



GUIDELINE

Net Zero: A practical guide for cooling businesses

November 2024



About the guideline

This guide, developed in collaboration with industry stakeholders, builds on the *Cooling suppliers: A stocktake on the path to Net Zero Report, 2nd edition*¹. It aims to share experiences and examples of how cooling manufacturers have embarked upon their decarbonisation journeys. It provides advice and support to businesses early in their climate journey to understand how to embark on a Net Zero pathway and share knowledge and good practices to help overcome recognised barriers and material challenges to Net Zero outcomes.

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Who we are

Our mission is to accelerate the move to a decarbonised future.

We have been climate pioneers for more than 20 years, partnering with leading businesses, governments and financial institutions globally. From strategic planning and target setting to activation and communication, we are your expert guide to turning your climate ambition into impact.

We are one global network of 400 experts with offices in the UK, the Netherlands, Germany, South Africa, Singapore and Mexico. To date, we have helped set 200+ science-based targets and guided 3,000+ organisations in 70 countries on their route to Net Zero.

¹ [Cooling suppliers: A stocktake on the path to Net Zero | The Carbon Trust](#)



**The Carbon Trust's mission is to
accelerate the move to a decarbonised future.**

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Abbreviations

BAU	Business-as-usual
BVCM	Beyond value chain mitigation
CO₂e	CO2 equivalent
CSRD	Corporate Sustainability Reporting Directive
ESPR	Ecodesign for Sustainable Products Regulation
ESRS	European Sustainability Reporting Standards
GHG	Greenhouse gas
GWP	Global warming potential
HVAC	Heating, ventilation and air conditioning
IFRS	International financial reporting standards
IMP	Inventory management plan
ISSB	International Sustainability Standards Board
OEMs	Original equipment manufacturers
RGMs	Refrigerant gas manufacturers
R&D	Research and development
SBT	Science-based targets
SBTi	Science Based Targets initiative
SDGs	Sustainable development goals
SEC	Securities and Exchange Commission
TCFD	Task Force on Climate-Related Financial Disclosures
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

Audience

This guide is aimed primarily at the manufacturers and value chains of heating, ventilation and air conditioning (HVAC) systems, refrigeration systems (e.g. fridges), and the refrigerant gases used in these systems (e.g. hydrofluorocarbons). Throughout this guide, the term 'cooling businesses' is used to refer to both cooling original equipment manufacturers (OEMs) and refrigerant gas manufacturers (RGMs), unless otherwise stated.

OEMs: Cooling OEMs are businesses that manufacture HVAC or refrigeration systems wholly or supply the parts and components which are then integrated into other HVAC or refrigeration products.

RGMs: Cooling RGMs are businesses that manufacture specific chemicals to be used as refrigerant gases or foaming agents in HVAC or refrigeration systems.

Aims and objectives

The purpose of this guide is to share experiences and examples of how cooling businesses have embarked upon their decarbonisation journeys. It provides practical advice and support to cooling businesses early in their climate journey on the steps, actions and processes needed to achieve Net Zero, and shares best practices to help overcome recognised barriers and material challenges to achieving it.

Scope

The guideline focuses on addressing and providing solutions to the key challenges that cooling businesses are likely to encounter when embarking on their decarbonisation journeys. It starts by outlining the drivers to the rise in demand for cooling solutions and the benefits of cooling to the global population, then moves on to explore the importance of decarbonisation and its impacts on businesses, including opportunities and risks. The guideline then describes the levers that cooling businesses can utilise to reduce their greenhouse gas (GHG) emissions and provides insights into some of the regulations driving Net Zero action before exploring what Net Zero actually is and the approaches required to achieve it. The final two sections of the guideline focus on the main sources of GHG emissions for cooling businesses through a heatmap analysis and outline the seven steps that strategically guide decarbonisation efforts, i.e. the Net Zero decarbonisation pathway.

2. Context

Cooling is essential to health, prosperity and the environment

Cooling is a necessity in an increasingly warming world. The demand for cooling solutions is driven by population and household income growth, as well as temperature rise and the increased frequency and intensity of heatwaves. **Cooling solutions help protect people from rising temperatures, maintain food**

quality and safety, keep vaccines viable and promote economic productivity². Cooling supports the achievement of several United Nations sustainable development goals (SDGs), such as SDG 3, which seeks to ensure healthy lives and promote well-being for all at all ages³.

Cooling demand is increasing rapidly and needs to be addressed equitably and sustainably

The cooling industry accounted for about 7-10% of the global GHG^{4,5} emissions, equivalent to 4.1 GtCO₂e in 2022². If current cooling industry practices were maintained, GHG emissions from the cooling sector would more than double to 9 GtCO₂e by 2050 about two or three times the total 2050 carbon budget. This expected rise in cooling emissions is driven by the expansion of the global middle class, with more people adopting energy-intensive equipment such as air conditioners and refrigerators, together with typically poor leakage prevention of refrigerants with high global warming potential (GWP) and poor maintenance of equipment globally². Cooling is a key driver of increasing GHG emissions and a threat to achieving Net Zero by 2050. Early action could provide near-term benefits in reducing short-term climate pollutant refrigerant emissions. Early adoption of more efficient technologies, especially in long-lived commercial equipment that can be in use for decades, could provide long-term benefits in reducing GHG emissions from cooling.

Reducing load through passive cooling measures and improving energy efficiency will also decrease the electrical grid capacity needed to meet the growing demand for cooling. The cooling industry could make a significant impact by acting now to achieve Net Zero GHG emissions in cooling by 2050.

The cooling sector has a key role to play

To minimise the growth of GHG emissions from cooling, the sector must rapidly decarbonise its business operations, its value chains, and the products and services it offers. Many of the tools and techniques needed to decarbonise are available today, and the rewards of adopting them are significant for society and business⁶. Cooling businesses can deliver Net Zero cooling by 2050 by **offering their customers better cooling choices that are accessible, affordable and scalable**, including the reduction of cooling loads, e.g. through adoption of passive cooling strategies, more insulation, optimising superefficient cooling products and refrigerant selection to minimise GHG emissions and grid decarbonisation².

Cooling is important for human wellbeing, food security and economic output. However, conventional cooling methods pose a significant threat to the environment. Business-as-usual (BAU) practices could see GHG emissions from cooling more than double by 2050², jeopardising the ability to curb climate change and meet 2050 Net Zero targets. Finding sustainable cooling solutions and implementing them at speed and scale is paramount to achieving sustainable development goals.

² [Global Cooling Watch Report 2023](#)

³ [UNSDG - 3](#)

⁴ [Global Climate Action Yearbook - 2018](#)

⁵ [Cooling Emissions and Policy Synthesis Report - 2020](#)

⁶ [The Carbon Trust - What is Net Zero and Why Does it Matter?](#)

3. Decarbonisation impact on business activities

The Paris Agreement emphasises the urgent need to decarbonise all sectors, including cooling

Decarbonisation is a journey. It is the process of reducing GHG emissions from a business's operations, value chain, products and services. The Paris Agreement underpins the need and urgency for decarbonisation and sets out an international commitment to halt the increase in global average temperatures to well below 2°C and pursue efforts to limit the increase to 1.5°C⁷. Keeping warming to 1.5°C, rather than allowing temperatures to rise to 2°C, is estimated to reduce the number of people exposed to drought conditions by more than 60 million⁸ and reduce the financial cost of global climate damages by 25%⁶. It could also prevent critical climate 'tipping points'⁶ from being triggered. Aside from regulatory compliance, it is important to note that cooling sector businesses that decarbonise their operations and activities can achieve greater revenues, growth and enhanced reputation.

Focused action on business activities is essential for decarbonisation

Decarbonisation has become a key priority for governments, businesses and societies at large because of its important role in reducing the most harmful effects of global warming. Many governments and business leaders have set binding and non-binding targets and have made commitments to reduce GHG emissions by a given date. The internationally recognised Science Based Targets Initiative (SBTi) states that to 'contribute to societal Net Zero goals, companies must deeply reduce their emissions and neutralise the impact of any emissions that remain'⁹. Businesses are therefore encouraged to not only set Net Zero targets but to also explore the implications decarbonisation will have on their activities – specifically, the opportunities and risks, as described in Table 1.

⁷ [The Paris Agreement | UNFCCC](#)

⁸ [1.5°C vs. 2°C – a World of Difference - Science Based Targets Initiative](#)

⁹ [SBTi Corporate Net-Zero Standard V1.2 \(sciencebasedtargets.org\)](#)

Table 1 presents a non-exhaustive list of opportunities for cooling businesses, as well as the risks such businesses will need to be aware of when planning and/or carrying out decarbonisation activities.

