud service providers (e.g., Microsoft, Salesforce, SAP), as well as historical vendors of Environmental, Health, and Safety (EHS) software (e.g., UL 360, Enablon, Sphera) have introduced carbon management solutions. However, only

13% of organizations in our survey say they have adopted a carbon management solution at scale.

Spanish financial services firm BBVA, for instance, has adopted a cloud-based carbon management solution to manage environmental data from its corporate buildings and network of offices. The solution automates data entry and calculations, enables granular analysis of global energy consumption, and provides alerts based on key indicators. Desirée Granda, Global Head of Premises and Services at BBVA, comments: ***"This new development allows us to make faster, more agile decisions and to follow up on the objectives established in our Global Eco-efficiency Plan."***[72]

Fig.17

Few organizations have scaled the implementation of a carbon management solution

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

- **Extend data governance capabilities to emissions data management.** Organizations will also need to extend existing data governance mechanisms to managing emissions data. Building trust in emissions data is a key component of this and will be vital for the adoption of insights powered by emissions data across the organization. Organizations will need to define processes to audit emissions data. In addition, they will also need to establish processes for data traceability in order to switch from using estimates to primary data for emissions footprint calculations. Greg Slabaugh, Professor and Director of the Digital Environment Research Institute at Queen Mary University of London, comments, ***"A regulatory framework and auditing process are required for reporting and validating emissions. Otherwise, there is the risk of untrustworthy actors providing invalid characterization of their emissions."*** However, only about one in ten (12%) organizations in our survey say they have set up processes at scale to build trust in emissions data (see Figure 18).

Fig.18

Few organizations have developed processes at scale to establish trust in emissions data

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

12%

of organizations in our survey say they have set up processes at scale to build trust in emissions data

"A regulatory framework and auditing process are required for reporting and validating emissions. Otherwise, there is the risk of untrustworthy actors providing invalid characterization of their emissions."

Greg Slabaugh
Professor and Director
of the Digital Environment Research
Institute at Queen Mary
University of London

Drive usage of emissions data across business functions

To equip business teams to apply emissions data to decision-making, organizations should consider the following:

- **Establish an internal carbon pricing system.** Organizations should set up internal carbon pricing systems to enable business teams to evaluate the carbon cost of business decisions. Simon Fischweicher, head of corporations and supply chains for CDP North America, comments on the need for internal carbon pricing systems: ***"Carbon pricing can be a useful tool that allows executives who don't think in metric tons of GHG to think in dollars."*** He adds: ***"It turns these decisions into the language that they speak – language of finance."***[73]

  Bayer, for instance, has established an internal price for CO_2 – at €100 per metric ton – to calculate the carbon cost of capital expenditure projects. This is aimed at helping Bayer align its capital expenditure with its goal of reaching net zero by 2050.[74] Similarly, Schneider Electric has set the internal carbon price at €50–130 per ton of CO_2 to guide decision-making and strategy. The internal carbon price is used to evaluate operational performance by calculating the cost of CO_2 emissions from energy consumption and sulfur hexafluoride (SF6, a greenhouse gas) leaks at industrial sites. It is also used in industrial network modelling to evaluate the potential impact of CO_2 pricing on the supply chain.[73]

  Nearly four in ten (38%) of organizations in our survey plan to set up internal carbon pricing systems, and 30% are setting them up in some regions or business units. Only 12% say they have set up an internal carbon pricing system at scale (see Figure 19).

12%

of organizations with net zero targets have set up an internal carbon pricing system at scale

Fig.19

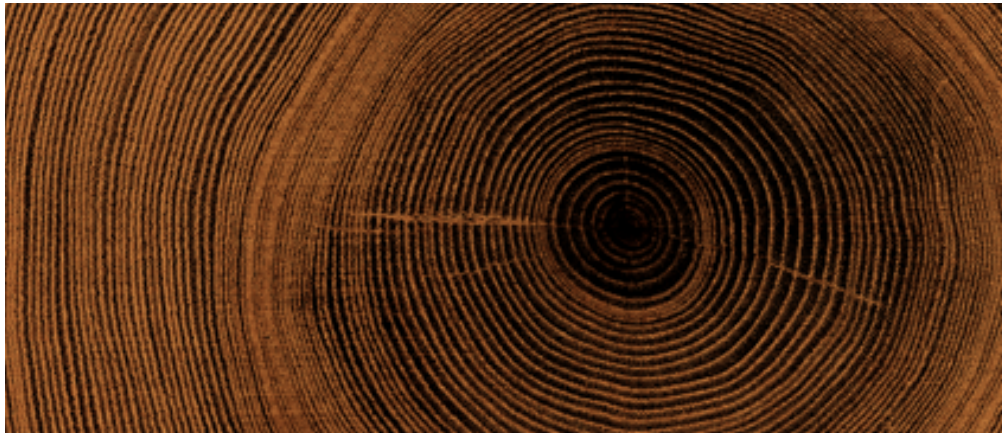
Organizations need to set up internal carbon pricing systems to calculate the carbon cost of business decisions – however, most haven't done so yet

