

Pathways to Net Zero: The Decisive Decade

EDF  + BUSINESS
ENVIRONMENTAL DEFENSE FUND

Deloitte.

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Executive Summary

Atmospheric carbon dioxide just reached its **highest level in 4 million years**, and 2021 has made crystal clear that **the impacts of these dangerous levels of greenhouse gases** (GHGs) are no longer distant and theoretical. Companies are recognizing the imperative for change and pledging to reach net zero emissions by 2050 or sooner, in line with the Paris Agreement's goals. However, many are struggling to figure out how to prioritize the near-term actions needed to make these ambitious goals possible. The urgency of acting now and halving emissions by 2030 has never been higher, making the 2020s the "Decisive Decade" for climate action.

To prepare for their net zero journey, **a company should first develop a detailed emissions profile** providing a foundation for implementing prioritized, high-impact solutions to reduce emissions across a company's entire value chain. This emissions profile, which categorizes emissions based on their source and distinguishes between different types of GHGs, is critical to inform near- versus long-term priorities.

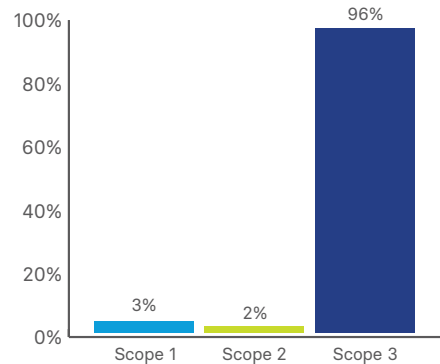
The three key elements of an emissions profile are:

1

Scopes 1, 2 and 3

Meets standard requirements for measurement and disclosure and provides a baseline understanding of emissions

Dairy Company - Sample Emissions Profile

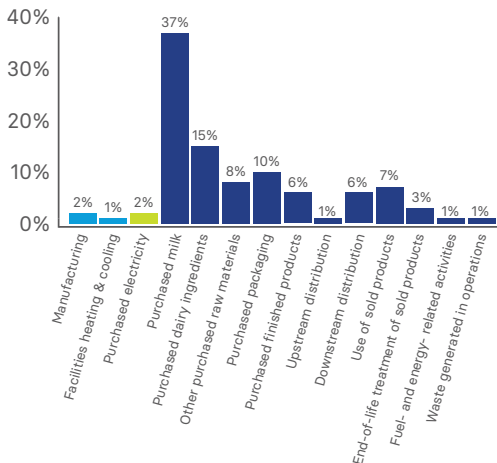


2

Subcategories

Provides a more detailed and actionable understanding of emission sources to inform which aspects of the business to target for abatement solutions

Dairy Company - Sample Emissions Profile

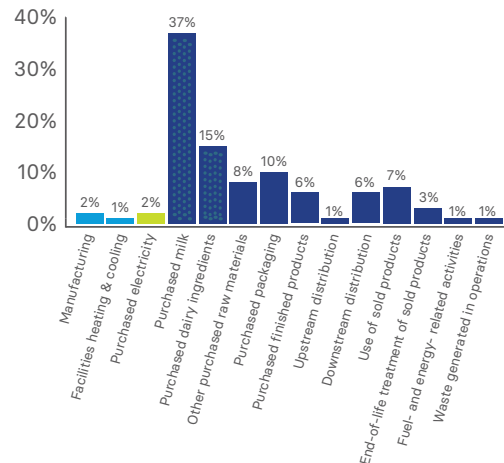


3

GHG Types

Informs near- vs. long-term priorities for abatement solutions based on the warming potential and lifespan of specific gases emitted

Dairy Company - Sample Emissions Profile



3

Organizations can then use a four-stage process to identify, map, evaluate and prioritize abatement solutions with the highest impact near-term for successful climate action.

Company leaders can use these simple, straightforward steps to accelerate their climate progress during the Decisive Decade and drive towards net zero emissions.

Abatement Solution Prioritization

1

IDENTIFY

Identify a list of potential abatement solutions from existing sources

2

MAP

Map the abatement solutions to emissions profile categories to filter the list

3

EVALUATE

Evaluate relevant abatement solutions against select criteria (e.g., near- and long- term climate abatement, business value, etc.)

4

PRIORITIZE

Prioritize near-term and long-term abatement solutions for implementation based on criteria scoring and begin to execute

Introduction

You're considering a net zero goal — or maybe you've just made one. What happens now?

2021 has continued to prove that the impacts of these dangerous levels of GHGs are no longer distant and theoretical — they are occurring now and are disrupting natural and human systems in both the developed and developing world. An unprecedented, **deadly heatwave in the Pacific Northwest** killed at least 180 people; **torrential floods in Germany, Belgium and China killed hundreds more**; **back-to-back hurricanes and failed crops fueled mass migration from Central America**; forests across the American West are burning well before peak fire season amid the worst drought conditions of the 21st century, **among other climate-induced disasters**. The latest Intergovernmental Panel on Climate Change (IPCC) report said it best — the state of the planet is a **“code red for humanity.”**

Atmospheric carbon dioxide just reached its highest **level in 4 million years**. If our **emissions of GHGs** continue unabated, it will put the Earth on track to warm by at least 3° Celsius

(C) over preindustrial levels by the end of the century. The planet has only warmed by 1.2° C over preindustrial levels so far and is already experiencing **catastrophic effects**, which contextualizes just how dangerous 3° C of warming could be. Even warming above 2° C would lead to the disappearance of coral reefs, millions of humans exposed to water scarcity, and over \$12 trillion in annual flood damages due to sea level rise, to name just **a few of the worst effects**.

Companies, nonprofit organizations and governments are recognizing the imperative for change and committing to being a part of the solution. Most notably, many have pledged to reach net zero emissions by 2050 or sooner in line with the **Paris Agreement's goal** to limit global warming to well below 2° C, preferably to 1.5° C, compared to preindustrial levels. Net zero is the practice of a company, sector or economy neutralizing the further climate impact of all of its GHG emissions beginning in a certain year by reducing all emissions possible and offsetting residual emissions with removal strategies.





Elements of a Strong Net Zero Commitment

Includes all GHGs

With methane being responsible for nearly half of all expected planetary warming from GHG emissions between now and 2050, 'carbon neutral' alone will not cut it.

Targets are Aligned with Science

The complexities of the underlying climate science can be confusing — groups like the Science Based Targets initiative (SBTi) help bridge that gap and ensure that corporate pledges are consistent with Paris-aligned pathways.

Sets Interim Targets

Acting now on climate and halving emissions by 2030 is essential for having a meaningful chance of averting the worst impacts of climate change.

Plans for Action

A pledge on its own is not enough — it must be supported by concrete plans for climate action in the near- and long-term. This includes using a company's political leverage to support relevant policies.

Transparency

Transparency is the new normal, and stakeholders expect an open dialogue on progress and challenges. Publishing public progress reports is critical.

These net zero pledges have become a business imperative. We cannot solve climate change without accelerating climate ambition in the private sector. Investors, employees and customers recognize this point and are pressuring companies to lead and to set net zero targets. According to the U.N., the **number of net zero pledges** from local governments and businesses has **roughly doubled** in less than a year, including 61% of countries and companies with a combined revenue of nearly \$14 trillion. However, setting a public net zero commitment is just the first step towards securing a climate-stable future.

Emissions reduction will not happen overnight, and in many cases will require decades of ongoing action, investment and advocacy. To have any meaningful chance of meeting the Paris Agreement's goals by 2050 and averting the worst impacts of climate change, top climate scientists are imploring governments and corporations to act now and halve emissions by 2030 en route to net zero by 2050. Given this, many have deemed the 2020s as the "Decisive Decade" for climate action. Many companies are currently falling short due to lack of interim targets and over-reliance on

distant goals of net zero by 2050 without a robust near-term action plan.

Currently, only 20% of these companies' net zero commitments meet the minimum criteria outlined by the **U.N.'s Race to Zero Campaign**. Essential attributes of a strong net zero goal include setting goals that are aligned with science, interim targets for the next decade, plans for action to meet both near- and long-term goals, governance mechanisms to drive accountability and regularly published **public progress reports**.

In developing plans to meet net zero goals, businesses have prioritized solutions that focus on mitigating emissions in their operations or value chains. While these necessary solutions will help them to lead in their field, they are not enough to drive transformational change. A rigorous net zero strategy must look beyond the "four walls" of a company. This includes establishing a portfolio of concrete ways to invest in solutions that may not yet be technologically feasible or commercially viable, and developing a strategy to advocate for policies that enable a net zero economy. These coordinated efforts are critical for driving sectoral and economy-wide transitions to net zero.

An aerial photograph of a dense forest. A dirt road curves through the trees, separating a section of deciduous trees on the left from a section of coniferous trees on the right. The lighting is bright, creating strong shadows and highlights on the foliage.

**Only 8% of
companies with
net-zero goals
have interim targets**

Figure 1.

The range of solutions necessary to achieve net zero



For companies that have set a net zero target, or for those considering one, this report provides guidance on how to follow through and become agents for climate action during the Decisive Decade and beyond. Company leaders — both within and outside of designated sustainability roles — will learn concrete, practical steps for advancing their company's net zero journey, particularly in the next decade, and explore real-world examples of how to accelerate progress.

The report is structured into three sections:

- 1 Build the Foundation**
Understand your emissions profile to build the foundation for your net zero journey.
- 2 Scan for Solutions**
Develop a short list of abatement solutions to consider for implementation.
- 3 Execute and Deploy**
Evaluate, prioritize and initiate the highest impact abatement solutions.



2020 is really the decisive decade for action...It's great to have a net zero 2050 timeline out there. But what's even better is to show us how you're getting there by 2030.

Melanie Nakagawa

Special Assistant to the U.S. President and NSC Senior Director for Climate and Energy

Build the Foundation

What to understand about your organization's emissions to build the foundation for your net zero journey

You're considering setting a net zero target, or maybe you just announced one — now what? To prepare for their net zero journeys, organizations must measure and understand their current emissions to build a baseline understanding of what is required to go from here to there. To do this, companies can start by learning the basics of how emissions are measured and classified, and then get to work building an emissions profile of their organization's categories and types of emissions to serve as the foundation for the emissions reduction work ahead.

The Basics of GHG Accounting

Organizations emit GHGs directly from their own operations, as well as indirectly from their value chain. While operational emissions such as heating and cooling company buildings or driving company-owned fleets are top of mind for most company leaders, emissions from the value chain are often overlooked. These value chain emissions are emissions from other entities that occur either upstream — before inputs reach the company — or downstream — after the product or service is sent to customers and beyond. A **company's value chain emissions**, on average, are over eleven times greater than their operational emissions.

Figure 2. Sources of **direct and indirect company emissions**

Direct Emissions	Indirect Emissions
<p>Emissions from sources that are owned or controlled by the organization, including:</p> <ul style="list-style-type: none">Gas or oil combustion in company buildingsFuel to power company-owned vehiclesFugitive emissions from pressured gas containment (e.g., refrigeration)	<p>Emissions that are a consequence of the organization's activities, but occur at sources owned or controlled by another entity, including:</p> <ul style="list-style-type: none">Purchased electricity to power company facilitiesRaw material extraction and processingThird party delivery to customers and consumers

Emissions can be further defined as direct or indirect emissions and are measured and categorized in terms of Scopes 1, 2 and 3. Scope 1 includes direct emissions from sources owned or controlled by the company, such as on-site fossil fuel combustion or fleet fuel consumption. Scope 2 includes indirect emissions from the generation of purchased electricity, i.e., **emissions from utility providers** proportional to the amount of electricity

purchased and consumed. Scope 3 includes all other indirect emissions from entities not controlled or owned by the company, both upstream and downstream, such as purchased materials, use of sold products and business travel. **These definitions and measurement standards** are governed by the Greenhouse Gas Protocol and are widely recognized across industries and geographies.



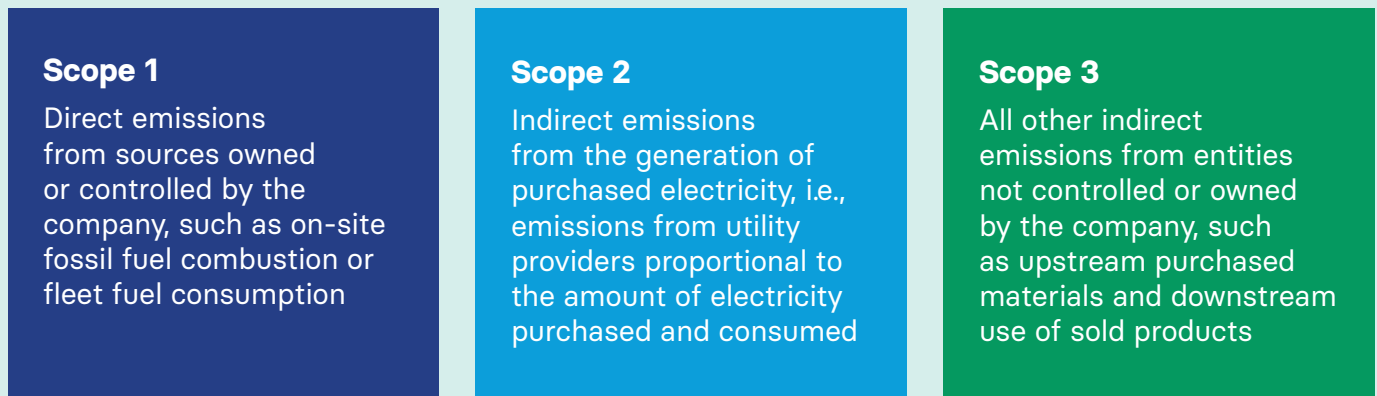
Transform to Net Zero (TONZ)

TONZ is a cross-sector initiative to accelerate the transition to a net zero global economy. With Environmental Defense Fund (EDF) as a founding member, TONZ aims to drive collaboration, enable systematic change and bring to life the net zero transformation journey for companies.

