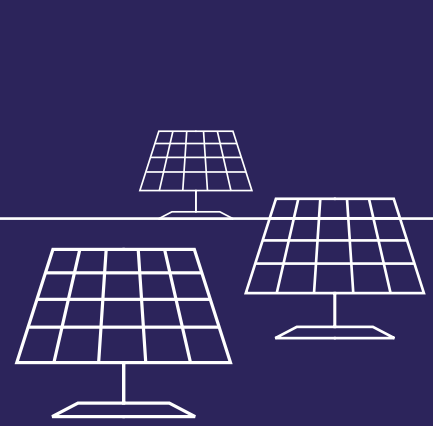
UNIVERSITY OF CAMBRIDGE
INSTITUTE FOR SUSTAINABILITY LEADERSHIP

Targeting Net Zero

A strategic framework for business action



The University of Cambridge Institute for Sustainability Leadership

The University of Cambridge Institute for Sustainability Leadership (CISL) is a globally influential Institute developing leadership and solutions for a sustainable economy. We believe the economy can be 'rewired', through focused collaboration between business, government and finance institutions, to deliver positive outcomes for people and environment.

For over three decades we have built the leadership capacity and capabilities of individuals and organisations, and created industry-leading collaborations, to catalyse change and accelerate the path to a sustainable economy. Our practitioner orientated research builds the evidence base for action

Rewiring the Economy

Rewiring the Economy is our ten-year plan to lay the foundations for a sustainable economy, built on ten interdependent tasks, delivered by business, government, and finance leaders co-operatively over the next decade.

Publication details

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Introduction

For over 30 years, the University of Cambridge Institute for Sustainability Leadership (CISL) has worked with companies and individuals who have stepped up to lead change and to tackle critical global challenges in businesses, financial institutions and governments around the world.

Our *Rewiring the Economy*[1] framework sets out a vision for harnessing the engine of economic activity to deliver positive outcomes for people and the environment through ten key tasks. Delivering this rewiring vision requires an understanding of the global context for business and calls for bold, collective leadership to drive the transformations required to successfully deliver a net zero economy and the UN Sustainable Development Goals (SDGs).

The next decade to 2030 will be critical in the transition to a sustainable economy that delivers the future we want – as envisaged by the SDGs. CISL is committed to working with our partners in business, government and the finance system, plus our global leadership network of 16,000 individuals, to accelerate this transition. Our energies are especially focused on decarbonising the economy, protecting and restoring nature, and supporting fair and resilient societies.

Developing leadership capacity, both at the individual and organisational level, is where our unique contribution and strength lies. We do this in a variety of ways: by working with hundreds of major organisations to develop transformative strategies and action plans; by accelerating enterprises and collaborative initiatives with potential to offer breakthrough solutions; by building the evidence and tools to underpin transformative leadership; and, above all, by shaping the operating context for business in favour of organisations that deliver value to society and the environment.

CISL's Net zero framework for business is designed for those companies tasked with delivering net zero in a business context and/or influencing the societal transition towards this ambition. By drawing on a range of leading frameworks and CISL's insights, it provides a 'one-stop-shop' for the key tasks that need to be set in place to align with net zero.

Companies will be at different stages of the journey towards implementing these tasks. For those that are already well advanced, the framework will serve as a useful benchmark to determine the priorities for further action. For others where climate action has not yet been a priority, it will serve as a 'road map' for urgent action.

The framework is motivated by the need for holistic guidance. It sets out practical advice for all types of companies, regardless of sector or size. While the scale and complexity may vary, the overall agenda for action is similar. Nevertheless, further work will be necessary to develop the context-specific details required to achieve the tasks.

This framework covers everything from strategy and governance to setting evidence-based targets and engaging external stakeholders. For this reason, it provides a comprehensive approach for anyone leading a business's overall net zero strategy. For managers tasked with delivering specific components of a net zero agenda (such as in operations, procurement, human resources, external affairs or research and development), meanwhile, it provides a useful context for their contribution. In all cases, it can increase confidence by providing clear alignment with emergent best practice and, more generally, a beacon for the road ahead.

This framework is designed to support the key messages from the Intergovernmental Panel on Climate Change (IPCC), namely the need to limit global warming to 1.5°C and a preference for emission reduction over carbon dioxide removal (CDR) to achieve this:

"The longer the delay in reducing CO_2 emissions towards zero, the larger the likelihood of exceeding 1.5°C, and the heavier the implied reliance on net negative emissions after mid-century to return warming to 1.5°C (high confidence). The faster reduction of net CO_2 emissions in 1.5°C compared to 2°C pathways is predominantly achieved by measures that result in less CO_2 being produced and emitted, and only to a smaller degree through additional CDR."[2]

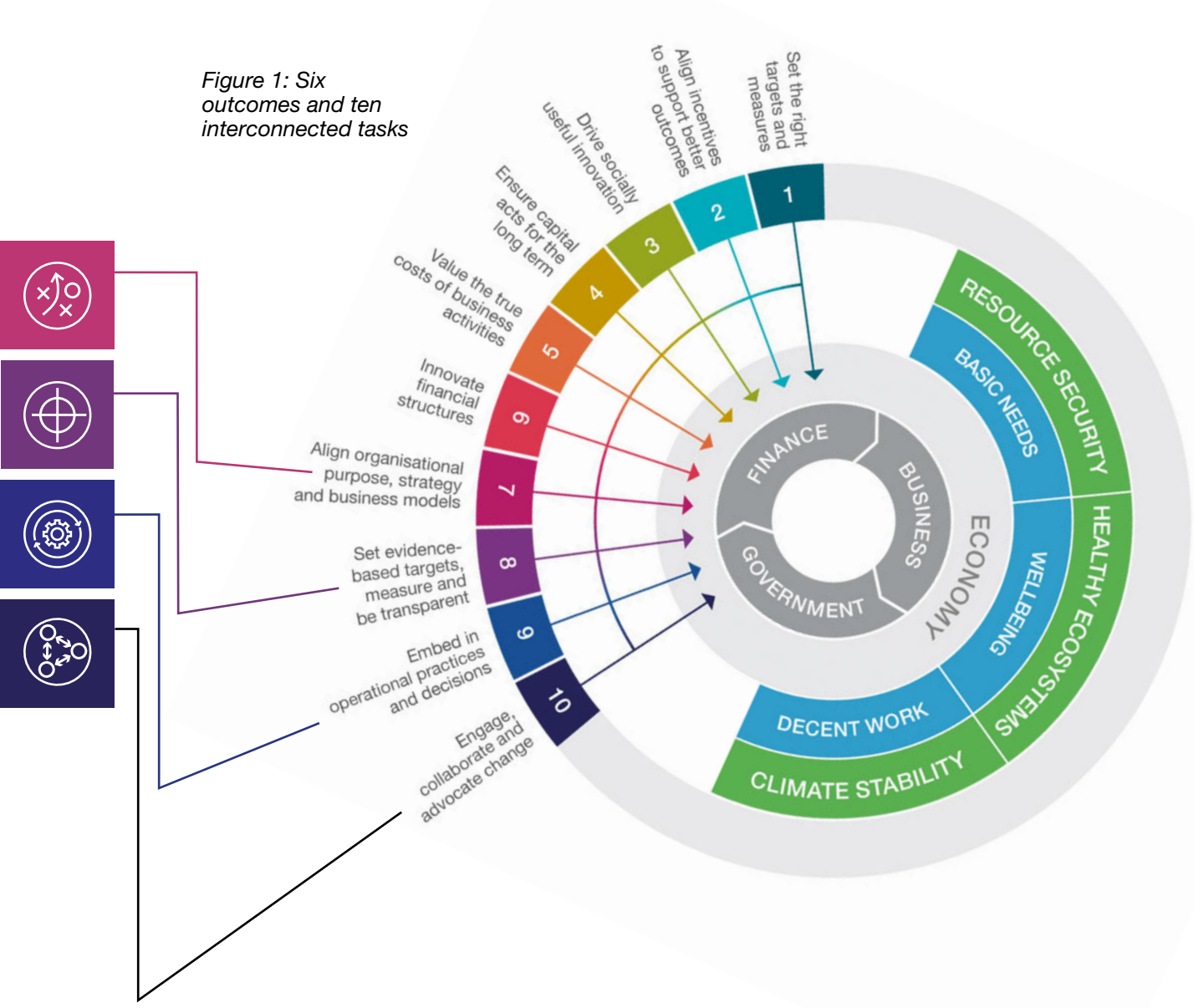
The Annex contains further details to support the case for decisive action by implementing the tasks in the framework.

Contents

Click the relevant topic you wish to visit

Developing a strategic response to net zero

Figure 1: Six outcomes and ten interconnected tasks



Rewiring the Economy: Ten tasks, ten years[1]

Rewiring the Economy is CISL's ten-year plan to lay the foundations of a sustainable economy that is capable of delivering the SDGs. The plan starts from the principle that the economy can and should be delivering the outcomes demanded by the SDGs. It outlines a set of ten interconnected 'tasks' that target the systemic changes required across government, finance and business, including businesses' role in enabling the structural and cultural transformations needed.

These tasks are not unique to the plan. Rather, *Rewiring the Economy* shows how they can be tackled co-operatively during the next decade to create an economy that encourages sustainable business practices, and thus delivers the positive social and environmental outcomes demanded by the SDGs. *Rewiring the Economy* arranges the 17 SDGs into six areas of social and environmental impact: basic needs, wellbeing, decent work, climate stability, resource security and healthy ecosystems. Each impact area encompasses one or more SDGs, making it easier to visualise the connections between them. The Investment Leaders Group (also convened by CISL) is developing a set of metrics to help companies assess their social and environmental impact in each area.

This report adds climate-specific detail to the four business tasks in CISL's *Rewiring the Economy* framework.

"Any serious rewiring of an economy will […] require active business engagement and leadership. We present four strategic tasks for business, in collaboration with governments and financial institutions."[1]

Net zero framework for business

Our framework, which derives from CISL's *Rewiring the Economy* plan, sets out the core components that we believe are essential for any company looking to be fully aligned with net zero by 2050 at the latest.

Companies using the framework should start by undertaking a gap analysis to determine where the business is least or most advanced.

By building upon areas of strength, initiate an iterative, continuous improvement process in keeping with a typical Plan–Do–Check–Act model. Some organisations may begin by ramping up the strategic commitment, whereas others may use the results of more comprehensive measurement and reporting to catalyse increased strategic commitment, for example. Use scoping and analysis to ensure that commitments and the associated goals and targets are based on the best availablescience and address the material risks and impact areas.

Figure 2: Net zero framework for business

Align organisational purpose, strategy and business models

Contents

How to guide

The detail

Myths and barriers

Navigate this pdf using these links

> **Within a commercial context, businesses can explicitly set out to improve people's lives, whilst operating within the natural boundaries set by the planet. […] Successful businesses of the future will need to find ways to create value while making a fair social contribution, with neutral or positive impacts on the natural world.**[1] CISL *Rewiring the Economy*

A. Analysis required: assess climate-related risks and opportunities for the organisation and its impacts

B. Revisit organisational purpose, establish the right governance and build capacity

C. Align the organisational strategy and business models with net zero

Click bold text on this page for relevant pages or scroll down

A. Analysis required: assess climate-related risks and opportunities for the organisation and its impacts

Tasks

"Enhanced [analysis] can support the transition towards more sustainable business by understanding the real rate at which critical natural resources (such as soil, water, biodiversity and a stable climate) are being depleted; the risks their business is exposed to as a result; and the true impact of their business on society [...] For many businesses this will mean working differently with a range of stakeholders to understand the full lifecycle of their products and services, to innovate and adapt."[1]

Undertake analysis and build analytical capability: to ensure business responses to net zero are informed by thorough understanding of climate-related risks and opportunities and the organisation's contribution to climate impacts. Depending on the level of board awareness and buy-in, this may need to be iterative to build the case for a more thorough analysis (see Figure 2).