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

7%

of organizations have scaled initiatives aimed at upskilling employees on sustainability and climate change across levels (i.e., executive leadership, operations teams, and new joiners)

- **Invest in upskilling initiatives across the organizational hierarchy.** Organizations need to ensure employees at all levels are onboard and equipped to play their roles in the push to net zero. To do so, organizations should invest in awareness and training programs across different parts of the organization, including the executive leadership, operations teams, and new joiners. They must also invest in building carbon accounting skills – more than two-thirds (67%) of organizations in our research cite the lack of carbon accounting skills as a key challenge in emissions measurement and reporting. However, most organizations are not investing in upskilling initiatives, and only 7% are upskilling employees at scale across the three levels mentioned above (see Figure 20).



67%

of organizations in our research cite the lack of carbon accounting skills as a key challenge in emissions measurement and reporting

Fig.20

Most organizations are not upskilling employees on sustainability and climate change

Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

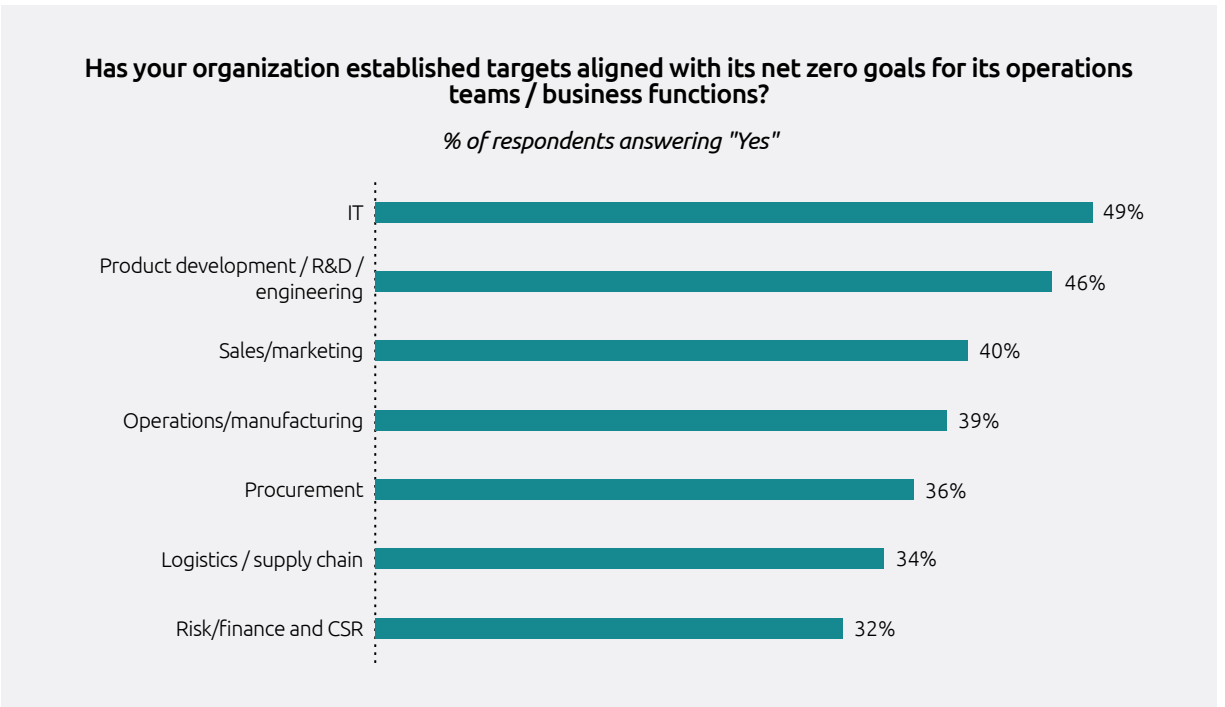
Establish mechanisms to ensure accountability for decarbonization

Setting up strong governance mechanisms is key to ensuring that business teams account for emissions in decision-making and take concrete measures to mitigate them. To establish accountability for net zero across the organization, we recommend the following actions:

- **Define clear emissions targets for business teams to establish accountability for emissions reduction.** Organizations need to ensure that overall organizational targets for net zero are reinforced by clear targets and objectives for individual functions / business units. This is critical towards building clarity on the role and contribution of various teams/functions in the organization's overall net zero plan. However, the majority of organizations in our survey have not established such targets for their internal functions (see Figure 21). Wind-turbine manufacturer Vestas, for instance, has appointed "Module Sustainability Leads" who are responsible for emissions reductions for the individual modules of a turbine (e.g., blades, towers).[76]

Fig.21

Most organizations have not established targets for internal teams/functions linked with their overall net zero targets