The coalition's goal is to build net zero goals and transformation plans for all Fortune 1000 companies by 2025. Throughout this report, concrete insights and examples from TONZ member companies illustrate how others can make immediate progress toward their net zero goals.

Figure 3.
Definitions of Scope 1, 2 and 3 emissions.

Source: Greenhouse Gas Protocol



Scope 2 - Indirect

Purchased electricity, steam, heating and cooling for own use

Scope 1 - Direct

Company facilities
Company vehicles

Scope 3 - Indirect

Purchased goods and services
Capital goods
Fuel and energy related activities
Transportation and distribution
Waste generated in operations
Business travel
Employee commuting
Leased assets

Scope 3 - Indirect

Transportation and distribution
Processing of sold products
Use of sold products
End-of-life treatment of sold products
Leased assets
Franchises
Investments



As companies translate these classifications into company-specific data and reporting, they should rely on existing, best-practice standards for guidance wherever possible. Historically, emissions reporting has varied widely, leaving companies to make their own determinations about what and **how to measure and disclose**. Widespread recognition of climate change and a rising interest in ESG investing from both institutions and

individuals has led to a push for standardization of policies and practices, with the **SEC likely to enact standardized disclosure regulations** for publicly-traded companies in the U.S. later this year. Companies can anticipate this trend by leveraging widely accepted, industry-standard protocols that are likely to serve as the foundation for ESG reporting policy to create their unique emissions profile.

Figure 4. Standards and tools for emissions measurement and reporting

Emissions Measurement and Reporting Standards	Emissions Measurement and Reporting Tools
<p><u>Greenhouse Gas Protocol</u> Requirements and guidance for companies preparing a GHG emissions inventory</p> <p><u>Value Reporting Foundation</u> Standards for public reporting of sustainable accounting data</p> <p><u>Global Reporting Initiative Standards</u> Framework for creating organizational sustainability reports</p>	<p><u>Scope 3 Evaluator</u> Free, web-based tool for companies to estimate their emissions based on company spend</p> <p><u>CDP Questionnaire</u> Climate change questionnaire to help disclose and manage environmental risks and opportunities</p> <p><u>Sustainability Management Software Platforms</u> Platforms to track, analyze, and report environmental data</p>

First, company leaders should become familiar with the standards recommended by leading institutions for GHG accounting — the Greenhouse Gas Protocol, Value Reporting Foundation (formerly the Sustainable Accounting Standards Board and the International Integrated Reporting Council) and Global Reporting Initiative Standards — to understand high quality emissions measurement and reporting.

Next, leaders can use established tools to support their emissions measurement work, including Greenhouse Gas Protocol’s Scope 3 Evaluator, which helps estimate Scope 3 emissions based on company spend, CDP’s Questionnaire and other third-party sustainability management software platforms to track, analyze and report

environmental data. For Scope 3 measurement, it’s most important for companies to start measuring, using real company data and not simply industry averages, in order to have an overarching sense of emissions, even if the result is not perfect. In other words, Scope 3 measurements remain challenging, but it helps to seek best practices and assistance from academics, consultancies and NGOs.

These protocols and measurement tools are not perfect — notably, they often bias towards long-term, CO₂ reduction over more pressing near-term reduction of high intensity gases due to their method of converting all GHGs into a CO₂-equivalent (CO₂e) metric.

Nonetheless, it's critical that companies use existing frameworks and tools as a baseline, and then add further layers of detail to distinguish between GHG types and their relative global warming potentials over the near- and long-term.

Developing Insights through the Emissions Profile

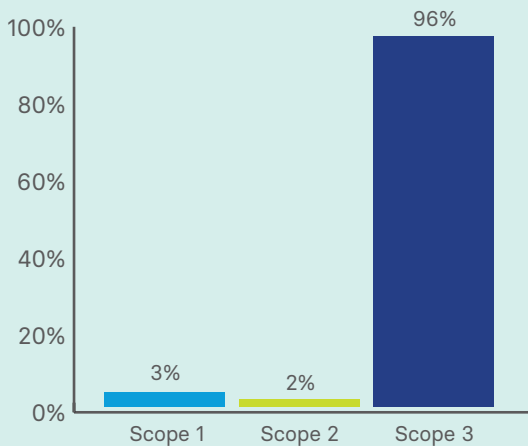
Companies can go beyond the prescribed Scope 1, 2 and 3 categories to build an emissions profile that paints a more robust and complete picture of emissions across the organization. Two elements in particular can take an emissions profile from one that "checks the box" on disclosure practices to one that provides a meaningful and actionable foundation for emissions reduction: subcategories and distinctions between GHG types.

Subcategories: While most companies report broadly on Scopes 1 and 2 — and on select Scope 3 categories where possible — more actionable emissions profiles go one step further to understand what activities are driving emissions within each of the Scope 1, 2 and 3 categories. This additional detail provides company leaders with a more specific and actionable understanding of the largest emissions sources for their business so that they can better prioritize among emissions abatement solutions.

Figure 5.

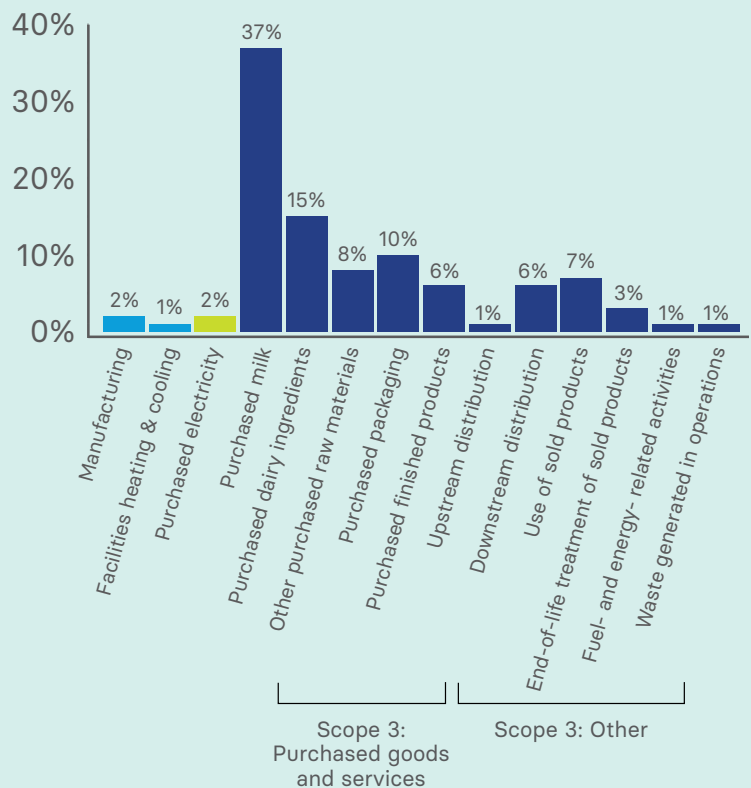
Example emissions profile for a dairy company with Scope 1, 2 and 3 subcategories

Dairy Company - Sample Emissions Profile



- Scope 1
- Scope 2
- Scope 3

Dairy Company - Sample Emissions Profile



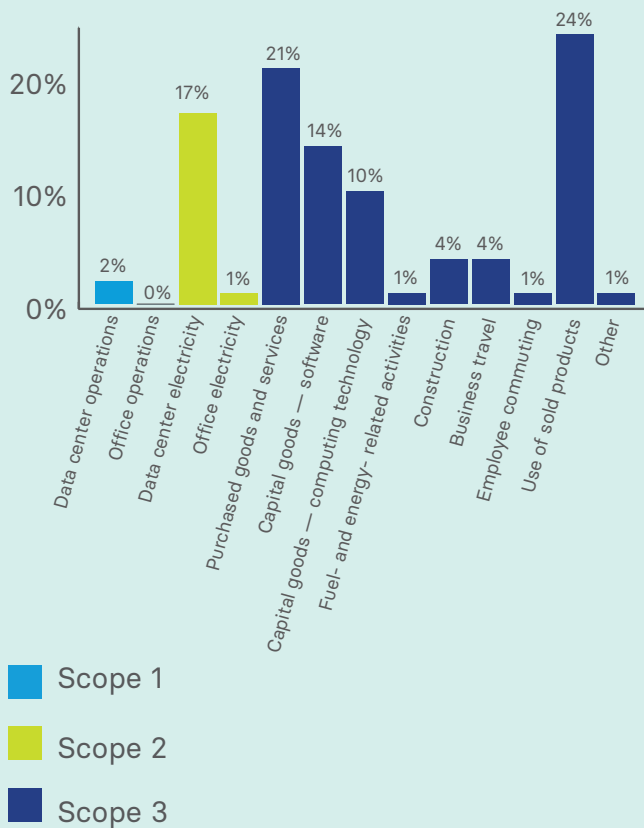
An example dairy company profiled above illustrates what this looks like in practice. The company's simple breakdown of Scope 1, 2 and 3 emissions on the left shows an outsized portion of emissions from Scope 3 — 96% — which is an interesting insight but would leave company leaders wondering what actions to take to abate these emissions. These Scope 3 emissions could range from transportation to purchased good and services to use of sold products, which provides little clarity on where to focus emissions reduction efforts.

By contrast, the more detailed emissions profile on the right side of Figure 5 elucidates what falls within these Scopes while maintaining the high-level categories through color coding. In this example, company leaders can pinpoint purchased

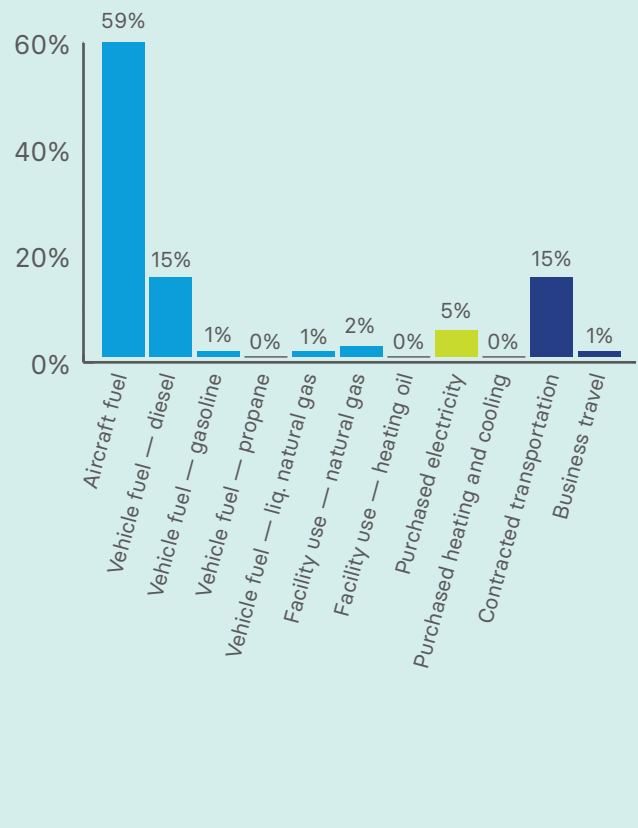
goods and services as a driver of over three quarters of the company's overall emissions, with purchased milk as the highest emissions product at 37% of total company emissions. This gives company leaders crucial insights to help them assess the benefits of working collaboratively with milk producers and distributors to reduce emissions, diversify their product portfolio to include plant-based foods, switch milk producers or take other measures to reduce the largest emissions drivers. This specificity arms leaders with a more informative foundation for understanding which aspects of their business to target for emissions reduction.

Company leaders can learn more by exploring example emissions profiles from the technology and transportation industries as illustrated below.

Technology Company - Sample Emissions Profile (GWP100)



Technology Company - Sample Emissions Profile (GWP100)



Many technology products, such as computers or servers, consume large amounts of energy during their use phase, which shifts technology companies' emissions profiles toward downstream Scope 3 emissions. Transportation companies, by contrast, emit most of their GHGs directly (Scope 1) through fuel consumption by company-owned vehicles. In this example, breaking apart Scope 1 into subcategories helps illustrate that aircraft fuel is responsible for over half of the multi-modal transportation company's emissions.

