



# THE 1.5°C BUSINESS PLAYBOOK

For companies on a mission  
to change the world

This playbook is supported and used by some of the most influential and innovative companies in the world with a combined annual revenue of over one trillion dollars.

## EXPONENTIAL ROADMAP INITIATIVE

RACE TO ZERO



[www.exponentialbusiness.org](http://www.exponentialbusiness.org)

# INTRODUCTION

Climate change is already causing severe harm to societies and the global economy. Evidence shows that humanity is taking grave risks with the stability of Earth's life support systems if the global average temperature continues to rise.

The most important goal for humanity is to stabilise the global climate at 1.5°C above pre-industrial levels or as close to this limit as it is possible to achieve. This will reduce the risk of crossing irreversible tipping points.\* To achieve that, global greenhouse gas emissions† should be halved by 2030 from a 2020 baseline, and reach near zero by 2050. At the same time, natural carbon sinks and carbon removal technologies must be scaled

up rapidly.<sup>48</sup> This will require the fastest economic and societal transition in history – one which is necessary and may be achievable. This transition will bring significant benefits ranging from biodiversity recovery, reduced pollution to improved health and economic development.<sup>1,3</sup> The world is however on the wrong trajectory which increases the risk of dangerous climate change, requiring even more dramatic reductions.

It is critical to mobilise the entire business sector for the 1.5°C ambition to halve emissions by 2030. Businesses must contribute in four ways. First, by rapidly reducing their own emissions. Second, by reducing emissions in their value chains. Third, by providing climate solutions (products, services and projects) that enable others to avoid and remove emissions. Finally, by accelerating climate action in society and helping to protect and restore nature.

\* The Greenland and West Antarctic ice sheets collapse, widespread abrupt permafrost thaw, collapse of convection in the Labrador Sea, and massive die-off of tropical coral reefs becomes likely already at 1.5°C warming.<sup>40, 49</sup>  
† "greenhouse gas emissions" are also referred to as "emissions" in the Business Playbook.

# 2030

LET'S HALVE  
GLOBAL  
EMISSIONS BY

# WHO IS THIS PLAYBOOK FOR?

This is a handbook for CEOs, board members, business leaders and employees who want to engage in the fastest economic transition in history – and help accelerate it.

We've developed it for companies and for companies and organisations of all sizes that want to align with the 1.5°C ambition through concrete action. It contains solid guidelines for setting climate targets, strategies, transition plans, taking action and disclosing results.

We focus on simplicity and speed. The playbook is grounded in the latest science and it is based on practice and experience from world leading experts and companies. The playbook provides a strategic framework for business planning, business development, strategy and target setting. It is used as the foundation for Climate Performance Reviews, to assess and benchmark companies, provide strategic advice and used as framework for impact reporting.

The Playbook is compatible with existing standards and criteria from initiatives such as the UN-backed Race to Zero, Greenhouse Gas Protocol, Science Based Targets Initiative, EU\*, ISSB, UN Secretary-General's High-Level Expert Group on net zero commitments, CDP and the Mission Innovation.<sup>9</sup>

The climate crisis is directly linked with acute threats to nature: wildlife, water, land and oceans. The aim of this Playbook is to ensure that climate goals and action support the protection and restoration of land and oceans – for human prosperity and equity.<sup>30</sup>

By implementing the strategies in this playbook, companies will also help address the UN Sustainable Development Goals.<sup>1,10</sup>

\* The EU's main initiative today on companies' climate reporting is CSRD.

# CARBON LAW

The world needs to halve emissions by 2030, and halve again and again by 2040 and 2050 to reduce the risk of dangerous climate change. This trajectory is called the Carbon Law.<sup>2</sup> In 2022, the Intergovernmental Panel on Climate Change<sup>39</sup> concluded that it was economically and technically feasible to halve emissions by 2030. In all key sectors, affordable solutions exist to take giant leaps to slash emissions.

The Carbon Law is a simple rule of thumb or heuristic that can be applied at all scales: companies, cities, nations and citizens. If all follow this trajectory then together emissions can fall 50% in under a decade. But we should remember the Carbon Law is a global average. This means it must be viewed as a minimum ambition and the wealthiest countries, companies and citizens should go much faster. Therefore,

companies acting in line with the 1.5°C ambition should strive to reach net zero by 2040 at the latest, and acknowledge that this is an intermediate step towards absolute zero and net negative emissions.

At the same time, the world needs to follow a similar carbon law for nature. This means that emissions from farming and deforestation and other land use must reach zero by 2030, and our land systems then increasingly become greater stores of carbon decade by decade.

**Definition of Net Zero:** The state reached by an organization that has reduced its value chain emissions (scope 1, scope 2 and scope 3 emissions) following a science-based pathway, with any remaining residual greenhouse gas emissions being fully neutralized by permanent or like-for-like removals exclusively claimed by that organization. The term "residual" refers to emissions that remain technically unfeasible to be eliminated. A widely applicable guideline is that such residual emissions shall not exceed 10% of baseline emissions.<sup>†</sup>

\* Definition based on RtZ Criteria 3.0, ISO IWA 42:20234 and SBTi Net Zero.<sup>46</sup>

† The permissible level of residual emissions depends on the baseline, and science-based thresholds for residual emissions at net zero have been established for some sectors.

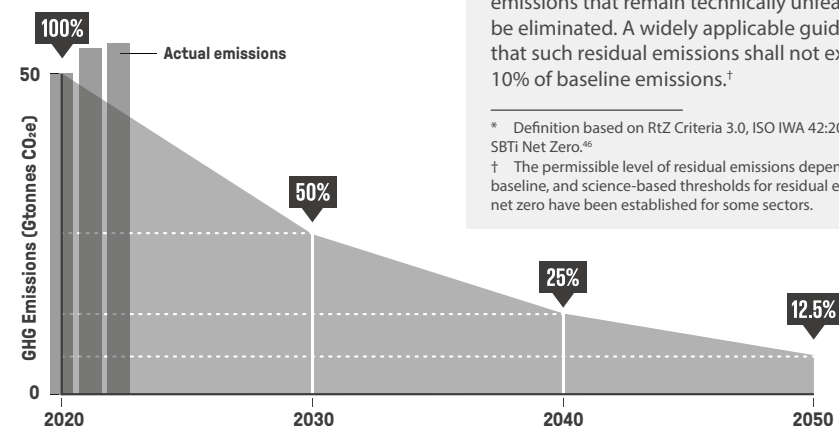


Figure 1. To stabilise global average temperature around 1.5°C emissions need to halve every decade - a trajectory called the Carbon Law. In 2022 emissions rose 1.5% relative to 2021 levels, depleting the remaining carbon budget for 1.5°C by at least 13%<sup>37</sup>. Reductions during the remaining years of this decade need to exceed 7% per year in order to keep within the required carbon budget.

# PLANETARY STEWARDSHIP IS THE FUTURE

Our future depends upon this generation becoming better planetary stewards. The good news is that people want to become better planetary stewards. A recent study found that 83% of people in G20 countries are willing to do more to halt climate change and protect nature.<sup>57</sup>

But we are running out of time. To minimise the risk of reaching climate tipping points the fossil economy needs to end rapidly. We need to push hard to cross social and economic tipping points. The good news is that the economic tipping points have already been crossed for renewable energy and electric vehicles.

- Clean energy is expanding exponentially. In the first half of 2023, renewables generated 25% of the United States' electricity. These renewables helped keep the lights (and air conditioning) on when intense heatwaves struck, driving record demand.
- The costs of renewables are falling sharply. In the last decade (2012–

22), the cost of solar and onshore wind power fell by 80% and 57% respectively. In 2023, the levelized cost of energy (LCOE) of solar and wind was just over \$40 per MWh, about half that of coal and gas.<sup>59</sup> Indeed, in 2020 it was announced that solar energy had become the cheapest form of energy in history in many places.<sup>58</sup> In the last five years, wind and solar have experienced a compound annual growth rate of 24% for and 13% respectively.<sup>59</sup>

- The transport sector is also experiencing rapid and unstoppable transformation. Electric cars' share of the overall car market has risen from around 4% in 2020 to 14% in 2022 and is set to increase further to 18% in 2023. This represents 35% growth in a year according to the International Energy Agency.
- Halving emissions by 2030 is the new normal. 1136 cities, 8307 businesses, and 595 of the largest financial institutions have committed to reach net zero by 2050 at the latest through the UN-backed Race to Zero campaign. Collectively the Race to Zero actors represent 35% of global CO2 emissions and over 50%

of global GDP. Companies representing over one third of global market capitalization have set emission reduction targets with the Science Based Target initiative.