Undertake the following in the context of business strategy, supply chain, markets and regions of operation:

- Agree boundaries for the organisation's net zero ambition (see Figure 1).
- Scenario and risk analysis, including: physical, transition, liability across all aspects of the business model:
  - o Develop and implement a process to identify and assess climate-related risks and integrate into the organisation's overall risk management.
  - o Define multiple climate-related scenarios of vivid, distinct futures, gauging the range of uncertainty, and then quantify implications across each scenario and assess the resilience of the organisation's strategy.
  - o Consider the latest thinking on sector and regional transition pathways.
  - o Consider indirect risks to societies and economies and the risk of global failure to meet the net zero goal by 2050.
- Opportunities analysis, including: competitive advantage from superior performance (e.g. increased access to talent, reduced costs of capital, more resilient supply chain), cost savings due to improved efficiency and potential new revenue streams from 'green' innovation.
- Life cycle assessment (LCA) to inform choices on how to effectively reduce the impacts of products/services across their full life cycles.
- Impact analysis, including: understanding the organisation's carbon footprint and where it has negative impact, which may not translate into a direct business risk, but which needs to be mitigated if we are to achieve global goals.
  - o Determine the actual and potential climate-related impacts on the organisation's businesses, strategy and financial planning (operating expenses, capital expenditure, mergers & acquisitions and debt) over the short, medium and long term.

Company case studies and resources

- Carbon Tracker carries out scenario analysis to examine and understand how potential changes to supply and demand will impact the future of fossil fuel-exposed companies and projects.
- ISO 14067:2018 specifies principles, requirements and guidelines for the quantification and reporting of the carbon footprint of a product, in a manner consistent with International Standards on life cycle assessment (LCA) (ISO 14040 and ISO 14044).
- The ClimateWise Physical Risk Framework demonstrates how the risk analysis tools of the insurance industry can inform other parts of the financial sector and demonstrate the role of adaptation in mitigating these risks.
- The ClimateWise Transition Risk Framework provides an open-source model which explores how to quantify risks and opportunities resulting from the low carbon transition within infrastructure investment portfolios.
- The Climate Action Pathways outline the sectoral visions for a 1.5°C climate-resilient world by 2050 and set out actions needed to achieve that future.
- The Long-Term Energy Scenarios (LTES) Network aims to provide a platform for national and regional practitioners to share their experiences and good practices in the use and development of long-term energy scenarios to guide the clean energy transition.
- The NGFS Climate Scenarios explore the impacts of climate change and climate policy with the aim of providing a common reference framework.

Figure 3: Possible boundaries for the organisation's net zero ambition

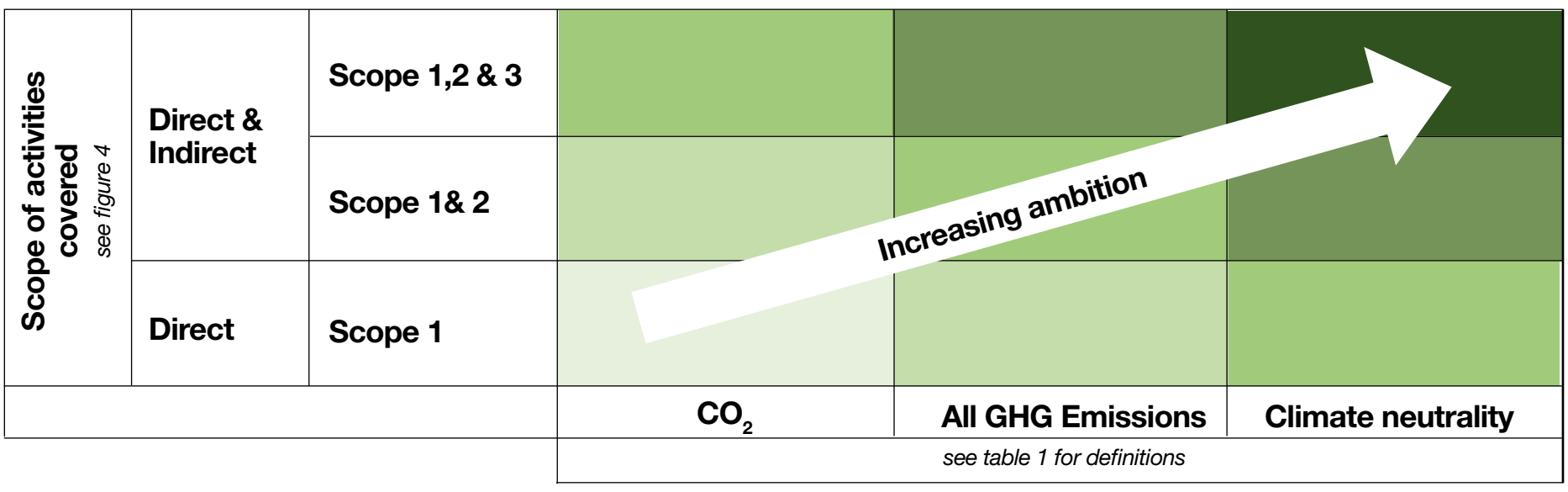
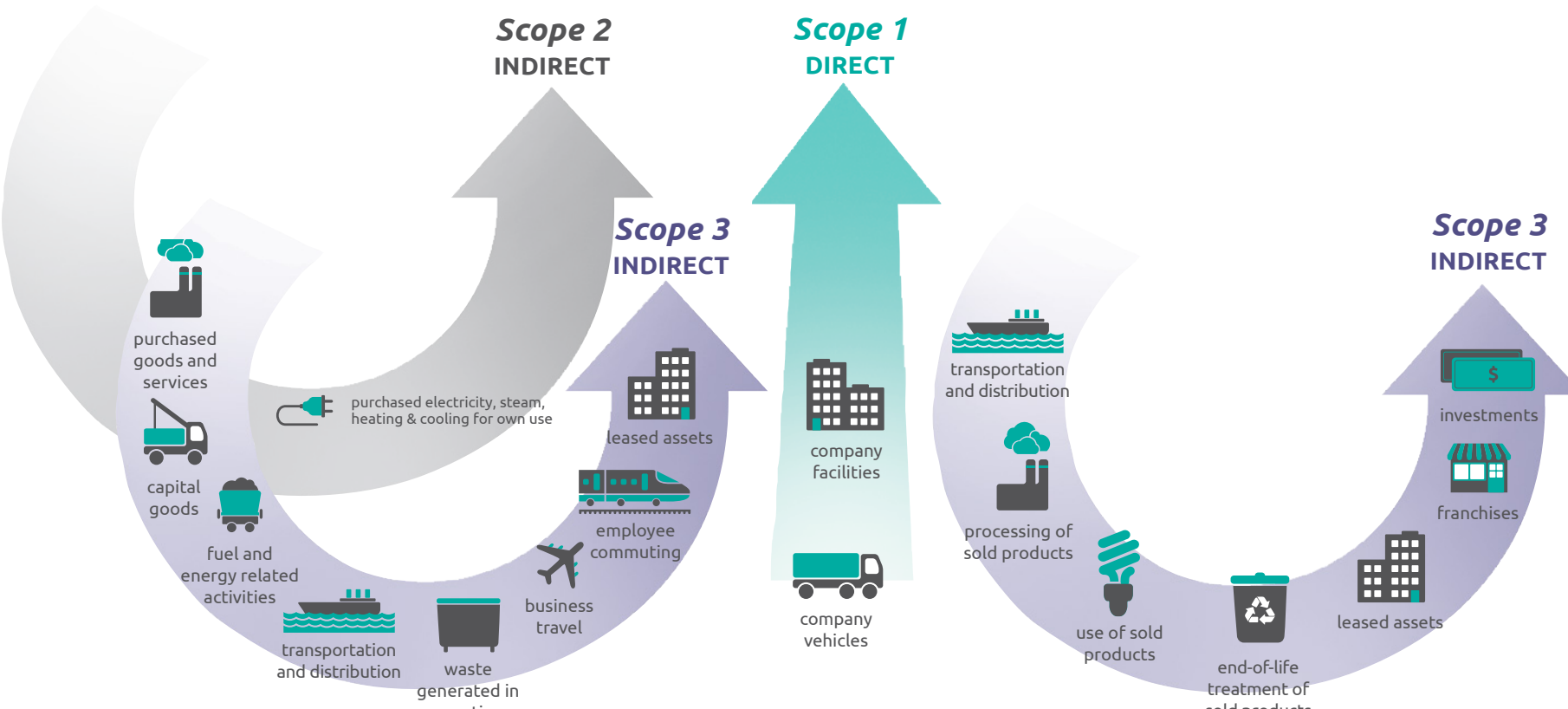


Figure 4: Scope of the organisation's net zero ambition[9]



Prioritising the net zero ambition

When determining priority areas for action, it makes sense for companies to focus first on where their influence for change is greatest. This invariably means concentrating on direct emissions from assets that they own or control (Scope 1) and then from indirect emissions linked to purchases on electricity, heat and steam (Scope 2). Some companies have influence that extends beyond this. For example, financial institutions can have significant influence through their investment and lending decisions, professional services through the advice they provide, and media companies through their communications.

Another governing principle for mitigation is to focus on areas that are most material; namely, where a company's overall emissions are greatest and where the risks and opportunities for the business are greatest. Often, there is a strong convergence between the two. For many companies, especially those with major investments, a substantial supply network or an extensive customer base, the bulk of their emissions may well be emitted in their value chain (Scope 3). These include emissions from the purchase of goods and services, business travel, employee commuting, waste disposal, the use of sold products, transportation and distribution, and investments, among other areas. Scope 3 emissions extend companies' responsibility to engage with suppliers and consumers alike, while understanding that the company has less control over these emissions.

B. Revisit organisational purpose, establish the right governance and build capacity

Contents

How to guide

The detail

Myths and barriers

Tasks

"[Businesses can have] neutral or positive impacts […] by aligning the organisation's core purpose with sustainable development such that the business exists to have a positive impact on the world, without trading the needs of one stakeholder for those of others."[1]

Determine how net zero response delivers on and aligns with the organisation's purpose:[4]

- Develop a clear and transparent process for aligning the purpose and strategy, including which stakeholder groups to engage, and integrate this into the strategic planning process.
- Ensure this process has a balance of perspectives and approaches, in particular:
  - o internal insights and views plus external insights and expectations from a range of perspectives
  - o top-down guidance and mandate plus bottom-up insights, building on what is working well
  - o corporate-centre direction and guidance plus insights and adaptation from other functions and regions.

Company case studies and resources

- **Case study: Unilever - Integrated Business Strategy.** In their 2019 Annual Report and Accounts, published in 2020, global consumer goods giant Unilever announced a new integrated business strategy entitled 'The Unilever Compass'. The strategy seeks to embed the company's concept of being a multi-stakeholder model with an integrated business strategy and sustainability strategy. The plan is framed around three primary beliefs, all of which tie into Unilever's guiding purpose "to make sustainable living commonplace". The three goals are supported by nine 'imperatives', one of which (to "improve the health of the planet") gives explicit reference to fighting climate change. **Read the full case study.**
- **Leading with a sustainable purpose: Leaders' insights for the development, alignment and integration of a sustainable corporate purpose** sets out the principles and practices required to align and integrate a sustainable purpose, by capturing the collective insights and experiences of leaders from four large multinational companies that are far along this journey.
- A **Chartered Management Institute White Paper** presents findings from UK and international brands on 'what purpose means' at the organisation level, why companies are pursuing it and how it might be effectively pursued.
- **Olam has defined its purpose** as "'Re-imagining Global Agriculture and Food Systems' within the boundary conditions of Growing Responsibly".

"To fulfil a purpose aligned with a sustainable economy, businesses will need to act differently through their […] governance."[1]
Establish leadership and governance with the necessary capabilities, remit, time and structures:

- Establish clear board (with named accountable individual/position responsible) or board committee oversight of climate-related risks and opportunities:
  - o Ensure alignment, through shared involvement and ownership of the purpose (see above) and strategy (see C, below) by the executive team and board. This is in line with emerging corporate governance best practice, which includes ownership of the purpose and strategy formulation.[5]
  - o Ensure each executive director has a clear role, ownership and accountability over the strategic areas that align with their function, both in operational terms and in areas of thought leadership, such as functional carbon reductions.
  - o Sub-committees of the board can enable co-ordination and focus across departments and business units providing oversight, co-ordination and scrutiny of strategic plans. They can be made up of senior leaders from across the business that meet quarterly and supplemented by full- or multiple-day workshops and meetings with the full board and advisory panel.
- Include capacity building of the executive team and board to help them understand the need for change and the benefits of aligning the purpose and strategy with sustainability, raise awareness of impacts (using the analysis from TCFD Appendix), and rapidly shifting stakeholder expectations.
- Incorporate climate change performance into remuneration for senior executives.