Table 1: Decarbonisation impact on business activities¹⁰¹¹¹²

Opportunities	Risks
<p>1. Innovative products and services: Decarbonisation creates demand for new low-carbon technologies and solutions, opening doors for innovation and competitive advantage, which businesses can tap into.</p>	<p>1. Capital constraints: Initial cost of decarbonising may reduce the motivation to implement decarbonisation plans and react to climate events. This is especially true for smaller businesses.</p>
<p>2. Cost savings: The deployment of energy-efficient methods, adoption of clean energy and redesign of product life cycles leads to resource efficiency improvements and reduction in costs of operations.</p>	<p>2. Knowledge gaps: Limited knowledge of how to reduce carbon emissions may also pose compliance challenges, particularly with governments passing new laws to combat climate change. This could leave businesses unaware of new requirements or adaptation methods. In addition, the lack of appropriate skillsets may lead to businesses not taking advantage of decarbonisation opportunities.</p>
<p>3. New market opportunity: Decarbonisation offers businesses an opportunity for wealth creation and revenue augmentation. Decarbonising your business activities can improve brand reputation, attract investment, open new opportunities and even attract and retain talents.</p>	<p>3. Insufficient adoption of decarbonised technologies: The lack of regulatory mandate or voluntary adoption of new technologies to justify investment may hinder adoption.</p>
<p>4. Optimisation of business cost of capital: Decarbonisation reduces exposure to business risks that might arise from future GHG key events, such as GHG taxation or even climate change regulations. It can also provide opportunities to access green finance.</p>	<p>4. Difficulty in accessing low carbon solutions: Some businesses may face challenges in obtaining low-carbon or energy efficient technologies, materials, components and solutions due to geographical constraints or other factors. Due to existing infrastructure, some businesses may face additional difficulties in transitioning away from fossil-fuel based energy sources.</p>
<p>5. Decarbonisation offers businesses an opportunity for futureproofing: Decarbonisation not only enables businesses to attract investors and increase market share, but it also enables them to remain relevant in the light of new climate-related policies and regulations.</p>	<p>5. Uncertainty in regulations and policies: Uncertainty in regulations and policies on decarbonisation can pose a challenge for businesses to make long-term plans and prepare for any adjustments that may affect their operations.</p>

¹⁰ [Decarbonization: A Business Imperative for a Sustainable Future](#)

¹¹ [WTO - Small Business and Climate Change](#)

¹² [The Carbon Trust - A Guide to Net Zero for Businesses](#)

4. Levers to reduce GHG emissions along the cooling value chain

Good governance could deliver 96% GHG emissions reductions

Many potential solutions to reduce and mitigate cooling-related emissions will require government intervention, policy changes and implementation efforts. It is therefore essential for cooling businesses to collaborate with policy makers to drive these initiatives forward.

Broadly, global cooling emissions can be decarbonised by reducing cooling loads through measures, such as applying **passive cooling measures** (e.g. building orientation, insulation, natural shading and ventilation), achieving the lowest possible GHG footprint through selecting the **lowest GWP refrigerants for the application**, together with use of **highly energy efficient equipment** and rapid **grid decarbonisation**. The following actions could reduce emissions from cooling by 60%, around 5.9 billion tonnes of CO₂e emissions by 2050, compared with BAU²:

- Traditional cooling load reduction strategies and passive cooling implementation have the potential to slow the growth in demand for cooling capacity in 2050 by 24%, which will reduce CO₂e emissions by 1.3 billion tonnes by 2050.
- Minimum energy performance standards in conjunction with reduced cooling loads could deliver 30% of the required energy savings by 2050, despite a massive expected increase in cooling, while greatly reducing food loss and waste.
- The rapid uptake of lowest GWP technologies in all new equipment, together with enhanced refrigerant life-cycle management to prevent leakages and end-of-life emissions, could halve hydrofluorocarbon emissions in 2050.

The emission reductions grow to 96% when these actions are combined with rapid electricity grid decarbonisation².

Proven regulatory actions underpin GHG emissions reduction potential

Key areas of regulatory work to ensure emissions from the cooling sector are reduced and mitigated include:

- Minimum energy performance standards that incorporate the lowest climate footprint, including consideration of refrigerant emissions.
- Increased adoption and enforcement of building energy codes that support the uptake of cooling and heating equipment with the lowest climate footprint, including consideration of refrigerant emissions, and reduced cooling load.
- Increased use of energy efficiency programmes, focusing on utilities, and cost-effective interventions to mitigate refrigerant emissions.
- Encouraging the implementation of stronger regulations on leak prevention.
- Ensuring mandates for refrigerant recovery at end-of-life are required and enforced; investigate and address barriers to refrigerant recovery during servicing and/or disposal of equipment.
- Incorporating good refrigerant management practices into contractor and technician training programmes, including scheduling and recovery equipment.
- Training programmes to raise awareness about Net Zero cooling across the value chain.
- Consumer awareness campaigns to influence behavioural change.

Proven regulatory actions such as these are encouraged by the Global Cooling Pledge, endorsed by more than [70 countries](#), which targets a 68% reduction in cooling related emissions by 2050, relative to 2022

levels, a significant increase in access to sustainable cooling by 2030, and an increase in the global average efficiency of new air conditioners by 50% by 2030 at the latest, from a 2022 installed baseline¹³.

Each business in the cooling value chain can play its part by decarbonising

Key actions that each business can take include:

- Understand its GHG emissions and set a decarbonisation plan to reduce these to the greatest extent possible.
- Decarbonise business operations through resource and energy efficiency measures, switching to renewable energy sources and use of efficient supply practices.
- Manufacture products that are efficient by design, use the lowest GWP solution available for the application, use greener materials (e.g. recycled, recovered and/or renewably produced) and are easy to service and maintain.
- Reclaim and recycle used refrigerants from customers to prevent leakages and end-of-life emissions and manufacture low-GWP refrigerants.
- Cooperate with peers, value chain partners and customers to learn from and support them on their Net Zero decarbonisation journeys.
- Participate in regulatory reporting of decarbonisation data fairly and transparently.

Regulatory reporting on Net Zero action is used to track value chain decarbonisation progress

The regulatory landscape is also witnessing a global shift as countries across the world are beginning to mandate the disclosure of emissions data for larger businesses, including those in the cooling sector who meet the threshold. This means that many businesses may need to submit a mandatory emissions data disclosure, or that a larger client or supplier could request that a business provides key climate data so they can discharge their mandatory disclosure requirements.

- **Task Force on Climate-Related Financial Disclosures (TCFD)**¹⁴

The TCFD framework requires businesses to disclose their climate-related risks and opportunities. While not mandatory, TCFD encourages businesses to disclose Scope 3 emissions¹⁵. TCFD aligned reporting is already compulsory across the UK, with more countries and regions expected to follow, including the EU, Colombia and the US. Additionally, TCFD framework is being incorporated into International Financial Reporting Standards (IFRS) S1 and S2 standards¹⁶. Compliance with TCFD signifies compliance with IFRS S1 and S2 standards; therefore, businesses reporting to the IFRS S1 and S2 Standards will simultaneously comply with the TCFD framework. However, there are additional requirements within IFRS S2 which extend beyond the TCFD framework's original recommendations.

- **Corporate Sustainability Reporting Directive (CSRD)**¹⁷

The EU has announced it will bring sustainability reporting in line with financial reporting. The new CSRD framework phased rollout began in 2024 and requires businesses to be more detailed in their

¹³[Global Cooling Pledge - Cool Coalition](#)

¹⁴[Recommendations of the Task Force on Climate-Related Financial Disclosures](#)

¹⁵[See the Carbon Trust guideline on managing and reducing Scope 3 emissions](#)

¹⁶[Making the transition from TCFD to ISSB](#)

¹⁷[Official Journal of the European Union - Corporate sustainability reporting](#)

sustainability reporting. For environmental reporting, EU businesses should have footprinted their entire value chain (Scopes 1, 2 and 3) and have set (science-based) targets.

- **European Sustainability Reporting Standards (ESRS)¹⁸**

Companies subject to the CSRD will have to report according to ESRS. These take a 'double materiality' perspective, whereby companies are legally obliged under the Paris Agreement to report on how their activities impact people and the environment, and how social and environmental issues create financial risks and opportunities for the company. ESRS applies to any company with a significant presence in the EU.

- **Securities and Exchange Commission (SEC)¹⁹**

SEC has proposed a new climate-related risk disclosure rule. As part of this, registrants are required to disclose information about their direct GHG emissions (Scope 1) and indirect emissions from purchased electricity or other forms of energy (Scope 2). Any business with a 'material' value chain or with a Scope 3 target is required to disclose their emissions from upstream and downstream activities.

- **International Sustainability Standards Board (ISSB)²⁰**

In June 2023, the ISSB issued its inaugural IFRS Sustainability Disclosure Standards – IFRS S1 'General Requirements for Disclosure of Sustainability-related Financial Information' and IFRS S2 'Climate-related Disclosures'. These standards create a common language for disclosing the impact of climate-related risks and opportunities for a company in the short, medium and long term.

- **California SB 253²¹**

SB 253 applies to companies that do business (with an annual revenue over \$1 billion) in California and requires thousands of such companies to disclose their Scope 1, 2 and 3 GHG emissions. The first disclosures will be due in 2026; emissions disclosures will have to be independently verified and will be housed on a new publicly available digital registry administered by an organisation contracted by the California State Air Resources Board.