- In May 2023, the European Union passed historic legislation to stop deforestation. The law, which comes into force in 2024, means imports of seven commodities – palm oil, cattle, soy, coffee, cocoa, timber and rubber – will have to comply with strict traceability obligations and evidence must show that they have not been grown on deforested or degraded land. This is the first law of its kind and other countries can follow. This will have a significant impact on the companies using these products and sends a powerful signal about company responsibility for planetary stewardship.
- In the US the Inflation Reduction Act has accelerated the energy transformation. Within its first year companies have already announced nearly 200 new clean energy projects totaling more than \$110 billion in investment. While Europe's Green Deal puts the continent on track to reach net zero by 2050.
- The finance sector is also stepping up. The Task Force on Climate-Related Financial Disclosures,<sup>16</sup> Glasgow Financial Alliance for Net Zero<sup>41</sup> and the UN-convened Net Zero Asset Owner Alliance<sup>38</sup> are driving investment portfolios towards net zero.
- And the companies that act on climate outperform those that don't.<sup>52,53,54,55,20,21</sup> As an example, Tesla, which has a mission to “accelerate

the world's transition to sustainable energy”, has a market capitalization that exceeds that of Toyota, Volkswagen, Mercedes, BMW, Ford & GM combined.

This momentum means it is likely that the decade to 2030 will see the fastest economic transition in history. It presents a huge market opportunity for transformative and disruptive companies in the front line. There are however still strong headwinds. Fossil fuel subsidies reached a record \$7 trillion in 2023, according to the International Monetary Fund, as a result of high energy prices caused by the war in Ukraine. Removing these harmful subsidies, and instead incentivising consumers to adopt clean energy products, is essential to accelerate the transition.<sup>61</sup>

## Exponential Roadmap

The Exponential Roadmap highlighted 36 key solutions that together can halve global emissions by 2030. These solutions are market-ready, they are affordable (like renewable energy), can be scaled rapidly (like electrical vehicles) and can save money (like energy efficiencies). For businesses, reducing greenhouse gas emissions and providing solutions that help customers and society to cut their emissions opens up new exponential growth opportunities and an opportunity to reduce costs and increase performance and profitability.<sup>12,13,14</sup>

# SETTING A FOUR-PILLAR STRATEGY

This guide describes the four pillars of climate action that need to be included in companies' business strategies.

**Pillar 1** focuses on a company's activities to reduce its own emissions\* and impact on nature, aligned with a 1.5°C pathway.

**Pillar 2** focuses on a company's activities to reduce its value chain emissions† and impact on nature, following the same trajectory.

**Pillar 3** focuses on the company's contribution to avoided emissions in society through the use of its products and services.‡ It shifts the focus from only reducing the footprint (Pillar 1 and 2) to providing solutions for the needs in society. Such a shift requires the alignment of the company's mission, strategy, R&D, marketing, value proposition and customer offerings with the 1.5°C ambition. It means shifting the portfolio of offerings towards solutions that help customers and others to avoid and reduce emissions, further enabling sustainable lifestyles and consumption,

and phasing out products with an adverse climate impact.

**Pillar 4** describes how to contribute to the 1.5°C and net zero ambition beyond the company's own business and value chain. This means accelerating global climate action by sharing examples and scaling best practices through collaboration with other industry leaders. It also includes influencing policies and engaging industry associations to accelerate climate action, making climate and nature contributions beyond the value chain and helping management and employees to adopt sustainable practices.

The pillars should be integrated into a company's iterative planning cycle. The starting point is to measure and analyse current emissions and the business model driving those emissions. Then set targets, create plans and move to implementation. The first cycle is complete when results have been measured and disclosed, corrective actions taken and strategy re-evaluated.

A comprehensive approach including all pillars is essential but the priorities and implementation will vary. Companies should be aware that acting on just a few pillars will not be sufficient to align with the 1.5°C ambition.

\* Own emissions in this context include direct emissions from own activities (scope 1) and indirect emissions from purchased energy (scope 2) as described in the Greenhouse Gas Protocol.

† Value chain emissions is described as scope 3 emissions in the Greenhouse Gas protocol standards including upstream and downstream emissions.

‡ Avoided emissions in this context relate to the impact in society where the GHG emissions from the way a service is provided in a reference situation are compared with the emissions in society due to the product or system provided by the company.

## THE 4 PILLARS



Visual design by TND: Christina Rüegg Grässli and Jakob Trollbäck (designer of the Sustainable Development Goals).

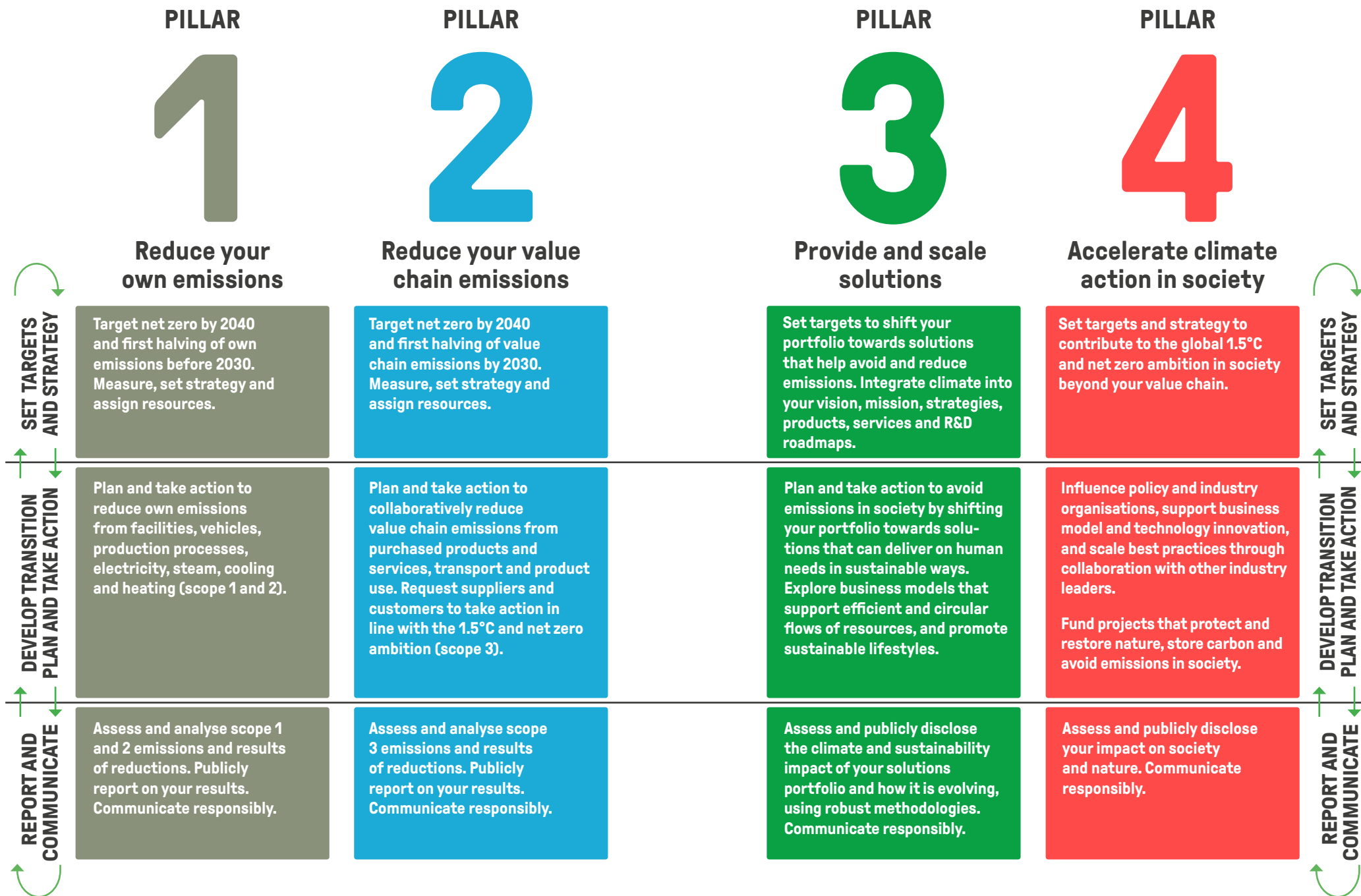
## Transition Plans

Transition plans are an important new climate action tool for businesses and should over time become an integral and central part of the company business plan. A transition plan documents the pathway an organization will take to contribute its fair share to global net zero by decarbonizing its value chain and scaling solutions which are positive for climate and nature.