Greenhouse Gas Type: Distinguishing between GHG types within an emissions profile is another essential step to inform near- versus long-term priorities. This entails noting the dominant GHG

type within each category and subcategory in the emissions profile. In the example below, the pattern of each bar in the emissions profile (solid or dotted) corresponds to a unique GHG type to visually depict which emissions categories release predominantly CO₂ and which categories release predominantly CH₄ (methane), a gas with a much higher intensity but shorter lifespan than CO₂. For this dairy company, purchased milk and dairy emissions are both in the form of methane due to enteric fermentation from cattle, which happens to be **the second largest anthropogenic source of methane emissions** across all sectors in the U.S., so their associated bars are differentiated using a dotted coloring pattern.²⁶

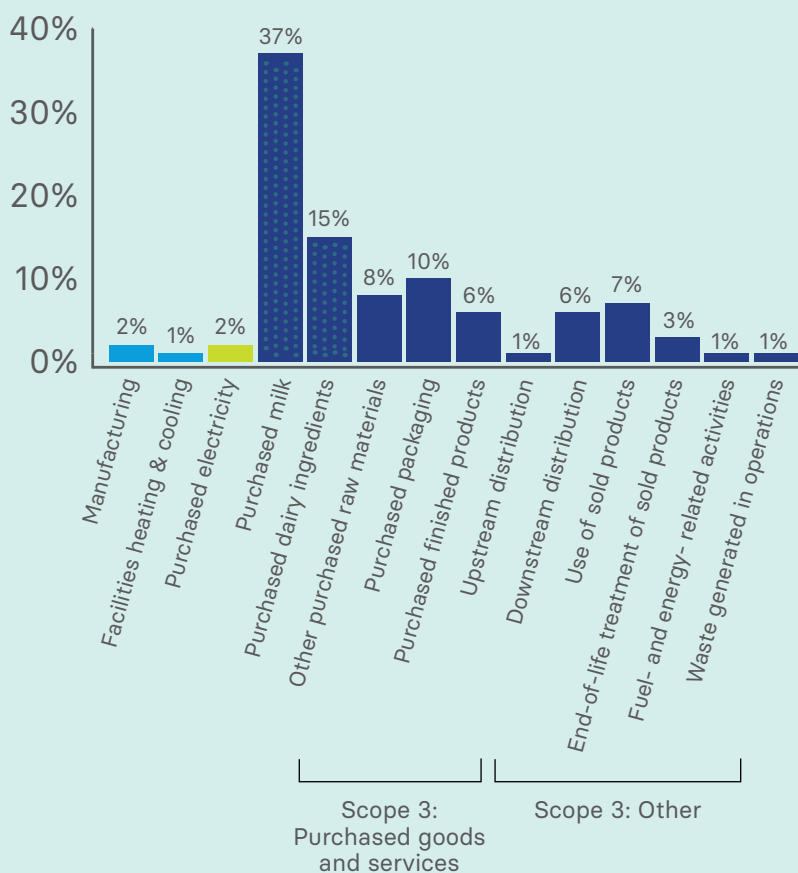
Figure 6.

Example emissions profile for a dairy company with distinctions between GHG types, using GWP100 conversation rates

Dominant GHG Type:

- Solid = CO₂
- Dotted = CH₄ (methane)
- Scope 1
- Scope 2
- Scope 3

Dairy Company - Sample Emissions Profile (GWP100)



Noting which GHG type is emitted may seem like a straightforward step, but in fact many organizations do not incorporate this detail into their emissions profiles due to a push towards standardized reporting in terms of CO₂e using a 100-year global warming potential for conversion. To understand the pros and cons of this approach — and why even the most reputable GHG accounting organizations often overlook the importance of reporting by GHG type — it is useful to provide additional context on the range of GHGs that exist and how they are converted into a standard base unit of CO₂e.

Mainstream GHG accounting institutions are converging towards unified emissions reporting standards by advocating for common emissions categories and a common metric of CO₂e. CO₂e is a standardized unit that represents how much energy the emissions of one ton of a GHG will absorb over a given period, relative to the emissions of one ton of CO₂. This standardization helps company leaders, customers, investors, employees and other stakeholders compare apples to apples when evaluating emissions within and across organizations.

GWP measures how much energy the emissions of 1 ton of a gas will absorb over a given period, relative to the emissions of 1 ton of CO₂.

The U.S. primarily uses a 100-year Global Warming Potential (GWP) as a measure of the relative impact of GHGs. A 20-year GWP better represents the warming impact of gases with shorter lifetimes, because it does not consider impacts that happen more than 20 years after the emissions occur when these gases are no longer in the atmosphere.

Figure 7.

The pros and cons of CO₂e as a GHG accounting standard

The Pros

Standardization helps company leaders, customers, investors, employees, and other stakeholders compare apples to apples across emissions categories

Using one unit can simplify the measurement and reporting process



The Cons

Using one metric diverts attention away from the importance of abating high-intensity gases in the near-term

Most organizations only use GWP100 conversion rates and do not use GWP of any other time horizons to show the climate impact of their emissions on different timescales

Example CO₂e calculation for a dairy company

Emission Source	Scope	Emissions Type	Emissions Total (metric tons)	% of Total	GWP100 Conversion Rate	GWP100 CO ₂ e (metric tons)	% of Total (GWP100)	wGWP20 Conversion Rate	GWP20 CO ₂ e (metric tons)	% of Total (GWP20)	
Manufacturing	1	CO ₂	470,196	3.6%	1	470,196	1.7%	1	470,196	0.8%	
Facilities heating and cooling	1	CO ₂	208,976	1.6%	1	208,976	0.8%	1	208,976	0.4%	
Purchased electricity	2	CO ₂	470,196	3.6%	1	470,196	1.7%	1	470,196	0.8%	
Purchased milk	3	CH ₃	385,561	3.0%	28	10,795,700	38.9%	84	32,387,100	55.3%	
Purchased dairy ingredients	3	CH ₄	157,777	1.2%	28	4,417,753	15.9%			3.7%	
Other purchased raw materials	3	CO ₂	2,194				7.9%			3.7%	
Purchased packaging	3	CO ₂	2,507,712	19.4%	1	2,507,712	9.0%			4.3%	
Purchased finished products	3	CO ₂	1,619,564	12.5%	1	1,619,564	5.8%			2.8%	
Upstream distribution	3	CO ₂	313,464	2.4%	1	313,464	1.1%	1	313,464	0.5%	
Downstream distribution	3	CO ₂	1,619,564	12.5%	1	1,619,564	5.8%	1	1,619,564	2.8%	
Use of sold products	3	CO ₂	1,880,784	14.6%	1	1,880,784	6.8%	1	1,880,784	3.2%	
End-of-life treatment of sold products	3	CO ₂	783,660	6.1%	1	783,660			783,660	1.3%	
Fuel and energy related activities	3	CO ₂	287,342	2.2%	1	287,342			287,342	0.5%	
Waste generated in operations	3	CH ₄	6,269	0.0%	25	156,732	0.6%	84	526,620	0.9%	
						27,725,891			58,522,684		
						CO ₂ e total using GWP100			CO ₂ e total using GWP20		

GWP100 CO₂e = Emissions Total * GWP 100 Conversion Rate

Methane represents a larger portion of total emissions under GWP20 conversions than for GWP100 conversions

GWP20 CO₂e = Emissions Total * GWP20 Conversion Rate

This standardization comes at a cost, however. Most organizations only use a 100-year global warming potential timeline (GWP100) when converting methane, nitrous oxide and other high-intensity GHGs into CO₂e. Because these gases have higher near-term impacts and shorter lifespans in the atmosphere, using a 100-year conversion rate understates how harmful these high intensity gases can be for the planet relative to CO₂, and often leads interpreters of the data to bias CO₂ reduction over high intensity GHG emissions reduction.

To correct for this, organizations measuring their emissions should keep emissions of different GHGs separate in their accounting, and, where required, convert into CO₂e using both a 100-year time horizon (GWP100) and a 20-year time horizon (GWP20), which entails using higher multipliers for converting high intensity GHGs to CO₂e. For an overview of GHG types and their associated GWP100 and GWP20 multipliers, see Figure 8 (note that GWP values are not fully standardized and vary slightly across institutions).

Figure 8.
The four main types of GHGs

Type of GHG	Description	Half-life (years)	GWP20	GWP100
Carbon Dioxide CO ₂	Caused by burning fossil fuels, solid waste, trees, and other biological materials and through some chemical reactions; removed by plants	300 - 1,000	1	1
Methane CH ₄	Emitted during production and transport of coal, natural gas, and oil; also results from livestock and other agricultural practices, land use, and the decay of organized waste in landfills	12.4	84	28
Nitrous Oxide N ₂ O	Emitted during agricultural practices, land use, industrial activities, combustion of fossil fuels and solid waste, and treatment of wastewater	121	264	265
Chlorofluorocarbons HFCs, PFCs, SF ₆ , NF ₃	Synthetic, powerful greenhouse gases that are emitted from industrial processes and contribute to ozone depletion in the upper atmosphere	13.4 - 50,000	3,710 - 17,500	1,300 - 23,500

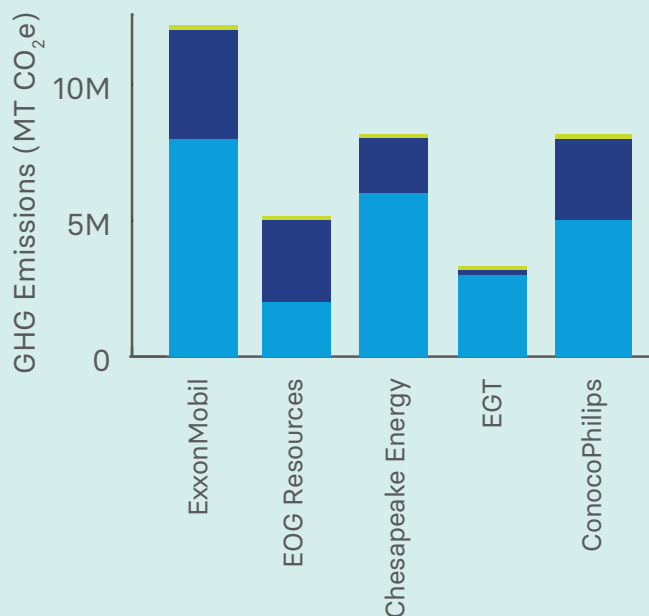
To illustrate how critical it is to distinguish between GHG types, consider the difference in CO₂e among the top five hydrocarbon producers in the U.S. when using GWP100 versus GWP20 in the figure below. In Figure 9, ExxonMobil's CO₂e total is approximately 7,000,000 metric tons using a GWP100, with roughly half of CO₂e from CO₂ and half from CH₄ (methane). In the GWP20 image below, ExxonMobil's emissions jump to approximately 12,000,000 metrics tons, with CO₂e from CH₄ increasing from roughly 3,000,000 to over 8,000,000 metric tons.

The emissions profiles of the remaining companies reinforce the same theme — aggregating all GHGs without using a range of GWP conversion rates can significantly alter the proportion of CO₂ versus CH₄ and lead to vastly different emissions totals. At a minimum, companies should disclose which GWP conversion rates they use to allow consumers of the data to adjust accordingly.

Figure 9. CO₂e emissions from the top five hydrocarbon producers in the U.S. using both GWP100 and GWP20 conversion rates ³¹

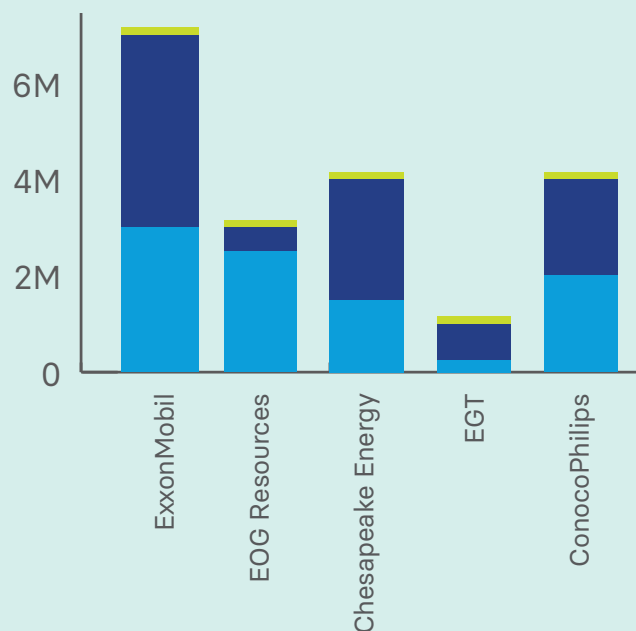
GWP 20 Emissions Total (Top Five U.S. Hydrocarbon Producers)

- CH₄ (GWP=87)
- CO₂
- N₂O (GWP=268)



GWP 100 Emissions Total (Top Five U.S. Hydrocarbon Producers)

- CH₄ (GWP=36)
- CO₂
- N₂O (GWP=298)



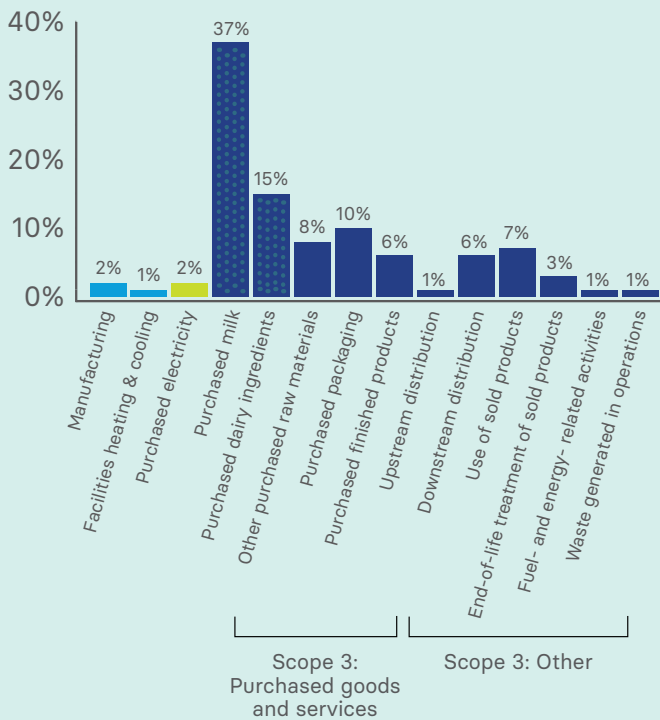
In the context of the example dairy company profiled in Figure 6, the two categories of methane sources similarly represent a larger portion of the total CO₂e emissions when using GWP100 conversion rates. Figure 10 illustrates what the emissions profile would look like for the same company when using GWP20 rates. Ideally, if a company chooses to use CO₂e to evaluate its

emissions profile it would create two versions — one using GWP100 and one using GWP20, as pictured to the right.