- **Ecodesign for Sustainable Products Regulation (ESPR)²²**

The ESPR, which came into force on 18 July 2024, is the cornerstone of the EU approach to more environmentally sustainable and circular products. It aims to significantly improve the circularity, energy performance and other environmental sustainability aspects of products placed on the EU market and will contribute towards helping the EU reach its environmental and climate goals, double its circularity rate of material use and achieve its energy efficiency targets by 2030. The ESPR builds upon the EcoDesign Requirements for Energy-Related Products, which has had significant positive climate impacts on EU and global cooling and refrigeration product markets.

¹⁸ [Official Journal of the European Union - European Sustainability Reporting Standards \(ESRS\)](#)

¹⁹ [SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors](#)

²⁰ [IFRS - ISSB Issues Inaugural Global Sustainability Disclosure Standards](#)

²¹ [California SB 253 and SB 261: A Guide for Companies](#)

²² [Ecodesign for Sustainable Products Regulation - European Commission \(europa.eu\)](#)

Understand these levers and deploy them as part of your business's decarbonisation plan

The governance, regulatory, business and reporting levers summarised above highlight the need for each cooling business to develop a multipronged decarbonisation strategy that seeks to utilise these levers impactfully. While decarbonisation might at first be assumed to be an 'inside the factory gate' challenge, the reality is that many of the barriers to action are common to many or all cooling businesses. For this reason, industry-wide knowledge-sharing and cooperation will increase the likelihood of success and drive down the cost of decarbonisation.

5. Decarbonising to Net Zero

What is Net Zero?

Net Zero is a target and the destination for a cooling business's decarbonisation journey. It is the point when the business's GHG emissions and GHG removals from the atmosphere are in balance. Specifically, it is the point when a business has maximised its own GHG emissions reductions to the greatest extent possible, leaving a small percentage of initial baselined GHG emissions²³. These remaining GHG emissions – those that are left after maximising uncontrollable (grid decarbonisation) and controllable decarbonisation levers – can then be offset through the use of GHG carbon removal credits⁹. For SBTi, achieving Net Zero means reducing GHG emissions across Scopes 1, 2 and 3 by at least 90%.

Why does my business need to reduce its emissions to about 10% of its baselined emissions? Why can't a business simply offset its emissions?

Put simply there is not enough 'verifiable' offset capacity available today, or which could be available by 2050, to permit all businesses to simply offset their GHG emissions. Global GHG emissions in 2050 need to be about 10% of today's emissions if we are to avoid the worst effects of climate change.

To maximise our chances of achieving Net Zero emissions, each business needs to take specific, strong actions to internally reduce its emissions from its new equipment and improve the operational efficiency of existing equipment in line with Net Zero targets. Delaying emissions reduction activities through near-term offsetting of its current emissions would create a need for ongoing tightening of the Net Zero target in the coming years, together with increased cost for climate action.

Net Zero is vital to limit global warming to 1.5°C and avoid the most catastrophic effects on the climate. Net Zero is not a passing trend. It is a crucial lever for driving urgently needed ambitious climate action. The widespread global adoption of Net Zero targets²⁴ – from countries to businesses – is part of a long-term shift to decarbonise economies in response to the climate emergency.

Climate scientists have modelled scenario decarbonisation pathways that would slow global warming and prevent the world average temperature increase from surpassing 1.5°C. The pathways that achieve this goal all have a common theme: halving emissions by 2030 without offsets and reaching Net Zero by 2050^{5 6}. It is therefore vital that Net Zero is achieved globally to stabilise temperature increase, and Net Zero targets must cover all United Nations Framework Convention on Climate Change (UNFCCC) GHG emissions.

Sources of a cooling business's GHG emissions

Before acting on Net Zero a cooling business must first identify the sources of its own GHG emissions. To support the identification of these sources a cooling business can use the GHG Protocol document, *A Corporate Accounting and Reporting Standard*²⁵, which outlines the identification of GHG emissions sources and the capture of emissions data. The protocol classifies GHG emissions into three Scopes.

²³ [Net-Zero Jargon Buster - a guide to common terms - Science Based Targets Initiative](#)

²⁴ [Climate Action Tracker](#)

²⁵ [The GHG Protocol - A Corporate Accounting and Reporting Standard](#)

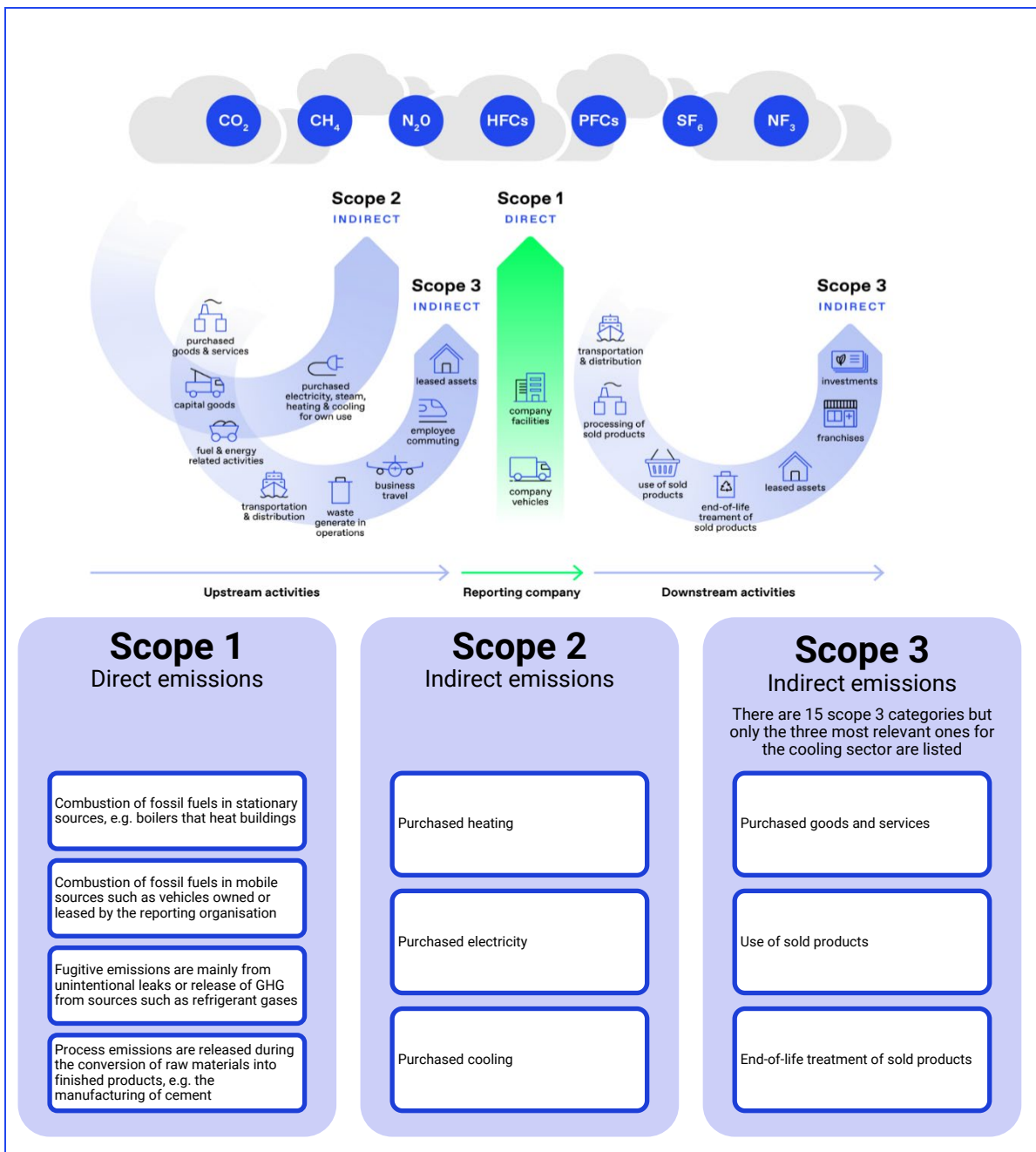


Figure 1: Overview of GHG Protocol Scopes and emissions across the value chain²⁵

GHG Protocol emissions categories

Scope 1: Direct emissions from activities within a business’s control. This includes onsite fuel combustion from buildings and company vehicles, as well as manufacturing and process emissions, and direct emissions from agriculture.

Scope 2: Indirect emissions from any electricity, heat or steam purchased and used by a business. By using energy, a business is indirectly responsible for the release of GHG emissions.

Scope 3: Any other indirect emissions from sources outside a business’s direct control. The GHG Protocol’s Scope 3 standard categorises emissions across 15 different categories, covering business activities common to many organisations, such as purchased goods and services, business travel and waste in operations. It also encompasses activities such as leased assets, transport and distribution, the use and disposal of sold products, and the impact of any investments.