A holistic plan should cover all four pillars of climate action: reducing own and value chain emissions, transforming products and services so they're aligned with a net-zero world, and influencing wider society positively. The UN-backed Race to Zero included advice on transition plans in its 2022 Interpretation Guide and during 2023 guidelines on transition plans have been written by the UN Climate Action Team\* and within the EU's Corporate Sustainability Reporting Directive. A good place to start when developing a transition plan is undertaking a double materiality assessment.<sup>58</sup>

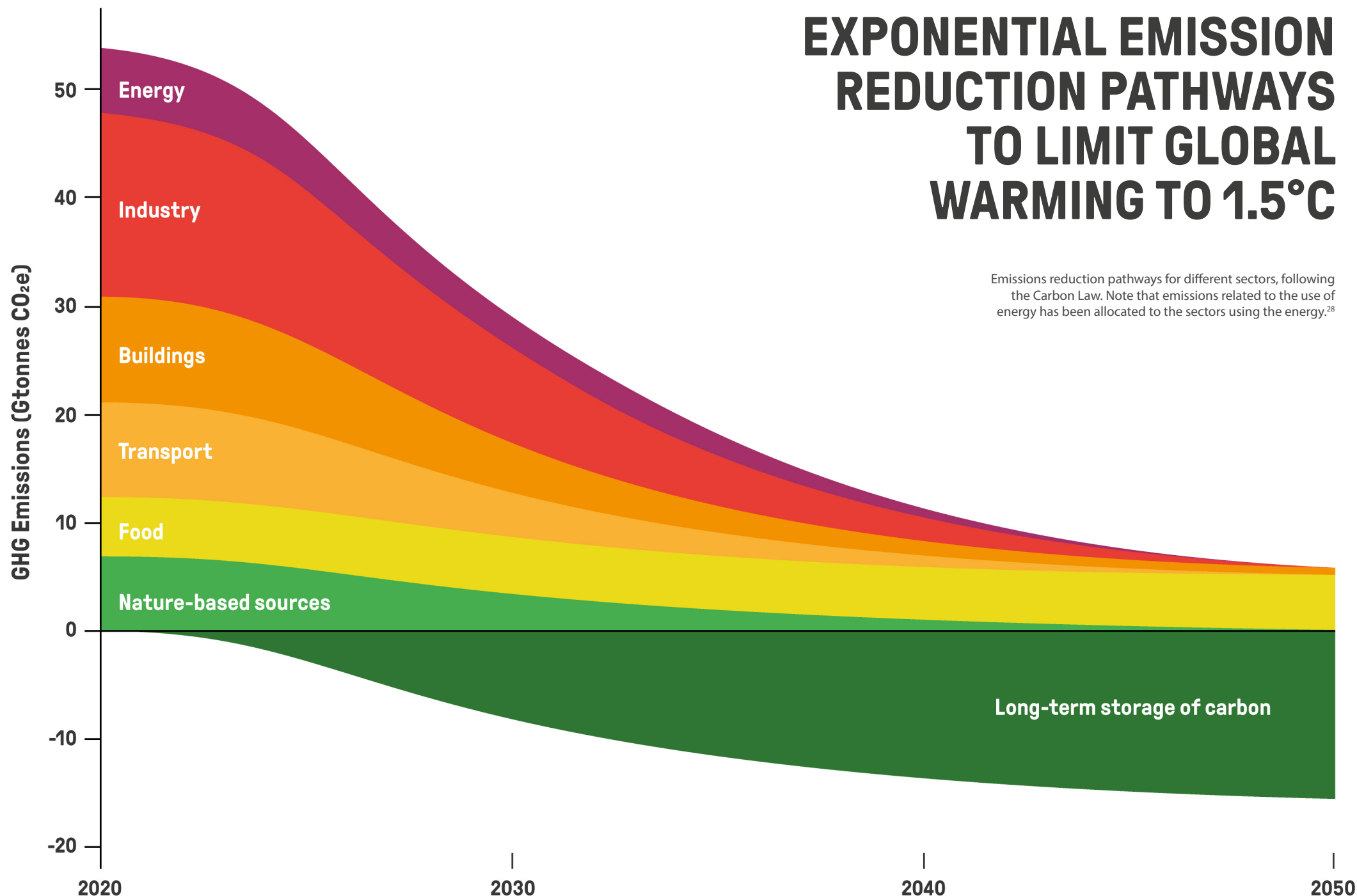
\* Based on the recommendations of the UN Secretary General's High Level Expert Group on net zero for non-state actors.

[https://www.un.org/sites/un2.un.org/files/high-level\\_expert\\_group\\_n7b.pdf](https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf)



# EXPONENTIAL EMISSION REDUCTION PATHWAYS TO LIMIT GLOBAL WARMING TO 1.5°C

Emissions reduction pathways for different sectors, following the Carbon Law. Note that emissions related to the use of energy has been allocated to the sectors using the energy.<sup>28</sup>





# SET TARGETS AND STRATEGY

Action begins by acknowledging the planetary crisis, publicly committing the company to align with the 1.5°C and net zero ambition and assigning the resources needed to achieve the climate goals. This requires climate leadership from top management. Commitment is also about democratising climate work to ensure that all employees can contribute, and identifying and empowering potential climate leaders across the organisation.

## ACTIONS

- Commit publicly, at head of organisation level, to do your utmost to halve emissions across your own operations and your entire value chain by 2030 or earlier.
- Commit publicly, at head of organisation level, to reaching net zero or absolute zero emissions by 2040, preferably sooner, and to sustaining net zero thereafter.
- Set the pathway for reducing emissions and increasing removals towards net zero, with interim targets along the way.
- Commit to targets to phase out use of fossil fuels in own operations and value chain, for all energy sources (including electricity, heating, steam, cooling and transportation).
- Update your company's vision and mission statement to reflect your commitment to contributing to the 1.5°C ambition, including protection and restoration of nature and ecosystems.
- Assess your company-wide emissions, climate-related risks and business opportunities and incorporate the assessment into strategic planning processes.
- Assess your company's impact on nature and natural ecosystems (eg using the TNFD framework) and incorporate assessment into strategic planning processes.
- Assign responsibilities, mandate and resources for climate action (eg. create a climate transformation programme with business development, R&D, sourcing and sales executives, with a direct line to the top leadership and board)
- Establish and report on key performance indicators (KPIs) for climate with the same importance as financial indicators.
- Integrate climate action into the company's articles of association and shareholder agreements, and ensure all board members have sufficient competence to set 1.5C-aligned strategy.
- Connect remuneration for executive management and employees to climate-related KPIs.

- Join the UN-backed Race to Zero campaign through one or several of the partner initiatives aligned with the 1.5°C ambition such as:
  - » Exponential Roadmap Initiative
  - » SME Climate Hub
  - » Science Based Targets initiative and Business Ambition for 1.5°C
  - » Net-Zero Asset Owners Alliance

## Race To Zero<sup>8</sup>

Race to Zero is a global campaign rallying non-state actors – including companies, cities, regions, financial, educational, and healthcare institutions – to take rigorous and immediate action to halve global emissions by 2030 and deliver a healthier, fairer zero carbon world.

As of September 2022, the campaign mobilises a coalition of leading net zero initiatives, representing 1136 cities, 67 regions, 8307 businesses, 595 financial institutions and 1,039 Higher Education Institutions and is constantly growing. These 'real economy' actors join 120 countries in the largest ever alliance committed to achieving net zero carbon emissions by 2050 at the latest. Collectively these actors now cover nearly 25% of global CO2 emissions and over 50% of global GDP.

## The Exponential Roadmap Initiative<sup>32</sup>

The Exponential Roadmap Initiative (ERI) is a global climate initiative that brings together innovators, disruptors and transformers taking action in line with 1.5°C. ERI is the leading advocate of the Global Carbon Law; halving emissions each decade while at the same time protecting and restoring nature.