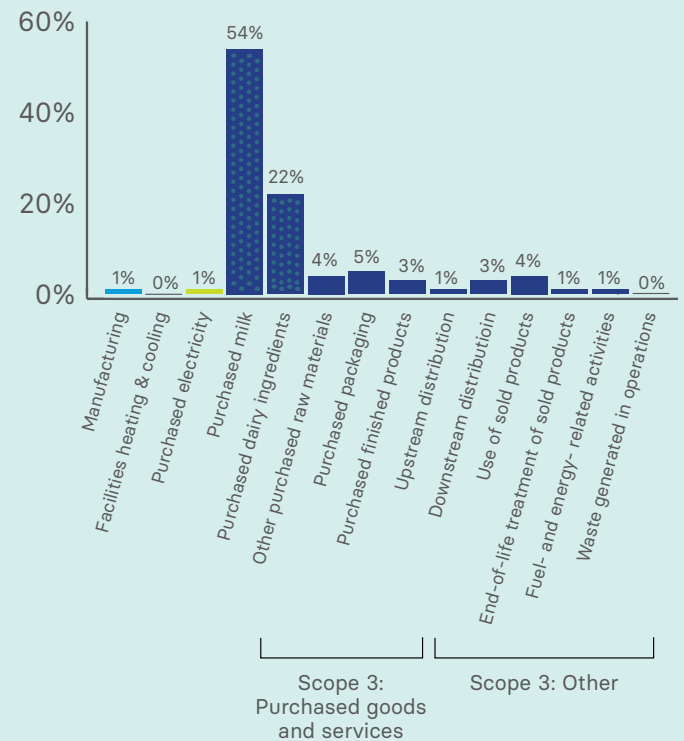
Figure 10.

Example emissions profiles for a dairy company with distinctions between GHG types, using GWP100 (left) and GWP20 (right) conversion rates

Dairy Company - Sample Emissions Profile (GWP100)

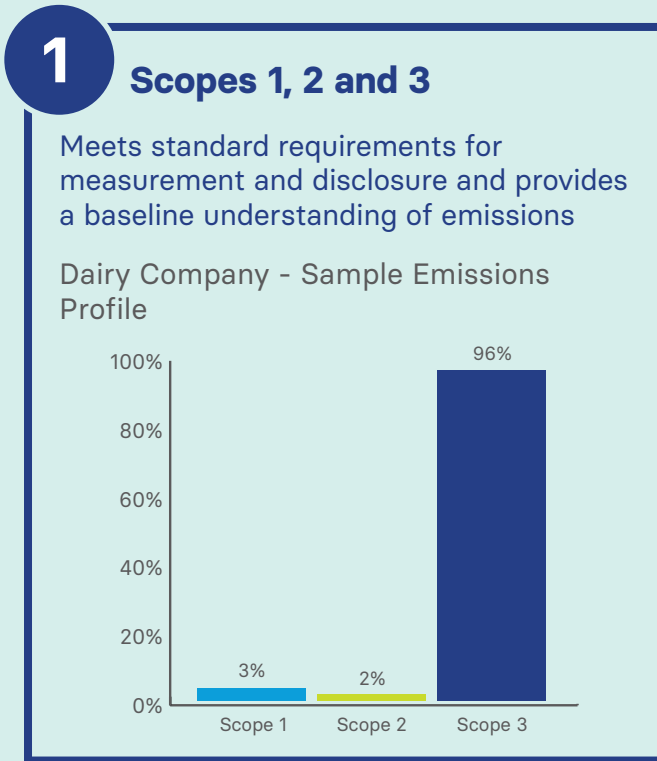


Dairy Company - Sample Emissions Profile (GWP20)



- Dominant GHG Type:
- Scope 1
 - Solid = CO₂
 - Dotted = CH₄ (methane)
 - Scope 2
 - Scope 3

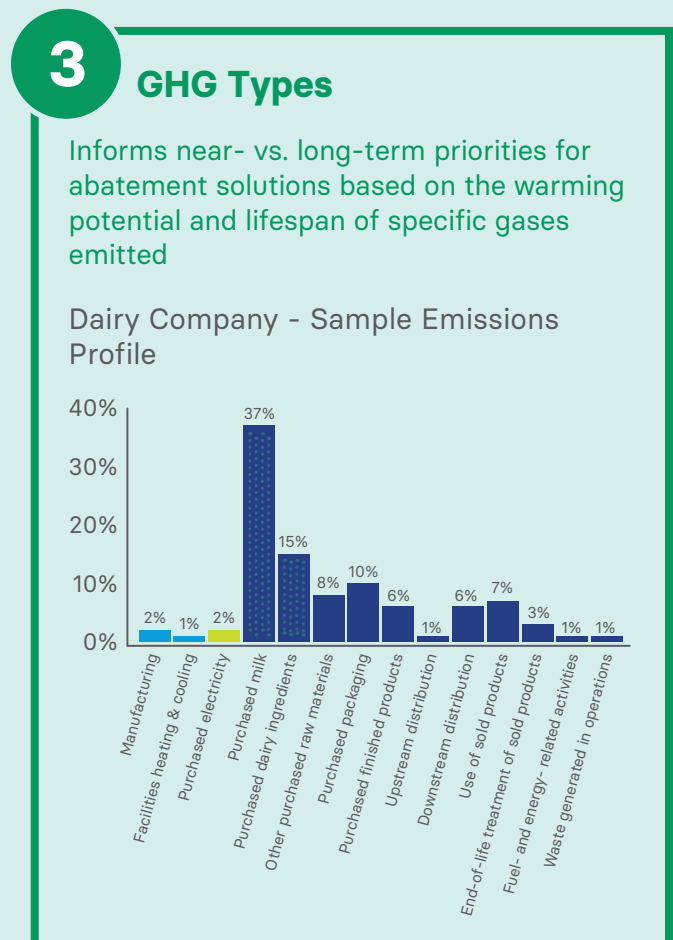
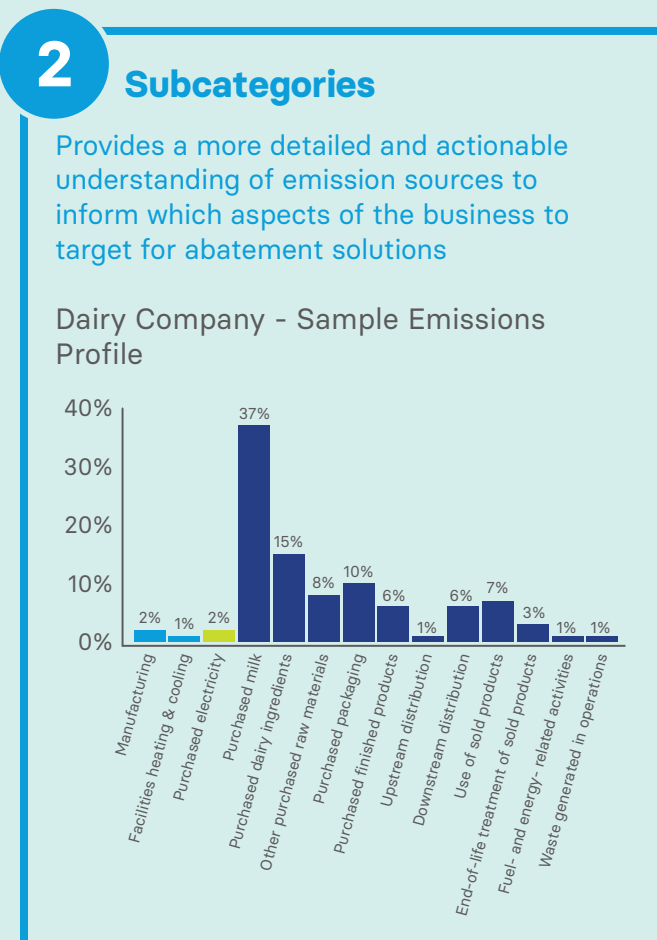
Figure 11.
The three elements of a strong emissions profile



Bringing it all Together to Construct an Emissions Profile

In review, a strong emissions profile combines three key elements: Scopes 1, 2 and 3, subcategories and GHG type. Starting with Scopes 1, 2 and 3 enables a company to measure, benchmark and manage environmental risks using widely accepted, increasingly standardized practices. A further subdivision of categories within each Scope provides a more nuanced and actionable understanding of the specific emissions sources within a company.

Layering in a distinction between primary GHG types such as CO₂ versus CH₄ informs how a company should balance near- and long-term priorities in their emissions reduction activities. A strong emissions profile helps a company understand its current emissions in detail and sets the foundation for identifying and prioritizing the highest-impact solutions for abating them, which will be explored in the next section.



Walmart Case Study

Leading a large-scale switch to renewable energy to target its largest source of direct (Scope 1 and 2) emissions

Measurement

When Walmart set out to construct its emissions profile, three Scope 1 categories and one Scope 2 category naturally emerged — refrigeration, transportation, on-site fuels, and electricity. The results were striking; **electricity represented more than 60% of total Scope 1 and 2 emissions.** This provided the clarity and direction needed to prioritize abating emissions from electricity by launching a **large-scale renewable energy project.** Renewable energy scored highly against other evaluation criteria such as expected financial return, resilience, and reputational benefits, which made it a clear choice for implementation.

Action

To get started, Walmart relied on **NGO partners** who accelerated the project by endorsing the goal, helping build the case for investment, and providing connections to key partners for implementation, such as the Renewable Energy Buyers Alliance. Building the **case for financial return** helped gain **leadership buy-in** early, which came in the form of a **public CEO commitment** to 100% renewable energy and was key for building early momentum. The Real Estate Team, reporting up to the VP of Energy, then got to work procuring Power Purchasing Agreements (PPA) from off-site wind and solar farms and installing on-site solar on the roofs of stores.

Impact

Walmart reached **36% renewable energy globally in 2020** and is on track to meet its targets of **50% by 2025 and 100% by 2035.** As a result, the company has achieved consistent year-over-year reduction in its Scope 2 emissions. The significant emissions reduction gave Walmart's leadership team the confidence to become the first-ever retailer to set a **Science-Based Target**, and the company has since updated the target from the 2° Celsius path to be in line with the 1.5° path, an even more ambitious goal. **To extend the benefits of the project, Walmart recently rolled it out to its suppliers** to provide them with an easy on-ramp for entering the renewable energy market. The program, called Gigaton PPA, will help smaller players coordinate to share a PPA, which are often large contracts, to reduce their emissions which are reported towards Walmart's larger Project Gigaton goal of **reducing one billion metric tons of CO₂e from its Scope 3 emissions by 2030.**



We all have to move faster on the switch to renewable energy. The contracts can seem complicated, but it's easier than ever to enter the market right now.

Zach Freeze

Senior Director of Strategic Initiatives, Sustainability

Scan for Solutions

How to develop a short list of abatement solutions for implementation

An emissions profile in isolation is not enough to showcase climate leadership or meet stakeholder demands for climate action. Yet it is critical to build the foundation for identifying, prioritizing and implementing the highest-impact solutions that can reduce emissions across a company's value chain.

Companies can use a four-step process to identify and prioritize the highest impact near-term abatement solution for successful action on climate.