How to achieve Net Zero

To reach a science-based Net Zero target by 2050, a cooling business will need to reduce GHG emissions by the greatest extent practicable and use high-quality carbon removal offsets to remove the small GHG emissions residual by 2050. Until 2030, a cooling business should focus on reducing GHG emissions without the use of offsets. This means the business will have to undertake ambitious transformation and decarbonise its operations, products, services and business models to produce minimal GHG emissions by 2050. To achieve Net Zero by 2050, the UNFCCC has called for a halving of GHG emissions by 2030, and the SBTi supports this call by guiding its members to set ambitious reduction targets for 2030 and 2050.

If Net Zero is to be achieved, each cooling business, its value chains and customers will have to rapidly decarbonise with significant progress in emissions reduction by 2030 and maximal emissions reductions by 2050, ideally earlier. The necessary steps are outlined in Figure 2⁹.

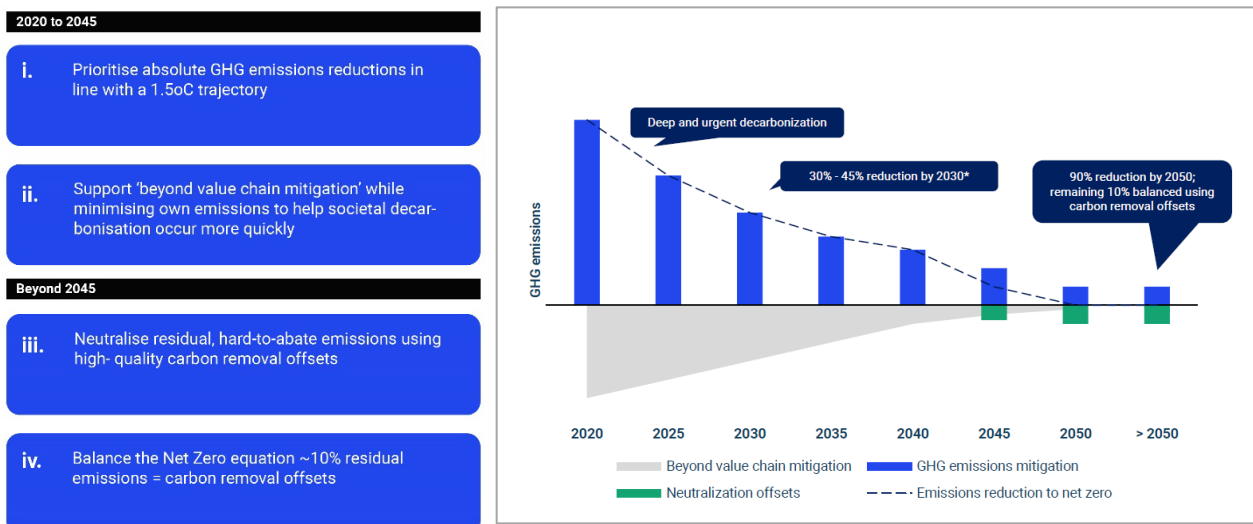


Figure 2: Steps to achieving Net Zero by 2050 as outlined by SBTi⁹

i. Prioritise absolute GHG emissions reduction (2020–2045)

Cooling businesses should prioritise GHG emissions reductions by undertaking deep and urgent decarbonisation activities through to 2045 and beyond. They should set near-term and long-term science-based targets (SBTs) to help achieve maximum emissions reduction by 2050. For SBTi compliance, the near-term SBTs should aim for a 30-45% emissions reduction by 2030 and long-term SBTs should aim to reduce emissions by 90% by 2050 in line with the science-based 1.5°C pathway.

Achieving a 90% reduction in GHG emissions by 2050 will require a cooling business to make significant business decisions that lead to emission reductions, such as:

- Maximise energy and resource efficiency in offices, buildings, manufacturing operations and services, and shift to electric vehicles and renewable power (e.g. onsite wind or solar power, power purchase agreements).
- Create new products that minimise energy and use of materials and are constructed with greener materials (e.g., green steel, recycled material, use of lowest GWP refrigerant for application).
- Offer alternative lower-emissions services (e.g. refrigerant reclaiming) and switch to green business models.

A combination of these actions would contribute significantly to reducing a cooling business's GHG emissions to a residual level consistent with reaching Net Zero emissions. Each business should also actively participate in the decarbonisation of their own value chain (Scope 3) and the markets in which they operate.

ii. Beyond Value Chain Mitigation (BVCM) after maximal emissions reductions (2020–2045)

A cooling business should focus primarily on decarbonising its internal operations, products, services and value chain in line with reaching its Net Zero targets for 2030 and 2050. That said, should it have the resources, it could go beyond these targets and make investments in mitigation activities outside its own value chains to contribute towards reaching societal Net Zero by exploring BVCM.

BVCM is defined in the SBTi Corporate Net-Zero Standard⁹ as: 'mitigation action or investments that fall outside a business's value chain, including activities that avoid or reduce societal GHG emissions, or remove and store GHGs from the atmosphere.' In one sense, BVCM seeks to 'crowd in' leadership and finance to facilitate the building of the infrastructure, regulations and markets that underpin future absolute removal of carbon emissions. For example, brewing company Carlsberg invests in Project Seagrass, which is seeking to expand use of seagrass as a coastal carbon store²⁶.

BVCM actions seek to support societal Net Zero progress by helping third parties to reduce or remove GHG emissions by taking responsibility for emissions which have not yet been abated. The SBTi recommends that a business delivers BVCM alongside, but not before, activities that reduce a business's own emissions. Efforts to deliver BVCM must not replace or delay corporate value chain decarbonisation in line with a 1.5°C pathway. Investments in BVCM cannot be accounted for as reductions in a business's own value chain emissions. Table 2 summarises some of the activities that qualify as BVCM actions.

²⁶ [Sustainability » Case stories » Planting Seeds of Hope by Restoring Seagrass in the UK « Carlsberg Group](#)

Type of action	Example of BVCM activities
Forestry	Jurisdictional REDD+ (afforestation)
Conservation projects	Peatland or mangrove restoration
Energy efficiency	Cookstove projects
Methane destruction	Landfill gas projects
Renewable energy	Solar, wind, biogas, etc.
Industrial gasses	N ₂ O destruction at nitric acid facilities
Scaling up CDR	Direct air capture and storage
Support and advocacy	Supporting research and development (R&D) for new climate solutions, or supporting organisations advocating for more ambitious climate policies

Table 2: Examples of activities that qualify as BVCM

Case study examples of BVCM

Milkywire – Climate Transformation Fund²⁷

Milkywire connects businesses with selected locally rooted non-profits to fund causes with full transparency and follow the impact the money has on their projects. Businesses can choose which projects they donate to. Milkywire enables businesses to engage their customers and employees in their environmental impact goals. This fund includes projects in permanent carbon removals, restoring and protecting nature and decarbonisation. It presents an alternative to traditional carbon offsetting solutions, which do not necessarily focus on finding the best solutions. Focusing on impact instead of fulfilling an offset claim opens the possibility to support solutions with the greatest long-term effects, wherever they may be.

iii. Neutralising any residual emissions (beyond 2045)

For most cooling businesses, residual emissions will likely remain after maximum efforts have been made to decarbonise. To reach Net Zero, these remaining emissions must be neutralised through the purchase of high-quality, verified carbon removal offsets generated by carbon offset removal projects. Carbon removal methods recommended by the IPCC can be grouped into three categories: biological, engineered and a hybrid of biological and engineered.

iv. Balancing Net Zero from 2050

After 2050, cooling businesses need to follow a strategy of balancing annual GHG emissions with an annual purchase of high-quality verified carbon removal offsets to sustain the Net Zero target.

²⁷ [Climate Transformation Fund - Milkywire](#)

What is the difference between carbon neutral and Net Zero

Net Zero and carbon neutral are similar, but distinct, concepts. Net Zero first requires maximal decarbonisation, approaching 90% of baselined GHG emissions. The remaining ~10% of emissions are then mitigated through carbon removal offsets. 'Carbon neutral' refers only to the counterbalancing of CO₂ emissions with carbon offsets without the need for emissions reductions to have taken place^{28, 6}.

According to SBTi²³²³:

'Although often used interchangeably with Net Zero, the two are not the same. In general, when companies claim carbon neutrality, they are counterbalancing CO₂ emissions with carbon offsets without necessarily having reduced emissions by an amount consistent with reaching Net Zero at the global or sector level. This may conceal the need for deeper emissions reductions that are in line with what the science requires for the world to keep global warming to 1.5°C. Carbon neutrality claims also do not necessarily cover non-CO₂ GHGs. The SBTi does not validate carbon neutrality claims.'