- The **World Economic Forum** produced a white paper on how to set up effective climate governance on corporate boards.
- The **Cambridge Earth on Board Programme** supports boards to align profitability and sustainability by informing them and individual directors about the implications of climate change and wider social and environmental issues for long-term corporate performance.
- **Unilever Sustainable Living Plan**: Sharing ownership across the executive team: The Unilever Executive formed a Unilever Sustainable Living Plan (USLP) Steering Team, made up of most of the Executive leaders. Throughout 2018 the group met several times, including face-to-face workshops. They explored the complex implications of global trends for the business's purpose, also gaining external input from the USLP Advisory Council. This 'outside-in' approach was vital for pushing the thinking beyond the walls of Unilever. The Steering Team created a powerful space to ask fundamental questions and explore the impacts, opportunities and connections for the business. This broadened the commitment across the team and led to a shared view of the beliefs and ambition required for Unilever's long-term success. This underpins the new compass strategy that integrates sustainability and corporate strategy into one. One of the Steering Team members, Alan Jope, went on to succeed Paul Polman as CEO in 2019.
- The Embedding Project Next Generation Governance guide outlines how companies should articulate their positions, and we have applied these criteria to the positions featured in this database.

C. Align the organisational strategy and business models with net zero

Tasks

"Businesses will be required to shift activities away from those which are not aligned with a sustainable economy. They may need to forego some short-term income in unsustainable activities, whilst growing new sustainable markets. Executives must navigate the leadership dilemmas inherent in focusing on the long term whilst performing in the short term. New opportunities will emerge from the redrawing of market boundaries, and many businesses will find themselves in very different markets from those they operate in today, with potential rewards for those which lead."[1]

Align the organisational strategy and business models with net zero:

- Align the organisation's strategy with the science, i.e. working towards a global goal of net zero carbon by 2050.
- Identify current carbon impacts across the value chain.
- Set evidence-based, zero carbon goals for each of the material impact areas:
  - o Consider both the strategic goals and targets and the strategy to meet these goals, considering different mechanisms of change.
  - o Incorporate climate change risks and opportunities, including potential new markets through new products and services, into the organisation's strategy, including vision and mission.
  - o Keep pace with the science and be prepared to evolve the strategy if science evolves.
  - o Cascade or Align the organisational strategy into business unit and function sub-strategies.
  - o Ensure senior leaders own relevant aspects of the strategy and goals for their part of the business.
- Ensure that all financial investments/capital allocation are aligned with transition to a zero carbon economy.
- **Develop and maintain agility** to adapt as the policies, economics, markets and technologies evolve.

Company case studies and resources

- Developing a climate strategy in line with net zero and business priorities: In January 2020, Lloyds Banking Group staked a strong claim to climate leadership by becoming the first major UK retail bank to commit to reducing the carbon emissions it finances by more than 50 per cent by 2030. The announcement, which is in line with the UK government's net zero target by 2050, came with news of a series of new pro-climate products, including a £2 billion Clean Growth Finance Initiative. The commitment is tied to Lloyds' corporate purpose to 'Help Britain Prosper' and is supported by a series of targets closely linked to the UK's Clean Growth Strategy. **Read the full case study here.**
- Ethical Corporation's Responsible Business Trends 201 report shows the extent to which sustainability is being integrated into mainstream strategy.
- Olam has launched a six-year strategy, which positions the company as a regenerative, net positive global agri-business aligned to purpose.
- Transition of Umicore from highly pollutant to clean tech and recycling leader. The company has shown metal-related materials can be efficiently and infinitely recycled, making them the basis for sustainable products and services.

"We know that for many businesses, the current operating model isn't going to be sustainable in the long term [...] New regenerative business models, which adopt circular material flows and a blend of product and service approaches, alongside sustainable production and consumption models, can improve rather than deplete natural resources."[1]

Commit to net zero innovation, aligning the business model and investing in new opportunities for value creation.
Achieving net zero represents a strategic challenge as well as a technological one. Many companies will need to innovate to develop models for generating value that are cleaner and less resource intensive:

- Evaluate the viability of the current competitive advantage in a low carbon world, recognising that there are likely to be fundamental shifts in consumption and growth; hence some traditional sectors/business models may have no future.
  - o Do not assume there will always be a clear transition pathway and win–wins for every sector/business model. There will be winners and losers.
  - o Shift to service-based and circular business models and drive products/services that help customers avoid and remove emissions.
  - o Identify new opportunities in a low carbon economy, focusing on new value creation.
  - o Identify external collaborators that can help to co-create new products and services and advocate for a zero carbon future.
- Note: given the potential knock-on impacts for workers, companies need to be mindful to ensure that any such transition is socially inclusive and fair.

- Signify (formely Philips Lighting) have developed a 'Light as a Service' (LaaS) model that shifts from a one-time sale to one where Philips maintains ownership of the materials and is contracted to deliver the lighting service; thereby incentivising the use of long-life and energy-efficient technologies.
- The Better Business, Better World report from the Business and Sustainable Development Commission shows how pursuing the SDGs could raise trillions in new market opportunities.
- A growing number of companies are adopting business models in line with achieving a climate neutral Europe.
- Stora Enso is transitioning from being a paper and pulp company to a renewable and recyclable materials company.

Set business goals and evidence-based targets measure and report progress

> **Transformative targets, like net zero emissions, require every aspect of the business to be engaged. In other words, every process and every method of working should be seen as a net zero emissions opportunity. Incremental targets can contribute to a 'tinkering around the edges' approach, creating risks later down the line if a target changes radically and shorter timescales are introduced. Transformative targets can also spark opportunities for innovation. In striving to meet stretching targets companies can release creative thinking, use technology and processes from other sectors, and create safe spaces to challenge the status quo. By doing things on a bolder scale, businesses can drive forward advancements in research and development, roll out solutions more quickly, bring costs down faster, enjoy efficiencies earlier, and improve productivity. […] Some companies have already been able to commit to net zero, serving as both a powerful leadership signal and a useful recognition of the long-term direction of travel. […] Companies that have made significant progress did not, generally, know at the start how to achieve their goals: innovation at the right level only came with the challenge of an ambitious target. In many major engineering businesses, for instance, the feedback has been: 'Give us a target of 10% reduction and we won't have to do anything new to meet it, but give us the challenge of 100% reduction and we will have to find new solutions.' A net zero target gives the right signal to examine business processes and then initiate business change.**[6]

The tasks set out below, with supporting case studies and resources, serve to help business contribute to a sustainable future via the following:

A. Set commitment, goals and evidence-based targets

B. Measure the right things, and report progress

Click bold text on this page for relevant pages or scroll down

A. Set commitment, goals and evidence-based targets

Contents

How to guide

The detail

Myths and barriers

Tasks

"Setting bold, ambitious targets sends a strong signal to staff, partners and other stakeholders that the leadership is committed to delivering its purpose, together with the radical innovation and new thinking required to achieve it."[1]

Public commitment:

- Publish a policy or commitment statement on climate change that commits the organisation to addressing the issue, or to reducing or avoiding impact on climate change.
- Goals should be set for all key aspects of strategic response, not just decarbonisation across Scopes 1–3.
- Consider joining initiatives aligned with the 1.5°C ambition.

Company case studies and resources

- The Climate Pledge is a commitment to meet the Paris Agreement by 2040 – a decade ahead of the Paris Agreement goal of 2050. It was founded in 2019 by Amazon and Global Optimism.
- More than 500 B Corps have publicly expressed to commit to net zero by 2030 – deliberately amplifying their voice.
- Unilever has set out public commitments to ambitious actions to fight climate change, including becoming carbon positive by 2030 and achieving net zero emissions from all its products by 2039. Also, Unilever's brands will collectively invest €1 billion in a new dedicated Climate & Nature Fund.
- Microsoft has publicly committed to being carbon negative, and by 2050 to remove from the environment all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975.
- BT is focusing on three areas to become a net zero carbon emissions business by 2045: switching on to renewables, decarbonising its buildings and transitioning to a low carbon fleet.

"[Businesses] can set targets informed by evidence, whether from science or international commitments, which take into consideration the nature of the business and its position in the economy, and are not limited to current capabilities."[1]

Evidence-based targets:

- Establish baselines for historical and future emissions across the value chain to serve as a reference point.
- Taking into consideration the nature of the business and its position in the economy, set targets aligned to what the science indicates is necessary, rather than what is currently possible or convenient:[7]
  - Set quantified, short- and long-term targets (i.e. more than five years in duration) to reduce emissions in relative or absolute terms (Scopes 1, 2 and/or 3).[8]
  - Target net zero and a first halving of the organisation's and its value chain's emissions in less than ten years.
  - Be transparent about the boundary of targets, their timeframe and the measures that will be used to track progress.[9]
  - Set specific targets for 'hot spot' areas.

- DSM released a new set of climate targets[10,11] in line with the Science Based Targets initiative (SBTi). The targets, the first of their kind of a European company working in its sector, commits the company to reduce its direct carbon emissions by 30 per cent in absolute terms by 2030. To achieve its new targets, DSM has set a multi-layered strategy. In the first instance, it committed to increase its purchase of renewable electricity from current levels of 41 per cent to 75 per cent of its total power demand by 2030. On top of this, it introduced an internal carbon price of €50 per ton of CO_2 to further guide its decision-making. Finally, it set itself the ambitious target of a 28 per cent reduction in its indirect (Scope 3) emissions by the end of the decade. **Read the full case study here.**
- The Science Based Targets initiative features case studies of companies that explain why they have chosen to set such targets and how they achieved buy-in for them.
- The CLG Europe report Raising European climate ambition for 2030 includes evidence of the strong targets and commitments that CLG members are already making in support of climate neutrality by 2050.
- Walmart is targeting zero emissions in its own operations by 2040, i.e. Scope 1, and they "intend to achieve this without carbon offsets by harvesting enough wind, solar and other energy sources to power our facilities with 100% renewable energy by 2035".

B. Measure the right things, and report progress

Tasks	Company case studies and resources
"Businesses will need to embrace new measures to understand their full impact and dependencies on the natural world and society."[1] *"Business leaders say they must measure what they seek to manage. They must also measure what matters. Businesses can ensure that they measure the right things in their operational practices using appropriate social, environmental and economic criteria."*[1] **Metrics and information systems:** • Establish metrics/indicators to measure progress relative to targets set by the organisation to assess performance in relation to the management of relevant climate-related risks and opportunities. • Establish robust information systems and processes for data management and deploy analytics to generate new insights and solutions. • Measure positive and negative climate impacts of the solutions portfolio. Evaluate the impact of societal influence initiatives.	• The GHG Protocol establishes comprehensive global standardised frameworks and calculation tools to measure and report GHG emissions. It produces standards for companies and other organisations, cities, corporate value chains (Scope 3) and products • The Task Force on Climate-related Financial Disclosures (TCFD) has produced a table of common carbon footprinting and exposure metrics and links to other useful resources. • The Investment Leaders Group (ILG) developed the Investment Impact Framework , which provides investors with a simple dashboard to check their alignment with an otherwise complex web of SDGs • The World Resources Institute has published research that provides insight into which metrics public-and private-sector banks can use to report on the extent to which their activities help or harm the transition towards a low carbon economy. • The World Benchmarking Alliance is developing a Climate and Energy Benchmark that will rank the 450 keystone companies in high-emitting sectors.
"By broadening the use of environmental, social and governance (ESG) reporting, businesses can send a clear message to society, capital markets and other stakeholders that their longer-term approach to value creation is aligned with a sustainable economy."[1] **Report publicly** • Report progress publicly on goals and targets and progress towards them, disclosing reliable, balanced information on climate action: o Follow the Greenhouse Gas Protocol Standards.[12] o Report on the TCFD recommended areas of Governance, Strategy, and Risk Management. o Disclose emission targets that have been set and performance against them. o Disclose material Scope 1, Scope 2 and Scope 3 GHG emissions and the related risks, and strive to include at least 95 per cent of total emissions. o Disclose the impact of climate change risks and opportunities on financial planning (OPEX, CAPEX, M&A, debt). o Disclose positive (or negative) climate impacts of the solutions portfolio and societal influence initiatives. o Disclose internal carbon price. o Disclose memberships of trade associations that engage on climate-related issues.	• The Climate Disclosure Standards Board (CDSB) developed a framework for reporting environmental and climate change information in mainstream corporate reports, such as the annual report. • ISO 14064-1:2018 specifies the principles and requirements for designing, developing, managing and reporting organisation-level GHG inventories. • CDP runs a leading global disclosure system for carbon and other environmental impacts for use by investors, companies, cities, states and regions. • The GRI developed a standard that sets out reporting requirements on the topic of emissions, including GHGs. • The TCFD established a repository of case studies to enable organisations to share experience and provide peer-to-peer learning on how to integrate climate-related information within existing reporting practices. • A4S launched a series of practical examples to show how organisations have started to implement the TCFD recommendations, which show how the results from scenario analysis were able to inform decisions within their respective organisations. • The C2ES report The Business of Pricing Carbon describes the business case for internal carbon pricing, the different internal carbon pricing approaches used by companies, and key lessons learned.
Verification • Have operational GHG emissions (Scope 1 and/or 2) independently audited/verified by a third party, or in accordance with an international assurance standard.	ISO 14064-3:2019 specifies principles and requirements and provides guidance for verifying and validating GHG statements.