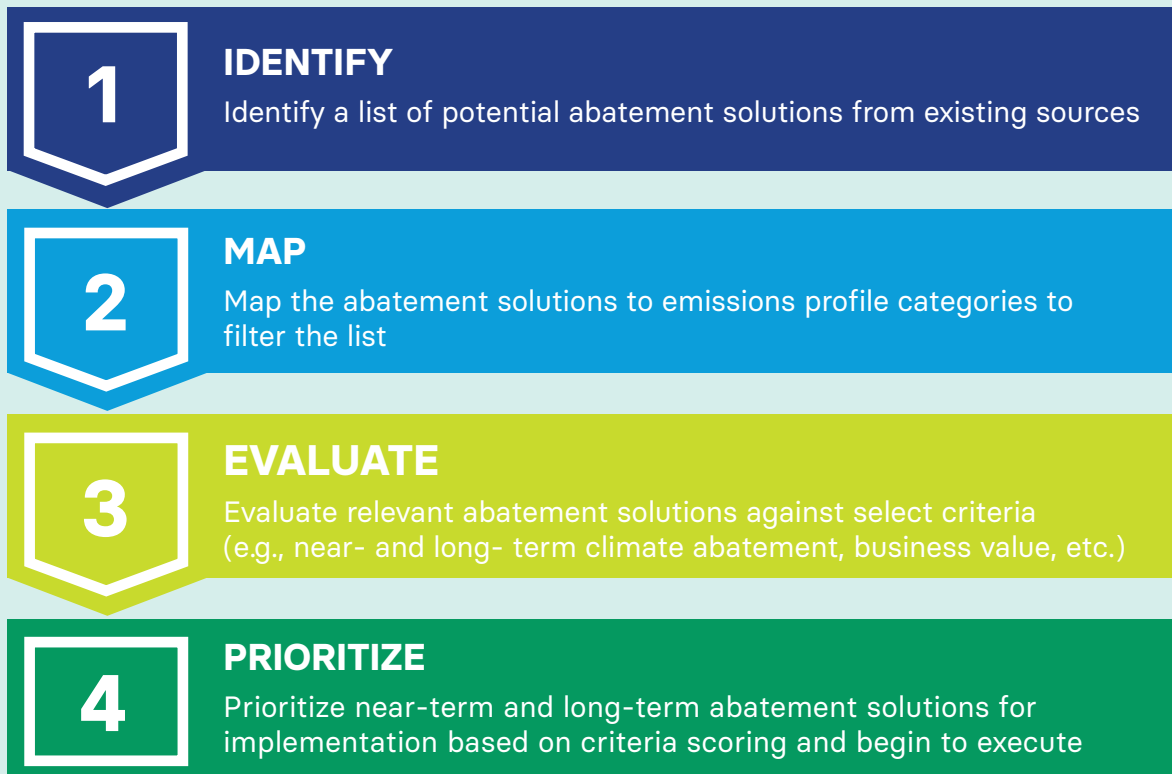
1. Identify a list of potential abatement solutions from existing sources
2. Map the abatement solutions to emissions profile categories to filter the list
3. Evaluate relevant abatement solutions against criteria (e.g., near- and long-term climate abatement, business value, etc.)
4. Prioritize near-term and long-term abatement solutions for implementation based on criteria scoring

An abatement solution is an initiative, program, and/or investment designed to reduce or remove GHGs.

Abatement solutions vary by sector and include things like cover crops for farming, vehicle electrification for shipping, and building retrofits for retailers

Figure 12.

The four-step funnel for selecting the highest-impact abatement solution based on a company's emissions profile



Step 1: Identify

Companies can start by locating a set of abatement solutions relevant to their sector or industry. The good news is that a wealth of resources already exist to help organizations identify possible abatement solutions relevant to their sector. During this first step, companies can reference a combination of cross-sector abatement solution resources — such as EDF and Deloitte’s Pathways to Net Zero report, Project Drawdown’s Table of Solutions and the EPA’s GHG Reduction Programs & Strategies — to identify solutions applicable across sectors, as well as sector-specific abatement solution sets as relevant.

Companies should prioritize abatement solutions that leverage net zero opportunities in their own business, thus helping to lead in their field. Yet a set of solutions is incomplete without identifying strategies to invest or advocate in a way that enable others to move faster in their net zero journey.

The lead, invest and advocate framework should be incorporated into the process of identifying solutions and actions. For example, a company might identify renewable energy as a key abatement solution. The company can then translate this solution into a set of actions, like installing renewable energy on site or purchasing renewable energy from another provider (lead), developing coalitions with industry peers to scale renewable energy purchasing (invest) or advocating for policy reform to provide renewable energy incentives (advocate).

After researching abatement solutions and identifying the actions required to deploy them, an example technology company might develop the list of abatement solutions in Figure 14 as a completion of the Identify step.



Figure 13.

Useful resources for identifying cross-sector and sector-specific lists of abatement solutions

Cross-Sector Abatement Solution Sets	Sector-Specific Abatement Solutions Sets
<p><u>Pathways to Net Zero Report</u> Includes sets of abatement solutions for transportation, agriculture, retail, and technology</p> <p><u>Project Drawdown Table of Solutions</u> Cross-sector and sector-specific climate solutions, ranked by CO₂e reduction potential</p> <p><u>EPA’s GHG Reduction Programs & Strategies</u> Resources and guides to identify and implement GHG reduction opportunities</p>	<p><u>Energy: IEA Net Zero by 2050</u> Roadmap for global energy sector to reach net zero emissions by 2050</p> <p><u>Industry: UN Climate Action Pathway</u> Action table with specific recommended climate actions for each heavy and light industry</p> <p><u>Transport: UN Climate Action Pathway</u> Action table with specific recommended climate actions transportation</p>

Figure 14.

Example set of **abatement solution activities for a technology company**



Lead

Champion net zero in your own business

Scope 1

- Building retrofits
- Equipment efficiency upgrades
- Adjustments to temperature, ventilation, and lighting to reduce energy use, including building automation
- Reduced demand for new buildings
- Centralized data centers and facilities to optimize operations

Scope 2

- Switches to renewable energy
- Low-carbon heating and cooling
- Decommission of legacy networks

Scope 3

- Ensuring products and services are not enabling production and sales of fossil fuels or other destructive practices
- New business models to decarbonize end-user device electricity consumption
- Circular materials, products, and processes
- Purchase of high-quality carbon credits
- Encouraging suppliers to set science-based targets

Invest

Invest in short-term and long-term solutions



- New data center efficiency measures
- Innovation in technologies and platforms that support carbon reduction across sectors
- Partnerships with low-carbon construction capabilities
- Technology for buildings to produce their own energy

Advocate

Advocate for policies consistent with net zero by 2050



- Renewable energy incentives
- Policies that support building retrofits and onsite renewable energy
- Ongoing grid decarbonization
- Incentives for efficient technology

Step 2: Map

After developing a list of abatement solutions and their associated actions, the next step is to map the actions to emissions profile categories. To conduct the mapping, create a table that lists company emissions sources from largest to smallest categories of emissions based on volume and GHG type, e.g., prioritizing high intensity emissions such as methane, using the emissions profile as a guide. Smaller categories of emissions do not need to be included. Then, map the abatement solutions to each row by selecting the activities that would directly reduce each type of emissions. If the mapping exercise is not straightforward, companies can seek experts and publications from industry associations, NGOs and universities for guidance.

In this example, most GHG emissions in the technology industry are in the form of CO₂, so this

company did not need to consider the nuances of GHG type or GWP100 versus GWP20 conversions. Companies with a mix of CO₂ and other GHG emissions, such as those in the agriculture, waste or energy sectors, will need to consider these differences and can do so by creating two versions of their emissions profile and associated mapping — one using GWP20 and one using GWP100 — or noting non-CO₂ categories of emissions to treat them uniquely based on their high intensity characteristics.

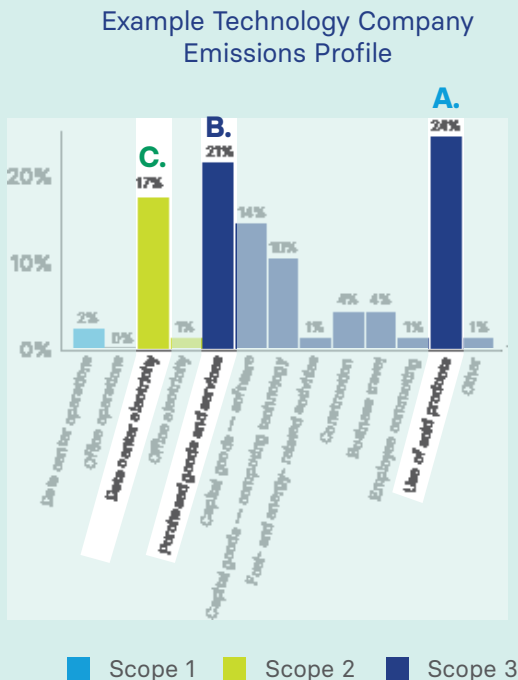
After completing the mapping, companies will then have a short list of abatement solution activities to evaluate and prioritize for execution, which will be covered in the next section.



Figure 15.

Example: mapping abatement solutions activities to emissions profile categories for a technology company

Now that you know the biggest drivers of emissions at your company, how can you map the abatement solutions activities that directly address them?



Emissions Driver	Mapped Abatement Solution Activities	
A. Use of sold products (Scope 3)	Lead (Scope 3)	<ul style="list-style-type: none"> New business models to decarbonize end-user device electricity consumption Ensuring technology is not enabling production and sales of fossil fuels
B. Purchased goods and services (Scope 3)	Lead (Scope 3)	<ul style="list-style-type: none"> Encouraging suppliers to set science-based targets
	Lead (Scope 3)	<ul style="list-style-type: none"> Developing emissions performance-based purchasing specifications for suppliers
	Invest	<ul style="list-style-type: none"> Circular materials, products, and processes
C. Data center electricity (Scope 2)	Lead (Scope 1)	<ul style="list-style-type: none"> Centralized data centers and facilities to optimize operations
	Lead (Scope 2)	<ul style="list-style-type: none"> Switches to renewable energy Decommission of legacy networks
	Invest	<ul style="list-style-type: none"> Data center efficiency measures

Microsoft Case Study

Developing a smart building management system that reduces energy and generates revenue

Measurement

For Microsoft, distinguishing between emissions from different business groups and product lines is not done just for the sake of building an emissions profile — it also enables the company to levy an **internal carbon tax to fund its sustainability commitments**. The tax provides incentives for internal leaders to reconfigure their products and processes to abate emissions from their business units. To measure downstream emissions such as Scope 3 use of sold products, Microsoft uses industry averages but is working on collecting telemetry data specific to Microsoft's products to measure product-specific data in a cost-effective way, which will better reward product teams for reducing the energy consumption of their products.

Action

On-site electricity consumption from data centers and offices has been a persistent driver of the company's overall emissions. To abate these emissions, Microsoft partnered with various hardware and software providers to design an **analytical solution that connects their campus' building management systems**. The solution aggregates building data through IoT sensors and a centralized control dashboard.

Impact

Microsoft developed the idea for the building management system in 2012 and implemented it in 2013. **By 2015, the project has already paid for itself through a nearly 20% reduction in energy consumption**, including identifying a forgotten fan in a parking garage that was running 24/7 and cost the company \$66k in just six months. In addition to energy, the solution helped drive improvements in meeting employees' preferences for temperature and layout, which has helped to improve their daily experience and productivity. With the increase of wildfires in Washington, the ability to monitor and regulate air quality in offices has been critical. Microsoft's initiative was so successful that it recognized an **opportunity to sell similar building management solutions as a service to other companies**, which has since blossomed into a full-fledged new business unit and revenue driver for the company, in addition to a solution for helping other companies reduce their emissions.



Picking a solution that tied to our business capabilities helped unlock financial investment and senior executive support, and ultimately led to a new business.

Michelle Lancaster
Director, Sustainability

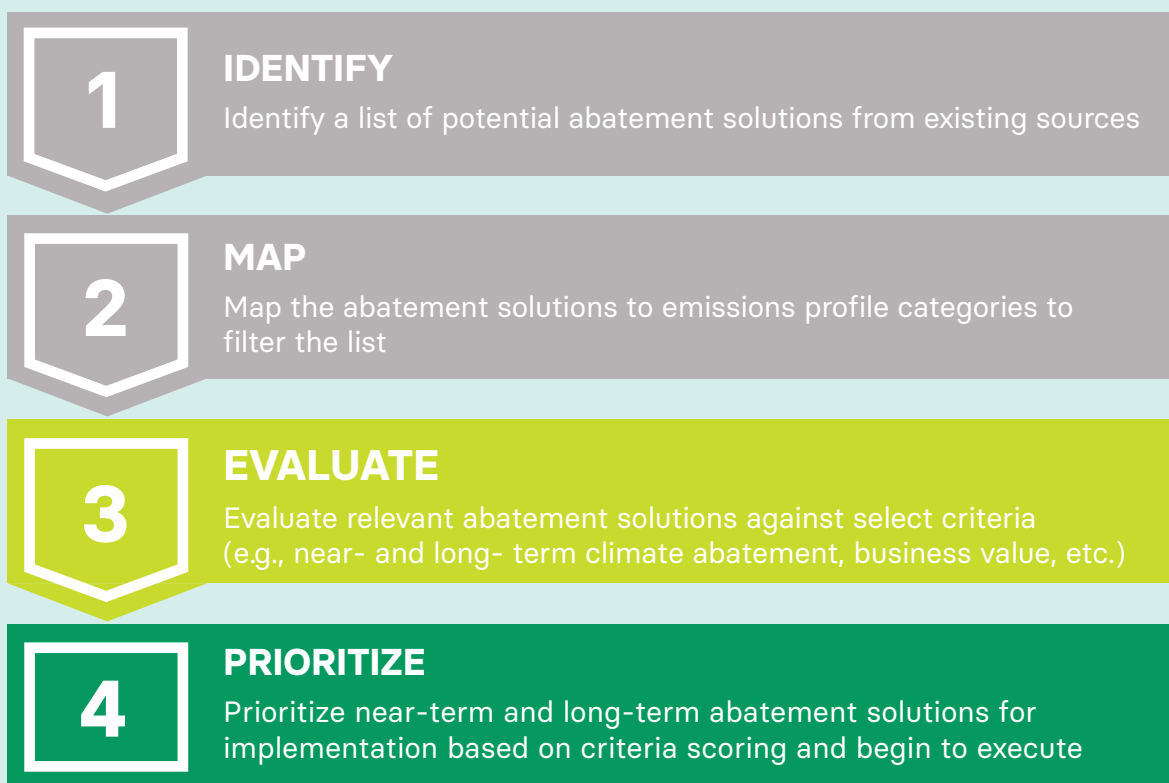
Execute and Deploy

How to evaluate, prioritize and initiate the highest impact abatement solutions

After completing the Identify and Map stages, companies will have a short list of relevant abatement solutions and activities to then Evaluate and Prioritize for execution. Some abatement solutions can be quick and easy wins while others will require years of investment

and planning to execute, so identifying these differences early on is a critical step in taking a strategic approach to abatement. This section focuses on how organizations can evaluate and prioritize initiatives to deploy a portfolio of abatement solutions.