Carbon neutral can be a step in the journey to achieving Net Zero emissions goals by combining Scopes 1, 2, and 3 decarbonisation strategies with the approaches shown in Figure 2 and steps noted in Section 7. Carbon neutral has a minimum requirement to cover Scopes 1 and 2 emissions, with the optional addition of Scope 3 emissions. It refers to a specific product or service, instead of encompassing the value chain (Scope 3) of the entire organisation. Carbon neutral does not require the setting of specific long-term targets to reduce emissions and is not enough on its own to balance emissions and their removal from the atmosphere and stop, global warming from worsening.

²⁸ [Carbon-neutral vs. Net Zero: what's the difference?](#)

6. Typical sources of cooling businesses’ GHG emissions

Cooling businesses’ main sources of GHG emissions are in the value chain

The heatmaps presented in Figure 3 highlight typical Scope 1, 2 and 3 GHG emissions arising in OEM and RGM businesses²⁹. The main source of GHG emissions in these businesses are produced by the value chain (i.e. Scope 3).

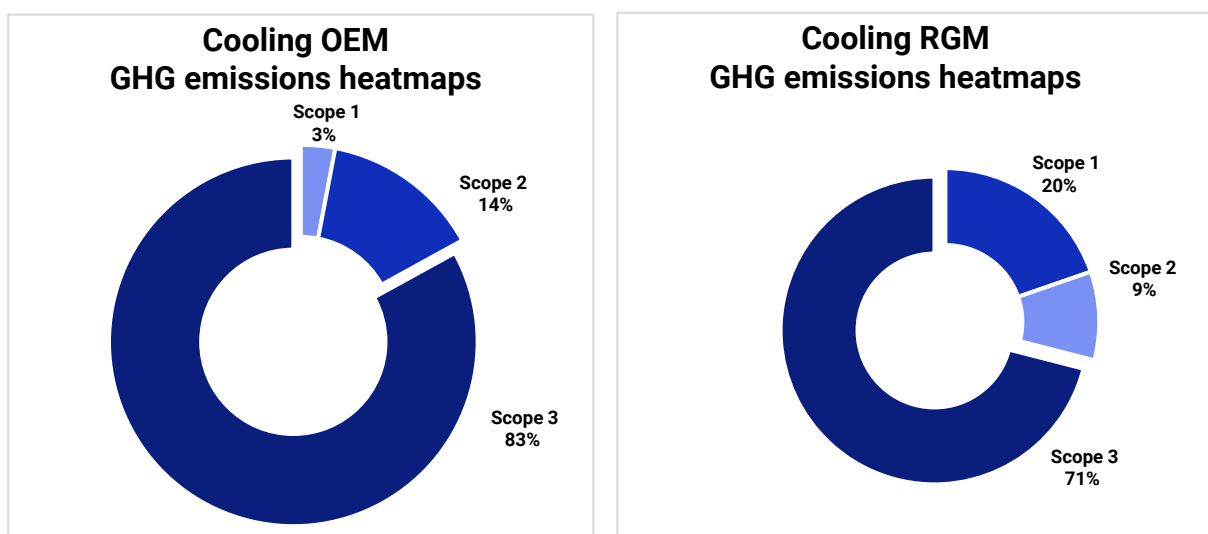


Figure 3: Cooling OEMs and RGMs heatmaps

These heatmaps represent the total percentage of GHG emissions of OEMs and RGMs broken down into Scope 1, 2 and 3 emissions.

The differences between Scope 1 and 2 positions in the OEM and RGM heatmaps reflects the energy and material intensities of the OEM and RGM underlying manufacturing operations. It is important to note that while the largest source of GHG emissions is the value chain, it is also the most difficult source of emissions to actively decarbonise as these emissions are often not under direct control of the business, at least in the short term. Guidance on the management of value chains emissions can be found in the Scope 3 Guide for Cooling Businesses¹⁵.

A cooling business that commits to achieve Net Zero decarbonisation will need to tackle Scope 1, 2 and 3 GHG emissions as part of its decarbonisation plan. Scope 1 and 2 emissions are easier to identify and manage and should be the focus for a cooling business that is less progressed in its decarbonisation to Net Zero journey. Tackling Scope 3 emissions is not a substitute for tackling Scope 1 and 2 emissions. One business’s Scopes 1 and 2 is another business’s Scope 3.

²⁹ [Analysis of 11 cooling OEMs and 9 RGMs 2023 sustainability, ESG and non-financial reports provided the data](#)

Tackling all three scopes simultaneously is exceptionally challenging. A business in the first or second year of its emission reduction journey typically starts by addressing Scope 1 and 2 emissions and then progresses to Scope 3. [See the Carbon Trust guide *Managing and reducing Scope 3 emissions for cooling businesses*]¹⁵.

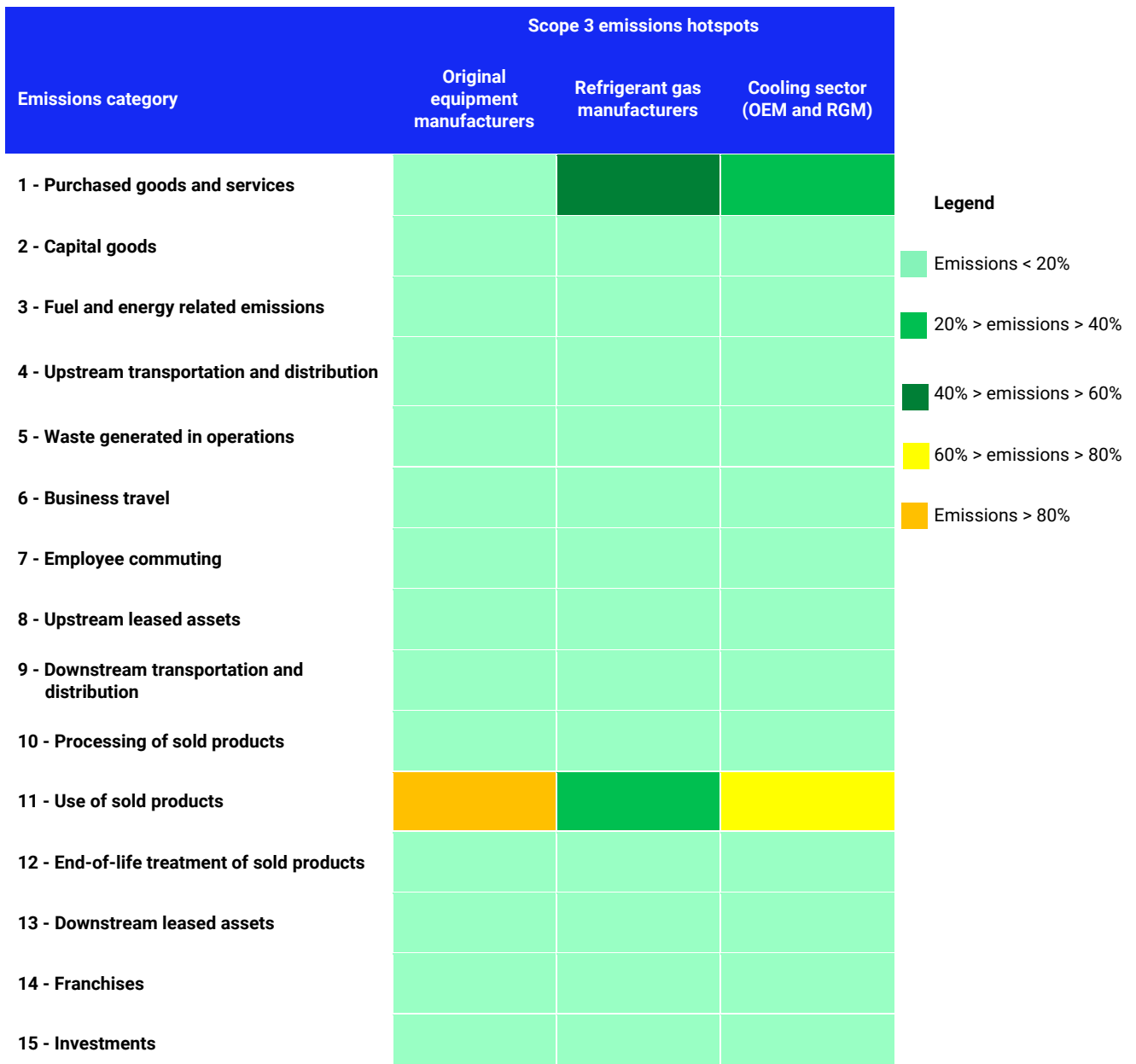


Table 3: Intensity GHG emission matrix of 15 Scope 3 categories for OEMs and RGMs²⁹.

Deeper analysis of Scope 3 GHG emissions by category highlights the emission hotspots for the cooling sector. Approximately 80% of Scope 3 GHG emissions arise from three categories. OEMs: GHG emissions hotspots are Use of Sold Products (>85%), Purchased Goods and Services (<12%) and End-of-life Treatment of Sold Products (2%). RGMs: GHG emissions hotspots are Purchased Goods and Services (44%) where the feedstock that goes into making

F-gases is the prominent contributor to category 1 emissions, Use of Sold Products (19%) and End-of-life Treatment of Sold Products (<14%).