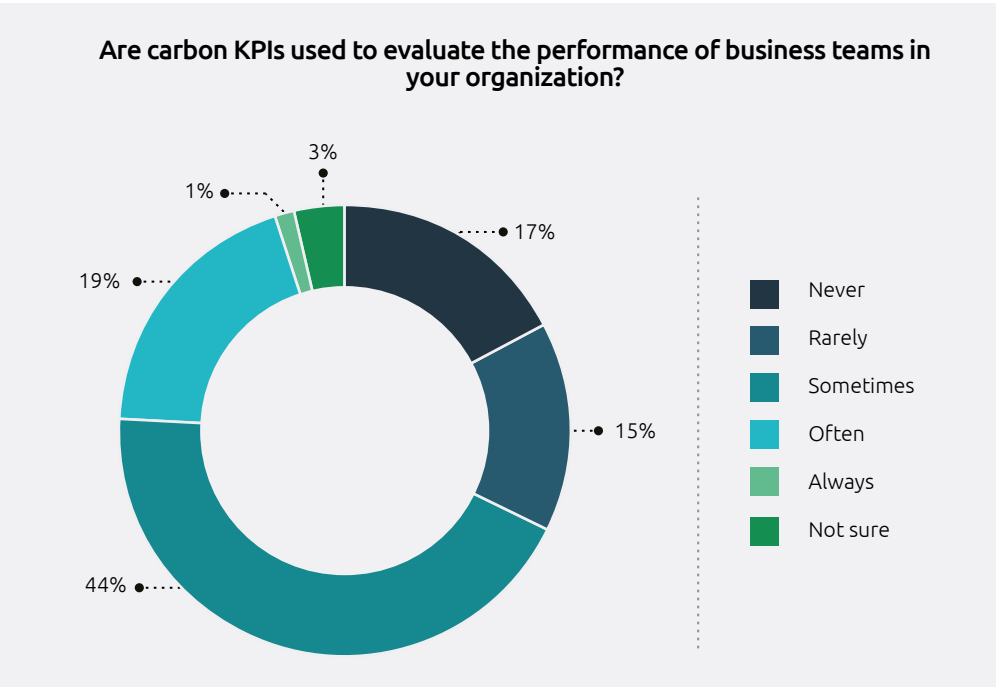
Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

- **Define carbon KPIs for business teams.** To ensure that emissions reduction is a priority across the business, organizations also need to define carbon KPIs for business teams. Marius Perrois, CSR Officer at Belgium-based train operator Thalys, describes the organization's approach to incorporating carbon reduction targets into company KPIs: ***"The target is central to the whole company strategy. It is integrated from Board level down, and aligns with all the business objectives. Hitting the target is a company priority but it requires change management to involve individual teams to achieve their share of the reduction. They are incorporating the reductions into their KPIs. Sometimes the changes that are being made are quite big, but at other times they're smaller and more incremental."***[77]

However, only 20% of organizations in our survey say they regularly (i.e., often or always) evaluate the performance of internal functions based on carbon KPIs (see Figure 22). To increase accountability for the achievement of emissions reduction targets, organizations should also consider linking compensation with carbon KPIs. Bayer, for instance, has linked the long-term compensation of its Board of Management and managerial employees with the achievement of emissions reduction targets. Bayer has also made climate protection an integral element of annual variable compensation.[78]

Fig.22

Most organizations do not use carbon KPIs to evaluate business performance



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

Collaborate with the wider ecosystem to expand access to reliable emissions data

Given the scale of the transformation required and the complexities involved, meeting net zero targets will require collective effort. Collaboration is also critical to gain access to reliable data – especially scope 3 data, which is outside of organizations' direct control. Below, we look at collaborative approaches that organizations should consider adopting.

- **Participate in alliances and validate targets to raise net zero ambitions.** As seen previously, the level of net zero ambition falls short of what is required. Organizations should consider joining cross-sector or industry-specific net zero alliances such as Race to Net Zero that require net zero targets to meet certain defined criteria. However, currently, fewer than four in ten (36%) organizations that have set net zero targets say they are involved in such initiatives (see Figure 23). In addition, organizations should also validate their targets to ensure they are science-based and aligned with a 1.5°C pathway.
- **Collaborate with the wider ecosystem to develop common methodologies for emissions measurement.** The proliferation of emissions measurement frameworks has made it especially difficult for organizations to access data in standardized formats. To help address this issue, organizations should consider collaborating with their wider ecosystem – including competitors – in order to develop common industry-wide methodologies to measure emissions. However, only a third (33%) of organizations in our research are doing so. L'Oréal, for instance, is participating in the EcoBeautyScore Consortium, which brings together 36 companies and professional associations from the cosmetics industry to establish an industry-wide environmental impact assessment standard and scoring system for cosmetics products.[79]
- **Help suppliers measure emissions.** To get to net zero, organizations must work closely with suppliers – potentially starting with the most strategically important, based on material spend or contribution to emissions footprint – to help them measure and manage their emissions. This is especially critical given that suppliers often lack visibility into their own emissions and struggle with quantifying them. For instance, in a survey of 1,000 suppliers, Schneider Electric found that 70% had not quantified their GHG emissions.[80]

  Aurelia Figueroa, Head of Sustainability at Breitling, highlights her organization's approach to engaging with suppliers: ***"We are prioritizing areas where our footprint is large and then going deep into the supply chain to get primary data to establish a baseline and develop tailored insetting measures to support our carbon reduction strategies."***

"We are prioritizing areas where our footprint is large and then going deep into the supply chain to get primary data to establish a baseline and develop tailored insetting measures to support our carbon reduction strategies."

