



HEAT NETWORK EFFICIENCY SCHEME



UK Government

TAIAN
Positive innovation

RAMBOLL

gleeds



HEAT NETWORK
EFFICIENCY SCHEME



HEAT NETWORK
EFFICIENCY SCHEME

HNES: Introduction to Carbon Emissions & Carbon Accounting



Agenda

Introduction and purpose of the session

Louise Singleton, Talan

Carbon Emissions – Scope 1 & 2

Lisa Hélesbeux, Talan

Measurement & Verification

Maja Radivojevic, Ramboll

Q&A



HEAT NETWORK
EFFICIENCY SCHEME



HEAT NETWORK
EFFICIENCY SCHEME

Introduction

Louise Singleton

Introduction

To meet our social value commitments through the HNES scheme, Talan and Ramboll have committed to support decarbonisation through the delivery of the HNES contract.

- One way is to provide applicants to the scheme (you) with information, advice and guidance on measuring and potentially reducing your carbon emissions.



Aims and objectives of the session

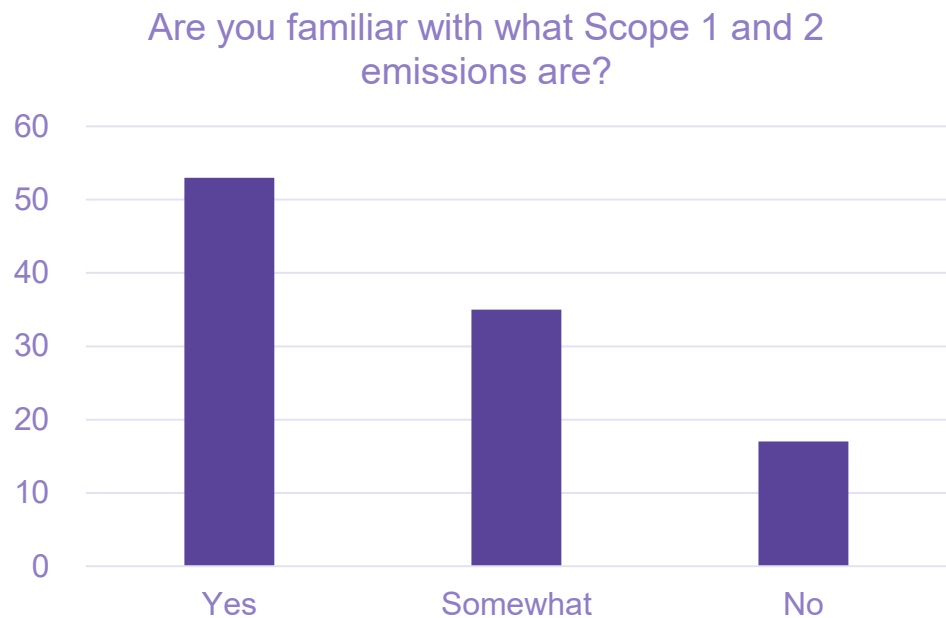
1. To support the objective of the HNES scheme to reduce the carbon impact of heat networks. To reduce carbon, you need to measure it!
2. To support the evidencing of carbon reduction achieved over time and through the HNES scheme.
3. To improve the carbon literacy of the heat networks supply chain

To note for the session:

- This session will be recorded
- Please keep your camera off unless speaking
 - Please keep your microphone muted
- Put questions in the Q&A section during the presentation



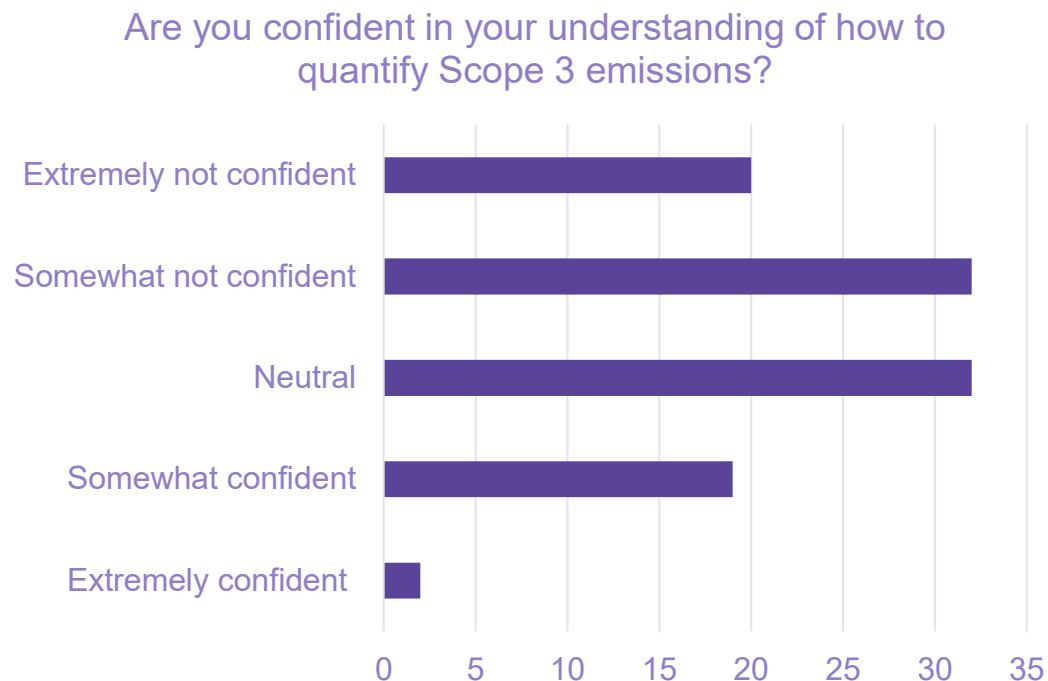
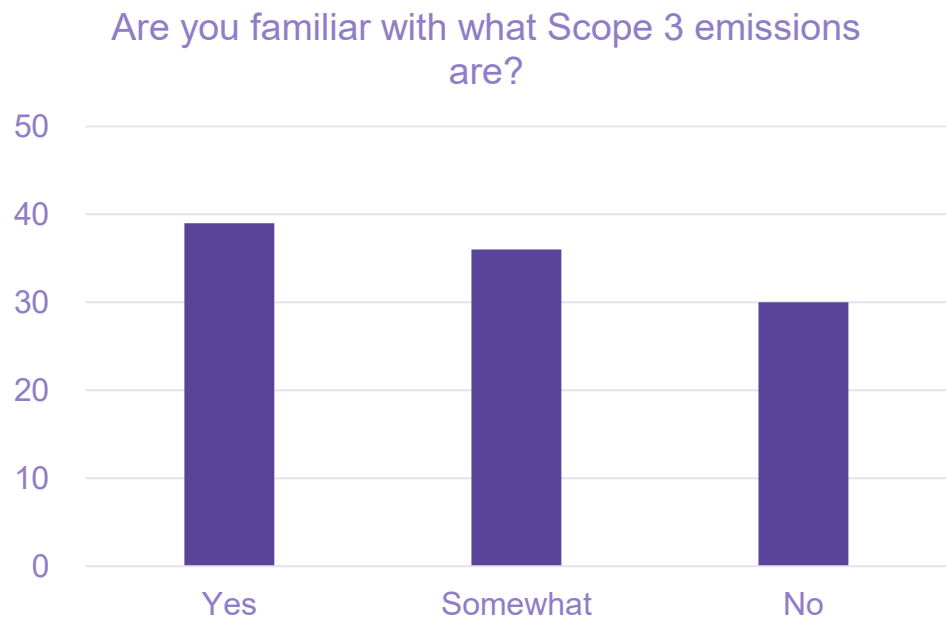
What you told us



- 50% of respondents were either 'somewhat' or not familiar with Scope 1 and 2 emissions, indicating a lack of confidence
- 65% of respondents answered between neutral – extremely not confident in their understanding of quantifying Scope 1 & 2 emissions



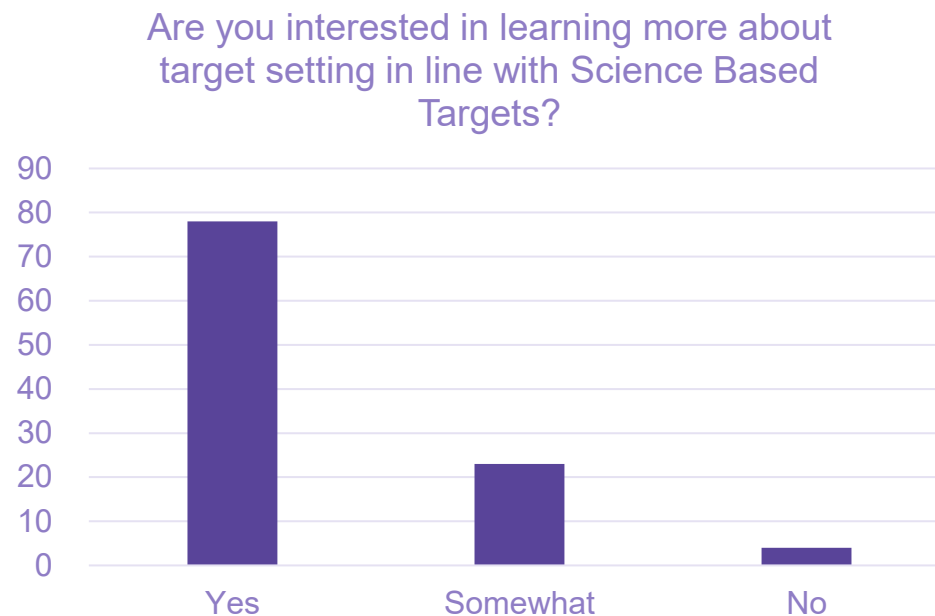
What you told us



- 63% of respondents were either 'somewhat' or not familiar with Scope 3 emissions, indicating a lack of confidence
- 80% of respondents answered between neutral – extremely not confident in their understanding of quantifying Scope 3 emissions