The learnings from these heatmaps are likely to be helpful to a cooling business embarking on its decarbonisation to Net Zero journey. Each business should conduct its own GHG emissions inventory, for instance, through a stage-gate approach method. This approach guides businesses to pinpoint the categories or sectors on which it should focus its decarbonisation activities.

The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard³⁰ provides a step-by-step approach to help businesses understand their full value chain emissions impact. This enables them to focus action on the areas with the greatest GHG reduction opportunities as this will lead to more sustainable decisions about the business's activities and the products they buy, sell, and produce.

7. How to deliver decarbonisation to Net Zero

Cooling businesses seeking to decarbonise to Net Zero by 2050 require substantial investment in leadership time, as well as the sustainable financing to drive business transformation across the organisation, its infrastructure, products, services, value chains and customers.

Cooling businesses more progressed on decarbonising to Net Zero use processes such as the Net Zero Pathway (Figure 4), which consists of seven intertwined steps that strategically guide decarbonisation efforts. Before pursuing such a path, it is worth reaching out to, and learning from, customers, key suppliers, trade bodies and other stakeholders who may also be decarbonising. The steps outlined in the Net Zero Pathway should be explored with the knowledge of what decarbonisation efforts (e.g. Net Zero targets, regulatory requirements) customers and key suppliers are pursuing.

Decarbonising to Net Zero by 2050 can only succeed if it is treated as a collaborative group activity and not an individual business activity. While the business will have to radically change its products, services and manufacturing activities, much of this change can only happen if others in the value chain also decarbonise (e.g. by producing low carbon materials). Transformative change will happen when all businesses in the value chain are heading in the same direction.

³⁰ [GHG Protocol Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#)



Figure 4: The Net Zero Pathway

Planning

To develop a Net Zero pathway, it is essential that the steps and resources required are well understood and that any external factors that could influence a business’s decarbonisation pathway, such as policies, regulations and existing schemes to report and communicate emissions, are identified. This is because the implementation process will be determined by:

- Good quality, standardised data
- Robust data management processes
- Delivery team experience
- Enabling internal policies that will allow business models to evolve
- Understanding of the areas the organisation can influence and control
- Flexibility in the planning process; various unknowns and stakeholders in the value chain will influence timelines and outcomes
- Internal and external collaboration
- Effective communication

During the planning and implementation stages, it is important to consider the human and financial resources required to meet climate targets (in the short and long term) and manage climate-related risks,

as well as the implications the change will have on an organisation's business model while contributing to the economy-wide climate transition.

Understanding the impact decarbonising operations, products and services will have on business models will help shape internal policies and procedures; existing ones may not be aligned with a Net Zero ambition so will need to be reviewed and revised accordingly.

Net Zero Delivery Manager

Some tasks, such as **data collection and management, project identification and prioritisation, and value chain decarbonisation**, might require additional support

It can be useful to assign the role of a **Net Zero Delivery Manager** to coordinate and oversee delivery across the business, and report progress to senior leadership. They will lead on engaging with stakeholders and external consultants/contractors to develop Net Zero aligned projects to be approved by senior leadership.

While the Net Zero Delivery Manager's remit will typically be to drive and monitor the implementation of a strategy and action plan, ultimate responsibility for achieving Net Zero emissions remains with senior leadership. As a result, it is also a good idea to have a leadership team member with specific responsibility for Net Zero.

Common challenges

- **Resourcing the team**

It is essential to understand the tasks and challenges that implementing a Net Zero decarbonisation pathway will bring, as this will inform the skills requirements for the team. Businesses also need to consider the cost implications of transitioning to manufacture or sell high efficiency, low GWP cooling products and services. This will inform financial planning and help businesses understand the level of financial support they may need to transition.

Businesses may need to form a coalition to tackle access to finance barriers or join an existing group with a common goal of reducing access to finance barriers and other barriers that could prevent uptake of climate-friendly cooling solutions.

- **Organisation-wide buy-in**

Leadership buy-in is essential in the transition to Net Zero. To achieve this, senior leadership needs to take an active role and **empower decision-makers across the business** to implement a step-change in decarbonisation activity. It is also a good idea to have a leadership team member with specific responsibility for Net Zero. All parts of the business must be continuously engaged in Net Zero delivery to maintain decarbonisation momentum.

- **Sustainable finance models**

Financial planning for Net Zero decarbonisation is fundamental to a successful outcome. Implementing a sustainable financing framework to leverage instruments such as green loans, bonds and equities to fund decarbonisation projects is a proven solution. Careful planning is needed to ensure the necessary transparency in green financing process to deliver commercial benefits (e.g. lower weight average cost of capital).

Case study examples

Electrolux Group – using green financing to transform to a sustainable business³¹.

Electrolux Group has invested SEK 6.8bn in green assets via its Green Financing Framework. In 2022, Electrolux Group issued five Green Bonds, worth a total of SEK 5bn, with tenors of two to five years. It uses these funds to support projects in five eligible categories:

- Be climate neutral and drive clean and resource-efficient operations
- Lead in energy and resource-efficient solutions
- Offer circular products and business solutions
- Eliminate harmful materials
- Support the UN Sustainable Development Goals and Climate Goals

Green financing is used to achieve: a 20%+ improvement in the energy efficiency of transformed manufacturing operations (delivering expected annual emissions reductions of 11.8kt CO₂e); the development of new product lines with energy efficiencies that are 15%+ better than the average fleet of products being replaced, which are forecast to deliver 240,000 tonnes CO₂e (lifetime) reductions; and replacement of harmful hydrofluorocarbons (HFCs) with alternatives with a global warming potential of 15 CO₂e or less, which is expected to deliver emissions reductions of 2 million tonnes CO₂e each year

Trane Technologies internal carbon pricing³²

Trane Technologies uses an internal carbon shadow price to perform scenario assessments for climate transition planning. For example, for climate scenario assessment, Trane assesses the risk from potential exposure to regulations and taxation due to advances in environmental and carbon policies as a relevant risk for analysis. This may require Trane's products to meet certain requirements for emissions, potentially increasing manufacturing and associated reporting costs for select jurisdictions.

The price is determined based on the price/cost of voluntary carbon offset credits and benchmarking against peers. The objectives for implementing the internal carbon price are to drive energy efficiency and low-carbon investment. The pricing approach can either be uniform (spatial variance) or static (temporal variance) and the carbon price is USD16 per metric ton CO₂e. The business decision-making processes to which this internal carbon price applies are capital expenditure, production, R&D and opportunity management. As an emitter of GHGs and manufacturer of products that emit GHGs, using a shadow price supports Trane in establishing the risks of increased costs for operating across its large geographic footprint.

³¹ [Electrolux Green Financing Impact Report - 2022](#)

³² [Trane Technologies 2023 CDP Climate Change](#)

- **Coordination**

Making sure all departments and local offices are aligned on decarbonisation efforts can be challenging³³. Managerial and operational engagement are fundamentals to enable Net Zero transformation; therefore, maintaining engagement across the entire organisation and ensuring long-term commitment to Net Zero goals is essential to achieve decarbonisation targets.

Measure emissions

A business should establish its baseline GHG emissions by measuring its Scope 1, 2 and 3 emissions accurately. To do this, the business should establish an inventory management plan (IMP)³⁴ and make use of the Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard²⁵. The IMP should include sections on boundary conditions, emissions quantification, data sources, collection process, base year and auditing and verification. Once baseline emissions are known, businesses are encouraged to publicly acknowledge their contribution to global GHGs emissions and/or climate change and how they intend on reducing their GHG emissions going forward.

Key considerations when measuring emissions and collecting data

- Using data collection templates could provide a more homogenous way of gathering and displaying information, leading to fewer input errors.
- Creating tables to handle information, along with standard equations, should lead to easier error traceability.
- Keeping a list of the assumptions applied to your carbon footprint model or a file listing insightful information may help people not involved in its creation to understand the model, as well as act as a refresh point for current users.
- A centralised file where all information is distributed between tables may reduce time losses when searching for specific data as well as referral errors.

Common challenges

- **Data collection**

Gathering correct activity data from within the business's own operations, as well as its value chain, often presents logistical issues. Unclear responsibilities and a lack of knowledge about what information is required in advance tends to cause overall delays in this stage of the process and leads to low data quality collection.

It is important to remember that data collection is a journey. Standardising data collection by utilising templates or addressing/allocating the right resources to obtain accurate data are key steps that will help assess your business's carbon footprint. The iteration of calculating this carbon footprint over the years will allow for more precise input data year on year (see Figure 5).