Embed net zero practices in operations and supply chains

Contents

How to guide

The detail

Myths and barriers

An effective response to net zero requires thoughtful and systematic planning to inform decision-making around interventions. Businesses are by nature places of action and can embed new ways of thinking in their operational practices and decision-making. Decisions and actions taken by employees shape the activities of the company, from executives to the shop floor. To progress to net zero, actions need to be implemented to decarbonise the organisation's operations and its supply chains. Any remaining hard-to-mitigate emissions may need to be addressed via carbon removal or offsetting. However, this should be a last resort, since the technologies and systems needed for this are not yet well proven.

The tasks set out below, with supporting case studies and resources, serve to help businesses embed net zero in their own operations and supply chains.

A. Plan to meet goals/targets

B. Take action within own operations and supply chains

Click bold text on this page for relevant pages or scroll down

A. Plan to meet goals/targets

Contents

How to guide

The detail

Myths and barriers

Tasks

"Many companies are likely to lack the clarity of means for delivering on a net zero goal. Others will need to win over shareholders and other interests before they can commit to the capital investment or innovation needed."[13]

An effective response to net zero requires thoughtful and systematic planning to inform decision-making around interventions:

- **Adopt a systemic approach to planning**, recognising the inter-relationship between climate change, people, the environment and the economy.
  - o Consider wider challenges to 'business as usual' (e.g. biodiversity loss, resource scarcity).
- **Review decision-making frameworks** and processes to enable decisions to be made based on best available data and analysis and in alignment with strategy.
- Set and use an **internal carbon price** to mitigate transition risks and improve decision-making around investments.
- Undertake **design process reviews and feasibility studies** to inform decision-making around interventions:
  - o Ensure that solutions will contribute to sustainability and not lead to unintended consequences.
- **Develop a road map and action plan** that covers Scope 1 and 2 and, as appropriate, Scope 3 emissions and sets out the practical steps required to achieve the net zero goals/targets. When developing the plan consider:
  - o where the business has **influence and leverage**
  - o the **process and mechanisms of change** required to ensure a just and rapid transition at scale
  - o generating an internal conversation on how change can be achieved
  - o convening internal workshops for key stakeholders and using systemic tools to identify and prioritise strategic responses
  - o the main obstacles to achieving net zero, the carbon reduction potential, and the implementation costs for innovative solutions when selecting/prioritising alternatives
  - o the organisational structure, roles, responsibilities and interfaces between sustainability function and other functions
  - o all key business processes (operations, procurement, product development, business planning, etc.) and their performance management
  - o the availability of data to inform decisions (i.e. in relation to future trends), and the nature of the new data (i.e. non-financial) to be factored into decisions.

Company case studies and resources

- ISO 14080:2018 gives guidelines by means of a framework and principles for establishing approaches and processes to identify, assess, develop, manage and revise methodologies on climate actions.
- A case study of Sky's approach to removing single-use plastic from its business provides transferable experience. The 'story of change' highlights the key factors that have enabled the business to transform. One of the four key factors is aiming for cost neutrality within existing budgets.
- The Embedding Project offers a selection of the most relevant resources and tools to help companies embed sustainability.

B. Take action within own operations and supply chains

Contents
How to guide
The detail
Myths and barriers

Tasks

"To progress to net zero, actions need to be implemented to decarbonise the organisation's operations and its supply chains. Any remaining hard-to-mitigate emissions may need to be addressed via carbon removal or offsetting; however, this should be a last resort, since the technologies and systems needed for this are not yet well proven."

Decarbonising operations and products

- Implement the action plan to **decarbonise own operations** (Scope 1 and 2 emissions).
- Specific actions will typically include:
  - improving the **efficiency** of buildings, fleet and industrial processes, including by investing in capital projects and/or better systems and processes for energy management
  - switching to **electricity from renewable sources** either via self-generation or purchasing from suppliers with guarantees of origin
  - switching to vehicles powered by non-fossil fuel sources, such as batteries, hydrogen and/or biofuels
  - replacing existing fossil fuel sources for **heating and cooling with more efficient or cleaner alternatives**
  - reducing business travel, especially flights
  - creating **dedicated climate funds** for strategic, longer-term, high-impact potential projects which still have an unclear business case.

Company case studies and resources

- **Ingka Group (IKEA): from ambition to action:** IKEA recently set itself the target of becoming 'net positive' by 2030, a goal that places it in the vanguard of corporate climate leadership. Supported by a €100 million fund to encourage suppliers to adopt renewable energy, this hugely ambitious objective emerges out of a preceding commitment to become 'energy positive' by 2020. A central pillar of IKEA's People and Planet strategy was to produce more renewable energy than it consumed as a company. It achieved this in large part through a €0.5 billion investment in rooftop photovoltaic panels on its stores, factories and warehouses, as well as major investment in industrial-scale wind and solar power generation plants. Other elements of its drive to become energy positive include extensive in-house energy efficiency measures and the development of innovative energy-saving products and a circular manufacturing process. **Read full case study here**.
- **From lighting to LEDs:** Back in 2006, Signify (formerly Philips Lighting) issued a global call to phase out traditional, incandescent light bulbs. At the time, Signify was the market leader in this product sector. The decision was a bold one for two reasons. Firstly, this was the product the company was founded on, and at the time it still made up two-thirds of its sales volume. Secondly, light-emitting diode (LED) lighting was not yet available as a commercially ready alternative. Today, Signify leads the market in LEDs, a low-energy innovation that now predominates in the lighting sector. The role of glass production as a key component in the manufacture of lighting products – a major barrier to entry for small market innovators – has diminished, and the industry is now considerably more dynamic and competitive as a result. **Read the full case study here**
- The Hybrit joint venture between SSAB, LKAB and Vattenfall is investing in the world's first fossil-free iron ore-based steel production by using fossil-free electricity and hydrogen instead of coke and coal.
- Interface has been able to ensure that all of its flooring products are carbon neutral and is exploring the use of carbon negative materials in their carpet tile products. With its Climate Take Back plan Interface also aims to contribute to reversing global warming by using materials that use waste carbon or sequester carbon for products like carbon-capturing tiles.
- Project Drawdown maintains a repository of climate solutions.
- The UN Global Compact has established the Business Leadership Criteria on Carbon Pricing, setting an appropriately high internal carbon price as the first step.
- Signify's President highlights improving the efficiency of old buildings and ensuring new buildings are carbon neutral by design, switching to electric vehicles and moving to renewable energy sources as ways businesses can go about making operations carbon neutral.
- DSM applies an internal carbon price of €60 per ton of CO_2 to further guide its investments and operational decisions towards low carbon operations.
- The CLG Europe Policy Briefing Forging a carbon-neutral heavy industry by 2050 describes approaches taken by companies to decarbonise industry.
- The International Renewable Energy Agency's Reaching Zero with Renewables report provides a comprehensive study of deep decarbonisation options.

"The development of organisational capability and capacity to deliver this change is a critical enabler of progress. Businesses can align staff recruitment, development and reward systems to equip employees with the insight, mindset and capabilities to drive change at the scale and pace required. Are businesses developing and attracting talented people with the capabilities, perspectives and capacity to operate and thrive in the future?"

Integrate into decision-making, accounting and planning systems, processes and policies.

- In particular, this includes:
  - incorporation into corporate risk function
  - developing and putting into place necessary policies, codes of conduct, management standards and associated procedures
  - incorporating strategy and goals into business planning processes and business management systems, e.g. project management systems and accounting or financial management systems.
- **Empower key functions, assign responsibilities and align incentives:**
  - Assign roles and responsibilities for delivering against the strategy, clarifying expectations and responsibilities of employees, and translating goals and targets into performance expectations of individual employees.
  - Where appropriate, link employee compensation to the achievement of net zero goals.
- **Develop the capability and capacity** to address the demands that net zero places on leaders across organisations:
  - Following an assessment of capacity needs, invest in staff development, move people with the skills and experience required into key roles, and – where necessary – create and recruit into new posts.
  - As well as requiring new insight and technical competence, new capabilities may be needed, for example in influencing effectively across complex systems, collaborating with others in the co-creation of solutions, and in innovating in product, process and business model.
- **Communicate and engage internally:**
  - Keep employees informed and up to date as the strategy, targets, policies, procedures, and products and services evolve, with visible leadership by the executive team to signal the strategic significance of the net zero transition to the future success of the business.
  - Proactively seek and leverage employee input and cultivate influential individuals as champions to support innovation, action and sharing across the business.
- **Foster innovation across the business:**
  - Integrate the net zero ambition into existing innovation processes, including into work to drive and harness tech innovation and digital transformation.
  - Where necessary, create new innovation forums and systems – and align resourcing – to develop pilots, review and refine, and scale up zero carbon alternatives to current, carbon-intensive ways of working.
  - Maintain leading-edge insight into emerging technologies and solutions, paying attention not only to peers but to disruptive innovators in other sectors and working closely with leading research institutes.
  - Create value chains around new technologies and scale up underused decarbonisation solutions such as carbon capture and utilisation, and low carbon, hydrogen or synthetic fuels.
  - Innovate low carbon solutions with other energy users in or near own operations, such as sharing the costs of commissioning or scaling low carbon energy technologies.
  - Develop technologies and products to help consumers/customers to reduce and/or remove carbon.
- **Address legacy issues:** Companies often find themselves with legacy products and services that are incompatible with a net zero future. Technological or economic barriers may prevent them from a process of rapid decarbonisation. In such circumstances, companies are faced with the prospect of investing significantly in research and development (at additional cost) or adopting a phase-out strategy (resulting in lost revenues), or a combination of these approaches. While there are real short-term costs and impacts, the prospect of significant market disruption as a result of transition to a net zero economy means that inaction will not be an option and grappling with these impacts is essential.

- CISL's Rewiring leadership report describes how to develop the leadership we need to deliver value for business, society and the environment.
- The Tata Sustainability Leadership Programme familiarised participants with the scientific evidence for climate change to enable senior leaders to build organisational resilience to climate change.
- Scottish Power has worked actively to improve diversity in the workforce and to increase mobility between offshore renewables and extractive industries.
- CISL engaged leaders across Anglo American to help them understand their contribution to the business's strategy in order to create long-term value for all stakeholders.
- Heathrow Airport has embedded sustainability and galvanised leaders across the organisation to deliver its decarbonisation strategy.

- The Whittle Laboratory brings together researchers, innovators and industry to develop technologies to improve the energy efficiency and aero-thermal performance of turbomachines, thereby reducing the environmental impact of power generation and aviation.
- A C2ES report provides business innovation case studies of bringing low carbon solutions to market.
- Interface has developed 'Proof Positive' carpet tiles that are carbon negative, thereby helping their customers to reduce their carbon footprint.
- **BT** is helping its customers reduce carbon emissions by providing products and services that reduce the need for travel, energy use and the amount of materials and manufacturing.
- As part of its 'climate positive' commitment, IKEA is developing circular solutions to help customers live low carbon lives through innovations in customer travel, home deliveries and product use at home.
- **Tetra Pak** provides a carbon calculator so that customers can be informed of the carbon footprint of the various types of packaging they produce.
- The Microsoft Sustainability Calculator helps enterprises analyse the carbon emissions of their IT infrastructure.