Currently, ERI gathers companies and organisations, representing over 1000 billion USD in yearly revenue and nearly 2 million employees. Its purpose is to accelerate exponential climate action and solutions through innovation projects, with the mission to contribute to halving greenhouse gas emissions by 2030.



### SME Climate Hub<sup>34</sup>

The SME Climate Hub is a global initiative that empowers small to medium-sized companies to take climate action and build resilient businesses for the future. The SME Climate Hub provides SMEs with access to free tools and resources to support their net zero journeys.

With tools for climate education, emissions calculations and reporting, SMEs can make strategic and impactful reductions, track their progress, and demonstrate climate leadership. Funded by the Exponential Roadmap Initiative, We Mean Business Coalition and the UN-backed Race to Zero campaign, the SME Climate Hub is the largest Race to Zero partner initiative in terms of number of companies with close to 7000 committed SMEs.

### Science Based Targets Initiative (SBTi)<sup>4</sup>

The Science Based Targets initiative (SBTi) drives climate action in the private sector by enabling organizations to set science-based near-term emissions reduction targets, and net zero targets.

By signing up to SBTi companies will also be recognized as members of the UN-backed Race to Zero Campaign.

### Net-Zero Asset Owners Alliance<sup>38</sup>

The UN-convened Net-Zero Asset Owner Alliance is an international group of 74 institutional investors with 10.6 trillion USD in assets under management, committed transitioning its investment portfolios to net zero greenhouse gas emissions by 2050.

Financial institutions joining the Race to Zero can also join the Glasgow Financial Alliance for Net Zero (GFANZ),<sup>41</sup> focusing on three key areas: net-zero transition planning for financial institutions, mobilising capital to emerging markets and developing economies and net zero public policy.

# PILLAR 1. REDUCE YOUR OWN EMISSIONS



To be aligned with the 1.5°C ambition, the minimum requirement is to halve your own emissions at least every decade. These emissions are referred to as scope 1 and 2 emissions in the Greenhouse Gas Protocol Corporate Standard.<sup>41</sup> They include emissions from in-house sources such as facilities, vehicles and internal production processes, as well as emissions from purchased electricity, cooling, heating and steam. Your own company

emissions may represent a small part of the total but are critical to reduce since these are under the company's direct responsibility. For many companies, a reduction of scope 1 and 2 emissions by 90% can be achieved by 2030.

## PLAN

- Map out your own emissions and plan reductions,<sup>\*</sup> if you haven't already done so. Identify the main sources of emissions – your hotspots – and make sure your plans focus on how to mitigate these.
- Decide on your base year. A base year will be used for comparison, to show progress towards emissions reductions goals.
  - » The base year is normally the most recent year for which data is available and the selected year shall not be more than two years back.<sup>†</sup>
  - » Companies that have already started their 1.5°C aligned emissions reduction and reduce at the annual pace of at least 7%, may use another base year, for instance to align with an existing Science Based Target.

<sup>\*</sup> The mapping should also include emissions associated with subsidiary companies.

<sup>†</sup> In case of unusual fluctuations of GHG emissions that makes such a base year non-representative (such as during the pandemic), businesses may refer to the year before or average over the most recent years when deriving the base year.

- » Historical emissions reductions deserve acknowledgement and can be highlighted, but they cannot be counted towards the next halving of emissions.
- Set your reduction targets, both short-term and long-term, including a net zero target by 2040 at the latest, but preferably earlier.
  - » Your minimum pace should be to halve absolute emissions every decade, but preferably faster. Halving in ten years means a 7% year-on-year reduction. Halving in five years equals 13% annual emissions reductions and halving in three years corresponds to a 21% annual emissions reduction rate.
- Decide in which order to reduce emissions for different sources and develop a transition plan on how to reach your targets.
  - » Start immediately with the “low-hanging fruit” which are economically attractive and bring other co-benefits. Energy efficiency, shifting to renewable and fossil-free energy, optimizing office space, transportation, and business travel emissions are often good candidates, but the priorities will be sector-dependent.
  - » Set specific targets for your emission hotspots, such as “100% renewable energy by 2025” and “halving business travel emissions in three years”.
- Disclose your company’s own emissions, targets and reduction plans as part of your annual public reporting. Clearly explain any slower pace than halving every decade.\*
- Evaluate results, take corrective actions and update your plan on a yearly basis.

\* Companies that provide climate solutions may apply intensity targets. See page 30 for further guidance on this area.

## ACTIONS – PILLAR 1

- Improve energy efficiency in own buildings through retrofitting and digital automation.
- Improve energy efficiency in factory production processes and machines eg by investing in new technology and digital automation.
- Switch to renewable energy for all processes, buildings and sites\* with the goal of reaching 100% renewable energy\* as soon as possible.
- Install new on-site renewable energy production and storage.
- When buying renewable energy enter into power purchase agreements to ensure additionality and contribute to expanding production. If renewable electricity is not available in one market, work with other stakeholders to increase supply.
- Monitor and match supply and consumption of renewable energy in both geography and time.
- Require low emissions buildings, whether owned or leased, when expanding or establishing new businesses or in new locations.
- Optimise the use of building space in all operations to reduce emissions and costs.
- Work systematically to reduce use of resources, materials, chemicals and water in all operations.
- Move towards a low-emission vehicle fleet by requiring 100% electrical or other low-emission owned and leased vehicles.
- Implement a plan to halve methane emissions by latest 2030 and to phase out hydrofluorocarbon refrigerants.

\* For all energy uses ie electricity, cooling, heating, ventilation and processes.

# PILLAR 2. REDUCE YOUR VALUE CHAIN EMISSIONS

## 2

Value chain emissions include all emissions “outside the company walls”. They often represent the largest share of a company’s total footprint and must therefore be addressed.

Value chain emissions are emissions from upstream and downstream activities associated with the operations of the reporting company, and are referred to as scope 3 emissions by the GHG Protocol.<sup>5</sup> Upstream activities include emissions all the way from raw material extraction and downstream activities include customer final use and end-of-life. The largest sources of emissions in this category are often **purchased goods and services** and the **use of sold products**, but

proportions vary between sectors and companies.

You should work actively to drive down value chain emissions. This can be done in many ways – examples of mechanisms include procurement guidelines, and supplier code of conduct criteria, changes in the design of products, collaborations with suppliers and customers, and reassessment of business models and investments.

As an example, partners of the Exponential Roadmap Initiative have founded the 1.5°C Supply Chain Leaders which work across sectors to develop strategies and tools for supporting their suppliers to reduce emissions.<sup>41</sup>

### PLAN

- Map out the emissions associated with your value chain to understand which are the most substantial and start tracking them systematically. Strive to measure all significant emissions categories so that no more than 5% of total emissions are omitted.
- Set a target for the first halving of absolute value chain emissions, including a target to reach net zero by 2040 at the latest, but preferably earlier.
  - » Apply the same base year as for your own company’s emissions (scopes 1 & 2).
  - » Your minimum goal to align with 1.5°C should be to halve emissions by 2030, but preferably faster.

- Decide in which order to reduce emissions from different sources, and develop a transition plan on how to reach the targets. Break down the plan into yearly targets and milestones.
- Disclose value chain emissions, targets and reduction plans as part of your annual public reporting. Clearly explain any slower pace than halving each decade.
- Evaluate results and update your targets annually if necessary.