³³ [Engie Impact - Bridging the gap between Net Zero optimism and operational reality](#)

³⁴ [Inventory Management Plan Guidance | US EPA](#)

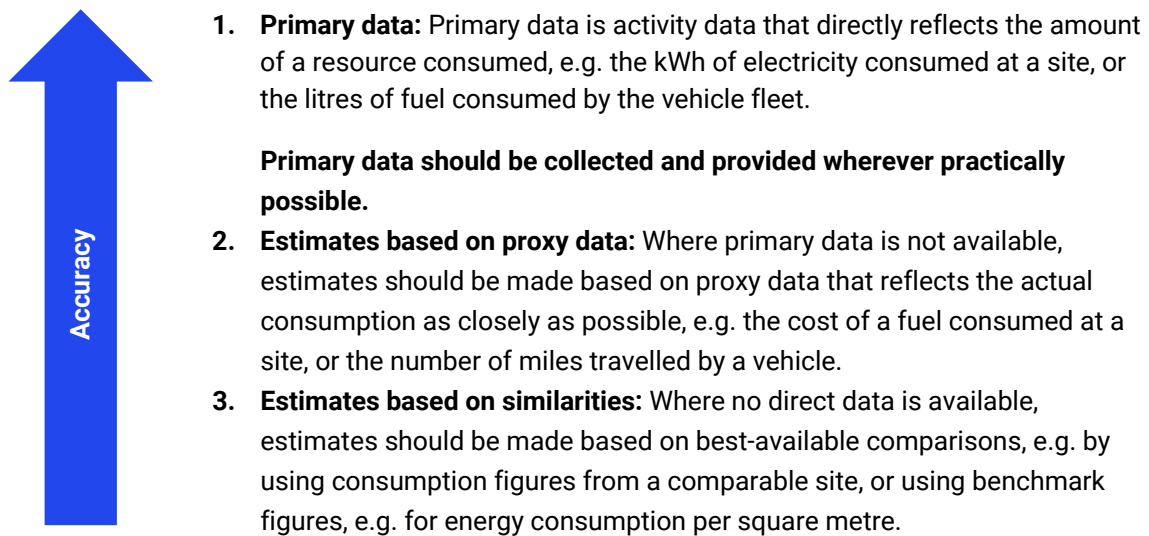


Figure 5: Data accuracy hierarchy

- **Consistent approach**

Low levels of standardisation when collecting data, particularly among businesses calculating their emissions for their first time, create errors. These are primarily inconsistent use of units and diverse assumptions applying to identical scenarios.

- **Correct methodology**

The most common methodology mistakes stem from using outdated, unrelated activity data, as well as not allocating emissions to their rightful scope and category.

It is important that cooling businesses account for previously unaccounted emissions. Businesses often simplify their GHG emissions accounting by using typical equipment emissions for a specific location. By using this more conservative approach, additional emissions prevention measures are often unaccounted for. Businesses could account for features such as load reductions (e.g. programmed thermostat) and solar panels providing alternative non-fossil fuel energy sources, which would better correlate with emission reduction technology installations.

Case study examples

Comparing the climate performance of the same type of aluminium product made at different sites³⁵

Norsk Hydro – US EV manufacturer aluminium pilot test

Pilot aluminium product-level GHG data reporting, following Rocky Mountain Institute (RMI)'s aluminium GHG emissions reporting guidance

Partners

RMI and leading aluminium supplier Norsk Hydro and a prominent US electric vehicle manufacturer (the buyer)

Challenge

A US electric vehicle manufacturer wants to accurately understand its upstream Scope 3 emissions so it can make informed business decisions for emissions reduction. The lack of comprehensive and reliable climate information of products is identified as a critical data reporting area.

Objective

Enable comparability of product climate performance: compare the climate performance of the same type of aluminium product from different sites to gain supply chain visibility at the asset level and develop an emission reduction plan.

Outcomes

- **Enhanced data accuracy:** Incentivised Norsk Hydro to use site- and supplier-specific data to achieve a higher ratio of primary data to emissions factors.
- **Transparency and climate performance:** The partners gained additional transparency regarding the climate performance of tested aluminium products. They specifically examined emissions calculation and data transfer for two extruded aluminium car parts produced at different sites: a front bumper from Norsk Hydro's Hungary site and a rear bumper from its Phoenix site.
- **Benefits and applications:** Leveraging RMI's recommended climate metrics, Norsk Hydro demonstrated its decarbonisation efforts at product level. **The standardised data exchange format** and aluminium guidance proved valuable for supplier and customer engagement, product design, sustainable procurement and overall decarbonisation strategy development.

Due to the varied production processes, the emissions of the two products were not directly comparable by an aggregated footprint value of the final product. The comparison was made possible by applying additional emissions data about each product's primary metal and precursor ingot, calculated with a fixed benchmarking boundary (using the aluminium guidance).

This collaborative pilot provided insights into aluminium product emissions and facilitated informed decision-making for emissions reduction in the electric vehicle industry.

³⁵ [RMI - Aluminium: Norsk Hydro - U.S. Electric Vehicle Manufacturer Aluminium Pilot Test](#)

Set targets

After measuring baseline GHGs emissions, the next step for a cooling business is to set science-based Net Zero targets. These are the level of permissible emissions that would be equitable for a business in the cooling sector at specific dates in the future, notably 2030, 2040 and 2050.

Businesses should set science-based Net Zero targets, covering Scopes 1, 2 and 3, in line with the Paris Agreement 1.5°C pathway. They should ensure that these Net Zero targets are set for the whole organisation – globally, regionally, divisionally, and departmentally – and that both interim targets for 2030 and long-term targets for 2050 are set. This ensures alignment with the Paris Agreement targets of halving global emissions by 2030 and achieving Net Zero by 2050⁷.

Setting science-based targets

For a business to demonstrate its commitment and ambition towards reducing emissions, it is essential to set science-based targets. The steps are:

- Commitment
- Target development
- Target submission
- Communicating targets
- Disclosing emissions

Setting realistic Net Zero targets is a key exercise as it is these targets that will inform the development of an ambitious decarbonisation pathway.

Common challenges

- **Timelines and lack of information**

Being unaware of timelines (e.g. SBTi timelines) and specific sector guidelines and requirements causes businesses to repeat stages in the target-setting cycle and risk having their targets unvalidated or unapproved.

It is vital for a business to set realistic growth plans and decarbonisation targets that won't impact on its ability to decarbonise its operations, products and services and reduce its environmental footprint. Setting overly ambitious growth plans might derail a business's decarbonisation plan, as more focus will be on achieving business targets. Therefore, as a business expands its operations, it should also ensure that it reduces its environmental footprint and resource use, according to its Net Zero targets.

Net Zero implementation strategy

After setting Net Zero targets, cooling businesses should identify their biggest potential decarbonisation impact levers, so they can select specific decarbonisation opportunities to pursue.

Businesses should create an implementation strategy that shows how they intend to achieve their Net Zero targets. This strategy should typically reduce the activities driving emissions, reduce the GHG intensity of those activities, or both.

Decarbonisation levers that cooling business can use to reduce their GHG emissions

- Switching to cleaner sources of energy (e.g. wind, solar power, energy-efficiency)
- Creating decarbonised products and services that minimise energy and materials use
- Using greener materials (e.g. green steel, recycled, lowest GWP refrigerant)
- Developing greener business models
- Working with customers and key suppliers

Prioritise decarbonisation levers based on:

- Impact (carbon savings potential, cost saving potential)
- Strategic value (new products or services, productivity or quality improvements)
- Feasibility
- Resources required, barriers, ownership
- Timescales/phasing
- Costs/value for money

The implementation strategy should guide the building blocks of a business's decarbonisation transition. It should cover tactical tasks, such as how to approach renewable energy procurement (e.g. contracting, installing assets) and how to phase out use of fossil fuels. Equally, it should answer strategic questions, such as to how redevelop products and services to transition away from high impact materials (e.g. high GWP refrigerants) and produce lower climate impacts (e.g. products with higher energy efficiency and use of low GWP refrigerants), and how to engage across the value chain to support industry wide decarbonisation.

Overall, developing a Net Zero implementation strategy means a business can set out its pathway to becoming a Net Zero organisation and the high-level steps required to achieve this goal. Typically, a Net Zero strategy will include the following:

- **Boundaries:** a description of the scope and boundaries of the strategy
- **Baseline:** a baseline carbon footprint and analysis of emissions hotspots
- **Planning:** an overview of planned carbon reduction initiatives and the enabling actions required
- **Pathway:** detail on how the strategic plan will be delivered, including: governance approach, resourcing, finance, monitoring and reporting and how to embed Net Zero across the business

The strategy should contain measurable targets and/or key performance indicators (e.g. renewable energy procurement target, fossil fuel phaseout target, amount and type of planned carbon dioxide reductions).

Common challenges

Developing a business's Net Zero strategy can be challenging, as this comprehensive process requires strong leadership, innovative financing, robust data management and continuous engagement with all stakeholders. Planning plays a vital role when taking action to decarbonise; poor planning will lead to further challenges when developing a Net Zero strategy.

Develop a decarbonisation pathway

Following the development of a Net Zero implementation strategy, a business should develop a decarbonisation pathway that outlines the cumulative impact of using multiple decarbonisation impact levers (i.e. identified reduction strategies) on its forecast emissions profile.