What you told us



- 74% of respondents selected 'Yes' to being interested in learning about target setting in line with Science Based Targets



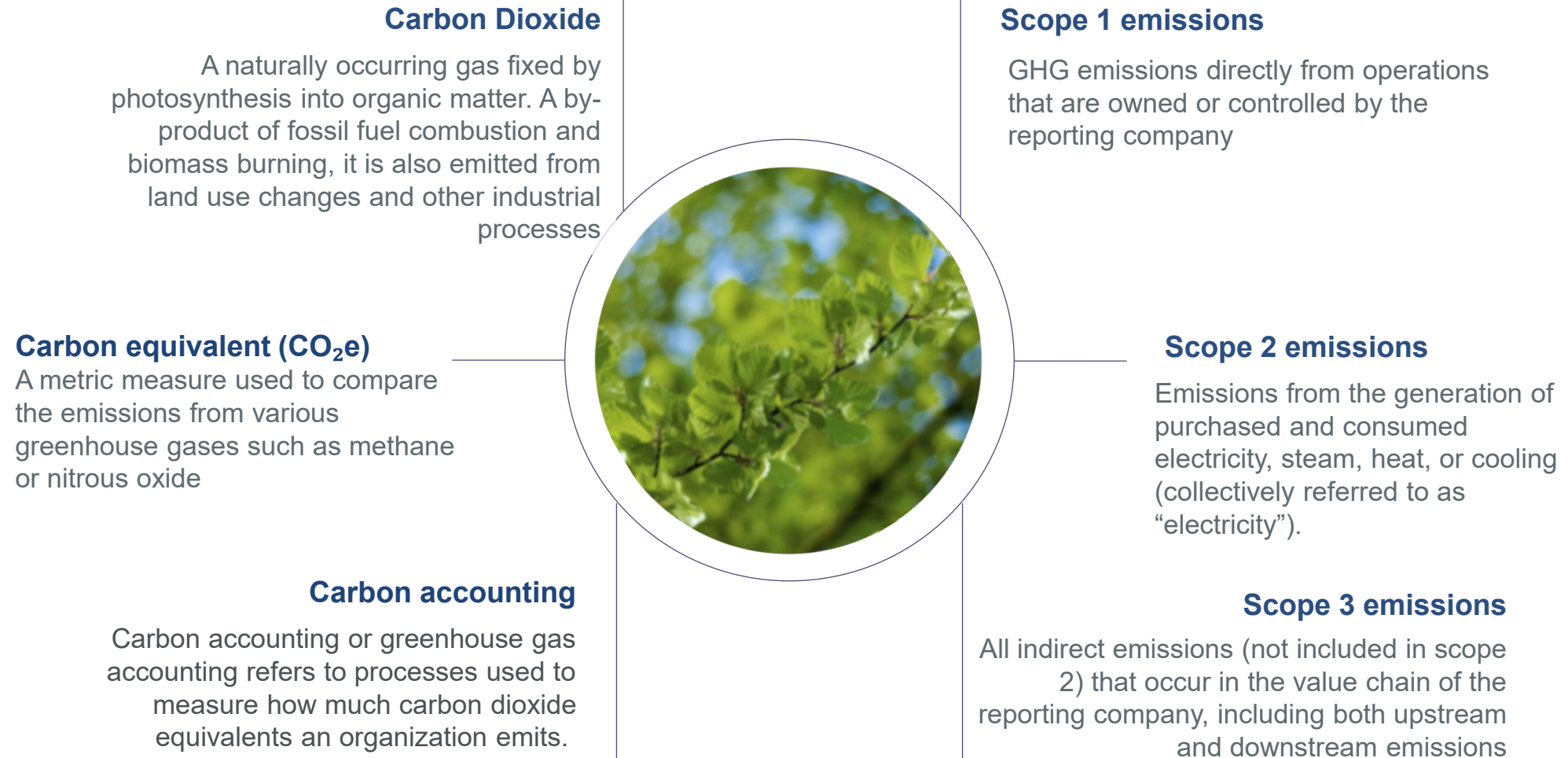


HEAT NETWORK
EFFICIENCY SCHEME

Carbon Emissions – Scope 1 & 2

Lisa Hélesbeux

Key Definitions

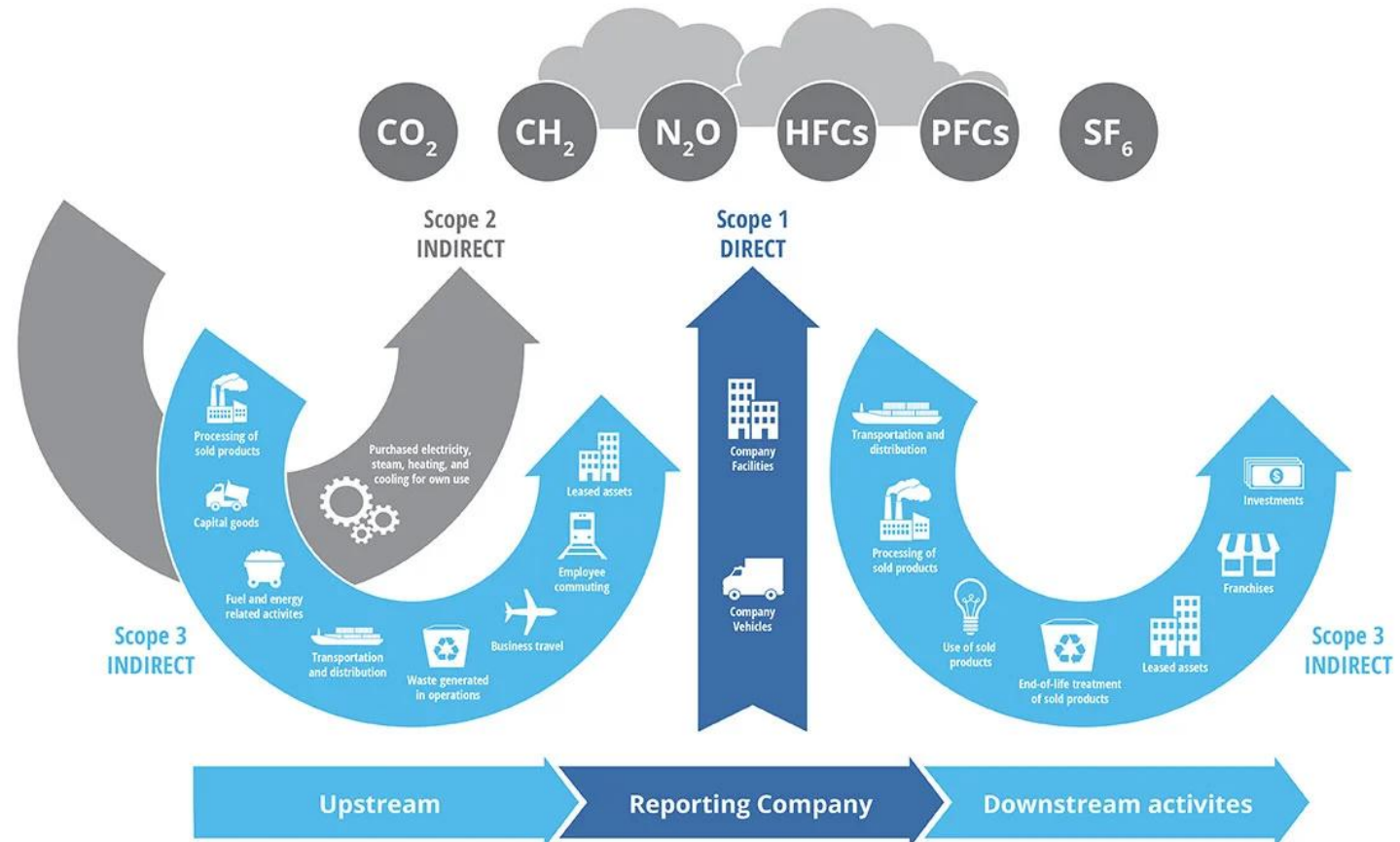


Scope 1, 2 and 3 Emissions

Scope 1 emissions are direct greenhouse (GHG) emissions that occur from fuel used in assets owned or controlled by an organisation i.e. for the purposes of HNES all gas boilers contribute to scope 1

Scope 2 emissions are those emissions which are indirectly associated with the organisation such as the purchase of electricity and heating/ cooling provision.

Scope 3 emissions are the upstream and downstream emissions of an organisation's value chain.