Figure 16. The final two steps of the four-step funnel for selecting the highest impact abatement solutions



Step 3: Evaluate

Each abatement solution will have its unique benefits and drawbacks. One may have a high expected ROI while another may present a valuable learning opportunity for the company. One may target short-term, high intensity gases while another may focus on long-term CO₂ reduction. In these cases, selecting one solution over another will inevitably entail tradeoffs and complex choices. Company leaders who develop and agree upon a set of criteria for evaluating

these opportunities — and who do so before debating the merits of a specific opportunity in isolation — will set themselves up for a consistent, rigorous and strategic approach to selecting the highest impact solutions based on the company's objectives, emissions profile and resources.



For many companies, two to five criteria with a set of two to five sub-criteria under each is the “sweet spot” for incorporating a breadth of relevant factors while also keeping the exercise focused and manageable. Ideally, the criteria will be intuitive, pithy and related to the company’s foundational values and goals in order to be top of mind for employees up and down the organization, which will help drive alignment and consistency.

Gaining this alignment upfront also prepares companies to measure their success against predetermined success metrics. Evaluation criteria typically emerge from a combination of leadership preferences, sustainability expertise and a knowledge of internal values and goals, which may come from inside or outside the company.

To accelerate the process, companies can use the criteria in Figure 17 as starting point for abatement solution evaluation criteria. The four criteria are designed to prioritize solutions that maximize climate abatement in a way that creates financial value for the business and drives just outcomes for impacted stakeholders. Company leaders who wish to use these criteria can tailor the framework to their specific organizational needs by altering the sub-criteria questions as desired and determining the right percentage weightings across categories.

Learn more about what “Business Value” means in this context and explore the different ways that driving towards net zero emissions can create tangible business value for companies by helping them grow revenue, reduce costs and avoid risks.

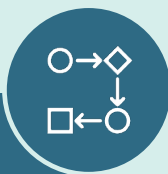
Figure 17. Recommended criteria for evaluating potential abatement solutions. Learn more about “Business Value” in Figure 18 (the Net Zero Business Value Lever Map).

1. Climate Abatement



- What is the **magnitude** of expected **long-term** (GWP100) emissions reduction?
- If emissions include high intensity gases (e.g., methane), what is the **magnitude** of overall expected **near-term** (GWP20) emissions reduction?
- What is the **expected timeline** for realizing emissions reduction (considering technological maturity and commercial viability)?
- What is the **likelihood** of it meeting its expected level of emissions reduction?

3. Cost and Feasibility



- What is the **expected cost** of implementation (CapEx and OpEx)?
- What **assets** and what level of **business transformation** would it require (bolt-on vs. full asset reconfiguration)?
- What **skills and resources** would it require?
- What **partnerships** would it require?

2. Business Value



- Is it likely to **generate new revenue** for the organization
- Is it likely to **reduce costs** for the organization
- Is it likely to **reduce organizational risks** (e.g., supply chain, shareholder, regulatory)?
- What is the magnitude of **overall expected business value**?

4. Equity and Justice



- Who is **impacted by the emissions** that the abatement solution aims to reduce?
- How would these populations be **impacted by the abatement solution**?
- What **additional stakeholders** would be impacted by implementing the abatement solution, and in what way?

Figure 18. The Net Zero Business Value Lever Map

Revenue Growth	Cost Reduction	Risk Avoidance
<p>Customer Acquisition</p> <p>Differentiate brand, product and/or service to attract new, values-driven customer segments who prioritize sustainability when making purchasing decisions</p>	<p>Operational Efficiency</p> <p>Reduce operational costs by improving efficiency of company energy, water, land use, PP&E, and other assets and inputs</p>	<p>Supply Chain Risk</p> <p>Reduce risk of operational performance challenges by incorporating climate risk and resilience into all supply chain activities (e.g., sustainable supplies, extended risk horizon, renewable energy)</p>
<p>Customer Loyalty</p> <p>Retain customers and increase “share of wallet” due to improved brand reputation and loyalty from values-driven strategy, operations, and product and service offerings</p>	<p>Raw Material and Waste Disposal</p> <p>Reduce need for required inputs and waste processing by converting to circular business models that require fewer raw materials and produce less waste</p>	<p>Brand Risk</p> <p>Protect against damages to brand reputation from not successfully achieving or reporting on public emissions reduction goals and bolster brand by contributing to sustainability solutions within and outside the company</p>
<p>Price Premiums</p> <p>Utilize sustainable attributes of products and/or services to capture price premiums where there is demonstrated customer willingness to pay for more sustainable products and services</p>	<p>Cost of Capital</p> <p>Decrease cost of equity and debt capital due to demonstrated trend of investors setting lower return expectations and banks issuing lower interest rates to companies that exhibit responsible environmental practices</p>	<p>Regulatory and Public Policy Risk</p> <p>Increase readiness for changing climate regulations and public policy, avoid lawsuits, and help shape policy as an actively engaged, early mover towards net zero</p>
<p>Product and Service Innovation</p> <p>Use emissions reduction activities as an engine of innovation to develop new, low emission products and services (e.g., in-setting) and invest in nascent emissions reduction technologies and solutions</p>	<p>Talent</p> <p>Increase engagement and reduce turnover and recruitment costs by aligning company and employee values and adapting to increasing trend of employees selecting employers based on environmental and social responsibility</p>	<p>Shareholder Risk</p> <p>Increase ability to raise capital from investors due to reduced long-term climate risk (policy, weather, customer preferences, etc.) and reduce likelihood of climate-related activist investor takeover</p>
<p>Offsets and Credits</p> <p>Grow and diversify revenue by capitalizing on carbon offsets, renewable energy tax credits, and other ways to create new business models from emissions reduction activities</p>	<p>Taxes and Penalties</p> <p>In countries with a mandatory carbon system such as a carbon tax or cap and trade, as well as regions considering adopting one, decrease direct liabilities by reducing company emissions</p>	<p>License to Operate Risk</p> <p>Increase the likelihood of community, employee, and NGO support of company priorities and reduce the likelihood of negative advocacy efforts that could be costly and damaging to the brand</p>



After developing criteria for evaluation, each abatement solution and activity can be scored quantitatively to make the exercise easier, faster and clearer for decision makers. To do this effectively and consistently across projects and employees, companies can develop a scorecard that defines what a score of 1 looks like versus a score of 5, depending on the designated scoring range.

Figure 19 represents what a scorecard could look like for the Climate Abatement criteria. In this example, the overall criteria is given a weight of 30% while each of the sub-criteria makes up an equal part of the total. The specific values are illustrative and can be altered based on a company's starting point and objectives. For the Feasibility criteria, companies can build **marginal abatement cost curves** to estimate the volume and costs of opportunities to reduce emissions in a simple and visually digestible way.

Using these types of simple scorecards with predetermined, objective definitions can help companies be efficient during their evaluations and avoid never-ending "analysis paralysis." These analyses can be refreshed on an annual or biannual basis to balance staying up to date on the latest innovations and employee time constraints.

After scoring each of the abatement solution activities against the evaluation scorecard, the next step is to compare the results side-by-side to understand the relative benefits and tradeoffs of each opportunity. Visualizing the data can help organizations understand the balance of attributes within their portfolio of potential solutions, which will inform decisions about where to prioritize and how to invest.

Figure 19.

Example scorecards for recommended evaluation criteria



1. Climate Abatement

1a. What is the magnitude of expected long-term (GWP100) emissions reduction?

- Score of 1 Abatement solution would address <1% of total organizations emissions
- Score of 3 Abatement solution would address 1-5% of total organizations emissions
- Score of 5 Abatement solution would address >5% of total organizations emissions

1b. If emissions include high intensity gases (e.g., methane), what is the magnitude of overall expected near-term (GWP20) emissions reduction?

- Score of 1 Abatement solution would address none of the organizations high intensity emissions
- Score of 3 Abatement solution would address <50% of the organizations high intensity emissions
- Score of 5 Abatement solution would address >50% of the organizations high intensity emissions

1c. What is the expected timeline for realizing emissions reduction (considering technological maturity and commercial viability)?

- Score of 1 Emissions reduction is expected to occur in greater than three years
- Score of 3 Emissions reduction is expected to occur between years one and three
- Score of 5 Emissions reduction is expected to occur within the first year

1d. What is the likelihood of it meeting its expected level of emissions reduction?

- Score of 1 Abatement solution has a <30% chance of meeting emissions reduction target
- Score of 3 Abatement solution has a 30-70% chance of meeting emissions reduction target
- Score of 5 Abatement solution has a >70% chance of meeting emissions reduction target

Total Score = 1a Score * 1a Weight + 1b Score * 1b Weight + 1c Score * 1c Weight + 1d Score * 1d Weight



2. Business Value

2a. Is it likely to generate new revenue for the organization?

- Score of 1 Abatement solution would impact 1 revenue growth value lever
- Score of 3 Abatement solution would impact 3 revenue growth value levers
- Score of 5 Abatement solution would impact 5 revenue growth value levers

2b. Is it likely to reduce costs for the organization?

- Score of 1 Abatement solution would impact 1 cost reduction value lever
- Score of 3 Abatement solution would impact 3 cost reduction value levers
- Score of 5 Abatement solution would impact 5 cost reduction value levers

2c. Is it likely to reduce organizational risks (e.g., supply chain, shareholder, regulatory)?

- Score of 1 Abatement solution would impact 1 risk avoidance value lever
- Score of 3 Abatement solution would impact 3 risk avoidance value levers
- Score of 5 Abatement solution would impact 5 risk avoidance value levers

2d. What is the magnitude of overall expected business value?

- Score of 1 Abatement solution would generate an overall expected business value equal to <1% of total organizational revenue
- Score of 3 Abatement solution would generate an overall expected business value equal to 1-5% of total organizational revenue
- Score of 5 Abatement solution would generate an overall expected business value equal to >5% of total organizational revenue

Total Score = 2a Score * 2a Weight + 2b Score * 2b Weight + 2c Score * 2c Weight + 2d Score * 2d Weight



3. Cost and Feasibility

3a. What is the expected cost of implementation (CapEx and OpEx)?

Score of 1	The project is expected to cost more than 25% of annual sustainability budget
Score of 3	The project is expected to cost between 10 and 25% of annual sustainability budget
Score of 5	The project is expected to cost less than 10% of annual sustainability budget

3b. What assets and what level of business transformation would it require (bolt-on vs. full asset reconfiguration)?

Score of 1	The project would require significant reconfiguration of the company's assets and business
Score of 3	The project would require some additional assets that could be "bolted on" to the company's existing configuration
Score of 5	The project could be executed successfully using only existing assets and current configuration

3c. What skills and resources would it require?

Score of 1	The project would require hiring or contracting several new personnel to execute
Score of 3	The project would require minimal hiring or contracting to be feasible
Score of 5	The project could be executed successfully by the current relevant team

3d. What partnerships would it require?

Score of 1	The project would require multiple and/or complex partnerships to be feasible
Score of 3	The project would leverage existing partnerships but also require additional support
Score of 5	The project could be executed successfully using only existing partnerships

Total Score = 3a Score * 3a Weight + 3b Score * 3b Weight + 3c Score * 3c Weight + 3d Score * 3d Weight



4. Equity and Justice

4a. Who is impacted by the emissions that the abatement solution aims to reduce?

- | | |
|------------|---|
| Score of 1 | Current emissions only directly relevant stakeholders to the extent that they contribute to global climate change |
| Score of 3 | Current emissions impact one or more groups of relevant stakeholders |
| Score of 5 | Current emissions impact several groups of relevant stakeholders, including disadvantaged, front-line communities |

4b. How would these populations be impacted by the abatement solution?

- | | |
|------------|--|
| Score of 1 | Abating these emissions would have no impact on affected populations |
| Score of 3 | Abating these emissions would drive some improvements in the health and well-being of impacted populations |
| Score of 5 | Abating these emissions would significantly improve the health and well-being of impacted populations |

4c. What additional stakeholders would be impacted by implementing the abatement solution, and in what way?