Aurelia Figueroa
Head of Sustainability
at Breitling

To help suppliers better measure their emissions, we recommend the following actions:

- **Encourage suppliers to set science-based emissions reduction targets.** As a first step, organizations should encourage suppliers to set their own science-based emissions reduction targets. HP, for instance, collaborated with the "We Mean Business Coalition," CDP, and industry peers to encourage IT supply chain companies based in the Greater China region to set science-based targets that are consistent with the SBTi methodology.[81]
- **Provide carbon accounting tools.** Vestas has developed reporting software to help suppliers provide data on key sustainability metrics. This has afforded Vestas access to actual or primary emissions data, instead of relying on industry averages. As a result, Vestas is better able to assess the full environmental impact of its turbines. Access to better data also helps Vestas to share insights with suppliers to help them improve their sustainability performance.[82]
- **Conduct training sessions on carbon accounting.** Schneider Electric launched The Zero Carbon Project (TZCP) with the goal of collaborating with 1,000 suppliers to reduce their operational emissions by 50% by 2025. As part of the project, it has conducted technical training sessions that cover various aspects of decarbonization, including the methodology for GHG footprint calculation. It has also set up "Quick Response Teams" to provide guidance on quantification of emissions to support suppliers at the regional level, and a web portal to provide suppliers with access

to resources such as training and tools for emissions quantification.[83] However, only 14% of organizations in our research have scaled initiatives aimed at upskilling suppliers and enabling them to provide emissions data at the right quality and using appropriate calculation methods.

– **Set up platforms to enable secure data sharing across the value chain.** To build visibility into scope 3 data, organizations should consider setting up data platforms that simplify the process of data collection from value chain partners. However, most organizations have not implemented such platforms – only 38% of organizations in our research say they are building a data portal to collect emissions data from suppliers. Further, Web3.0 technologies such as blockchain can play a key role in enabling transparency and traceability in complex supply chains. For instance, Siemens has developed a solution called SiGREEN, that is based on blockchain technology and enables product carbon footprint data to be securely shared among value chain partners.[82] Dr. Gunter Beitinger, Senior Vice President Manufacturing & Head of Product Carbon Footprint/SiGREEN, Siemens AG, says: ***"Verifiable primary data-based PCF (Product Carbon Footprint) connected along the supply chain enable partners to take action where it's most efficient. This requires cross-company collaboration and exchange that protects all partners' full data sovereignty."***[85]

38%

of organizations are building a data portal to collect emissions data from suppliers

Highlighting steps that organizations can take to engage with their suppliers on emissions measurement, Aurelia Figueroa says: ***"Together with our suppliers we focus on supporting each other with our existing capacity and act as a bit of a think tank. Where they may not have the capacities readily available in-house, we offer them support in areas such as carbon accounting, carbon reduction or development of ESG or environmental policies, for example."***

Brice Boissonneault, Sustainability Specialist at Breitling, adds: ***"We have regular check-ins where we guide our suppliers on carbon accounting. Our goal is to support our suppliers and to discuss our decarbonization goals and targets with them in order to really progress together."***

- **Participate in data ecosystem initiatives to share emissions data.** Organizations should also consider participating in data ecosystems to expand access to reliable emissions data. We define data ecosystems as partnerships between multiple institutions to share and manage data. Data sharing within an ecosystem is based on the mutual exchange of value, thus making shared data more beneficial for all participants. Data ecosystems can play a crucial role in helping organizations improve scope 3 emissions management by collectively addressing issues such as the lack of consistent approaches for measuring emissions and the lack of quality data. Catena-X, for instance, is an open and collaborative data ecosystem that aims to address such issues in the

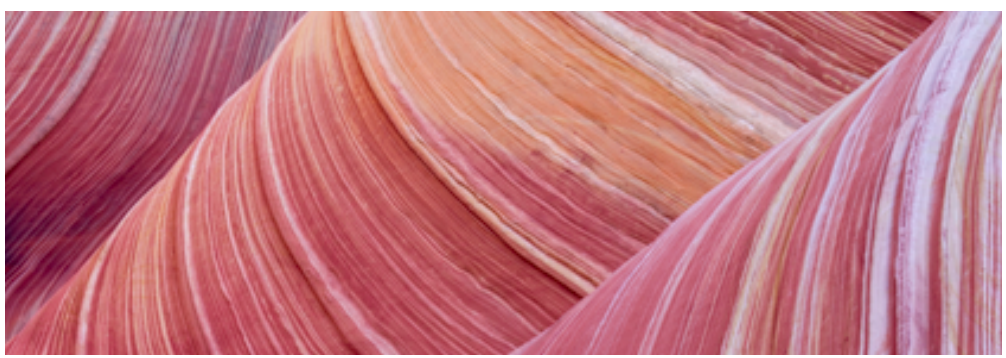
"We have regular check-ins where we guide our suppliers on carbon accounting. Our goal is to support our suppliers and to discuss our decarbonization goals and targets with them in order to really progress together."