## ACTIONS – PILLAR 2

- Integrate climate action into sourcing and purchasing functions, to facilitate halving of supplier emissions by 2030.
- Ask your suppliers to commit to the 1.5°C ambition by joining an initiative within the UN-backed Race to Zero campaign, to set science-aligned targets and to take action to halve their emissions before 2030.\*
- Include evaluation of suppliers' climate targets and performance in your procurement criteria.
- Reduce emissions in your value chain by lowering usage, shifting to recycled and low carbon materials, products and services. You should specifically target:
  - » Components and materials such as steel, concrete, aluminum and plastics.
  - » Transport of goods
  - » IT and consultancy services
  - » IT equipment
  - » Food selection, production, consumption and waste
- Take action to eliminate all deforestation in your value chain by 2025 at the latest.†
- Set targets and take action towards regenerative agriculture and sustainable forest practices throughout your value chain.‡
- Invest in projects to support your suppliers to accelerate climate action (e.g. installation of new renewable energy generation capacity).
- Encourage your customers to set targets, to take action to halve their emissions by 2030, and to join an initiative within the UN-backed Race to Zero campaign.
- Integrate circularity at the heart of all your innovation and development processes, in order to extend product lifespans, reduce material use, switch to low-carbon materials, and secure end-of-life material recycling.
- Evaluate and improve the energy efficiency of your own products and services, and optimize them for use with renewable energy.
- Identify opportunities to enhance carbon removals within value chains and invest.
- Act to reduce emissions from business travel by shifting to low-carbon alternatives and reducing emissions from flights.
- Reduce emissions from commuting through promoting and sponsoring low-carbon travel, and enabling employees to work from local green office hubs or at home.
- Evaluate and take action to reduce the footprint of your financial supply chain - your cash, investments, and pension funds - and ensure management of financed emissions is 1.5°C-aligned.§

\* The [SME Climate Hub](#) and [the Supplier Action Guide](#) can be used to facilitate this.

† Note that the importance of each category is sector and company dependant.

‡ Mainly relevant for food, land and agriculture sectors.

§ [The Greening Cash action guide](#), developed by the Exponential Roadmap Initiative can support organisations who want to reduce emissions from their company's cash holdings.

# PILLAR 3. PROVIDE AND SCALE SOLUTIONS

## 3

Solutions that stabilise the climate and allow everyone on earth to thrive must scale exponentially.

As well as slashing greenhouse gas emissions, this also means cutting material consumption, especially among the wealthiest in society. It means adopting plant-based healthy meals. It means regenerative agriculture. It means sharing vehicles, space and things. It means new, low-carbon materials.

Ultimately, it means a fundamental redesign of value chains. Business models now need to focus on human and planetary needs. They need to flip from ownership to usership, from products to services and from linear to circular – often enabled by digital technologies.

Your business proposition is the biggest determining factor for your contribution to a 1.5°C planet. For example, your growth can come from creating the future using fossil-free materials, renewable energy solutions, providing EV sharing services, and more to replace carbon-intensive alternatives.

You can help shift consumer patterns in a sustainable direction by making the sustainable choice the default lifestyle choice and by creating one-click low-carbon solutions.

If your services and products are consumer or business facing – e-commerce platforms, media, advertising, outdoor companies, travel agencies, conference organizers, data gathering companies and management consultancy – you can become a planetary steward by nudging customers to make decisions that are positive for the climate.

As a company, you will want to be on the forefront of this change to safeguard your competitive advantage. This may require transforming your portfolio and business model.

A first step is to map out the future value chain aligned with 1.5°C and a stable planet. Define what needs to be achieved for your company to create that value chain.

## ACTIONS – PILLAR 3

- Integrate climate and nature at executive level into strategy, business development, product management and R&D functions to ensure the 1.5°C ambition is incorporated into long-term business planning and roadmaps.
- Determine the business models, products and services for your sector that will be compatible with a net zero world.
- Develop a transition plan for how to transform your own business and contribute to reinventing your current value chain through radical collaboration.
- Set measurable goals and KPI's for accelerating the development and scaling of climate solutions.\*
- Start transforming your portfolio of products and services towards climate solutions which are compatible with a net-zero world and meeting humanity's needs.
- If your company manufactures and/or sells products, start transforming your business model to one which is service-based and circular.
- Encourage and enable sustainable lifestyles and purchase decisions by customers that are in line with the 1.5°C ambition. This is especially important if your services are influencing consumer and company decisions – such as digital platforms, advertising, finance and professional services.
- Make qualitative and quantitative assessments of the climate impact of your solutions, on both product and system levels. This should be done in a structured and transparent way, following robust frameworks and assessment principles.
- Make protection of climate and nature integral to your financial decisions by incorporating a carbon price.
- Educate and empower your employees to integrate climate and nature into all processes, decisions and their daily work as a driver for innovation and revenue growth.

\* See page 30 for detailed guidance on Climate Solutions.

## PILLAR 4. ACCELERATE CLIMATE ACTION IN SOCIETY

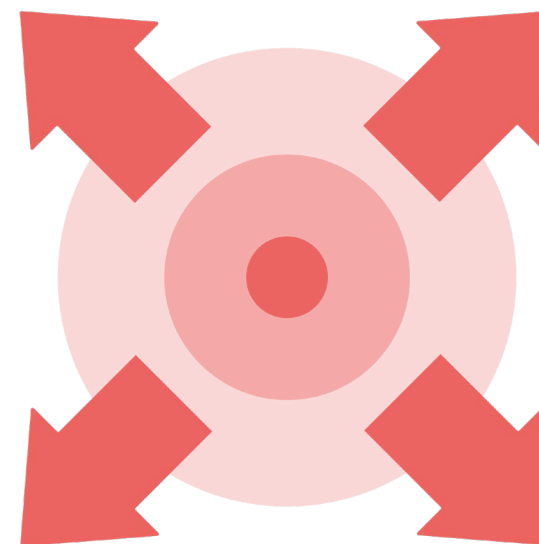
# 4

Becoming a climate leader means using your network and wider sphere of influence to support and accelerate exponential climate action and solutions beyond your own business and value chain. This includes:

- Demanding policy changes to align with the 1.5°C ambition, collaborating with customers, suppliers, peers, investors, government, cities,

research organizations and NGOs to accelerate ambition, action, best practices and solutions and contributing to climate awareness among customers and employees

- Contributing to funding of climate solutions and projects to protect and restore nature, to avoid emissions from energy and land-use, and to scale carbon removal technologies.



## ACTIONS – PILLAR 4

- Evaluate how your organization can contribute most effectively to accelerating climate action in wider society and decide on strategy.<sup>66</sup>
  - Integrate a 1.5°C climate commitment into the public affairs function of your company.
  - Share expertise, best practices, tools and roadmaps widely, to accelerate climate action by others.
  - Enable development and scaling of key climate solutions\* through funding and acceleration of demand.
  - Ensure that trade and business associations that you are part of are working in alignment with the 1.5°C ambition – or leave them.
  - Engage in lobbying for 1.5°C aligned policies† at local, national and international levels, including a stop for all fossil subsidies. This can be done by your company alone, but preferably in collaboration with other organizations (eg in trade associations) for maximum impact.
  - Encourage and help your employees, management,
- and owners to halve their own emissions and adopt sustainable lifestyles (eg through supportive policies† and by sharing educational materials and personal climate calculators).
  - Support publicly the inclusion of ecocide in legislation at all levels (global, regional, national, local).
  - Invest in the protection and restoration of natural ecosystems on land and in oceans beyond your value chain.
  - Support publicly the stop for deep sea mining.
  - Fund other emissions reduction, avoidance and removal projects beyond your value chain in order to contribute to global net zero (see next section).
  - Enable development and scaling of key climate solutions\* through funding, investment, purchases and other support.

\* Key climate solutions are those listed in the latest [IPCC synthesis report](#) and in Race to Zero's report on [2030 Breakthroughs](#).

† Policies such as ending fossil-fuel subsidies, refusing permission for expansion and development of new coal mines, oil and gas fields, stopping deforestation, granting finance to restoration of natural ecosystems, enabling scaling up of climate solutions, expanding the scope of carbon pricing.

## FUNDING CLIMATE AND NATURE PROJECTS BEYOND THE VALUE CHAIN

It is important that businesses take responsibility for their emissions by accelerating investments in natural climate solutions and solutions that avoid or remove carbon beyond their own business and value chain.

Companies shall fund climate projects on their journey towards net zero,\* for instance by purchasing high-quality carbon credits to address all or some of their unabated emissions, and companies are also encouraged to address historical emissions. Projects may be nature-based, or support the development of new technological carbon removal methods and technologies.

Companies are encouraged to create a financial mechanism to support climate projects, for example, by implementing an internal carbon fee for each ton they emit and using that money to fund projects.

Purchasing high-quality carbon credits is one way of supporting climate projects, but many credits issued in the past have been shown to be ineffective. Other options include funding NGOs and grassroots organizations working with climate and supporting the research and development of new carbon removal methods.