- **Resilience and adaptation in operations**
  Alongside decarbonisation, organisations must consider **resilience and adaptation** to a temperature increase of (at least) 1.5°C as well as to transition risks.[14] In its 2018 report, the IPCC[7] highlights options for adaptation, including:
  - identifying vulnerabilities through analysis, including using participatory scenario planning, for example (see 'Analysis required', above)
  - establishing more resilient infrastructure
  - implementing disaster risk management systems
  - using nature-based solutions to improve flood resilience
  - developing drought-resistant crops.

- ClimateWise has published reports outlining priorities, a planning framework and a toolkit for building urban resilience against the weather effects of climate change.
- ClimateWise's Investing for Resilience report explores how the insurance industry can contribute to redirecting substantial flows of capital into resilience-enhancing investments.
- The University of Cambridge's Institute for Manufacturing has an Industrial Resilience Research Group that focuses on how manufacturing can become more resilient at the factory, supply network and industrial system levels.
- The United Nations Environment Programme and Global Compact have published ten case studies on climate change adaptation that underscore the private sector's strengths in identifying new business opportunities, creating new markets, and recognising and managing risks that are critical in building resilient businesses and communities.
- The Shared Socioeconomic Pathways are part of a new framework that the climate change research community has adopted to facilitate the integrated analysis of future climate impacts, vulnerabilities, adaptation and mitigation.

"This may mean new policies and methods in sourcing and production; making bold decisions which go further than required by government policies to take voluntary action on labour rights, greenhouse gas emissions, or sustainable sourcing standards, for example."

Decarbonisation of supply chains:

- Factor climate change into all **procurement decisions**, including for professional and financial services:
  - Require **suppliers to have a strategy** consistent with the achievement of net zero carbon by 2050.
  - Incorporate requirements or standards relating to climate into **procurement policies** and have a strategy for sustainable sourcing.
- **Work with suppliers** to enable decarbonisation, focusing on the emissions hotspots:
  - Pursue opportunities for transformational changes and **mutual benefits** from innovation, increased efficiency and enhanced reputation.
  - Explore opportunities for investment projects within the supply chain, which will safeguard the resource that is being purchased, while enabling the avoidance or sequestration of emissions.

- **Interface: Embedding net zero into operations and supply chains:** Under its 'Climate Take Back' plan, launched in 2016, the commercial flooring manufacturer Interface is seeking to become a 'carbon positive' company by 2040. Critical to its ambitions is the engagement of its material suppliers (Scope 3), which account for the majority of the company's carbon footprint. Interface's current strategy replaces its 'Mission Zero' strategy, which it launched in 1996 with the goal of becoming net zero. The company announced the success of this programme in 2019. With the help of its supply base, Interface was able to reduce the carbon footprint of its carpet tile and flooring products by more than two-thirds (69 per cent) during this period. **Read the full case study here**
- **Danone: Taking action in the supply chain:** As part of its goal to become net zero by 2050, French food corporation Danone is promoting regenerative agricultural practices among its supply base of 58,000 farmers. The rationale: emission reduction and resilience. Danone's focus on its agricultural supply chain is motivated by the substantial percentage of its carbon footprint (around 62 per cent) that derives from the production of milk and other agricultural raw materials in its supply chain. As well as reducing its indirect emissions, regenerative agriculture promises to make Danone's supply chain more resilient to increasing temperatures and other climate shocks. **Read the full case study here.**
- CISL's Trado model provides transformative potential to harness digital innovation and financial technologies to improve the sustainability of global supply chains.
- CLG Europe members are committed to lowering GHG emissions that occur in their value chains, both upstream and downstream:
  - ACCIONA aims to reduce its emissions from purchased goods and services, capital goods, energy-related activities and upstream transportation and distribution by 16 per cent by 2030, against a 2017 baseline.
  - Stora Enso intends to have 70 per cent of suppliers and downstream transportation suppliers set their own GHG reduction targets by 2025, with the aim that they all adopt science-based targets by 2030.
  - Unilever commits to reduce GHG emissions from the life cycle of its products by 50 per cent per consumer use by 2030 from a 2010 base year.
  - Interface has delivered on its Mission Zero® commitment, set in 1994, to eliminate its negative environmental impact by 2020 by becoming the first global flooring manufacturer to sell all products as carbon neutral across their full life cycle.
- The Investment Leaders Group (ILG) Sustainable Investment Framework offers a new approach for the investment community to measure how progress is being achieved, using the UN SDGs as measures of performance.
- The International Renewable Energy Agency's Global Renewables Outlook: Energy transformation 2050 report highlights climate-safe investment options until 2050, the policy framework needed for the transition and the challenges faced by different regions.
- Microsoft has established a Climate Innovation Fund to primarily invest in climate solutions that have been developed and need capital to scale in the market.
- In June 2020 Amazon announced its Climate Pledge Fund with an initial $2 billion in funding to support the development of products and solutions that will facilitate the transition to a low carbon economy.
- Verra's Verified Carbon Standard (VCS) programme assesses projects against a set of rules and requirements in order to issue verified tradeable GHG credits for use in voluntary offsetting. Verra has been criticised for providing a 'licence to pollute', which they deny.
- The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is an emission mitigation approach for the global airline industry, developed by the International Civil Aviation Organization (ICAO). These schemes are criticised for providing a 'fig leaf' rather than targeting the root causes of the problem.
- **Qantas** Future Planet Programme is reportedly the largest offsetting scheme offered by an airline.

Engage, collaborate and advocate change across regions, sectors and markets

Companies cannot limit response to their own operations and suppliers. As well as decarbonising their own footprint (Scopes 1–3), there is also a critical role for business in supporting wider systemic shift that is needed.

> **“Businesses can use their influence to engage communities, and build public and government appetite for sustainable business. Given the significant business opportunities and risks in the transition to a sustainable economy, this is no time for greenwash, complacency or ‘basic compliance’ approaches. Business is expected to lead. Using corporate influence for constructive community engagement, positive policy dialogue and behaviour change is an essential characteristic of a sustainable business.[1]**
>
> **With these foundations in place, we observed that it becomes possible for the [organisation] to bring counterparties together to promote and then realise visions of a low carbon future – to connect clients with experts and capital that improve the visibility and attractiveness of low carbon business cases. It begins with a deep, trusting client relationship, where the [organisation] is a ‘critical friend’. This makes it possible to have difficult, but business-critical conversations about the transition. In these conversations the [organisation] can share a vision of a low carbon future with [customers]. If it has also spent time cultivating relationships with experts, it can then connect the [customers] with the experts or tools needed to realise that vision. These partnerships with experts provide the [customers] with confidence and/or technical assistance.[15]”**

The tasks set out below, with supporting case studies and resources, serve to help businesses:

- use their role to accelerate international, regional, sectoral, value chain transition to net zero
- engage with communities, public policy and customers to drive action towards a sustainable economy.

Tasks	Company case studies and resources
"Accelerating progress towards a sustainable economy will require businesses to enter new collaborations with their value chains, customers, communities, competitors and peers, to harness and deploy new innovations. Businesses can engage external stakeholders in ways that mitigate risk and unlock opportunities for sustainable business; this includes governments and regulators, customers, communities, suppliers, investors and business associations [...] Businesses can work with governments and communities to minimise potential negative impacts of change, such as job losses caused by industry transitions and automation. This gives communities a voice in transition planning and provides support to access new opportunities."[1] • **Engage and collaborate** with internal and external stakeholders, including employees, industry peers/competitors, partners, customers, regulators and key civil society organisations to address common barriers to progress and accelerate sectoral transition: • Leverage value chains to scale up the use of existing decarbonisation solutions, such as natural climate solutions and circularity. • **Engage with investors/shareholders** to influence their focus on long-term transition to a sustainable economy, not short-term financial performance. • Forge **strategic partnerships and deep collaborations** with key customers/clients. • **Connect customers/clients with experts, tools and/or capital** that improves the visibility and attractiveness of low carbon business cases. • Demonstrate support for mitigating climate change through **membership of industry associations** that are supportive and using this as a platform for wider influence. o Ensure consistency between the organisation's climate change policy and the position taken by the industry associations it is a member of, responding appropriately to instances where the industry association position is significantly weaker than or contradicts that of the organisation.	• The Better partnerships report by CISL and Ecofys analyses five co-operative initiatives involving the private sector and their emissions reduction potential. • The Consumer Goods Forum is a CEO-led organisation that brings together consumer goods retailers and manufacturers globally to address key sustainability challenges. • RE100 is a global corporate renewable energy initiative bringing together hundreds of large and ambitious businesses committed to 100 per cent renewable electricity. • EV100 is a global initiative bringing together companies committed to making electric transport the new normal by 2030. • **Countdown** aims to bring a wide spectrum of actors to find evidence-based solutions to the climate crisis. • Advancing Net Zero is the World Green Building Council's global project working towards total sector decarbonisation by 2050. • The heads of nine companies have established the Transform to Net Zero initiative to develop a road map to achieve net zero no later than 2050. • We Mean Business is coalition of the world's most influential businesses aiming to drive policy ambition and accelerate the transition to a zero carbon economy. • RE-Source is a platform made up of 50+ major companies calling for corporate renewables to be built into the EU's Covid-19 economic stimulus package.
"Public and government affairs experts can play a vital role in engagements with policymakers to shape future markets which favour sustainable businesses over unsustainable short-term business models."[1] • In all regions in which the business has credibility and influence, **lobby for progressive government ambition** – and ensure that lobbying undertaken on behalf of business by industry groups is aligned with this. • Engage and support the **process of developing and implementing climate change policy** and regulation.	• **Iberdrola: Engage, collaborate and influence change:** For more than a decade, Europe's second largest power firm Iberdrola has taken an active role in climate-related advocacy. One of the world's first companies to set a climate target in line with net zero, the $40-plus billion revenue multinational utility is a perennial contributor to public consultations and policy debates. Its engagement ranges from international summits (it is a regular sponsor of the annual United Nations climate summit) to national enclaves (it vocally supported Spain's recently launched Integrated National Energy and Climate Plan 2021–2030). Most recently, it has advocated strongly both in Madrid and Brussels for the European Commission's 'Green Deal' recovery package, which commits Europe to becoming a net zero continent by 2050. **Read the full case study here.** • The Corporate Leaders Groups advocate for robust business and policy solutions to environmental and sustainability solutions.
Communication • Establish a **robust communications strategy** to develop clear narratives that decarbonising the economy is in business interests, engage with stakeholders, and confidently and transparently communicate the organisation's net zero commitments, action plan and performance. • **Shape market demand: work to engage, inspire and educate customers** regarding benefits of less carbon-intensive products, thereby helping them to integrate climate impacts into their purchasing decisions. • For consumer-facing businesses, use marketing reach to positively **influence consumers** to transition to zero carbon lifestyles, informing purchasing and voting decisions and individual behaviours.	• Tesco and WWF Partnership map the environmental impact of food production. • The M&S Plan A framework brings together individual business unit strategies into a shared programme to engage M&S customers and create long-term sustainable business value. • Unilever's Sustainable Living strategy aims to support consumers in making a positive difference through their everyday shopping choices. • The Storytelling for Sustainability Guidebook from the Embedding Project helps businesses understand what storytelling looks like in practice; develop a sense of why stories are important for embedding sustainability and learn from other practitioners' experiences with storytelling

Net zero unpacked

Impact of climate change

All the available scientific evidence confirms that the world is warming and that it is predominantly due to human activity. Global temperatures are changing at a faster rate than at any time since the end of the last ice age, nearly 12 millennia ago. A combination of advanced scientific modelling and real-time alterations in weather patterns are bringing increasing clarity to the impacts of climate change, both now and in the future.[16]

Meteorologically, the repercussions of a warmer world include a greater intensity of extreme rainfall, an increased frequency of warm and cold nights, and shifts in the length of traditional seasons. The repercussions of these phenomena include a substantial rise in the risk of severe flooding and disruptions in food production, among other potentially disastrous consequences.

Looking ahead, climate scientists also warn of a potential rise in pandemics (as the geographic range of disease-spreading insects increases), mass migration (due to rises in sea levels, land deterioration and water scarcity), and an increase in economic and political instability (as competition over the world's decreasing resources intensifies).