Brice Boissonneault
Sustainability Specialist at Breitling

automotive sector. Catena-X brings together stakeholders from across the automotive industry, including manufacturers, suppliers, and service providers, to define standardized methods for CO_2 calculations and enable data transparency across the automotive value chain. Tracking product carbon footprint data is a key focus area of the initiative – which is a key challenge for organizations as we saw earlier in Figure 13.[86]

Hagen Heubach, Member of the Board Catena-X Automotive Network e.V. and Global Vice President Industry Business Unit Automotive, SAP, comments: ***"Data is a driving force – also when it comes to reducing carbon emissions. We are creating a data ecosystem that allows for the aggregation of real-time and transparent emission information of all contributors along the automotive value chain. Integrated data analytics services will serve as a lever to identify further reduction potentials."***[87]

However, less than one-third (32%) of organizations say they are currently participating in data ecosystems initiatives to share emissions data with external entities such as NGOs, competitors, suppliers, and customers (see Figure 23).

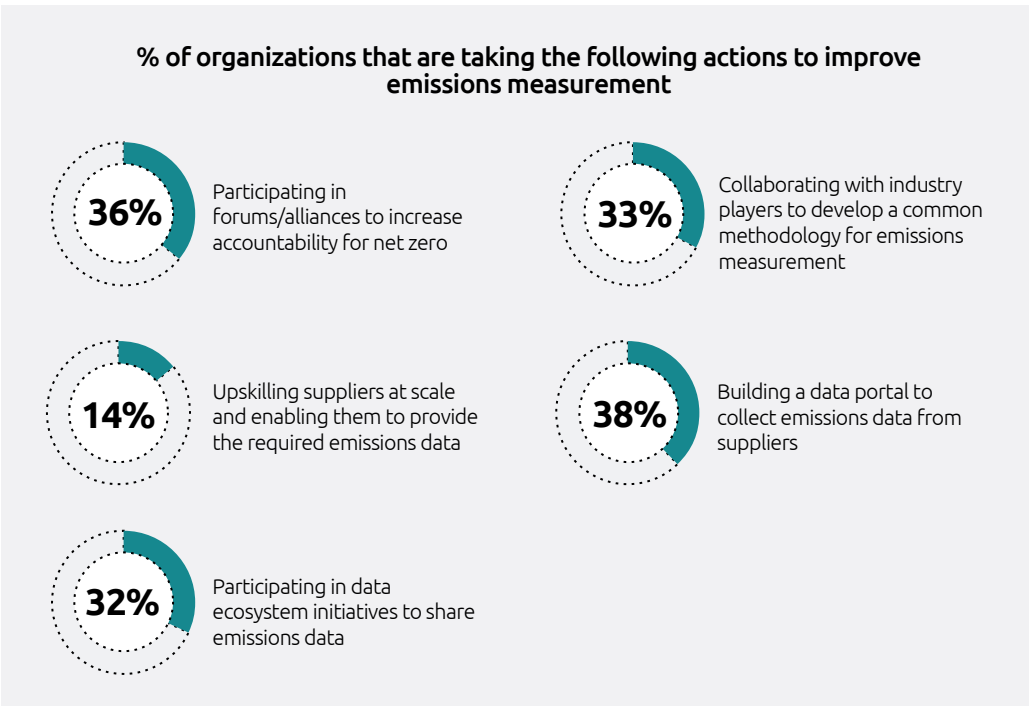


32%

of organizations say they are currently participating in data ecosystems initiatives to share emissions data

Fig.23

Most organizations are not collaborating adequately with their wider ecosystems to improve emissions measurement



Source: Capgemini Research Institute, Data for net zero survey, May–June 2022, N=900 organizations that have set net zero targets.

Highlighting the crucial role of collaboration in the journey to net zero, Dilek Mutlu-Kowalski of Siemens comments: ***"Collaboration is key to moving faster on the path to decarbonization. Organizations need to collaborate and be open to sharing information and insights that can help others on their path to net zero."***

CONCLUSION

A data-powered approach is fundamental to a successful net zero transition. Organizations that embed emissions data in decision-making are experiencing emissions reductions, enhanced transparency, and acceleration towards net zero goals. To achieve their net zero goals, organizations need to ensure that their net zero strategy and roadmap is founded on reliable and complete emissions data. This requires a robust data management foundation for efficient emissions data collection, analysis, visualization, and reporting. In addition, effective governance mechanisms are required to establish accountability for emissions reduction across the organization. Organizations must also ensure that employees are onboard with net zero goals and provide business teams with the necessary tools and training to implement data-powered business decisions. Further, collaboration with the wider ecosystem is critical to building access to reliable emissions data. Working with like-minded organizations via global cross-sector and industry-specific alliances and partnerships is key to developing standardized emissions measurement methodologies – a key challenge today for many organizations given the proliferation of emissions measurement standards and frameworks. Supporting suppliers, for example through providing them with carbon accounting training, is also critical to better measuring scope 3 emissions. A more intense focus on measuring scope 3 emissions, which often account for the lion's share of organizations' emissions footprints and which currently go largely unmeasured, will be necessary.