Developing the decarbonisation pathway will involve projecting BAU emissions that are likely to occur if nothing is done to change the status quo. The next step is to simulate different 'what-if' reduction scenarios to assess the effectiveness of identified decarbonisation impact levers. Simulations should be forward-looking and incorporate, at the very least, 2030 and 2050 outcomes.

Real projects or initiatives to implement effective decarbonisation impact levers identified during decarbonisation pathway analysis will need to be transformed into a **Net Zero action plan** that sets out the estimated investment required, energy, cost and carbon savings of each initiative.

The Net Zero action plan should consider the sequencing of initiatives and include a proposed implementation timetable between now and the Net Zero target date. It should also factor in current and future planned projects/programmes of work to ensure these are aligned.

Common challenges

- **Lack of information**

Lack of detail about main emissions sources creates unfeasible or unambitious decarbonisation pathways. Businesses are unclear about specific strategies and their applicability.

- **Unrealistic levers**

When defining decarbonisation levers to reach their targets, businesses tend to overestimate the readiness of current technologies and sometimes neglect its applicability across their diverse value chain.

Execution

All cooling businesses have their own unique management approach (e.g. project management, facilities management, operations management, product design, manufacturing, service and maintenance, supply chain management, etc). The actions outlined in the Net Zero action plan need to be executed using the business's existing management approaches; decarbonisation transformation must reach all parts of the business, and the outcomes of this transformation need to become part of its ongoing operations.

That said, in the earliest states of embedding decarbonisation activities effectively into the business management approach, short-term support steps might be needed. Such support is common to most business transformation activities (i.e. it is not unique to decarbonisation) and may include:

- Senior endorsement of the Net Zero implementation strategy and Net Zero action plan
- Reminding the organisation that decarbonisation isn't solely about reducing emissions; it's also about transforming the business to build 'Net Zero ready' products and services
- Regular and ongoing management and monitoring of progress
- Ensuring that Net Zero stays on the strategic agenda across the organisation, including with senior management and decision-makers
- An ability and willingness to make 'pivot strategies' when roadblocks or other challenges emerge
- Active communication and engagement with customers and the value chain, to ensure the right support is provided

Once a Net Zero action plan is being executed, quarterly reviews of the initiative pipeline should be conducted to ensure progress is maintained.

To achieve Net Zero, a robust yet dynamic organisational structure is essential. This ensures flexibility in the approaches being taken to both reduce emissions and transform the business to be ready for 2050.

Common challenges

- **Engaging the value chain/gathering support**

Considerable efforts and investments are often required to successfully engage a business's value chain along the decarbonisation journey. Unclear objectives, under-defined initiatives or overreaching approaches are the main issues encountered at this stage.

- **Collaboration across the sector**

As noted earlier, each individual cooling business¹ often has limited influence on its Scope 3 emissions (e.g. supply chains). However, a coordinated sector-wide approach with other cooling businesses could significantly strengthen market demand for low-carbon solutions, build capacity and action across the value chain and accelerate efforts to manage and reduce Scope 3.

Case study examples

The Kigali Cooling Efficiency Program (k-cep)³⁶

The K-CEP, established in 2017, is a collaboration between industry leaders, governments, development agencies and non-governmental organisations, who pledged USD52 million to increase the energy efficiency of cooling in developing countries and phase down the production and use of HFCs in favour of newer, climate-friendly refrigerants. This multi-stakeholder approach brings together expertise, resources and influence to drive change in cooling solutions in developing countries through the provision of financial support to international organisations, governments and the private sector. This support enables a scale-up of efficient clean cooling across four focused areas: institutional strengthening; policies, standards and programmes; financial mechanisms; and access to cooling solutions.

During the first four years (2017–2021), K-CEP supported: the proposal, adoption or implementation of 21 cooling appliance standards and labelling programmes around the world; the publication of nine National Cooling Plans; the development of three model regulation guidelines; the mobilisation of USD600 million in investment; and granted USD50 million to 54 partner organisations for projects in 57 countries.

The International Energy Agency (IEA) estimates that K-CEP's activities, primarily the development of cooling efficiency policies and plans, will prevent the emission of 4.2 gigatons of carbon dioxide (GtCO₂) by 2050.

Cool Coalition³⁷

The Cool Coalition has more than 140 partners driving change in the cooling sector. It is a global multi-stakeholder network that connects a wide range of key players from governments, cities, international organisations, businesses, finance, academia and civil society groups to facilitate knowledge exchange, advocacy and joint action towards a rapid global transition to efficient and climate-friendly cooling. The Cool Coalition has nine priority intervention areas, including increasing access to finance for sustainable cooling actions. It is supporting National Cooling Plans, Minimum Energy Performance Standards and labels, the scaling up of finance access, technology pilots, innovative products, district cooling, cooling-as-a-service agreements, nature-based solutions, cool and green roofs, cooling audits, and knowledge resources and services.

Report, validate, disclose, verify and communicating transparency

Transparently reporting, validating, disclosing and communicating emission reduction efforts and progress towards targets to external stakeholders is an essential component in any business's decarbonisation journey. **Transparent reporting and accountability help businesses to galvanise action and build support around their decarbonisation efforts.** Reporting involves providing transparent, regular updates to investors, board members, regulators, voluntary standards/bodies and other stakeholders about emissions, decarbonisation strategies and progress towards set targets.

³⁶ [SE4ALL - Chilling Prospects - Tracking Sustainable Cooling for All](#)

³⁷ [Overview - Cool Coalition](#)

Ideally, before such reporting is provided to stakeholders, a business should seek independent external verification/assurance of its Net Zero targets, GHG inventories, emissions data and transition plans, and endeavour that validated emissions data are published across all scopes including all Scope 3 categories. If possible, it should also publish historically validated emissions data alongside current data, to allow for comparison and to track progress against baseline.

Alongside the delivery of decarbonisation initiatives, GHG emissions performance (the impact of initiative delivery) must be monitored and reported to ensure decarbonisation progress is aligned with internal carbon budgets. A summary of performance against the carbon budgets can be incorporated into the annual GHG emissions reporting, along with commentary on the initiatives that have contributed to this and explanations of any variance from budgeted emissions.

Common challenges

- **Specific criteria for reporting**

Special efforts should be taken to be aware of specific sector and geographical reporting requirements; CSRD, ESRS and GHG are some in Europe, for example.

- **Disclose and communicate**

Being inconsistent, non-specific or unclear may cause issues with stakeholders and within your business value chain.

Summary

Decarbonisation is a growth driver

Decarbonisation is more than a compliance activity. As the world decarbonises, old cooling products and services will be replaced with new ones in a similar way to renewable energy products supplanting fossil fuels. Existing and new customers are implementing their decarbonisation activities and are seeking new cooling products and services that are decarbonised and 'Net Zero ready'.

Decarbonising the cooling value chain requires active industry-wide collaboration

Decarbonising the cooling value chain is beyond the resources of any one cooling business. Cooperation and collaboration are critical to the success of decarbonising the value chain because implementation of the most impactful decarbonisation levers requires industry consensus and agreement to succeed (e.g. refrigerant availability, life cycle management).

Deliver GHG emission reduction actions in line with 1.5°C by 2050

A cooling business should set near-term and long-term targets and focus on significantly reducing its emissions within its own inventory in line with 1.5°C aligned pathways, and then balance the residual emissions with carbon removal offsets. Actions to reducing GHG emissions include:

- Use cleaner sources of energy (e.g. wind, solar power, energy-efficiency)
- Create decarbonised products and services that minimise energy and materials use
- Use greener materials (e.g. green steel, recycled, lowest GWP refrigerant)
- Develop greener business models
- Work with customers and key suppliers

Emissions reduction focus should be on all three scopes

Scope 3 accounts for most of the cooling sector's GHG emissions, with category 11 – Use of sold products and category 1 – Purchased goods and services, accounting for most of these. Cooling businesses aiming to reach Net Zero need to commit to tackling Scopes 1 and 2 as part of their decarbonisation plan. Tackling all three scopes simultaneously is exceptionally challenging, so cooling businesses are encouraged to start by addressing Scope 1 and 2 emissions in the first or second year of their emission reduction journey and then progress to Scope 3 emissions.

Tools such as the Net-Zero decarbonisation pathway are there to support you

The Net Zero decarbonisation pathway consists of seven intertwined steps. Focus should be on executing a long-term decarbonisation strategy to remove GHG emissions from a business's operations and value chain, and on creating new decarbonised products and services. Emissions reporting should be validated, verified and transparently disclosed.

Embrace regulatory reporting to track progress on value chain decarbonisation

Cooling businesses should embrace regulatory reporting and produce informative decarbonisation reports that are validated, independently verified and transparently disclosed. It's also important to create a process to answer information requests made by customers and key suppliers who are making their own regulatory disclosures. Businesses should collaborate to reduce the regulatory reporting burden (e.g. agree common reporting standards for a cooling sector or sub-sector).

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