Transitioning to a hotter climate will present a new raft of environmental risks that will, without doubt, amplify existing social tensions and disrupt the way economic value is captured. At an operational level, companies can expect major supply-side shocks (as harvests fail, for instance), as well as severe disruptions to infrastructure (as, for example, flooding damages transport networks and buildings).

Climate change will also have implications for the global labour force. Should agriculture become unproductive in many parts of the world, as is predicted, mass unemployment and economic migration are expected to become the order of the day. Transition out of carbon-intensive industries could also place severe strain on the global labour market if managed poorly.

Why is net zero necessary and what is it?

Achieving net zero is vital to keep global temperatures in check and avoid atmospheric carbon accumulating to such an extent as to irreversibly lock in climate change. Reducing GHG emissions in absolute terms is the surest way to mitigate the risk of catastrophic climate change. The term 'net zero' carbon emissions refers to a state of equilibrium between the amount of carbon emissions that are emitted into the atmosphere and the amount that are extracted from it, which is necessary to achieve a stable climate. Table 1 contains more detailed explanations of the two forms of 'net zero' and the further progression needed to achieve 'climate neutrality'.

Table 1: IPCC definitions of net zero and climate neutrality[17]

Term	Scope of climate forcers	Definition from IPCC SR1.5[2]
Carbon neutrality or **net zero CO_2 emissions**	**CO_2 emissions**	Net zero carbon dioxide emissions are achieved when anthropogenic CO_2 emissions are balanced globally by anthropogenic CO_2 removals over a specified period.
Net zero emissions	All GHG emissions[18]	Net zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period. Where multiple greenhouse gases are involved, the quantification of net zero emissions depends on the climate metric chosen to compare emissions of different gases (such as global warming potential, global temperature change potential, and others, as well as the chosen time horizon).
Climate neutrality	All GHG emissions, regional or local biogeophysical effects of human activities, and, arguably, other radiative forces[19]	Concept of a state in which human activities result in no net effect on the climate system. Achieving such a state would require balancing of residual emissions with emission (carbon dioxide) removal as well as accounting for regional or local biogeophysical effects of human activities that, for example, affect surface albedo or local climate.

Impact of climate change

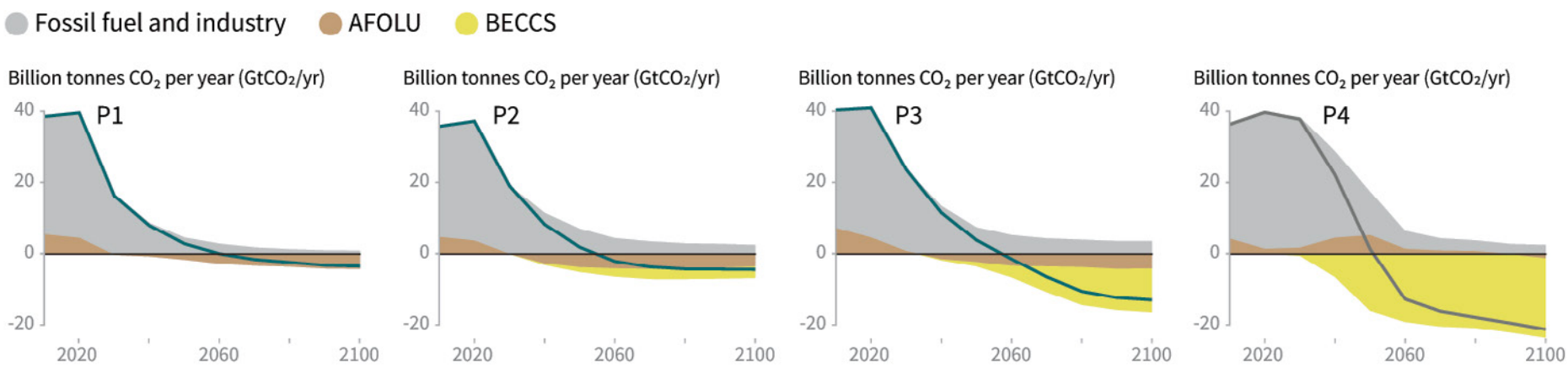
The neutralisation of emissions anticipated by a net zero scenario is achieved through a combination of emission reduction measures, such as introducing renewable energy and reducing reliance on fossil fuels in industry, and carbon removal techniques. Emissions removal can be achieved in two basic ways. First, through natural solutions, such as reforestation, land rehabilitation and soil carbon sequestration. Second, through technological interventions, such as direct air carbon capture and storage, enhanced weathering and ocean alkalinisation.[20]

Pathways to net zero

In a Special Report released in 2018, the IPCC presents a compelling case for limiting global warming to 1.5°C, but warns that the remaining emissions budget for 1.5°C is small and will be exceeded within ten to fifteen years at current emission rates.[2] The IPCC identifies profound material differences between a 1.5°C and a 2°C future, arguing that the latter would result in 61 million more people suffering from drought and 11 million more from extreme heat. It concludes that 2°C would contravene existing government commitments to "prevent dangerous anthropogenic interference with the climate system".[21] This conclusion was reflected in the landmark Paris Agreement in 2015, which calls on its 196 government signatories to commit to keeping global temperatures "well below 2°C above pre-industrial levels" and to "pursuing efforts to limit the temperature increase to 1.5°C".[22] To keep temperature rises to 1.5°C or below, it is necessary to cut carbon dioxide emissions by 45 per cent by 2030 and to reach net zero by 2050, the IPCC indicates.

The UN body presents four illustrative pathways for achieving a 1.5°C scenario (see Figure 5). These focus on a rapid reduction in energy demand, the adoption of sustainable consumption patterns, and greener modes of production and manufacturing, among others. All four pathways anticipate a combination of mitigation steps and emissions removal efforts, although each foresees the balance between the two differently. Varying timelines and contrasting levels of dependency on carbon removal (also referred to as 'negative emissions') are also anticipated. They are all theoretically possible, but this does not mean that they are equally feasible or desirable. Notably, all the pathways assume a large-scale increase in annual investments in low carbon energy technologies and energy efficiency, with estimates ranging from a four-fold to ten-fold increase on 2015 investment levels. In this regard, the P4 pathway's heavy reliance on the development, implementation and radical scaling of such technologies is high risk. In view of this, progressive businesses are, therefore, adopting strategies and advocating for policy which is more aligned to those pathways that have a greater focus on rapid decarbonisation.

Figure 5: Contributions to global new CO_2 emissions in four illustrative pathways[2]



P1: A scenario in which social, business and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

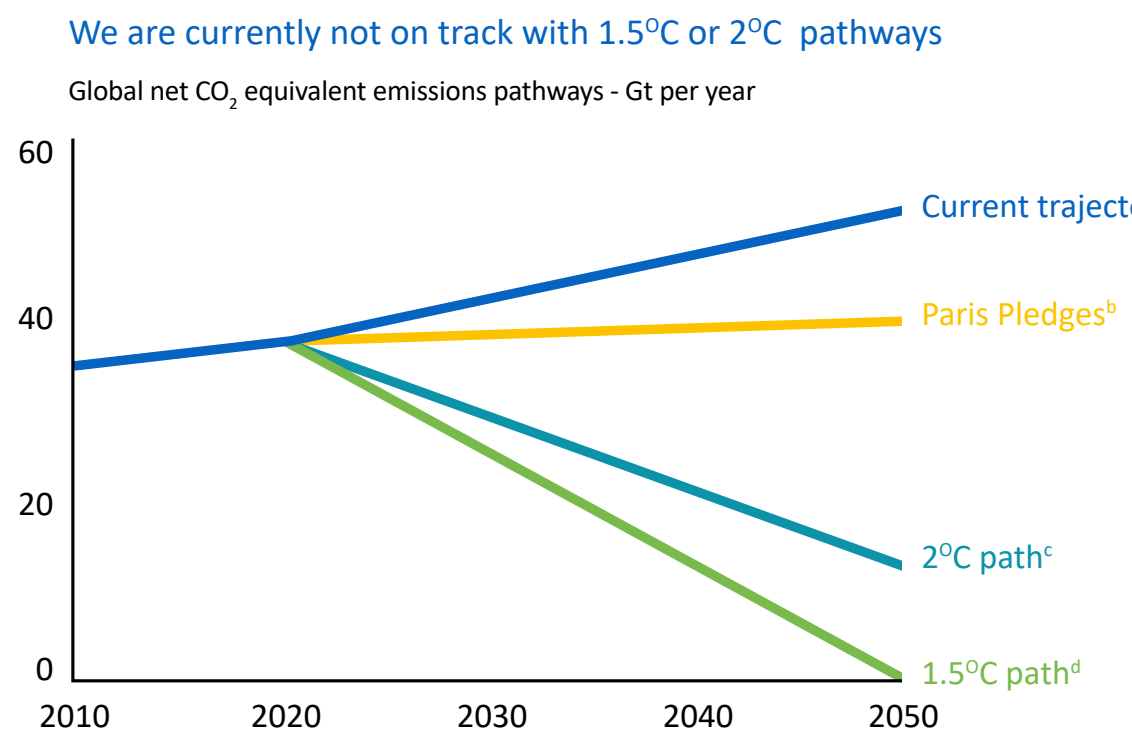
AFOLU = Agriculture, Forestry and Other Land Use
BECCS = Bioenergy with Carbon Capture and Storage

Risks of delaying near-term mitigation

If current trajectories for emission reductions continue, the imperative to keep temperatures below a 1.5°°C rise will not be achieved (see Figure 6). Despite the range of discussion and debate on the issue, emissions have continued to climb. Data for 2009–19 reveals an average global increase in carbon emissions of 1.5 per cent per year.[2] The picture is not entirely bleak. In 2019, for example, global CO_2 emissions related to the generation and consumption of power flattened for the first time this century.[23] This is primarily thanks to the growing role of renewables in today's energy mix.

Global emissions also slowed marginally during the first peak of the Covid-19 crisis in early 2020, with reductions in industrial activity and travel resulting in a 17 per cent drop compared to the year before.[24] This hiatus proved temporary as emissions from those activities returned to and, in some cases, even exceeded pre-pandemic levels after restrictions were lifted.[25] It is too early to tell what the global emissions from 2020 as a whole will be. It is likely we will see a decline, but even if we do we will find it challenging to judge how much of that decline is due to the changing nature of energy generation, increased energy efficiency and other measures, and how much is down to the pandemic and subsequent economic damage.

Figure 6: Current trajectory against 1.5°C and 2.0°C trajectories



a. Assumes CO_2 emissions grow from 2018 at same rate as the Current Policies scenario in UNEP 2019 Gap reort to 2050(1.1%CAGR)

b. Assumes countries decarbonise beyond at same annual rate that was required to achieve their INDCs between 2020 and 2030

c. Assumes 25% reduction by 2030 and net zero by 2070

d. Assumes 45% reduction by 2030 and net zero by 2050

Note: Emissions of non-CO_2 forcers are also to be reduced by more than 50% in pathways limiting global warming to 1.5OC. Source IPCC UNEP Emissions Gap Report. BCG analysis

Risks of delayed action

Net zero carbon goals are typically oriented towards a 2050 target date. This deadline is consistent with the science and provides a useful tool for galvanising action. However, it is very much an end date. Given real-world political and business pressures, a risk exists that the 1.5°C imperative will fall down the list of priorities .

This is concerning as action is required immediately. If atmospheric emissions increase on current trajectories, greater than 1.5°C climate change could become 'locked in' in around 15 years (i.e. long before the 2050 target date). The extent of global warming will be determined by the overall quantity of GHGs in the atmosphere and so any net emissions arising from the global economy worsen the problem. Furthermore, 30 years is not a lot of time for the scale of change required. Finally, a long-term target with no implications for current strategy lacks credibility. For this reason, many leading companies set themselves interim targets for 2025, say, or 2030.

> **"An adequate net zero goal must feed into more ambitious nearer term targets, but also provide a clear signal to prompt innovation and action from business by making the destination of travel crystal clear.[13]"**

Government commitments to a 1.5°C future

Under the term of the Paris Agreement, national governments commit to "achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century".[22] To demonstrate intent and to make clear their trajectory, governments are required to provide Nationally Determined Contributions (NDCs) in line with the accord's objective of keeping global temperature rises from increasing above 2°C (and aim to keep below 1.5°C).