Investments in natural climate solutions

are considered a priority as they channel funding to critically under-funded climate mitigation efforts and can contribute to global goals on nature protection. Investments in natural climate solutions must be high-quality and rights-based, contribute to local livelihoods, conserve or enhance biodiversity and other ecosystem services, and recognize the rights of Indigenous People and local communities. Moreover, measures must be taken to safeguard the projects lasting effects.

Funding of climate projects beyond the value chain should only be used as a complement to the reduction of value chain emissions. Hence, this shall not be a substitute for reducing emissions and creating climate solutions to avoid emissions. To ensure impact, it is important to carefully decide what climate projects to support. If carbon credits are purchased, we recommend using certified carbon credit projects which should be aligned with the Sustainable Development Goals and meet criteria for high-quality credits.

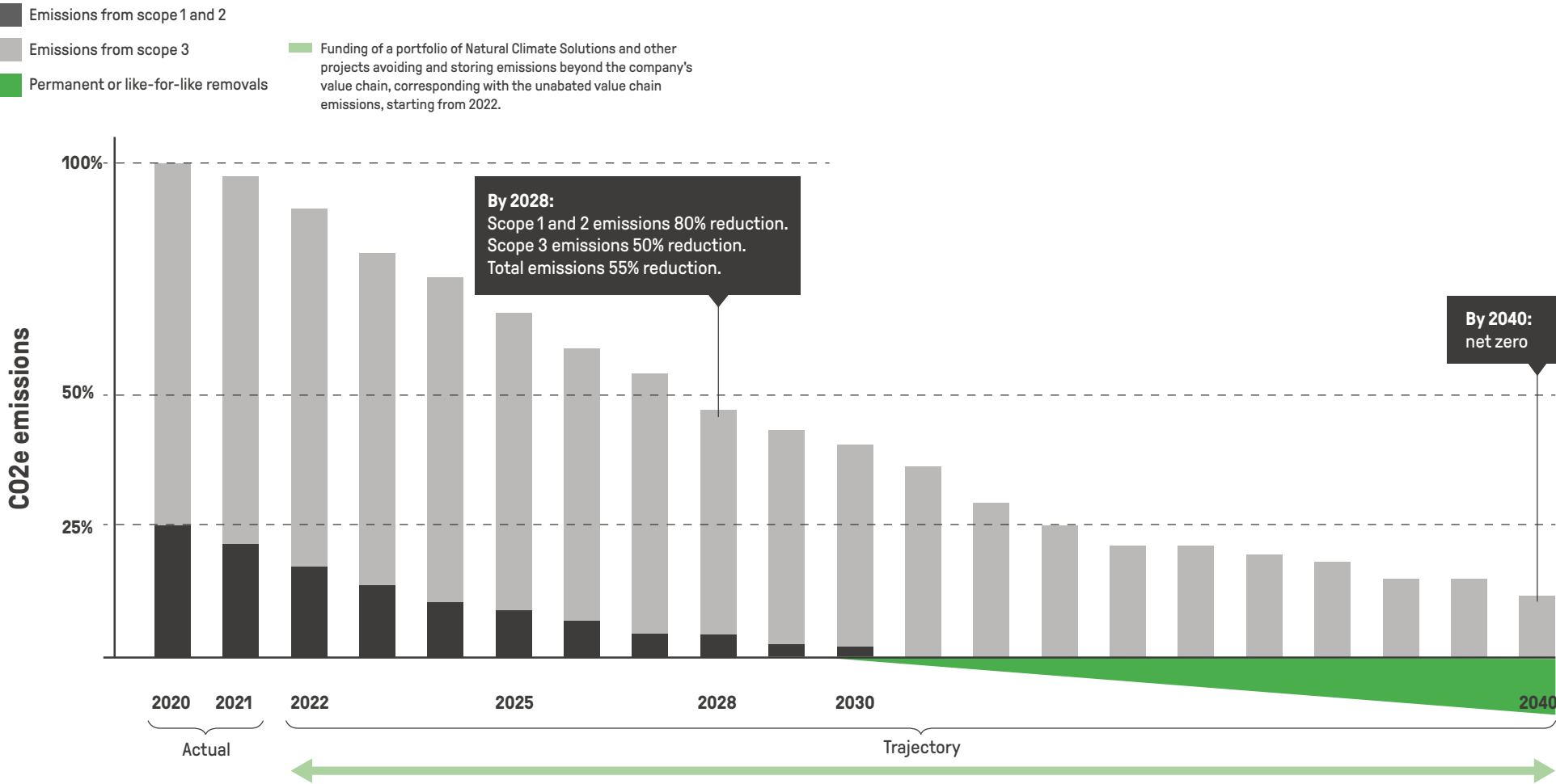
Companies should disclose their annual spending (and carbon price applied) on external climate projects in absolute terms and in relation to their unabated value chain emissions and information about what projects are supported.

\* At net zero, any residual emissions should be counterbalanced with an appropriate amount of permanent or like-for-like removals from climate projects.



# COMPANY EXAMPLE PILLAR 1 AND 2

The diagram describes a fictional company example applying a 2020 base year, showing actual emissions, near-term and net zero emission targets, target trajectory and carbon removals.



# CLIMATE SOLUTIONS CRITERIA

For a product or service to qualify as a climate solution\* it must be compatible with the global 1.5°C ambition and pathway.†

The Exponential Roadmap Initiative currently applies the following criteria (at least one) for products and services to qualify as climate solutions:‡

- significantly lower carbon footprint, at least 50% lower (preferably 90% or more) than the business as usual solution being replaced.§
- has the sole purpose of enabling others to avoid or reduce emissions.
- fulfills the thresholds set out in a robust taxonomy.¶

And in addition

- has no material negative impacts on nature (e.g. biodiversity on land and in oceans)
- fulfills human needs and is potentially scalable to all the world's population.

To be considered a climate solutions company, products and services fulfilling the criteria above should make up at least 90% of total sales, and the company should have integrated climate and nature into its purpose. When these companies are growing they may set emissions intensity targets instead of absolute targets, if they can show that their growth is 1.5°C compatible. This rule will enable exponential scaling of climate solutions.

For companies that haven't yet reached the 90% sales income threshold, emissions intensity targets may be used to guide the scaling of the climate solutions parts of their business.

\* Currently these products and services are sometimes referred to as impact solutions or climate and nature solutions.

† E.g. IPCCs SSP1 (LED) pathway

‡ Note that these criteria are under development and will be further refined in collaboration with Oxford Net Zero and other parties.

§ The proposed threshold of 50% lower carbon footprint means that climate solutions can be considered ahead of the Carbon Law by 10-30 years.

¶ The EU taxonomy has certain shortcomings but may provisionally be applied with the exclusion of fossil gas and nuclear.

# KEY PERFORMANCE INDICATORS

To be future aligned, companies shall implement and report on forward-looking Key Performance Indicators (KPIs) for the 4 pillars. Implementing these KPIs on the same level as financial or other corporate metrics will be essential to ensuring progress in meeting stated transition and acceleration goals. Additionally, tracking and reporting future aligned KPIs in harmonized formats will aid investors to steer investments in line with sectorial 1.5°C aligned pathways. The table below displays examples of KPIs, how they can be measured and examples of baseline and goals. For any sector and value chain, the most relevant KPIs would need to be identified.