Additional Definitions

Greenhouse Gases	Greenhouse gases, such as carbon dioxide and methane, trap and hold heat in the atmosphere and contribute to climate change. Much of human activity emits greenhouse gases, such as burning fossil fuels for energy and transport, farming land for food production, and deforestation.
Carbon footprint	The measurement used to quantify the carbon impact associated with an activity, business, product etc.
Embodied carbon	The carbon that is emitted in the construction of a building, through manufacturing, transport, storage and construction related activities up to Practical Completion (PC). This should be inclusive of scope 1, 2 and 3 emissions.
Operational carbon	The carbon that is emitted during the in-use operation of a building or asset. This should be inclusive of scope 1, 2 and 3 emissions. This should be subject to on-going monitoring and annual reporting as a minimum, to allow for offsetting.
Whole Life Carbon	Whole Life Carbon assessment (sometimes referred to as Life Cycle Assessment or LCA) describes the combined impacts of both operational and embodied emissions over a building's entire lifecycle and its ultimate disposal. Similar to Whole Life Cost, Whole Life Carbon should be managed and assessed to minimise overall carbon emissions over a building's entire life cycle and therefore support decision making to maximise carbon saving measures during design and construction phases.
Offsetting / Carbon offsetting	The process of investing in schemes that sequester (or absorb) CO ₂ (or CO ₂ e) from the atmosphere. In theory, this allows for the balance or offset of the emissions calculated with the natural sequestration.
Carbon Neutral / Carbon Neutrality	Balancing the carbon dioxide (equivalent - all GHGs) that is released into the atmosphere through everyday activities with the amount that is absorbed or removed from the atmosphere.
Net Zero Carbon (NZC)	This requires consideration of Scope 1, 2 and 3 emissions. These are supported with a proactive and positive set of actions to minimise emissions before then looking to offset the remaining emissions.
Carbon Negative	This means you have a quantifiable positive carbon impact - your offsetting and other positive impacts are greater than the negative impacts.
Zero Carbon	Zero carbon describes something (process, product, business) with no carbon impact and does not require reduction/offsetting. This is a rare status.

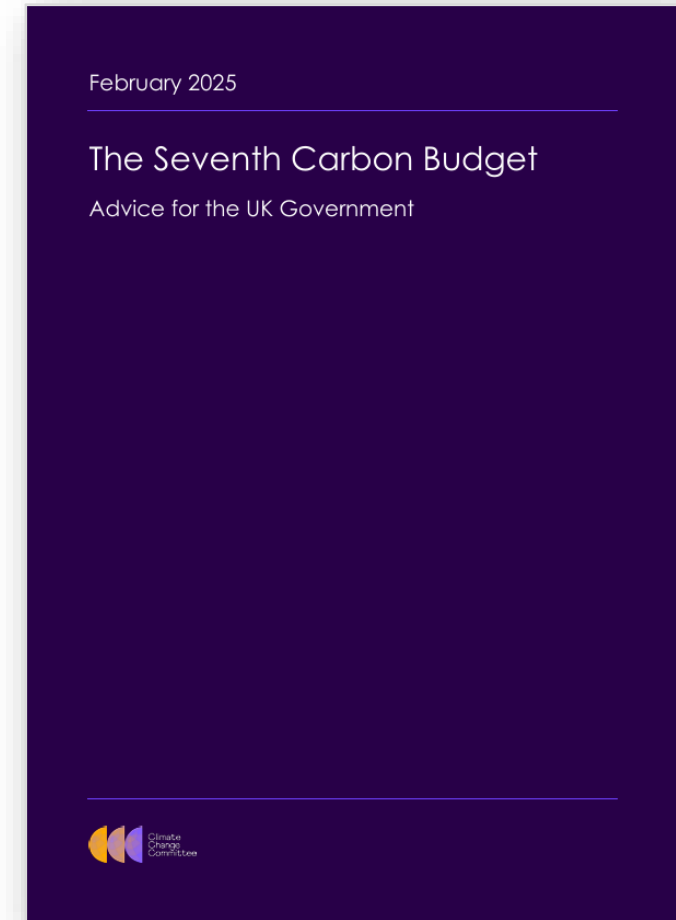


UK Climate Change Targets

- The UK government is committed to achieving **net zero by 2050** and delivering a **clean power system by 2030**, although further action is required to remain on track with future carbon budgets.
- The Seventh Carbon Budget requires UK greenhouse gas emissions to be **reduced by around 87%** compared with 1990 levels over the 2038-2042 period.

Other environmental targets include...

- Halt the decline in species populations by 2030, and then increase populations by at least 10% to exceed current levels by 2042
- Restore precious water bodies to their natural state by cracking down on harmful pollution from sewers and abandoned mines and improving water usage in households
- Deliver our net zero ambitions and boost nature recovery by increasing tree and woodland cover to 16.5% of total land area in England by 2050
- Halve the waste per person that is sent to residual treatment by 2042
- Cut exposure to the most harmful air pollutant to human health – PM2.5
- Restore 70% of designated features in our Marine Protected Areas to a favourable condition by 2042, with the rest in a recovering condition.



UK Grid emissions trajectory

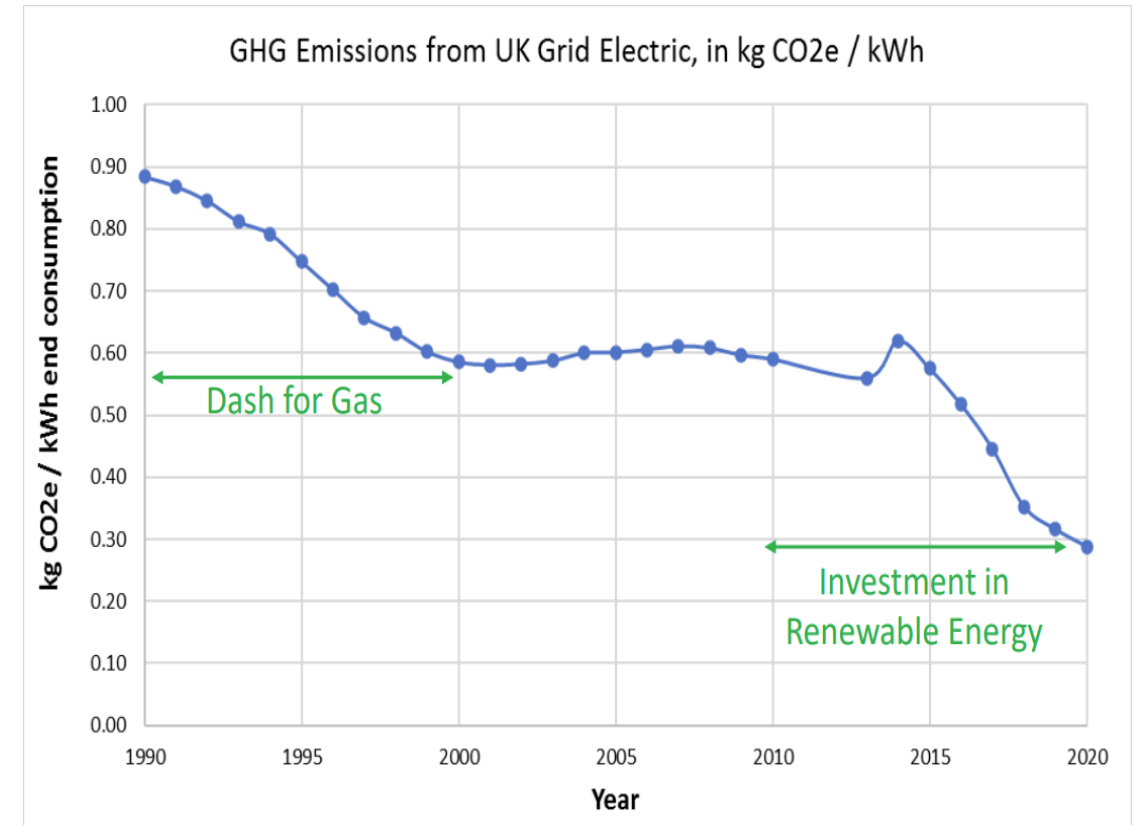
Significant progress has been made to reduce carbon intensity of the UK's grid electricity.

Reduced by 67% since 1990 due to two main reasons:

- 'Dash for gas' in 1990's (less coal fired power stations)
- Five-fold increase in renewable energy production since 2010: on & off shore wind, solar PV, and biomass. For the first time, renewable technologies accounted for a majority (50.4%) of UK electricity generation in 2024.

In amount of renewable generation feeding the grid is set increase out to 2050 and beyond. With the expectation that electrification and further deployment of renewables will allow the grid to become Net Zero within the next few decades.

The future of the UK gas grid and its carbon intensity is less certain with no official figures published on the projected decarbonization of the gas grid. This could be achieved through increases in biofuel use or through high deployment rates of hydrogen.



Green House Gas Protocol

The Green House Gas (GHG) Protocol is the world's most widely used greenhouse gas accounting standard. It provides a framework for businesses, governments and other bodies to measure and report GHG emissions to support their environmental goals.

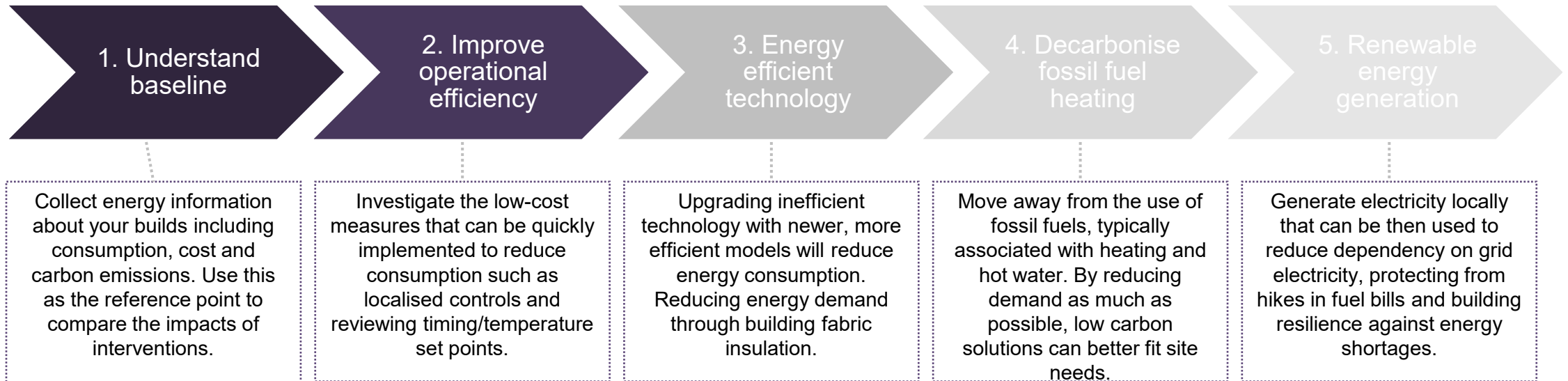
- The GHG Protocol ensures consistency and transparency in GHG accounting and reporting.
- The GHGs include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), which are emitted during the combustion of fuels.
- The Protocol requires that CO₂ emissions from biomass combustion (non-fossil fuels) are tracked separately from fossil CO₂ emissions.