Some progressive-minded countries have laid down the gauntlet, tying their NDCs to a net zero future and making these targets binding in national legislation. Currently, this group numbers half a dozen, including G7 world-leading economies (the UK, France and Germany)[26] but the number expands to cover the majority of the world's economy if we include countries such as China, Japan and South Korea that have committed to net zero but not yet legislated.€In a few cases, governments have made commitments to hit net zero carbon before 2050.[27] Sweden[28] and Scotland[29] have both set 2045 as the target date for balancing their emissions, for example, while Norway leads the pack with a binding target date of 2030.[30] The UK's revision of its 2008 Climate Change Act, passed in April 2019, is noteworthy in that it was the first major economy to set a net zero goal in legislation.[31]

However, if every national signatory to the Paris Agreement were to deliver on their NDCs, then global temperatures would still rise by an estimated 2.8°C above pre-industrial levels. According to the independent Carbon Action Tracker tool, Morocco and The Gambia are the only countries in the world currently with policies consistent with a 1.5°C pathway. Even those nations with legally binding net zero goals are shown to have targets and pledges that are currently "insufficient" (e.g. Norway, the UK and the EU).[32]

Common myths and barriers preventing climate action

Click bold text in this column for relevant pages

Contents
How to guide
The detail
Myths and barriers

	Category	Barrier	Tasks
1	**Practical solutions and technologies:** not yet developed, tested or available at scale	Despite huge advances in the recent past, such as those seen in the wind and solar markets, the search for technological solutions to emissions reductions continues. This is especially true for 'hard-to-abate' sectors, such as heavy industry (e.g. cement, chemicals and steel) and heavy transport (e.g. long-distance road transport, shipping and aviation). Another area where technology presents a current barrier is large-scale carbon removal solutions, such as carbon capture and storage.	**Foster innovation across the business by:** • integrating the net zero ambition into existing innovation processes • creating new innovation forums and systems – and aligning resourcing – to develop pilots, review and refine, scale up zero carbon alternatives to current, carbon-intensive ways of working • maintaining leading-edge insight into emerging technologies and solutions, paying attention not only to peers but to disruptive innovators in other sectors and working closely with leading research institutes.
2	**Knowledge and confidence:** lack of awareness and understanding of nature and scale of the issue and capability to respond	Very few senior executives or directors have the time or experience to be able to engage with the huge and growing body of science, analysis and examples of innovation. Without this subject knowledge or clear understanding of the wider context in which climate action is taking place, it can be difficult for them to judge what 'good' looks like or what strategic options might be most appropriate. These knowledge gaps can often feed into a lack of confidence to depart from business-as-usual strategies. This is particularly the case when climate actions result in knock-on effects elsewhere in the business, such as impacts on jobs or increased prices for consumers.	**Establish leadership and governance with the necessary capabilities, remit, time and structures.** Develop board capacity to raise awareness of impacts (using the assessment) and rapidly shifting stakeholder expectations. **Develop the capability** and capacity to address the demands that net zero places on leaders across organisations.
3	**Mindset or commitment:** misunderstanding or belief or mindset that this is not yet a material **business** issue, or that business should do only what is required by regulators, investors or customers	Some businesses still fail to recognise the strategic or operational risks or opportunities presented by rapid climate change. It is important to distinguish this from climate denial, which refutes the science of climate change (and is increasingly less commonplace). The stumbling block instead is one of relevance. Many companies, especially those in the services sector or other non-carbon-intensive industries, still have a poor or erroneous understanding of how their business will be affected. In light of the perceived immateriality of climate change, the predominant view in such cases is to see the issue as an external imposition for which only minimal compliance is necessary.	**Undertake analysis and build analytical capability:** to ensure business responses to net zero are informed by thorough understanding of climate-related risks and opportunities and the organisation's contribution to climate impacts. Depending on the level of board awareness and buy-in, this may need to be iterative to build the case for a more thorough analysis. **Determine how net zero response delivers on and aligns with the organisation's purpose.** Develop a clear and transparent process for aligning the purpose and strategy. Ensure this process has a balance of perspectives and approaches. Build capacity of the executive team and board to help them understand the need for change and the benefits of aligning the purpose and strategy with sustainability. **Align the organisation's strategy with the science**, i.e. working towards a global goal of net zero carbon by 2050.
4	**Resources, responsibility allocation or organisational structure:** lack of integration into governance and decision-making processes, lack of accountability and ownership, and/or insufficient scope or capacity for innovation and transformation	Achieving net zero requires a multi-divisional response that stretches across the entirety of a company. Often responsibility for delivery is delegated to a single business function, typically environmental management or a close equivalent. Even when this unit has a mandate to work across other divisions, it may lack the resources or internal influence to do so. The absence of senior leadership engagement or formal board responsibility for delivering on net zero stymies efforts further down the company to gain cross-functional buy-in and build momentum.	**Establish leadership and governance with the necessary capabilities, remit, time and structures.** Develop board capacity to raise awareness of impacts (using the assessment) and rapidly shifting stakeholder expectations. **Develop a road map and action plan** that considers the organisational structure, roles, responsibilities and interfaces between sustainability function and other functions. **Empower key functions, assign responsibilities and align incentives.** Assign roles and responsibilities for delivering against the strategy, clarifying expectations and responsibilities of employees, and translating goals and targets into performance expectations of individual employees. Where appropriate, link employee compensation to the achievement of net zero goals.
5	**Uncertainty and complexity:** lack of clarity and alignment on transition pathways for sectors and regions, and/or about climate impacts and the effectiveness of specific interventions	Emissions reductions are often systemic – therefore leading to uncertainty and complexity for businesses. For instance, to reduce emissions from the steel sector there are a number of options including substituting steel with alternatives, reducing its use and decarbonising its production. Businesses producing and consuming steel, public consumers, regulators, policymakers and investors all have contributions to make to those strategies. If different actors prioritise different approaches, there may be less effective and efficient progress – but how does each actor have confidence in what others will do?	**Undertake analysis and build analytical capability** to ensure business responses to net zero are informed by thorough understanding of climate-related risks and opportunities and the organisation's contribution to climate impacts. **Engage and collaborate** with internal and external stakeholders, including employees, industry peers/ competitors, partners, customers, regulators and key civil society organisations to address common barriers to progress and accelerate sectoral transition.
6	**Business case:** inability to reconcile long-term transition strategy with pressure to create value for shareholders in the short term due to inappropriate business models or misaligned incentives	Some company executives struggle to effectively calculate and articulate how a net zero pathway can contribute added value to the business, thus limiting the traction they gain both in the boardroom and across the business. Even when the business case may be clear, a failure to articulate the vision for a net zero future can limit internal buy-in and thus stymie progress.	**Establish leadership and governance with the necessary capabilities, remit, time and structures.** Develop board capacity to raise awareness of impacts (using the assessment) and rapidly shifting stakeholder expectations. **Align business models with net zero to produce goods and services in a lower carbon way** and/or to create new, zero carbon solutions. **Align the organisation's strategy with the science**, i.e. working towards a global goal of net zero carbon by 2050. **An effective response to net zero requires thoughtful and systematic planning to inform decision-making around interventions:** undertake design process reviews and feasibility studies to inform decision-making around interventions.
7	**Data, tools, frameworks and examples:** lack of standards on what 'good' looks like or the means to measure it	Data on climate issues remain a mixed bag very often. Access to information is often patchy or incomplete. Such data as are available, meanwhile, can often be found to be unclear or inconsistent. This requires business decision-makers to make strategic choices with considerably less information or analysis than they may be used to. The incipient nature of net zero standards and strategies further complicates this dilemma as it leaves executives with little by way of guidance or precedent to go by. Lack of clear metrics also hampers companies' ability to respond to external demands for evidence of progress.	**Metrics and information systems:** establish metrics/ indicators to measure progress relative to targets set by the organisation to assess performance in relation to the management of relevant climate-related risks and opportunities. **Engage and collaborate** with internal and external stakeholders, including employees, industry peers/ competitors, partners, customers, regulators and key civil society organisations to address common barriers to progress and accelerate sectoral transition. Leverage value chains to scale up the use of existing decarbonisation solutions, such as natural climate solutions and circularity.
8	**Boundary setting:** lack of clarity and agreement on the scope of business responsibility, especially in relation to Scope 3	Net zero runs against the grain of conventional environmental management procedures and legislation in that it calls on companies to look beyond the impact of their immediate operations and take responsibility for those of others, such as consumers and suppliers. Defining the nature, extent and means of exercising this responsibility is complex as a company's influence or agency is often limited.	**Identify priorities for intervention via benchmarking**, stakeholder engagement and materiality assessment using data such as Project Drawdown. **Publish a policy or commitment statement** on climate change that commits the organisation to addressing the issue, or to reducing or avoiding impact of climate change . Goals should be set for all key aspects of strategic response, not just decarbonisation across Scopes 1–3. **Engage and collaborate** with internal and external stakeholders, including employees, industry peers/ competitors, partners, customers, regulators and key civil society organisations to address common barriers to progress and accelerate sectoral transition.
9	**External engagement and communication:** absence of a clear strategy, lack of capacity/capability, reputation concerns or fear of over-promising	The net zero journey commences with a company making a clear commitment to set science-based targets in line with a 1.5°C future. Such a commitment carries with it an understanding of delivery or, at the very least, the intent to deliver. This represents a bold step for many companies, particularly those in high carbon sectors for which the requisite strategies or technologies to achieve net zero may not exist or may still be nascent. Companies with little experience in climate action may also lack the internal know-how or confidence to map a clear pathway to net zero or, having done so, to implement that pathway. This combination of uncertainties and doubts can dissuade companies from pledging publicly to become net zero as they fear reputational damage or even legal ramifications should they fail.	**Public commitment:** publish a policy or commitment statement on climate change that commits the organisation to addressing the issue, or to reducing or avoiding impact of climate change. **9B: Develop the capability and capacity** to address the demands that net zero places on leaders across organisations. **Establish a robust communications strategy** to develop clear narratives that decarbonising the economy is in business interests, engage with stakeholders and confidently and transparently communicate the organisation's net zero commitments, action plan and performance.
10	**Societal transition: lack of political ambition/progress, public investment and/or behaviour change at an individual level**	**Political intransigence:** despite the landmark Paris Agreement in 2015, some countries have either reneged on their climate commitments (most obviously the USA under the Trump Administration) or are falling short of the pledges they made. The 'ratchet mechanism' under the Paris Agreement expects governments to become incrementally more ambitious in regard to climate action. **Capital investment:** back in 2018, the Organisation for Economic Co-operation and Development estimated that US$6.9 trillion of investment would be needed every year up to 2030 to meet climate and development objectives.[33] To date, total investment pledges are several orders of magnitude lower than this, although private capital assigned to climate-related investments is growing fast. Ambitious public commitments, such as the European Commission's 750 billion Green Deal Investment Plan, are expected to accelerate the deployment of this private capital.[34] **Behaviour change:** Without large-scale behavioural change at an individual level, it can be tempting to conclude that corporate climate action is largely redundant. This neglects the influence companies can have on consumer behaviour, especially through marketing and advertising. It also overlooks the impact of systems-wide change, such as a switch in the grid to 100 per cent renewable electricity, which reduces the importance of individual behaviours.	In all regions in which the business has credibility and influence, **lobby for progressive government ambition** – and ensure that lobbying undertaken on behalf of business by industry groups is aligned with this. Engage and support the **process of developing and implementing climate change policy** and regulation. **Shape market demand: work to engage, inspire and educate customers** regarding the benefits of less carbon intensive products, thereby helping them to integrate climate impacts into their purchasing decisions. For consumer-facing businesses, use marketing reach to positively **influence consumers** to transition to zero carbon lifestyles, informing purchasing and voting decisions and individual behaviours.