As pressure grows to get to net zero by 2050, organizations are facing increasing scrutiny from a wide spectrum of stakeholders, including regulators, customers, investors, and civil society. Organizations must harness emissions data to meet their net zero goals and fulfill stakeholder expectations. At the same time, they must also bear in mind that while reducing emissions needs to be a key focus given the urgent need to limit global temperature rise to 1.5°C, they will also need to act on other environmental and social issues – such as resource depletion, pollution, loss of biodiversity, water scarcity, gender equity and diversity – in order to deliver on their overall ESG goals. By building data management capabilities to tackle emissions, organizations will also be laying the groundwork to measure and act on their overall environmental and social impacts, ultimately paving the way towards being net positive.

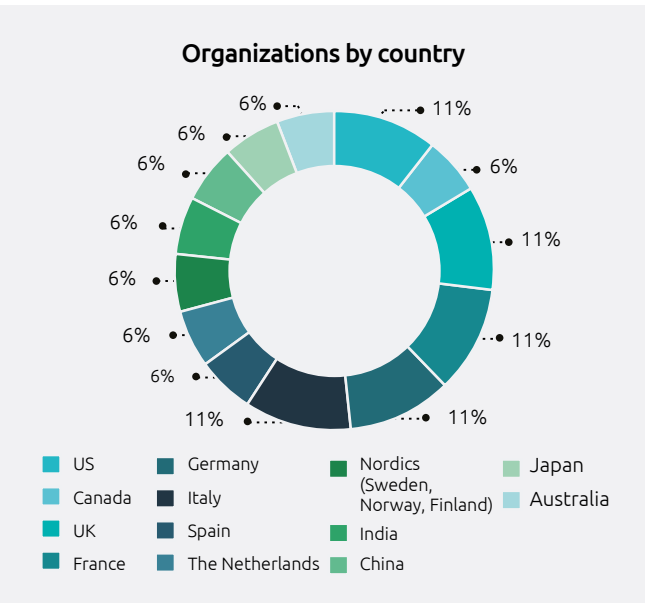
RESEARCH METHODOLOGY

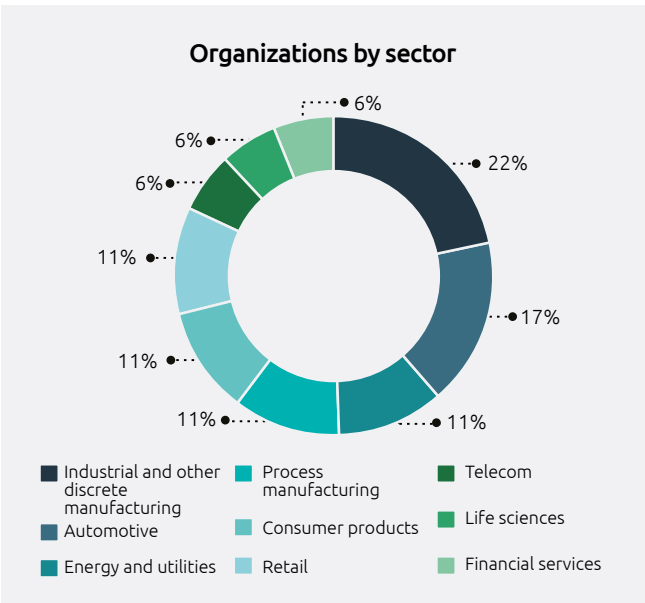
This research seeks to understand the role of data in converting net zero ambition to action, and the key data-related capabilities that organizations need to build to accelerate their journey to net zero.

Executive survey

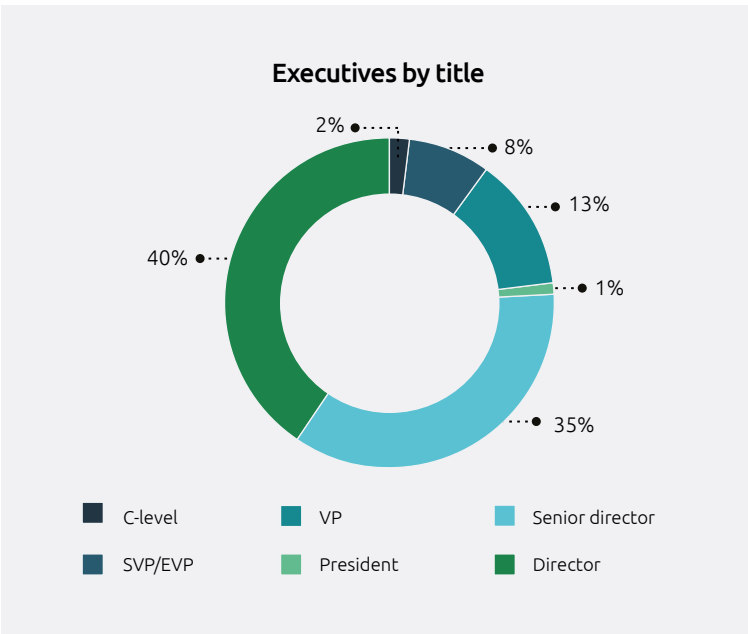
During May–June 2022, we surveyed senior executives (director level and above) from large organizations (with annual revenues of over $1 billion) that have set net zero targets. The organizations belonged to sectors including automotive, energy and utilities, industrial and discrete manufacturing, process manufacturing, consumer products, retail, telecom, life sciences, and financial services. Survey respondents were aware of or responsible for their organization's emissions reporting and measurement initiatives.