There are two main methods for estimating GHG emissions from stationary combustion sources:

1. Direct measurement: performed through the use of a Continuous Emissions Monitoring System (CEMS). This involves the continuous measurement of pollutants emitted into the atmosphere in exhaust gases from combustion or industrial processes
2. Analysis of fuel input: a mass balance approach in which carbon content factors are applied to fuel input to determine emissions. This involves determining a carbon content of fuel combusted using either fuel-specific information or default emission factors, and applying that carbon content to the amount of fuel burned to quantify CO₂ emissions.



Whole building approach



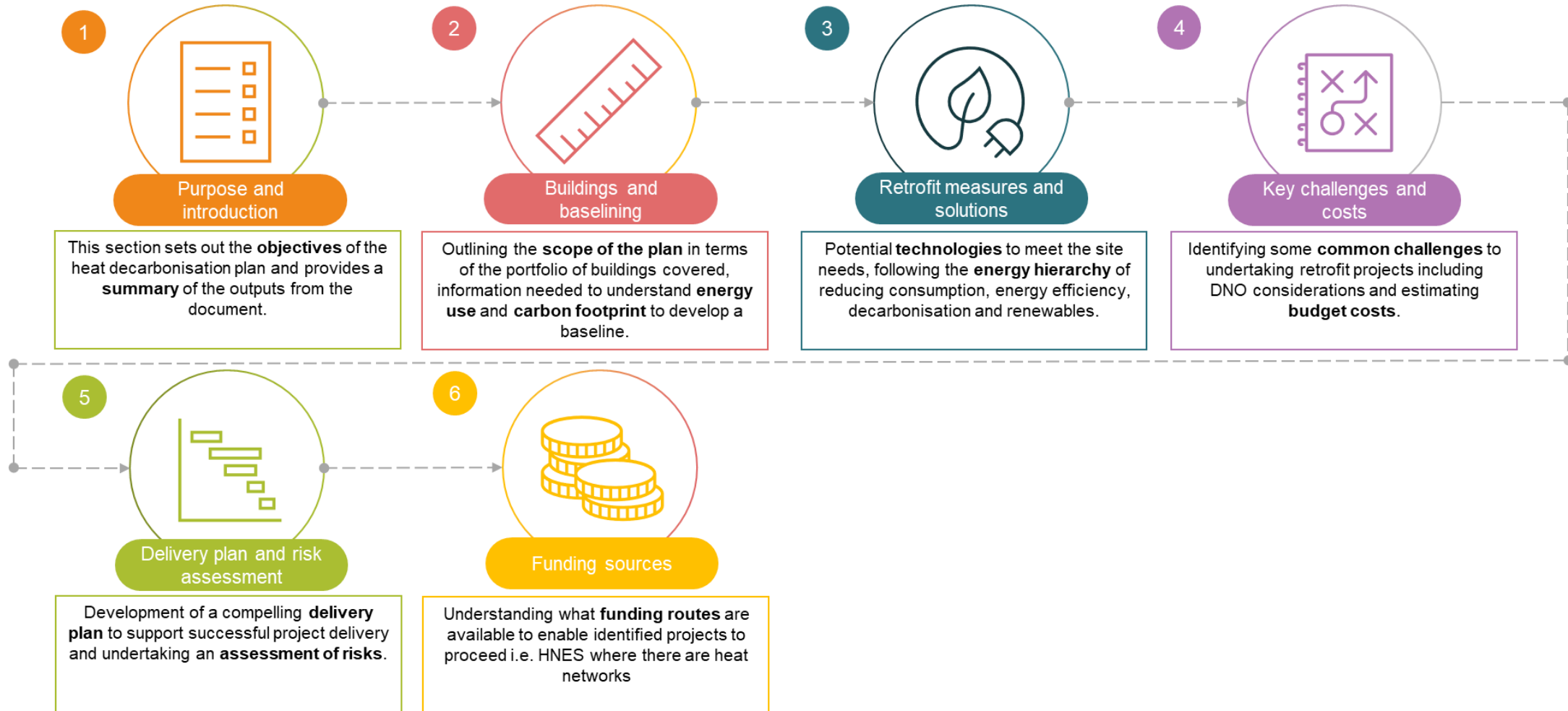
The whole building approach follows the logic of reducing energy demand as much as possible before moving to cleaner sources of fuel, before finally offsetting consumption with renewables.

It also helps a site plan a pragmatic journey towards net zero emissions.

Each of the heat decarbonisation plans are structured using this approach.