References

Contents

How to guide

The detail

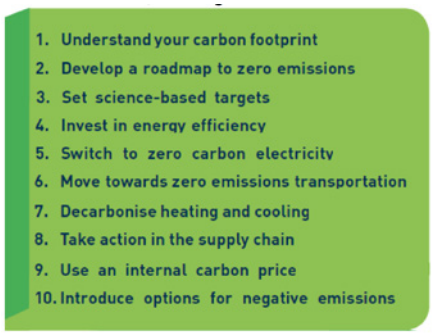
Myths and barriers

The additional detail has been developed by drawing on CISL's insights and a review of the following frameworks:

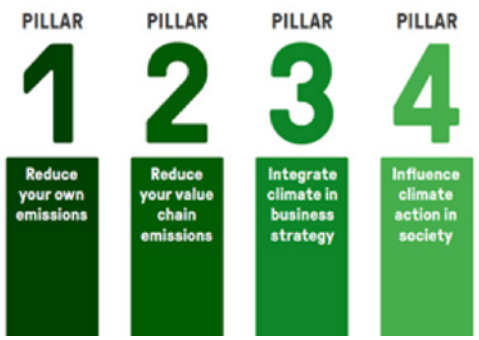
A. TCFD Appendix

B. Transition Pathway Initiative

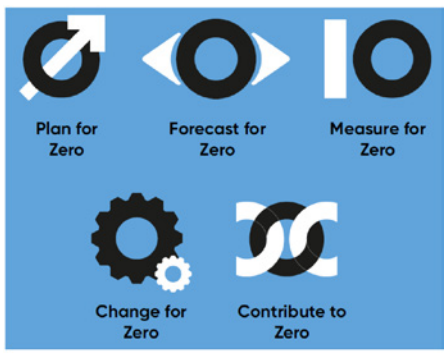
C. Carbon Trust, Aim Higher



D. The 1.5°C Business Playbook



E. EcoAct, A to Zero



F. WBCSD, SOS 1.5

A. https://www.fsb-tcfd.org/ The Financial Stability Board created the Task Force on Climate-related Financial Disclosures (TCFD) to improve and increase reporting of climate-related financial information.

B. Dietz, S., Fruitiere, C., Garcia-Manas, C., Irwin, W., Rauis, B., & Sullivan, R. (2018). An assessment of climate action by high-carbon global corporations. Nature Climate Change, 8, 1072–1075. https://doi.org/10.1038/s41558-018-0343-2

C. Carbon Trust. (2017, October). Aim Higher: How can business help achieve the 1.5°C ambition in the Paris Agreement? Retrieved from: https://prod-drupal-files.storage.googleapis.com/documents/resource/public/Aim%20Higher%20How%20REPORT.pdf

D. Falk, J., et al. (2020). The 1.5°C Business Playbook. Exponential Roadmap Initiative. Retrieved from: https://exponentialroadmap.org/wp-content/uploads/2020/09/1.5C-business-playbook-version-1.1.pdf

E. EcoAct. (2020). A to Zero. Net Zero Strategy. Retrieved from: https://eco-act.com/net-zero-emissions/

F. WBCSD. (2020). SOS 1.5: The road to a resilient, net-zero carbon future. Retrieved from: https://www.wbcsd.org/Programs/Climate-and-Energy/Climate/SOS-1.5/Resources/SOS-1.5-The-road-to-a-resilient-zero-carbon-future

References

1. University of Cambridge Institute for Sustainability Leadership (CISL). (2015; updated 2017). *Rewiring the Economy*: Ten tasks, ten years. Cambridge, UK: Cambridge Institute for Sustainability Leadership. Retrieved from: https://www.cisl.cam.ac.uk/resources/publication-pdfs/rewiring-the-economy-report.pdf

2. IPCC. (2018). Global Warming of 1.5°C: An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Geneva: World Meteorological Organization. Retrieved from: https://www.ipcc.ch/sr15/

3. Greenhouse Gas Protocol. (2013). Technical Guidance for Calculating Scope 3 Emissions: Supplement to the Corporate Value Chain (Scope 3) Accounting & Reporting Standard. World Resources Institute & World Business Council for Sustainable Development. Retrieved from: https://www.ghgprotocol.org/sites/default/files/ghgp/standards/Scope3_Calculation_Guidance_0.pdf

4. It is important to see aligning strategy and purpose as an iterative journey that will take time (also see Figure 2). It is unlikely to provide the 'right answer' first timearound, but rather emerge over time, as a result of evolving insights, experiences and conversations. There is likely to be an interdependency between the evolving purpose, corporate strategy, and approach to sustainability and net zero goals."

5. The Financial Reporting Council Ltd. (2018, July). The UK Corporate Governance Code. Principle B. London: The Financial Reporting Council Ltd. Retrieved from:https://www.frc.org.uk/getattachment/88bd8c45-50ea-4841-95b0-d2f4f48069a2/2018-UK-Corporate-Governance-Code-FINAL.pdf

6. Dietz, S., Fruitiere, C., Garcia-Manas, C., Irwin, W., Rauis, B., & Sullivan, R. (2018). An assessment of climate action by high-carbon global corporations. Nature Climate Change, 8, 1072–1075. https://doi.org/10.1038/s41558-018-0343-2

7. Targets adopted by companies to reduce GHG emissions are considered 'science-based' if they are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement – to limit global warming to well below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C. https://sciencebasedtargets.org/what-is-a-science-based-target/

8. Scope 3 is the major source of emissions in most sectors, therefore meaningful targets should go beyond direct operations and consider upstream and downstream emissions. See WBCSD. (2020). SOS 1.5: The road to a resilient, net-zero carbon future. Retrieved from: https://www.wbcsd.org/Programs/Climate-and-Energy/Climate/SOS-1.5/Resources/SOS-1.5-The-road-to-a-resilient-zero-carbon-future

9. Carrillo Pineda, A., & Faria, P. (2019). Towards a science-based approach to climate neutrality in the corporate sector. Discussion Paper (p. 27). Retrieved from: https://sciencebasedtargets.org/resources/legacy/2019/10/Towards-a-science-based-approach-to-climate-neutrality-in-the-corporate-sector-Draft-for-comments.pdf

10. DSM. (2020). Climate & Energy: Improving our own carbon footprint. Retrieved from: https://www.dsm.com/corporate/sustainability/climate-energy/improving-ourcarbon-footprint.html

11. DSM. (2019, March 13). DSM sets science-based reduction targets for emissions [Press release]. Retrieved from: https://www.dsm.com/corporate/news/newsarchive/2019/07-19-dsm-sets-science-based-reduction-targets-for-emissions.html

12. Greenhouse Gas Protocol. (2020). Standards. Retrieved from: https://ghgprotocol.org/standards

13. University of Cambridge Institute for Sustainability Leadership (CISL). (2018). Aiming for zero: a growing business movement. Cambridge, UK: The Prince of Wales's Corporate Leaders Group. Retrieved from: https://www.cisl.cam.ac.uk/resources/publication-pdfs/aiming-for-zero-a-growing-business-movement.pdf

14. Even if mitigation (i.e. preventing the release of GHGs) can deliver a rise in global mean temperatures that is capped at 1.5°C, adaptation to a changing climate will still be required. The IPCC describes adaptation as "the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities" (IPCC. (2018). Global Warming of 1.5°C: An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Geneva: World Meteorological Organization. Retrieved from: https://www.ipcc.ch/sr15/). The precise extent of adaptation remains unclear, although the IPCC confirms that it will be lower in a 1.5°C than a 2°C scenario. Even if emissions hit zero tomorrow we would still see locked-in warming of around 1.2°C – the impacts we are already seeing are here to stay and will worsen. Without urgent and effective mitigation the costs of adaption to climate change and the scale of impacts that cannot be adapted to (for example, the Australian tourist industry cannot replace coral reefs when they are gone) will grow.

15. University of Cambridge Institute for Sustainability Leadership (CISL). (2020). Bank 2030: Accelerating the transition to a low carbon economy. Cambridge: University of Cambridge Institute for Sustainability Leadership.

16. See: Diffenbaugh, N., & Burke, M. (2019). Global warming has increased global economic inequality. Proceedings of the National Academy of Sciences of the United States of America, 116(20). https://doi.org/10.1073/pnas.1816020116; Abel, G. J., Brottrager, M., Cuaresma, J., & Muttarak, R. (2019). Climate, conflict and forced migration. Global Environmental Change, 54, 239–249. Retrieved from: http://www.sciencedirect.com/science/article/pii/S0959378018301596; Letta, M., & Tol, R. (2019). Weather, climate and total factor productivity. Environmental and Resource Economics, 73(1), 283–305. Retrieved from: http://sro.sussex.ac.uk/id/eprint/76455/4/Letta%20%26%20Tol_R%26R%20No.%202.pdf

17. CDP. (2020, September). Foundations for Science-Based Net-Zero Target Setting in the Corporate Sector. Science Based Targets Initiative. Retrieved from: https://sciencebasedtargets.org/wp-content/uploads/2020/09/foundations-for-net-zero-full-paper.pdf

18. The GHG Protocol requires inclusion of all the GHGs required by the UNFCCC/Kyoto Protocol at the time a corporate or product inventory is being compiled. These GHGs are currently: carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) andnitrogen trifluoride (NF3).

19. There is ambiguity as to whether climate-warming non-CO_2 effects from aviation would be included within the term 'biogeophysical effects of human activities'. Some have coined a new term 'zero climate impact' as distinct from climate neutrality to unambiguously indicate that non-CO_2 effects from aviation should also be neutralised.

20. Among the organisations providing specific help and guidance on emissions removal strategies are: Climate Action 100+, LEED, Net-Zero Asset Owner Alliance,Oxford Martin Principles for Climate-Conscious Investment, RE100, Science Based Targets initiative, and The Investor Agenda.

21. UNFCCC. (2015). Report on the structured expert dialogue on the 2013–2015 review. Retrieved from: https://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf

22. The 27-page Paris Agreement text is available via the website of the United Nations Framework Convention on Climate Change: https://unfccc.int/process-andmeetings/the-paris-agreement/the-paris-agreement

23. IEA. (2020, February 11). Global CO_2 emissions in 2019. Retrieved from: https://www.iea.org/articles/global-co2-emissions-in-2019

24. Le Quéré, C., Jackson, R. B., Jones, M. W., Smith, A. J. P, Abernethy, S., Andrew, R. M., et al. (2020). Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement. Nature Climate Change, 10, 647–653. Retrieved from: https://www.nature.com/articles/s41558-020-0797-x

25. Storrow, B. (2020, June 16). Carbon Levels Surge Again as Countries Emerge from Lockdown. Scientific American. Retrieved from: https://www.scientificamerican.com/article/carbon-levels-surge-again-as-countries-emerge-from-lockdown/

26. As of July 2020, the full list of countries with net zero commitments (although not necessarily legally binding) comprises: Austria, Bhutan, Costa Rica, Denmark, the European Union, Fiji, Finland, France, Hungary, Iceland, Japan, the Marshall Islands, New Zealand, Norway, Portugal, Singapore, Slovenia, Sweden, Switzerland and the United Kingdom. See: the Energy and Climate Intelligence Unit's Net Zero Tracker: https://eciu.net/netzerotracker

27. Government Offices of Sweden, Ministry of the Environment and Energy. (2018, March 26). The Swedish Climate Policy Framework. Retrieved from: https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf

28. Government Offices of Sweden, Ministry of the Environment and Energy. (2018, March 26). The Swedish Climate Policy Framework. Retrieved from: https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf

29. Scottish Government. (2019, September 25). Scotland to become a net-zero society. Retrieved from: https://www.gov.scot/news/scotland-to-become-a-net-zerosociety/

30. Norwegian Ministry of Climate and Environment. (2019, December). Norway's National Plan related to the Decision of the EEA Joint Committee No. 269/2019 of 25 October 2019. Retrieved from: https://www.regjeringen.no/contentassets/4e0b25a4c30140cfb14a40f54e7622c8/national-plan-2030_version19_desember.pdf

31. The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Retrieved from: www.legislation.gov.uk/uksi/2019/1056/contents/made

32. Climate Action Tracker. (2019, December 10). Warming Projections Global Update. Retrieved from: https://climateactiontracker.org/documents/698/CAT_2019-12-10_BriefingCOP25_WarmingProjectionsGlobalUpdate_Dec2019.pdf

33. United Nations Environment Programme. (2018). Digital Finance and Citizen Action: In Financing the Future of Climate-smart Infrastructure. Retrieved from: https://www.oecd.org/environment/cc/climate-futures/case-study-digital-finance-and-citizen-action.pdf

34. European Commission (2020). EU'S Next Long-term Budget & NextGenerationEU: Key Facts and Figures. Retrieved from: https://ec.europa.eu/info/sites/info/files/about_the_european_commission/eu_budget/mff_factsheet_agreement_en_web_20.11.pdf

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