Examples of Key Performance Indicators	Pillar	As measured by	Goals examples
Total greenhouse gas emissions	Pillar 1 & 2	% reduction total CO2e	55% reduction by 2028 from baseline
Organisational emissions intensity	Pillar 1 & 2	tCO2e per \$USD revenue	50% reduction by 2030 from baseline
Product, service & material emission intensity <sup>§2</sup> .	Pillar 1 & 2	kgCO2e per unit	50% reduction by 2026 from baseline
Purchased renewable energy	Pillar 1	% renewable energy by kWh	100% by 2025
Phase out coal in purchased energy	Pillar 1	% electricity purchased from grids producing <5% of total electricity from coal	100% by 2032
Fossil-free product inputs	Pillars 1, 2, 3	% of product from non-fossil-based materials by cost	75% of product inputs fossil-free by 2025
Recycled materials in products	Pillar 2	% recycled material by weight	50% recycled material by 2025
Product energy efficiency	Pillar 2	Avg product-lifetime kWh useage	50% decrease by 2028 from baseline
Suppliers' use of renewable energy	Pillar 2	% of suppliers' energy that is renewable by kWh	75% by 2026
Suppliers' alignment with Race to Zero criteria	Pillar 2	% of upstream emissions from companies that have joined Race to Zero	90% of upstream emissions covered by 2025
Zero deforestation in supply chain <sup>§3</sup>	Pillar 2	Commodity deforestation exposure measure	Zero hectares by 2024
Sustainable forestry in supply chain	Pillar 2	% hectares forest sustainably managed	80% by 2028
Regenerative agriculture in agricultural products supply chain	Pillar 2	% of agricultural product tonnage produced regeneratively	50% of total tonnage by 2025
Emissions intensity of cash deposits <sup>§4</sup>	Pillar 2	tCO2e per \$USD	75% reduction in intensity by 2026 from baseline
Creating products designed for circularity	Pillar 2, 3	% of sales revenue from products that are fully recyclable or included in return programs	75% of products by 2030
Lifespan of product offerings	Pillar 2, 3	Meaningful product usage (eg wears/hours/years)	increase 100% by 2028 from baseline
Climate solutions revenue <sup>§5</sup>	Pillar 3	Climate solutions % of revenue. tCO2e avoided over product lifecycle	90% by 2030
Climate solutions impact <sup>§5</sup>	Pillar 3	tCO2e avoided over product lifecycle	tCO2e avoided by 2030
Climate solutions R&D and CAPEX	Pillar 3	R&D spending on climate solutions as % of CAPEX	90% by 2025
Shift investments toward Sustainable Finance Disclosure Regulation article 8 & 9 funds	Pillars 2, 4	% of investment portfolio value	66% of investment total is in article 8 and 9 funds by 2025
Funding of projects to protect and restore nature, and store carbon beyond value chains	Pillar 4	% unabated emissions matched with project funding at \$100 USD per ton	100% match of unabated value chain emissions by 2025
Organisation memberships aligned with the 1.5°C ambition	Pillar 4	% of associations and organisations that are aligned with 1.5°C	100% by 2025

# REPORT AND COMMUNICATE

**Reporting** publicly on your direction, targets, emissions and emissions reductions (Pillars 1 and 2), progress in integrating climate in business strategy (Pillar 3) and societal action (Pillar 4) is an integral part of your 1.5°C commitment. This will be required by customers, investors, and increasingly by governments and other regulatory bodies, and it will help you to position your company as a relevant and serious climate leader.

**Communicate** your direction, effort, progress and challenges towards society as a whole, customers, suppliers, employees and investors, as well as other stakeholders. Communication about your company's climate action should be honest, truthful, transparent, not misleading, representative and based on the latest science. Companies should not only highlight their success, but also communicate on challenges and barriers, to inspire others and build credibility.

## KEY REPORTING GUIDELINES

- Describe how climate change and the global net zero transformation, the associated opportunities and risks, and the necessary mitigation and adaptation, affect your organisation (e.g. in accordance with TCFD recommendations).
- Publish your transition plan for achieving your climate targets. Include information about allocation of responsibilities, how planned actions will be resourced, key challenges, innovation and policy gaps, and when the plan will be up-dated (at least once every five years).
- Report annually in an open standardised format, as an integrated part of your annual report, and via platforms such as CDP and the SME Climate Hub.
- Have your annual climate reporting audited by an independent third party.
- When reporting annual emissions follow the GHG Protocol Standards or equivalent. Include emissions in all scopes, all categories (minimum 95% coverage) and all jurisdictions. Where primary data or data from suppliers is not available, emissions should be estimated.

- List any scope 3 categories that are not yet quantified, give an estimate of how they contribute to the overall footprint and explain how you plan to quantify them in the future.
- Specify any land-use change emissions, carbon capture and storage, and removals separately.
- In annual reporting note how emissions have changed compared to previous years, describe mitigation actions taken, explain any deviations from targets and state the corrective actions you are taking. If you are not delivering at least 7% year-on-year reductions, highlight the hard-to-abate emissions and suggest collaborative solutions.
- Report on KPIs and concrete actions that have been taken to scale solutions which reduce and avoid emissions\* for customers and in society ie. Pillar 3. Explain any deviation from targets and the corrective actions you are taking.
- Report annually on your activities to accelerate climate action in wider society and your impact (e.g. through influencing policy and funding of climate projects beyond your value chain).
- Disclose annually your trade and membership association affiliations, their alignment or misalignment with the 1.5°C ambition and your other actions to ensure 1.5°C alignment across all policy and engagement activities.<sup>66</sup>
- Report on your funding of climate projects beyond your value chain.
- Clearly state the percentage of unabated emissions that are addressed by purchases of carbon credits and do not report purchased carbon credits as a deduction from your scope 1–3 emissions or for meeting reduction targets.
- Report on adverse environmental impacts from your company on nature, aside from greenhouse gas emissions, such as soil degradation or biodiversity loss, and on how you plan to reduce and eliminate these.
- Clearly state the percentage of unabated emissions that are addressed and money spent on carbon credits and other funding of climate projects each year, including the internal carbon price applied.
- Report on adverse environmental impacts from your company on nature, aside from greenhouse gas emissions, such as soil degradation or biodiversity loss, and on how you plan to reduce and eliminate these.

\* Any calculations of avoided emissions shall be presented separately from scope 1–3 emissions. The methodology used and all assumptions shall be transparently stated.

## ABOUT THIS PLAYBOOK

This playbook is developed by the Exponential Roadmap Initiative as a spin-off from the Global Carbon Law and the Exponential Roadmap. The purpose of the playbook is to help achieve a critical mass of companies aligned with the 1.5°C ambition and thereby accelerate exponential climate action. It is now backed and promoted by companies representing over 1000 Billion dollars in yearly revenue. It was initially developed by experts from a number of contributing and supporting organisations during 2019, launched in 2020 (v 1.0), updated in October 2020 (v.1.1), September 2022 (v 2.0) and September 2023 (v 3.0).

Key updates in the 3.0 version include alignment with new standards and frameworks, changes to the Actions segments, inclusion of transition plans, further guidance on Climate Solutions and forward looking KPI's. The playbook will continue to be regularly updated, based on learnings from users, latest science and upcoming standards. All companies and organisations are welcome to support the playbook and the 4 pillar framework by using it, endorsing it and promoting it publicly.

## REFERENCES

1. IPCC. Summary for Policymakers. In 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, Switzerland: World Meteorological Organization, IPCC (2018). <https://www.ipcc.ch/sr15/>
2. J. Rockström et al., A roadmap for rapid decarbonisation. Science 355.6331, 1269-1271 (2017). <https://science.sciencemag.org/content/355/6331/1269>
3. Burke et al., Large potential in economic damages under UN mitigation targets. <https://www.nature.com/articles/s41586-018-0071-9.epdf>
4. Business Ambition for 1.5°C. <https://sciencebased-targets.org/business-ambition-for-1-5c>
5. The Greenhouse Gas Protocol: <https://ghgprotocol.org>
6. Science Based Targets initiative: <https://sciencebasedtargets.org>
7. Carbon Disclosure Project: <https://www.cdp.net/en>
8. UNFCCC Race to Zero campaign. <https://unfccc.int/climate-action/race-to-zero-campaign>
9. Mission Innovation: Net Zero Compatible Innovations Initiative. <https://misolutionframework.net>
10. Sustainable Development Goals. <https://sustainabledevelopment.un.org/?menu=1300>
11. Lenton et al., Climate Tipping Points. Too risky to bet against. <https://www.nature.com/articles/d41586-019-03595-0>
12. J. Falk, O. Gaffney, et al. Exponential Roadmap. 1.5.1 (2020). [www.exponentialroadmap.org](http://www.exponentialroadmap.org)
13. P. Hawken, Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming. Penguin Books, New York (2017). <https://drawdown.org>
14. A. Grubler et al., A low energy demand scenario for meeting the 1.5 °C target and sustainable development goals without negative emission technologies. Nature Energy 3, 515–527 (2018). <https://www.nature.com/articles/s41560-018-0172-6>
15. Climate Emergency Declaration. <https://climate-emergencydeclaration.org>
16. Task Force on Climate-Related Financial Disclosures (TCFD). <https://www.fsb-tcf.org>
17. UN-convened Net-Zero Asset Owner Alliance: <https://www.unepfi.org/net-zero-alliance/>
18. EU taxonomy for sustainable activities. <https://climatechampions.unfccc.int/wp-content/uploads/2022/09/EPRG-interpretation-guide.pdf>
19. Carbon Disclosure Project. CDP S&P 500 Climate Change Report 2014. <https://www.issuelab.org/resource/climate-action-and-profitability-cdp-s-p-500-climate-change-report-2014.html>
20. Business Ethics. Study Finds Sustainable Companies 'Significantly Outperform' Financially. <https://business-ethics.com/2011/11/14/1503-study-finds-sustainable-companies-significantly-outperform-financially/> (2011)
21. Haga Initiative. Business for active climate responsibility. Climate Action Profitable. A study on 200 companies' profitability and their climate efforts. <https://www.hagainitiativet.se/files/Reports/climateactionprofitable.pdf> (2017)
22. Deloitte Insights. Leading the social enterprise: Reinvent with a human focus. 2019 Deloitte Global Human Capital Trends. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/human-capital/us-human-capital-leading-the-social-enterprise-reinvent-with-a-human-focus.PDF>
23. Business Ambition for 1.5°C Pledge. <https://www.unglobalcompact.org/docs/publications/Business-Ambition-for-1.5C-Pledge.pdf>
24. Exponential Business Initiative. [www.exponential-business.org](http://www.exponential-business.org)
25. Diagram from [www.exponentialroadmap.org](http://www.exponentialroadmap.org): Sectoral emission reduction pathways (through avoiding emissions and sequestering greenhouse gases) for halving global emissions every decade from 2020–2050 (Carbon Law). The pathways on the positive y-axis indicate emissions avoidance whereas on the negative y-axis they indicate ramping up natural sinks for greenhouse gas sequestration. According to this scenario, net-zero greenhouse gas emissions is achieved in 2039, and after that, greenhouse gas sequestration is greater than emissions. Note that the energy sector's emissions address only emissions related to the process of energy production (energy supply) and do not include electricity- and heat-related emissions in buildings, industry and the transport sector. In the food sector, solutions draw down emissions from 5.6 Gt in 2020 to 5.0 Gt (planetary boundary for food) in 2050. Note that the exponential mitigation curves for natural climate solutions are currently being updated in line with the Exponential Roadmap for Natural Climate Solutions.(CI)