Delivering best practice decarbonisation plans



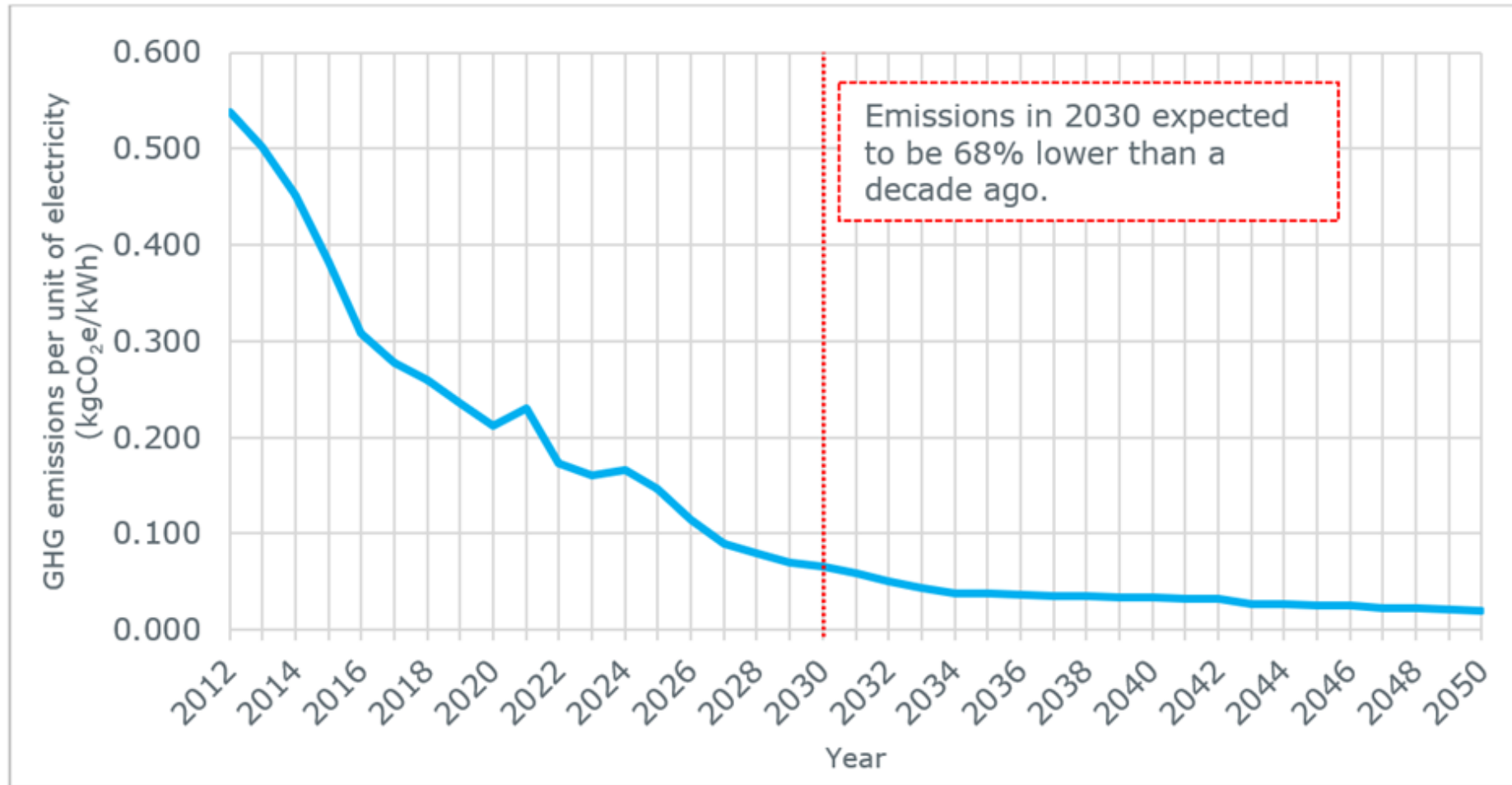


HEAT NETWORK
EFFICIENCY SCHEME

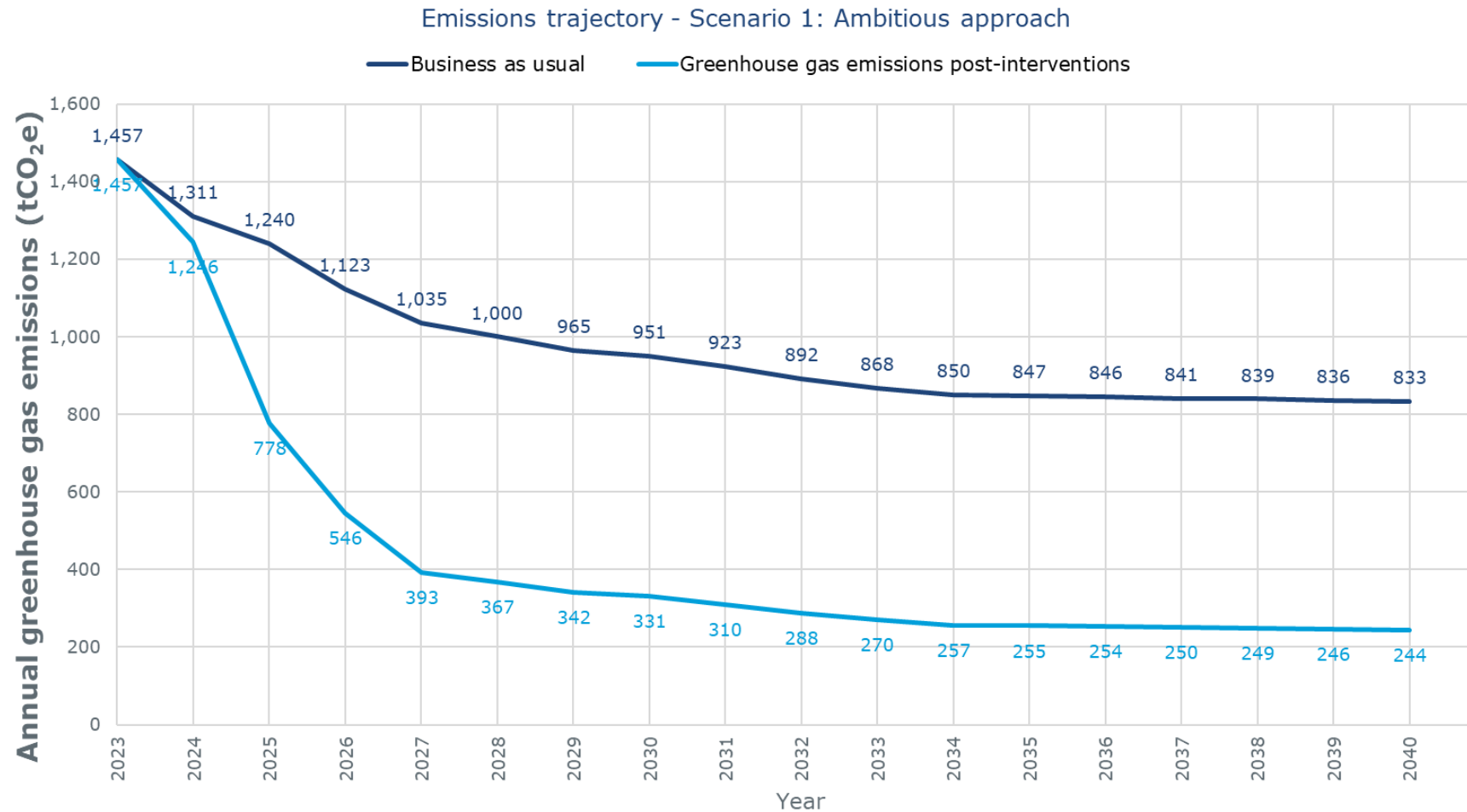
Measurement & Verification

Maja Radivojevic

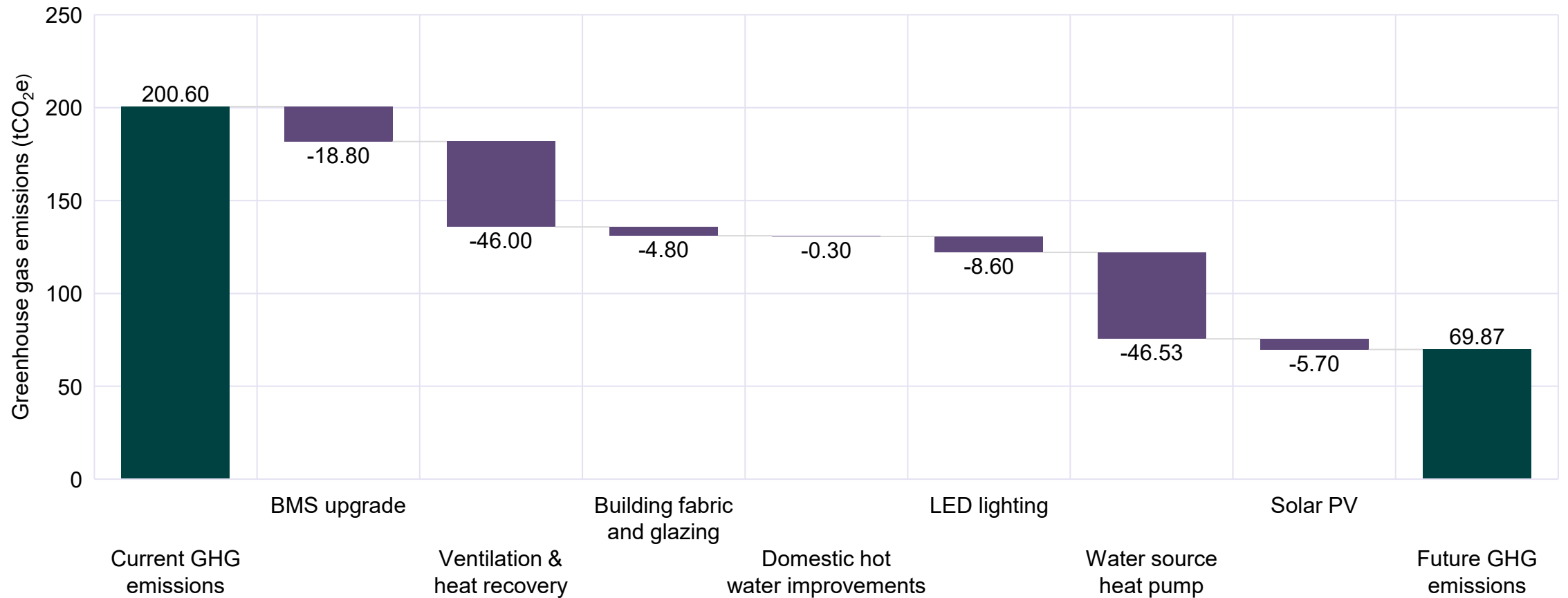
Electricity Grid Decarbonisation (Forecast)



Removal of Scope 1: Fossil Fuel Generation



Building decarbonisation pathway



Standards & Certification

UK Green Building Council (UKGBC) – UKGBC has developed a framework definition for net zero carbon buildings to provide the industry with clarity on how to achieve net zero carbon in construction and operation. The framework is intended to be used by building developers, designers, owners, occupiers and policy makers to inform the development of building tools, policies and practices.

Low Energy Transformation Initiative (LETI) – LETI have developed a Climate Emergency Design Guide which outlines the requirements of new buildings to ensure a net zero future. It is specifically aimed towards developers/landowners, designers, policy makers, and the supply chain. The guide covers five key areas: operational energy, embodied carbon, the future of heat, demand response and data disclosure.

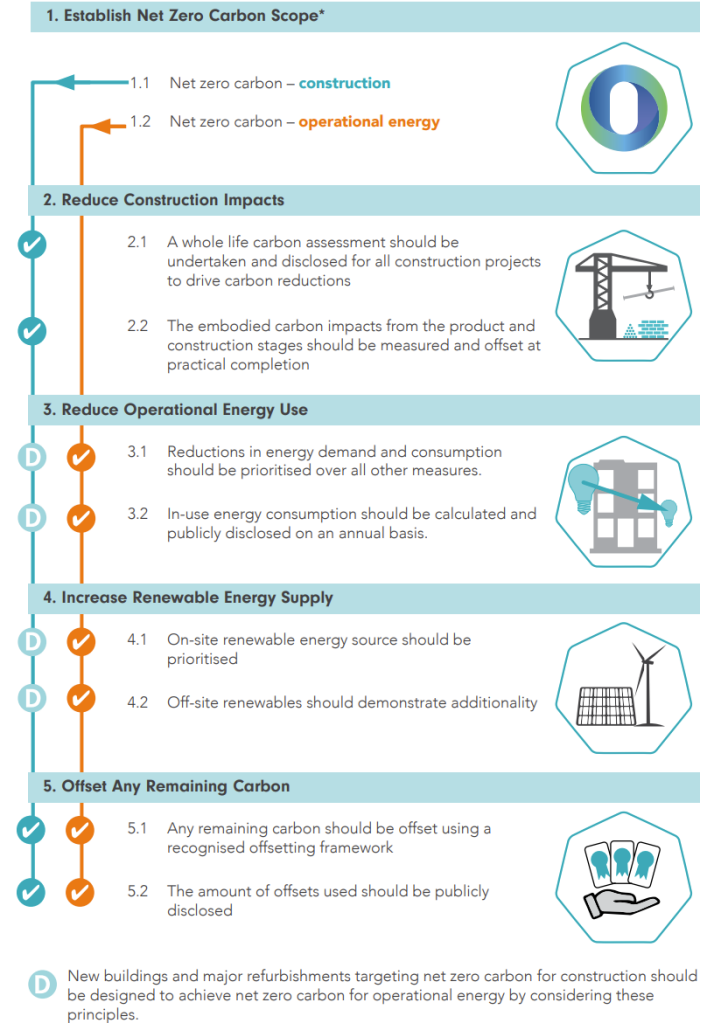
Net Zero Now – Official certification scheme provider for the Net Zero Sector Protocols - a series of industry standards that defines what Net Zero means practically for businesses in different sectors and what those businesses need to do to get there. Based on the GHG Protocol and the SBTi.