- | | |
|------------|--|
| Score of 1 | The project would merely transfer environmental risks to another stakeholder group |
| Score of 3 | The project would have no negative impacts on additional stakeholder groups |
| Score of 5 | The project would positively impact additional stakeholder groups |

Total Score = 4a Score * 4a Weight + 4b Score * 4b Weight + 4c Score * 4c Weight + 4d Score * 4d Weight

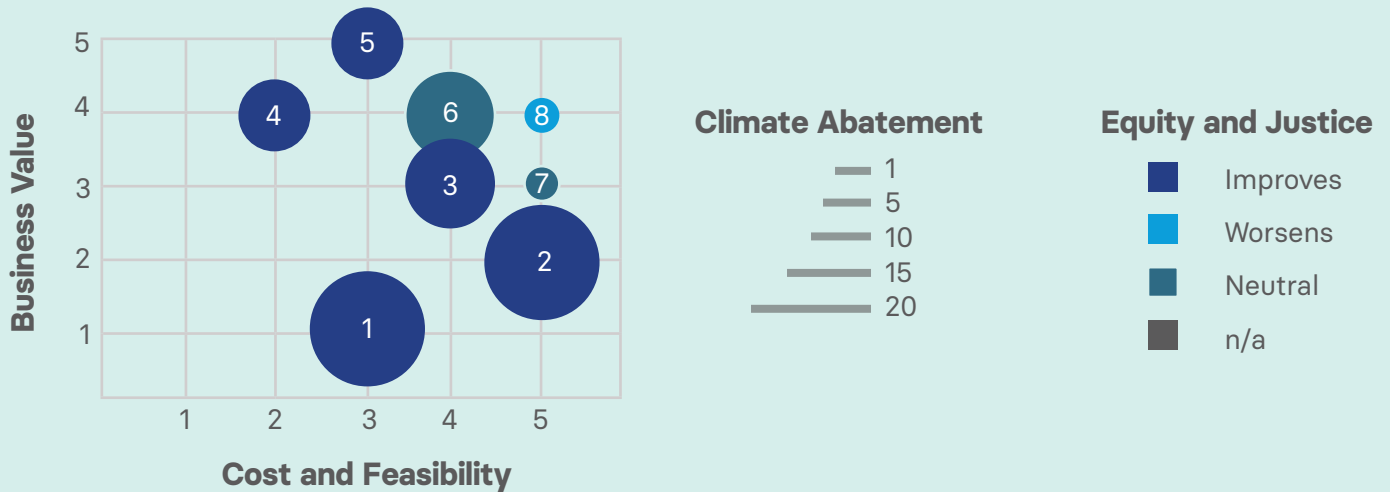
Figure 20.

Example abatement solution activity scorecard and data visualization

Example Technology Company Abatement Solution Scorecard

Abatement Solution	1. Climate Abatement (1-5)	2. Business Value (1-5)	3. Cost and Feasibility (1-5)	4. Equity and Justice (I/W/N)
1. New business models to decarbonize end-user device electricity consumption	5	1	3	Improves
2. Ensuring technology is not enabling production and sales of fossil fuels	5	2	5	Improves
3. Encouraging suppliers to set science-based targets	4	3	4	Improves
4. Developing emissions performance-based purchasing specifications for suppliers	5	4	3	Improves
5. Circular materials, products, and processes	3	4	2	Improves
6. Data center efficiency measures	3	5	3	Neutral
7. Switches to renewable energy	4	4	4	Neutral
8. Centralized data centers and facilities to optimize operations	2	3	5	Worsens

Example Technology Company Abatement Solution Comparison



In the above example, some criteria can be clearly evaluated against quantitative scores whereas Equity and Justice can be expressed more effectively in terms of “Improves,” “Worsens” or “Neutral.” The colors in the data visualization can communicate these nuances while the x-axis, y-axis and bubble size can be used to represent Feasibility, Business Value and Climate Abatement, respectively.

Step 4: Prioritize

In the final step of the four-step funnel, company leaders are ready to make strategic decisions about which abatement solutions to implement and how to implement them.

Using the emissions profile, the solutions map, and evaluation scorecard and visualization as

references, company leaders can evaluate and answer the following set of key questions to help translate analysis into near-term action during the Decisive Decade.



Figure 21.

Guiding questions to support the final prioritization of abatement solution activities based on mapping and evaluation

<h3>Which abatement solutions should I implement?</h3> <p>Organizations should prioritize solutions that are:</p> <ul style="list-style-type: none"> • In the “top right” (i.e., high business value and high feasibility) • The “big circles” (i.e., solutions with the highest climate abatement potential) • The “dark blue circles” (i.e., solutions that improve equity and justice) 	<h3>How many abatement solutions are enough?</h3> <ol style="list-style-type: none"> 1. Start by analyzing your current emissions profile 2. Then, calculate what it would take to get from “here to there” relative to company net zero target 3. Next, add to the abatement solution portfolio until the sum of expected emissions reduction potential equals the total goal for emissions reduction in the target timeframe
<h3>How do I get started?</h3> <ul style="list-style-type: none"> • Use the Net Zero Value Lever Map (Figure 18) to pitch the case for investment to company leadership to secure the funding and resources required • Start with quick wins to gain early momentum and buy-in • Identify the high-impact solutions and begin planning and investment now 	<h3>How can I improve the potential of solutions that scored poorly?</h3> <p>Low climate abatement: Assess opportunities to collaborate with coalitions and influence policy to drive greater scale of abatement</p> <p>Low business value: Explore potential government subsidies</p> <p>Low feasibility: Invest in R&D within and outside the organization</p> <p>Low equity and justice: Involve outside stakeholders to reimagine the solution design</p>

The first question helps guide the process of interpreting the data to select the highest impact activities. When answering the second question about how many solutions are enough, company leaders may be shocked to see how much will be required to reach net zero, so it is helpful to contextualize this framing as a long-term requirement that can be supported by external partners through coordinated investments and advocacy.

Progress will occur over time through a series of concrete individual steps. To get started on implementation, sustainability leaders often benefit from framing the investments in terms

of the expected business value return by using language like “efficiency” and “waste” rather than “emissions” and “climate.”

Quick wins are a valuable tool for generating early momentum to earn the buy-in and trust of potential champions of this work within the company. If few abatement solutions emerge from the analysis as viable opportunities, the fourth question offers suggestions for how to improve the expected returns of abatement solution activities by coordinating with external partners and impacted stakeholders.



The Importance of “Quick Wins”

Near-term, immediate action is essential for meeting 2030 emissions reduction requirements. These “quick win” solutions are often the low hanging fruit such as improving efficiency and waste, which can offer strong economic returns in addition to emissions reduction. Politically, “quick wins” are a powerful tool for gaining buy-in, funding, and resources for continued climate abatement work within an organization.

Danone Case Study

Empowering farmers to implement the abatement solutions that work best for them

Measurement

Over half of Danone's emissions are from agriculture (GWP100), so the company goes beyond the Scope 3 category of "purchased goods and services" to develop **farm-level data on specific sources of emissions within agriculture**. To do so, the company relies on **close, direct relationships with farmers** in their supplier network to gain their support in the data collection process. Some farmers conduct lifecycle analyses and share their data with Danone, and for those who do not, Danone uses the third-party Cool Farm Tool, an online calculator that helps farmers measure their emissions. For other companies measuring agricultural emissions, Danone recommends taking a similar approach of **starting at the farm level and working backwards** to the plants and other stages of the value chain.

Action

To reduce agricultural emissions from its supply chain, Danone focuses on **empowering farmers to select and implement the abatement solutions** that work best for them, rather than pushing a "banner project" with one solution across all farms. The company identified a set of regenerative agriculture practices that can be implemented on the farm and the presents them as a **menu of options for farmers to select from**. To make it attractive and easy for farmers to adopt these practices, **Danone offers a suite of four tools**:

- 1. Funding:** Farmers can apply to have a portion of the project paid for by Danone
- 2. Grant Support:** Danone streamlines the paperwork for USDA sustainability grant applications
- 3. Insights:** Danone offers analysis for farm-level data in the form of a consolidated report that farmers can share with creditors, buyers, and other stakeholders
- 4. ROI Calculator:** The tool combines academic insights with farm-specific data to help farmers estimate the long-term ROT of adopting different regenerative practices on their farm

Impact

Danone's farmer-led initiative is new, but the flexibility it offers farmers has already led to **better uptake than traditional projects** focused on implementing the same solution across all farms. The resulting impact on the company's Scope 3 emissions remains to be seen, but because there is such clear evidence linking adoption of regenerative practices to emissions reduction, Danone is **focusing on adoption for now to prepare for greater impact at scale down the road**.

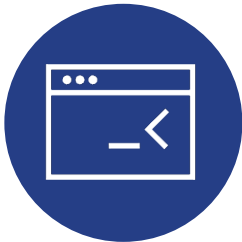


Having direct relationships with farmers is the base of all our agriculture abatement work. It allows us to give farmers the flexibility to select the solutions that work best for them.

Jennifer Simpson
Senior Director, Agriculture

Survey Results

A recent survey of companies involved in the [Transform to Net Zero](#) coalition asked business leaders about sector-specific abatement solutions that they have implemented or plan to implement; how they select abatement solutions; the biggest challenges and success factors for implementation; and the types of business value they've earned as a result of these efforts. Below are some of the key insights from this survey.



Sector: Technology

Historically, companies in this sector have the most experience executing renewable energy and equipment efficiency upgrades among industry-relevant abatement solutions.

Business models to reduce device energy consumption and encouraging suppliers to set science-based targets are two high priority emerging solutions among surveyed companies in this sector.



Sector: Transportation

Modal shifts, ZEV vehicles and sustainable biofuels are high future priorities for transportation companies, though few have executed them in the past.

Route and fleet optimization and fuel efficiency are the abatement solutions most frequently executed or planned for execution among surveyed companies.



Sector: Agriculture

Companies are prioritizing methane reduction through livestock-centric initiatives such as livestock feed mix and additives and manure management via anaerobic digestion which were the second and third most common abatement solutions in the sector (amongst surveyed companies, behind fertilizer application and timing).

Value Levers

Among the value levers in the net zero value lever map, license to operate risk was cited as the most common driver of realized and expected value for surveyed companies, followed by operational efficiency, customer loyalty and brand risk.

Evaluation Criteria

New revenue opportunities and potential for emissions reduction were the highest ranked criteria for abatement solution selection among surveyed companies, followed by reduced costs, reduced risks and potential for high intensity emissions reduction.

The Four-Step Funnel in Review

Organizations can follow a four-step funnel process to **Identify** a list of industry-specific abatement solutions, **Map** them to the largest emissions sources in the emissions profile, **Evaluate** the short list against selected criteria and **Prioritize** them for implementation. Using this process is critical to ensure companies can be successful at decarbonizing during this critical Decisive Decade. Figures 22 and 23 below show how a technology and transportation company, respectively, could implement the four-step process.

Figure 22.
Example technology company's completion of the four-step funnel process

1. Identify

Lead		Invest
<p>Scope 1</p> <ul style="list-style-type: none"> • Building retrofits • Equipment efficiency upgrades • Adjustments to temperature, ventilation, and lighting to reduce energy use, including building automation • Reduced demand for new buildings • Centralized data centers and facilities to optimize operations <p>Scope 2</p> <ul style="list-style-type: none"> • Switches to renewable energy • Low-carbon heating and cooling • Decommission of legacy networks 	<p>Scope 3</p> <ul style="list-style-type: none"> • Ensuring products and services are not enabling production and sales of fossil fuels or other destructive practices • New business models to decarbonize end-user device electricity consumption • Circular materials, products, and processes • Purchase of high-quality carbon credits • Encouraging suppliers to set science-based targets 	<ul style="list-style-type: none"> • New data center efficiency measures • Innovation in technologies and platforms that support carbon reduction across sectors • Partnerships with low-carbon construction capabilities • Technology for buildings to produce their own energy
		Advocate
		<ul style="list-style-type: none"> • Renewable energy incentives • Policies that support building retrofits and onsite renewable energy • Ongoing grid decarbonization • Incentives for efficient technology

2. Map

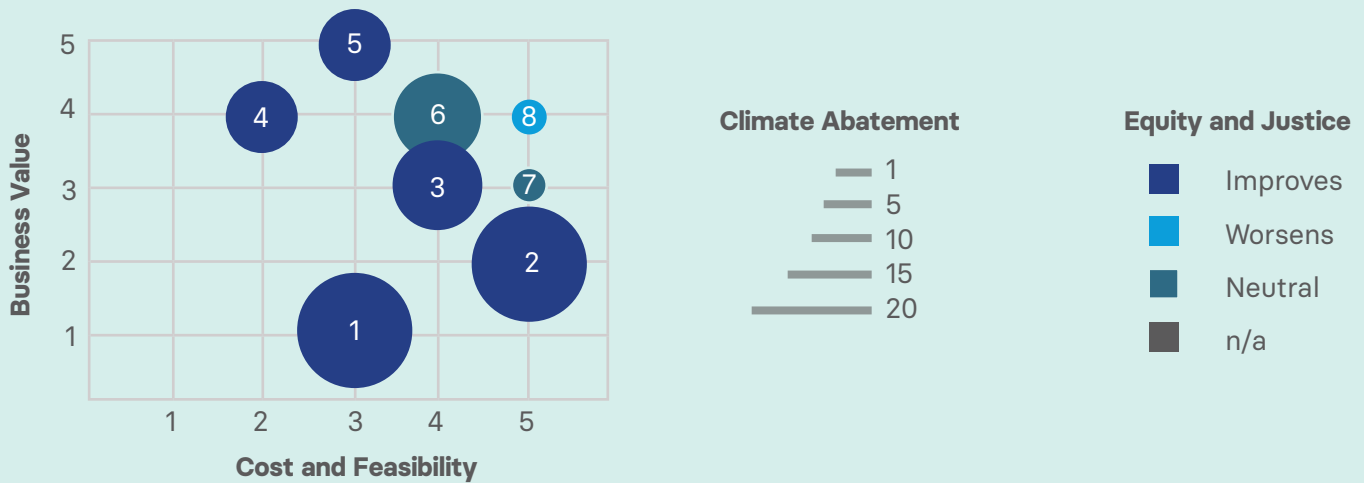
Emissions Driver	Mapped Abatement Solution Activities	
A. Use of sold products (Scope 3)	Lead (Scope 3)	<ul style="list-style-type: none"> • New business models to decarbonize end-user device electricity consumption • Ensuring technology is not enabling production and sales of fossil fuels
B. Purchased goods and services (Scope 3)	Lead (Scope 3)	<ul style="list-style-type: none"> • Encouraging suppliers to set science-based targets
	Lead (Scope 3)	<ul style="list-style-type: none"> • Developing emissions performance-based purchasing specifications for suppliers
	Invest	<ul style="list-style-type: none"> • Circular materials, products, and processes
C. Data center electricity (Scope 2)	Lead (Scope 1)	<ul style="list-style-type: none"> • Centralized data centers and facilities to optimize operations
	Lead (Scope 2)	<ul style="list-style-type: none"> • Switches to renewable energy • Decommission of legacy networks
	Invest	<ul style="list-style-type: none"> • Data center efficiency measures

3. Evaluate

Example Technology Company Abatement Solution Scorecard

Abatement Solution	1. Climate Abatement (1-5)	2. Business Value (1-5)	3. Cost and Feasibility (1-5)	4. Equity and Justice (I/W/N)
1. New business models to decarbonize end-user device electricity consumption	5	1	3	Improves
2. Ensuring technology is not enabling production and sales of fossil fuels	5	2	5	Improves
3. Encouraging suppliers to set science-based targets	4	3	4	Improves
4. Developing emissions performance-based purchasing specifications for suppliers	5	4	3	Improves
5. Circular materials, products, and processes	3	4	2	Improves
6. Data center efficiency measures	3	5	3	Neutral
7. Switches to renewable energy	4	4	4	Neutral
8. Centralized data centers and facilities to optimize operations	2	3	5	Worsens

Example Technology Company Abatement Solution Comparison



4. Prioritize

- 1 Prioritize new business models to decarbonize end-user device performance-based supplier purchasing, and renewable energy
- 2 Aim to implement three solutions by 2023 and two more by 2025
- 3 Start by centralizing data centers to optimize operations
- 4 Explore new business models to make end-user device decarbonization more profitable and equitable

Figure 23.