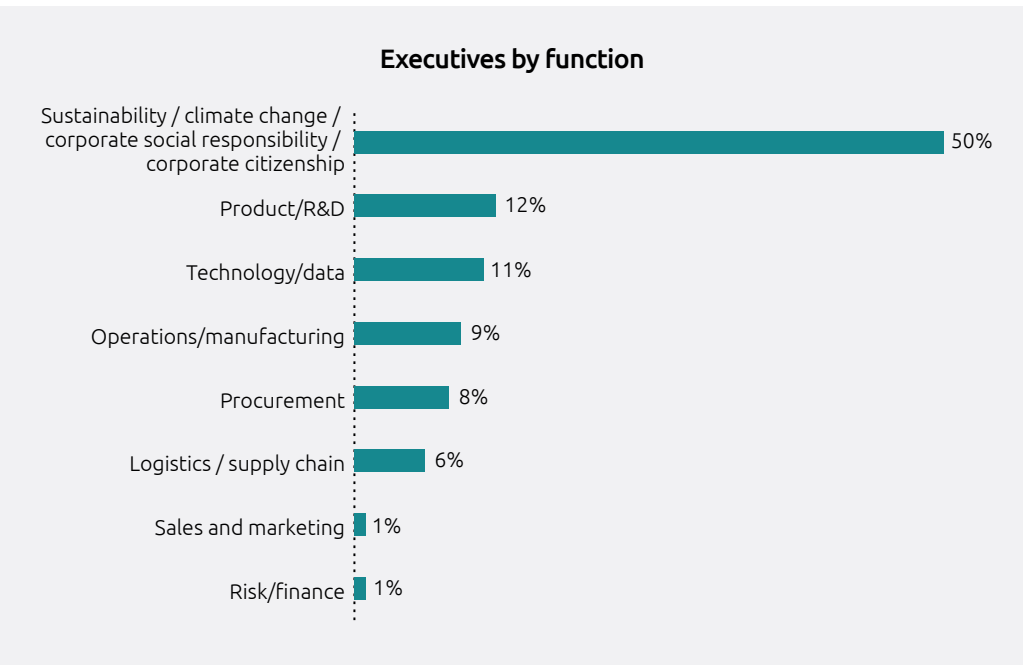
The distribution of respondents and their organizations is provided below.





Organizations by annual revenue
18%
28%
30%
24%
$1 billion – 4.99 billion
$10 billion – $19.99 billion
$5 billion – $9.99 billion
More than $20 billion


Executives by title
2%
8%
13%
40%
1%
35%
C-level
VP
Senior director
SVP/EVP
President
Director



Public sector survey

In addition to the survey above, we also conducted a separate survey of 80 public sector organizations (i.e., government entities such as ministries, city councils, and agencies) that have set net zero targets to understand how public sector organizations are using data to steer their operations towards net zero.

In-depth interviews

We also conducted 20 in-depth interviews with senior industry executives and experts.

The study findings reflect the views of the people who responded to our online questionnaire for this research and are aimed at providing directional guidance. Please refer to the methodology for details of respondents and get in touch with a Capgemini expert to understand specific implications.

APPENDIX

Calculation of reduction in emissions

For this analysis, we took into account all organizations that said they had experienced a reduction in emissions due to the use of data. For example, a sample organization may have set its net zero target in 2020 and achieved a total emissions reduction of 10% due to data-powered decision making. We calculated the average emissions reduction achieved per year for each organization by dividing the total emissions by the number of years since the organization had sent its net zero target. We then calculated the average annual reduction for all organizations to arrive at the figure of 4.6%. [assumption: for all organizations that selected "Before 2020" as the option for year of setting their net zero target, we considered the year of setting the target as 2015 (given that the term net zero came into prominence in 2015 when the Paris Agreement was signed and in order to arrive at a conservative estimate)]

ORGANIZATION#	YEAR OF SETTING NET ZERO TARGET	TOTAL EMISSIONS REDUCTION ACHIEVED	NUMBER OF YEARS (between year of setting target and 2022)	AVERAGE EMISSIONS REDUCTION ACHIEVED PER YEAR
1	2020	10%	2	5%
2	2020	15%	2	7.5%
-	-	-	-	-
-	-	-	-	-
Average emissions reduction achieved per year				

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+ DATA FOR NET ZERO OFFERS

Don’t just go with the flow

There is no choice but change. The question is, will you go with the flow? Or will you create change to get precisely the future you want?