Science Based Target Initiative (SBTi) – SBTi have developed a net zero standard which provides companies with the guidance and tools to set science-based targets

Net Zero International – Provides certification of an organisation's net zero status. The certification confirms the organisations current carbon footprint, confirms they have a net zero reduction plan, and enables an organisation to show their commitment to net zero to costumers/other stakeholders.



Steps to Achieving a Net Zero Carbon Building



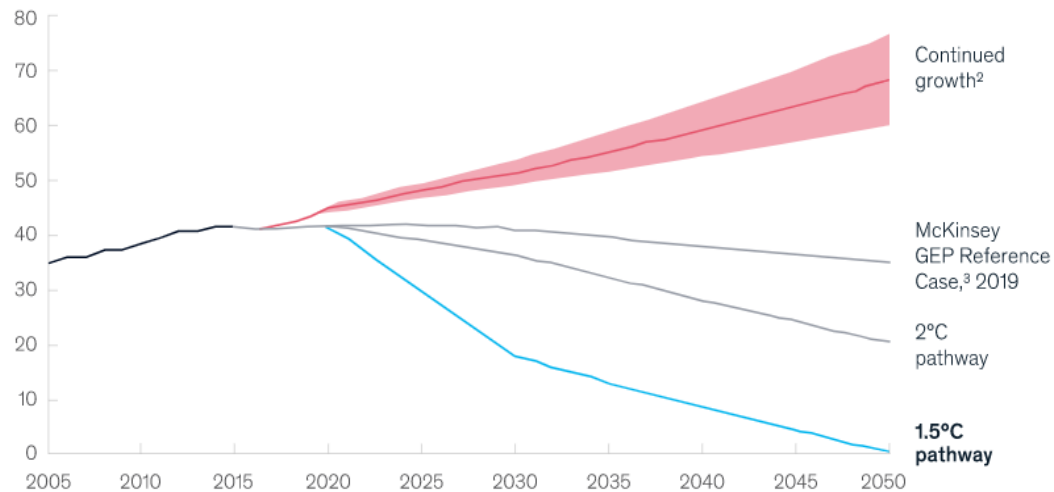
HEAT NETWORK
EFFICIENCY SCHEME

Why set reduction targets with the Science-Based Target Initiative (SBTi)?

Climate Scenarios Over Time

Projected global CO₂ emissions per scenario¹

Metric gigatons of CO₂ (GtCO₂) per year



¹In addition to energy-related CO₂ emissions, all pathways include industry-process emissions (eg, from cement production), emissions from deforestation and waste, and negative emissions (eg, from reforestation and carbon-removal technologies such as bioenergy with carbon capture and storage, or BECCS, and direct air carbon capture and storage, or DACCS). Conversely, emissions from biotic feedbacks (eg, from permafrost thawing, wildfires) are not included.

²Lower bound for "continued growth" pathway is akin to IEA's *World Energy Outlook 2019* Current Policies Scenario; higher bound based on IPCC's Representative Concentration Pathway 8.5.

³GEP = Global Energy Perspective; reference case factors in potential adoption of renewable energy and electric vehicles.

Source: Global Carbon Budget 2019; *World Energy Outlook 2019*, IEA, expanded by Woods Hole Research Center; McKinsey *Global Energy Perspective 2019*: Reference Case; McKinsey 1.5°C scenario analysis

1.5°C Scenario

- As of July 2022, all scope 1 and 2 targets must be aligned with this scenario, which aims to limit global warming to 1.5°C
- Scope 3 targets can optionally be aligned with this scenario

Well Below 2°C Scenario

- As of July 2022, scope 3 targets must be aligned with this scenario (at a minimum)

2°C Scenario

- As of July 2022, this scenario is no longer valid for SBTs
- Companies who set target prior to 2022 may have used this scenario for scopes 1,2 or 3 and will need to update when they reach their mandatory recalculation period

Source: "Climate Math: What a 1.5-degree Pathway Would Take." McKinsey, April 2020

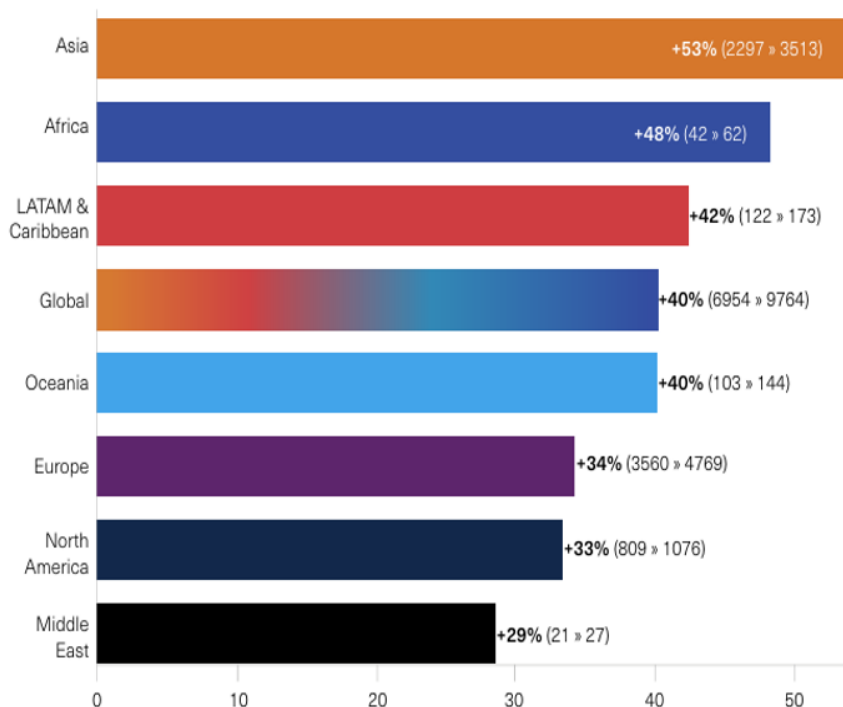


HEAT NETWORK
EFFICIENCY SCHEME

Companies from around the world and across different sectors can all set science-based targets (SBTs)

Where are the companies setting SBTs¹?

Growth in cumulative number of companies with SBTi targets between 2024 and 2025, by region, %



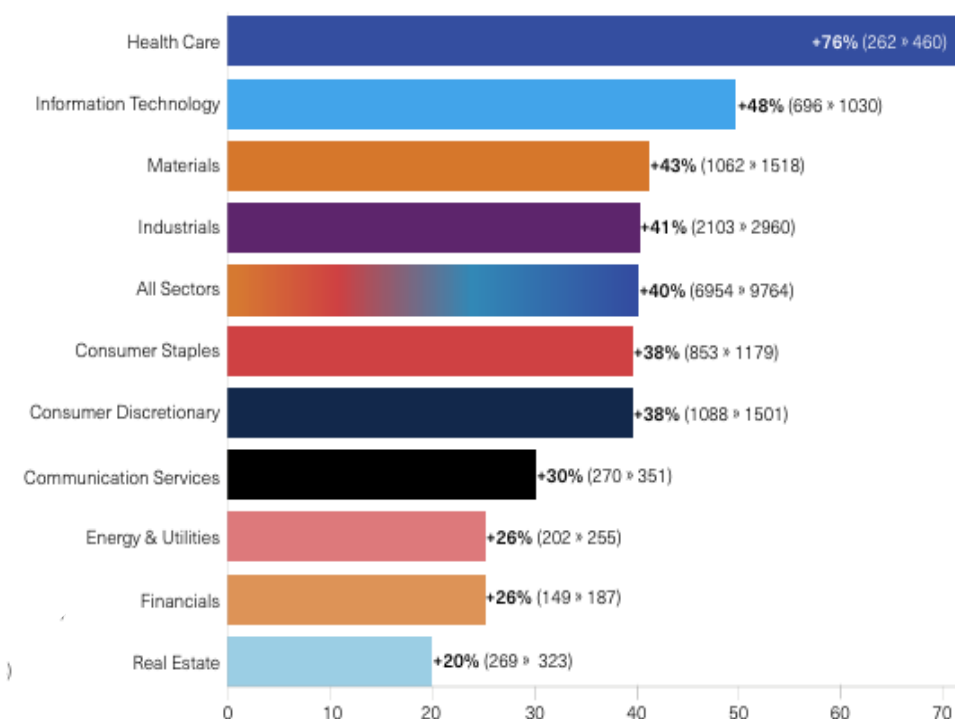
Asia saw the highest proportional growth in companies setting science-based targets - up 53% (from 2,297 to 3,513). Africa and Latin America and the Caribbean followed, increasing their totals by 48% (from 46 to 62) and 42% respectively (from 122 to 173).

Note: Absolute change in companies with targets is shown in brackets.

Source: SBTi (data correct up to end of 2025)

What sectors are these companies in²?

Growth in companies with SBTi targets by GICS sector, between 2024 and 2025, %



What is the process for setting Science-Based Targets?