Example transportation company’s completion of the four-step funnel process

1. Identify

Transportation Industry Abatement Solution Set

Assets	ZEV cars, trucks, buses, subways, shipping, commuter rail, and charging networks Fuel efficiency Thermodynamic efficiency of new engines Aerodynamic parts and design Wind assistance (shipping)
Production	Use of recycled materials for production Due diligence on sustainable practices of suppliers R&D for more sustainable materials and production methods
Demand	Route and fleet optimization Mode shifts (air to rail, heavy road to rail and shipping) Load factors improvement (air) Consumer demand reduction
Fuels	Sustainable biofuels and biodiesel Synfuels Liquid hydrogen Ammonia (shipping)

2. Map

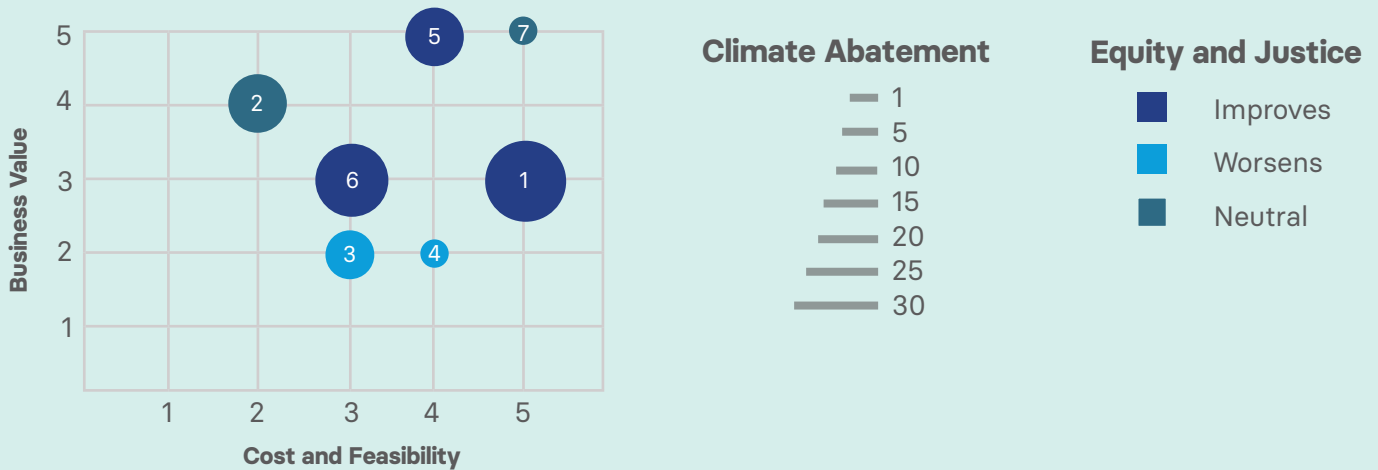
Emissions Driver	Example Automotive Company Mapped Abatement Solutions	
Use of sold products	Assets	<ul style="list-style-type: none"> ZEV cars, trucks, buses, subways, shipping, commuter rail, and charging networks Fuel efficiency Aerodynamic parts and design
	Demand	<ul style="list-style-type: none"> Consumer demand reduction
Purchased goods and services	Production	<ul style="list-style-type: none"> Use of recycled materials for production Due diligence on sustainable practices of suppliers R&D for more sustainable materials and production methods

3. Evaluate

Example Automotive Company Abatement Solution Scorecard

Abatement Solution	1. Climate Abatement	2. Business Value	3. Cost and Feasibility	4. Equity and Justice
1. ZEV cars, trucks, buses, subways, shipping, commuter rail, and charging networks	30	3	5	Improves
2. Fuel efficiency	20	4	2	Neutral
3. Aerodynamic parts and design	10	2	3	Worsens
4. Consumer demand reduction	5	2	4	Worsens
5. Use of recycled materials for production	30	5	4	Improves
6. Due diligence on sustainable practices of suppliers	20	3	3	Improves
7. R&D for more sustainable materials and production methods	5	5	5	Neutral

Example Technology Company Abatement Solution Comparison



4. Prioritize

- 1 Prioritize ZEV cars, recycled material for production, and due diligence on suppliers
- 2 Aim to implement three solutions by 2023 and two more by 2025
- 3 Start with ZEV cars and trucks in the near-term
- 4 Explore new business models to make consumer demand reduction profitable

Tyson Case Study

Partnering with the Department of Energy to host a training on energy-efficient refrigeration management practices

Measurement

When measuring its emissions, Tyson reports both the absolute totals as well as “intensity,” which is the emissions per pound of meat produced. For guidance on these types of reporting decisions, **Tyson hopes to see approved, sector-wide methodologies** for both calculations and public disclosure.

Action

Before asking its partners to reduce their emissions, Tyson wanted to start within its four walls and reduce its direct (Scope 1 and 2) emissions. Its emissions profile identified electricity as the source of roughly half of direct emissions, and **refrigeration as the source of 60% of electricity**, making refrigeration a top priority for abatement.

The company then **partnered with the Department of Energy** to have the government agency deliver its **free, two-hour training on efficient refrigeration management** practices through its Better Plants program. During the training, plant managers and mechanics learned best practices for maintaining and controlling refrigerators in an energy-efficient way. Following the training, participants were empowered to identify specific cost-saving opportunities at their plant through an **“energy treasure hunt”** and then used an **online calculator** to estimate potential cost savings and develop a reduction plan.

Impact

One year after the training was offered, Tyson's **overall energy consumption has declined by 1.9%** as a result of more efficient refrigeration practices, which adds up to a significant cost savings across their 150 US plants, particularly given the low cost of the program. The company's energy savings have been negatively impacted by COVID-19, so Tyson **expects to see even greater savings** down the road. To create the buy-in needed to achieve these savings, Tyson's sustainability team relied on **strong relationships with the operations team** and incorporated the program's goals into group president's **performance evaluations and bonus structures**, which helped to align incentives and gain buy-in.



We want to get out the quasi-regulatory space for emissions and see sector-wide standards for accounting and reporting methodologies.

Jamie Burr

Director of Sustainability
Implementation

Conclusion

Lessons from the field on how to accelerate along the net zero journey

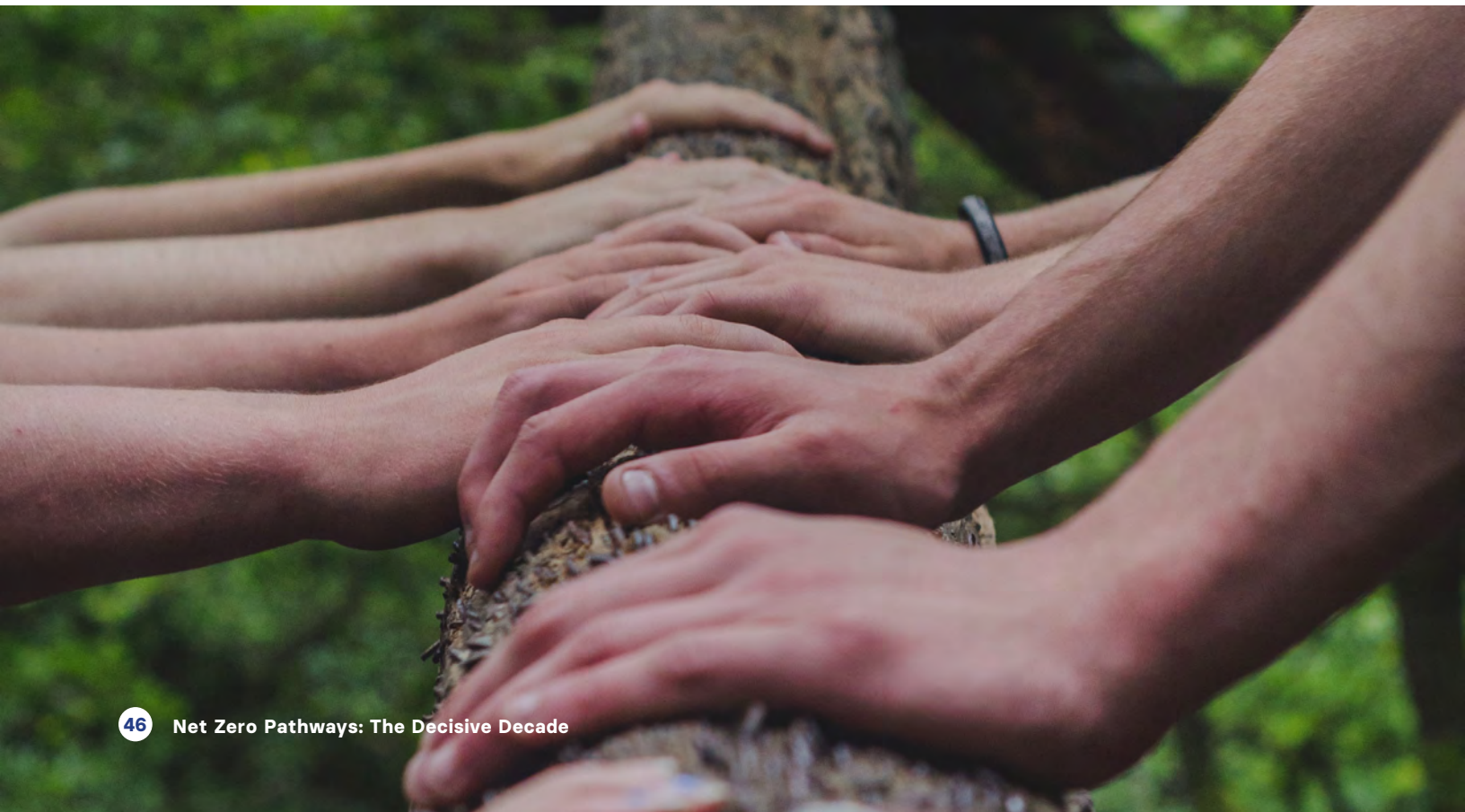
Amidst the wave of recent net zero commitments, the Conference of the Parties (COP) 26 meeting in Glasgow in November, and the approaching third year of the Decisive Decade for climate action, the importance of companies' ability to understand and abate their emissions has never been more urgent. Companies that follow the above framework to create an emissions profile with detailed subcategories and GHG types, identify relevant sets of abatement solutions to draw from and prioritize the highest impact near-term solutions for implementation will be well positioned to drive the climate action needed to help reach global net zero by 2050.

To accelerate the process, companies can look to peers within or outside of their industries to better understand leading best practices and learn from real-world examples. Microsoft, for example, uses an internal carbon tax to both generate funds for net zero projects and provide incentives for business group and product leaders to reduce their emissions. Walmart extends its renewable energy procurement process to its suppliers to help reduce its Scope 3 emissions. Danone

provides the farmers in its supplier network with a menu of regenerative agriculture practices to choose from and then offers a suite of tools to help them adopt the new methods. Tyson leverages a partnership with the Department of Energy to train its employees on energy-efficient refrigeration management practices. Leading climate scientists are clear that companies and governments must act urgently to avert the worst impacts of climate change. The steps outlined in this report are intended to be straightforward to accelerate the process and kickstart work now through the next decade.

Many of these strategies will require coordinated investments and advocacy that reach across the public, private and nonprofit sectors. Simply said, they require hard work. But there is no other alternative to create a stable climate, a thriving planet that supports people and nature, and an economy that is truly sustainable long into the future.

Companies that act now with a sense of immediacy will be best positioned to emerge as leaders in the Decisive Decade and beyond.



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