To enable real change, and to establish crucial sustainability performance and transparency, you’ll need to achieve data mastery. Because it’s not enough to have data. You also need to learn to trust it and to use it.

Data mastery is about achieving data source transparency; universal accessibility; alignment of data sources; control of human error; clear ownership criteria; and sensitivity to growing demand.

It is crucial to keeping your business current and competitive. And to accomplishing sustainability maturity.

Act on your carbon accounting with Data for Net Zero

Capgemini Data for Net Zero gives you the opportunity to own your sustainability journey.

Our approach is to support organizations at any point of their environmental data journey.

This approach is based on their profile and maturity, and we support each CxO to set up a net-zero-intelligence nerve center at the crossroad of all enterprise functions, converting their climate pledges into tangible insights.

As part of our sustainability framework, Data for Net Zero is seamlessly utilizing net-zero intelligence to build resilience and reduce climate and business risks by addressing three main objectives:

- **Measure** to steer progress
- **Improve** to reduce impact
- **Anticipate**, adjust the climate action plan

Capgemini help you make the most of data to accelerate and secure your sustainability transformation through three components:

- Data Strategy for Net Zero
- Sustainability Data Hub
- Environmental, Social, and Governance (ESG) Data Performance

Data Strategy for Net Zero offers clarity to help organizations navigate the complexity of regulatory frameworks in order achieve compliance. It conducts data projects and indicators; implements organizational models and governance; enables the right technologies and solutions to be deployed; and orchestrates the optimum data partner ecosystem.

Sustainability Data Hub enables granular activity data identification to feed the data hub with your external emission data base. It initiates industrialized data collection through the deployment of automated ingestion and normalization pipelines and inference algorithms.

And it allows data management and technological platform design and set up. The hub also establishes data founded insights measurement, and facilitates data models packaging to enhance sustainable analytics and reporting.

ESG Data Performance provides ESG insights and performance measurement; enables ESG reporting automation in accordance with frameworks and indices to comply with regulations and meet expectations from investors; and organizes the steering and governance of the transformation.

We'll support you on every step of your journey, orchestrating a dedicated team of more than **25000 highly skilled data** experts across the globe, among them specifically experienced in sustainability projects, and all members of our **center of excellence**. In addition, we partner with strategic hyperscalers and start-ups to accelerate results. Finally, our Data & AI Academy allows us to leverage and nurture in-house expertise to support your upskilling journey.

Selected client projects and engagements

We helped

- *a mining and metallurgy company achieve a -40% reduction in FeSi* consumption and -25% reduction in furnace production loss.*
- *a leading retailer to achieve a -4% inventory reduction after optimizing supply chain.*

**** ferrosilicon***

- ***Data Strategy for a Manufacturer and retailer***

The client has committed to reduce absolute scope 1 and 2 GHG emissions 33% by 2030 from a 2017 base year and scope 3 GHG emissions 16% by 2030. We deliver recommendations for the solutions strategy for 4 geographical regions and across 4 functional areas.

- ***Data Hub for a Car manufacturer***

The client has communicated an aggressive target for 2025 to reduce CO2 emissions by 40% over its product lifecycle, and to be a climate neutral company by 2040. We are implementing a unified CO2 data & analytics platform covering E2E supply chain & logistics from inbound to outbound logistics and spare parts management processes. The solution will enable capabilities supporting data, analytics, automation and ML / AI through required business capabilities.

- ***ESG Data performance for a European bank***

We are assisting the client on meeting its ESG commitments by measuring ESG initiatives and monitoring ESG risk exposure, in order to report to stakeholders (investors,regulators, staff, …)

Data for Net Zero is part of Capgemini Sustainability Framework.

To learn more about how we support CxOs to tackle challenges ahead as they progress on their net zero journey, read our POV.

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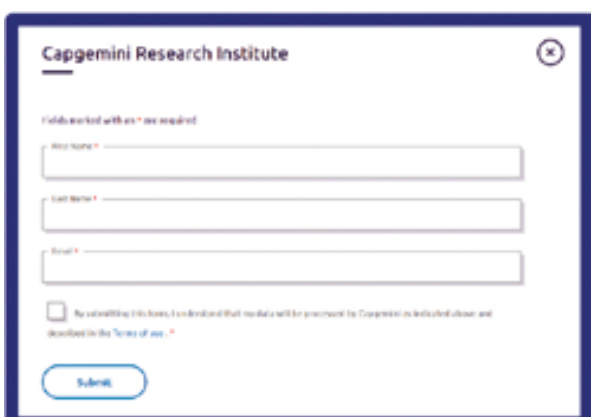

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