COMMIT

- Register [online](#) and send a [letter](#) to SBTi stating commitment to set a target
- Once accepted, companies have 24 months to get a target developed, validated, and published



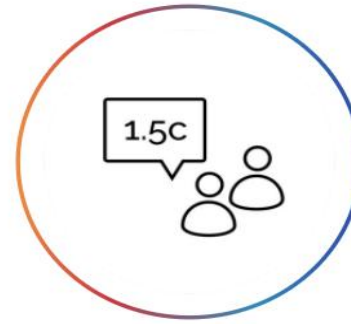
DEVELOP

- Develop scope 1+2 targets for the near term (5-10 years, must achieve 1.5° C) and long term (before 2050)
- If scope 3 emissions >40% of total emissions, set near-term (must be well-below 2°C) and long-term target for scope 3



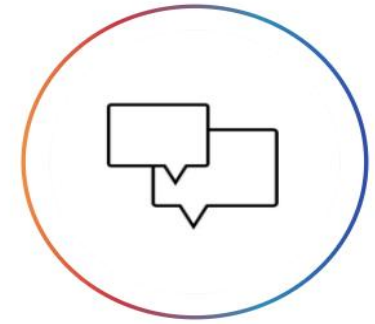
SUBMIT

- Submit [target submission form](#) for SBTi review
- SBTi will validate the target against the [Target Validation Protocol](#)
- Review typically takes 30 days or less (though experiencing backlog of up to 6-12 months in 2022)



COMMUNICATE

- Once approved, company must make target public within 6 months



DISCLOSE

- Companies must disclose emissions annually and monitor progress towards targets
- SBTi recommends disclosing through CDP and company annual / ESG reports and website



What target-setting options are available for SBTi?

Near Term Targets

Covers how organizations will reduce emissions over the next 5-10 years

Required when committing to SBTi

Long Term Targets

Indicates the degree of emission reduction needed to achieve net zero targets (achieved no later than 2050*)
Also includes any targeted reductions with a target date > 10 years away

Not required when committing to SBTi

Net Zero Targets

Commitment to reducing scope 1,2 and 3 emissions to zero / a residual level, and neutralizing any residual emissions released thereafter

Most companies will require deep decarbonization of 90-95% to reach net-zero

Not required when committing to SBTi, but must set near-term and long-term targets to set a net zero target

Source: "About Us." SBTi, accessed June 23, 2022. "SBTi Corporate Net-Zero Standard." SBTi, October 2021.

*Long term targets must be met no later than 2040 for the power sector.



HEAT NETWORK
EFFICIENCY SCHEME

How does a company develop Science-Based Targets?

Scope 1	Scope 2	Scope 3
Absolute Contraction	Absolute Contraction	Absolute Contraction
Emissions Intensity Reduction	Emissions Intensity Reduction	Category-specific Intensity
Asset Transition	Asset Transition	Supplier Alignment

Depending on which method is chosen, companies may need to use different strategies to achieve their targets

*Not all methods may be available to all companies. Companies should consult with any sector-specific guidance to verify if certain methods are allowable for their industry..

Target methodology

An **Absolute Contraction** target covering **100%** of Scope 1 & 2 emissions.

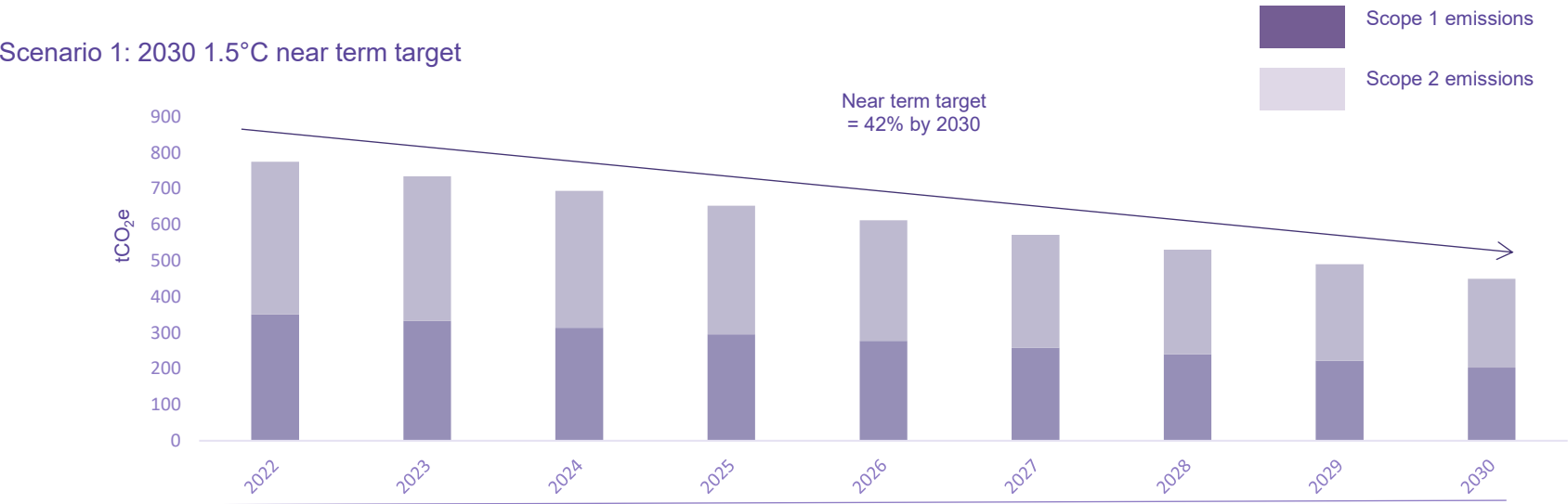
2022 Scope 1 & 2 Emissions:
750 tCO₂e

Reduction of
42%

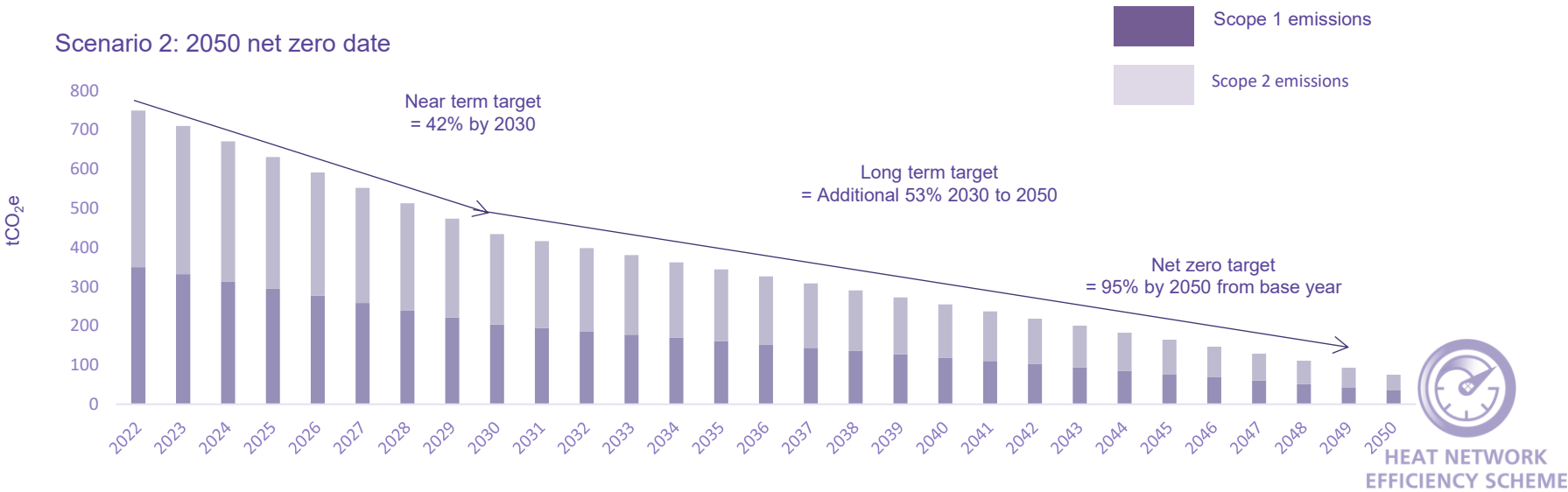
2030 Near-term target: 435 tCO₂e

Example Targets – Scope 1 & 2 Emissions

Scenario 1: 2030 1.5°C near term target



Scenario 2: 2050 net zero date



Target methodology

Absolute
Contraction target
covering all of Scope 3 for
near-term targets.

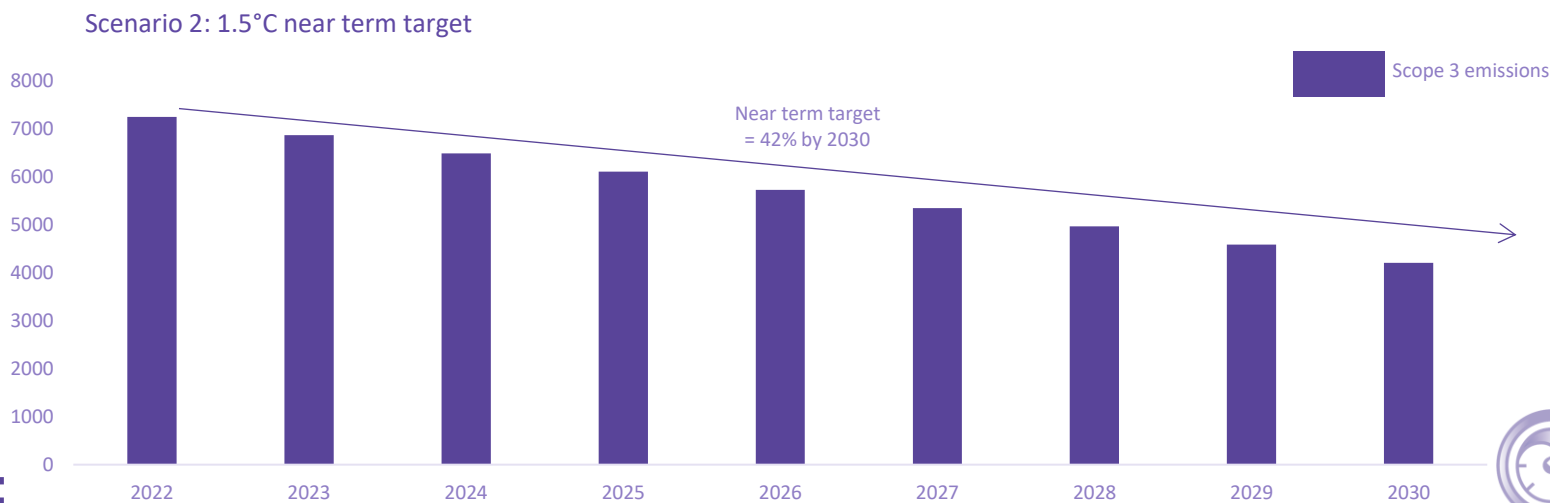
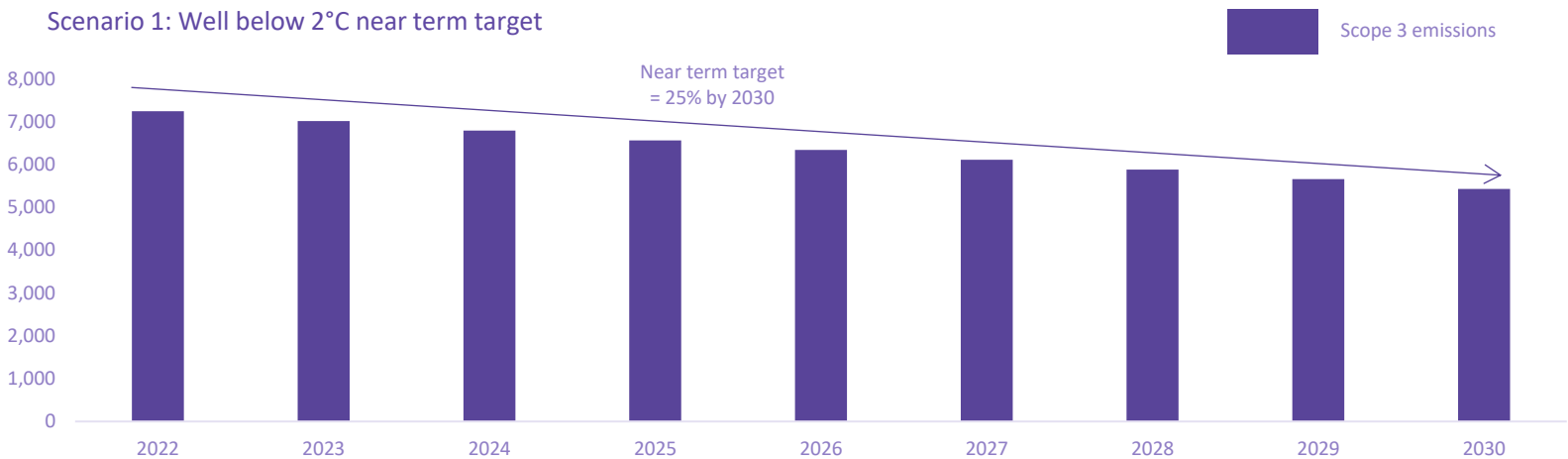
There is the option to do
1.5 degrees aligned, or a
well-below 2 degrees
aligned.

2022 Scope 3 Emissions:
7,000 tCO₂e



2030 1.5 target:
4,060 tCO₂e

Example Targets – Scope 3 Emissions



Communication & Disclosure: SBT

Example targets:

Scope 1 & 2 – Company A to set an ‘Absolute Contraction’ target for Scope 1 and 2 because it covers the required >95% of Company A’s Scope 1 and 2 emissions and has the lowest reduction rate compared to other available SBTi target setting methods.

Scope 3 – 67% coverage needed

- An Absolute Reduction target could be set for reduction of Business Travel emissions. In 2019, this accounts for 44% of Scope 3 emissions.
- For the remaining 23% of Scope 3 emissions required for coverage, a Supplier Engagement target is could be considered.

Disclosure & subsequent monitoring:

- After communicating your target, you will be required to keep up on disclosing progress made against the science-based targets, as well as monitoring progress.
- You can do this through CDP, annual reports, your own company’s website etc.

Scope 1	Scope 2	Scope 3
Absolute Contraction		Absolute Contraction
2019 Base Year: 50.7% reduction by 2030 2022 Base Year: 42.0% reduction by 2030		2019 Base Year: 27.5% reduction by 2030 for WB2°C aligned 2022 Base Year: 25% reduction by 2030 for WB2°C aligned
Covers all required Scope 1 and 2 emissions		Covers all required Scope 3 emissions
Renewable		Physical or economic intensity
100% Scope 2 renewable electricity by 2030		51.6% by 2030
Electricity only. Doesn't cover all required Scope 1 and 2		Could be applied to emissions embodied in construction and would cover all required Scope 3 emissions
		Supplier Engagement (coverage)
		Not a tCO ₂ target
		Would require a certain % of suppliers to set SBT's to meet coverage needed

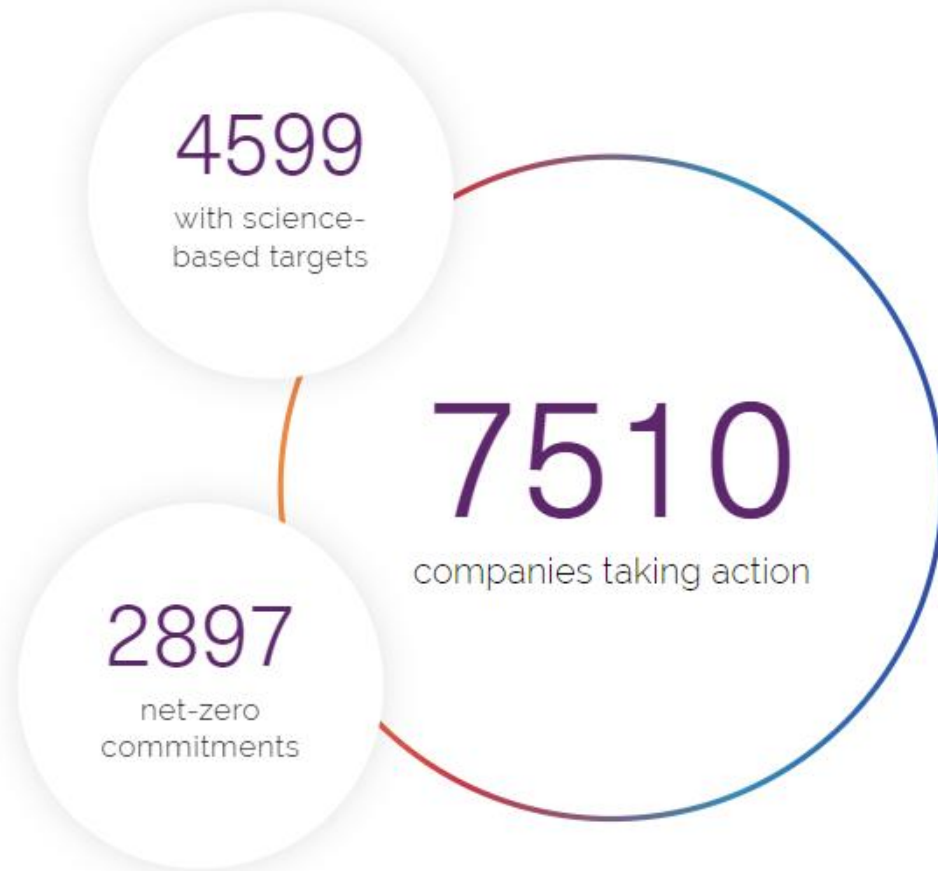
Example target statements:

“Company A commits to reduce absolute Scope 1 and 2 GHG emissions 50.7% by 2030 from a 2019 base year.”

Company A also commits to reduce absolute Scope 3 GHG emissions from business travel by 27.5% by 2030 from a 2019 base year, and that 60% of suppliers by emissions impact covering purchased goods and services will have science-based targets by FY2028.”



Taking the next step on your climate journey with SBTi



Resources:

- [SBTi Corporate Manual](#)
- [SBT Commitment Letter](#)
- [SBTi Standard Commitment application](#)
- [SBTi How-To Guide](#)
- [SBTi Criteria and Recommendations](#)
- [Net-Zero: Getting Started Guide](#)
- [Net-Zero Standard Criteria](#)
- [Target Validation Protocol](#)
- [Target Setting Tool](#)
- [Target Setting Tool for Well-Below 2°C Targets](#)
- [Net-Zero Tool](#)
- [Sector-specific Guidance and Requirements](#)
- [SBTi Buildings Guidance Pilot Testing](#)
- [List of All Resources](#)





HEAT NETWORK
EFFICIENCY SCHEME

Any Questions?

What happens now?

- We'll save and share the recording of this session.
- If you have any questions we've been unable to answer, or any feedback you'd like to give us on the session, please contact us at: HNES@talan.com
- We will circulate feedback forms over the next couple of days to gather your views.



Follow us on socials



[Heat Network Efficiency Scheme \(HNES\)](#)



[@HNEScheme](#)

Join our mailing list



hnes@talan.com



HEAT NETWORK
EFFICIENCY SCHEME



HEAT NETWORK EFFICIENCY SCHEME



UK Government

TAIAN
Positive innovation

RAMBOLL

gleeds



HEAT NETWORK
EFFICIENCY SCHEME