26. 1.5 Degree Lifestyles <https://www.sitra.fi/en/publications/1-5-degree-lifestyles/>
27. Science Based Targets Network <http://sciencebased-targetsnetwork.org>
28. A Methodology for Assessing the Environmental Effects Induced by ICT Services.Part I-II <https://dl.acm.org/doi/10.1145/3401335.3401716>, <https://dl.acm.org/doi/10.1145/3401335.3401711>
29. Exponential Roadmap Initiative. <https://exponentialroadmap.org>
30. B Corp Collective. <https://www.bcorpclimatecollective.org>
31. SME Climate Hub. <https://smeclimatehub.org>
32. Climate Pledge. <https://www.theclimatepledge.com>
33. L.1471 : Guidance and criteria for information and communication technology organizations on setting net zero targets and strategies. <https://www.itu.int/rec/T-REC-L.1471-202109-I/en>
34. ISO IWA 42:2022 <https://www.iso.org/netzero>
35. IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [MassonDelmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 3–32, doi:10.1017/9781009157896.001
36. Realization of Paris Agreement pledges may limit warming just below 2°C. <https://www.nature.com/articles/s41586-022-04553-z>
37. Net zero Asset Owners Alliance. <https://www.unepfi.org/net-zero-alliance/>
38. SBTi Progress Report 2021. [SBTi Progress Report 2021 - Science Based Targets](https://www.sbtigroup.com/sbti-progress-report-2021-science-based-targets)
39. IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. Cambridge University Press, In Press.
40. Glasgow Financial Alliance for Net Zero. <https://www.gfanzero.com/>
41. Supplier Engagement Guide: Practical guidance for 1.5°C aligned targets and action throughout global supply chains. <https://exponentialroadmap.org/supplier-engagement-guide/>
42. Corporate climate responsibility monitor 2022. Day, T., Mooldijk, S., Smit, S., Posada, E., Hans, F., Fearneough, H., Kachi, A., Warnecke, C., Kuramochi, T. and Höhne, N., 2022.
43. Mission Innovation: The Next Generation of Climate Innovation. [https://www.misolutionframework.net/pdf/Next\\_Gen\\_Climate\\_Innovation.pdf](https://www.misolutionframework.net/pdf/Next_Gen_Climate_Innovation.pdf)
44. Mission Innovation: 21st Century Climate Innovation Assessment. [https://www.misolutionframework.net/pdf/21st\\_Century\\_Climate\\_Innovation\\_Assessment\\_V0.9.pdf](https://www.misolutionframework.net/pdf/21st_Century_Climate_Innovation_Assessment_V0.9.pdf)
45. The Net-Zero Standard, Science Based Target initiative. <https://sciencebasedtargets.org/net-zero>
46. Friedlingstein, P., Jones, M. W., O'Sullivan, M., Andrew, R. M., Bakker, D. C. E., Hauck, J., Le Quéré, C., Peters, G. P., Peters, W., Pongratz, J., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Anthoni, P., Bates, N. R., Becker, M., Bellouin, N., ... Zeng, J. (2022). Global Carbon Budget 2021. Earth System Science Data, 14(4), 1917–2005. <https://doi.org/10.5194/essd-14-1917-2022>
47. The Exponential Roadmap for Natural Climate Solutions. Conservation International. 2022. [www.conservation.org/roadmap](https://www.conservation.org/roadmap)
48. Exceeding 1.5°C global warming could trigger multiple climate tipping points. David I Armstrong McKay et.al.
49. Race to Zero criteria 3.0 <https://climatechampions.unfccc.int/wp-content/uploads/2022/06/Race-to-Zero-Criteria-3.0-4.pdf>
50. PCAF. <https://carbonaccountingfinancials.com>
51. Value(s): Building a Better World for All. Carney, M. 2021.
52. Tomorrow's Economy: A Guide to Creating Healthy Green Growth. Stoknes, P.E. (2021)
53. Creating competitive advantage through sustainability. Grant Thornton. <https://www.grantthornton.global/en/insights/articles/creating-competitive-advantage-through-sustainability/>
54. Embedding sustainability into core strategy and business operations. Deloitte. [www2.deloitte.com/content/dam/Deloitte/au/Documents/strategy/deloitte-au-con-embedding-sustainability-in-to-core-strategy-and-business-operations.pdf](https://www2.deloitte.com/content/dam/Deloitte/au/Documents/strategy/deloitte-au-con-embedding-sustainability-in-to-core-strategy-and-business-operations.pdf)
55. COP26: World leaders promise to end deforestation by 2030. BBC. <https://www.bbc.com/news/science-environment-59088498>
56. The Global Commons Survey: attitudes to planetary stewardship and transformation among G20 countries. Global Commons Alliance. <https://globalcommonsalliance.org/wp-content/uploads/2021/08/Global-Commons-G20-Survey-full-report.pdf>
57. Monitoring global carbon emissions in 2022. <https://www.nature.com/articles/s43017-023-00406-z>
58. Solar is now 'cheapest electricity in history', confirms IEA. Carbon Brief. <https://www.carbonbrief.org/solar-is-now-cheapest-electricity-in-history-confirms-iea/>
59. X-Change: Electricity. RMI. <https://rmi.org/in-sight/x-change-electricity/>
60. Demand for electric cars is booming, with sales expected to leap 35% this year after a record-breaking 2022. IEA. <https://www.iea.org/news/demand-for-electric-cars-is-booming-with-sales-expected-to-leap-35-this-year-after-a-record-breaking-2022>
61. Fossil Fuel Subsidies Surged to Record \$7 Trillion. IMF. <https://www.imf.org/en/Blogs/Articles/2023/08/24/fossil-fuel-subsidies-surged-to-record-7-trillion>
62. Net-Zero Asset Owner Alliance calls on companies and data providers to provide critical sector data. UNEPFI. <https://www.unepfi.org/industries/net-zero-asset-owner-alliance-call-to-companies-and-data-providers-for-critical-sector-data-on-key-performance-indicators/>
63. Supply Chains Data Explorer. Trase. <https://explore.trase.earth/>
64. Greening Cash Action Guide. Exponential Roadmap Initiative. <https://exponentialroadmap.org/greening-cash-action-guide/>
65. Guidance on Avoided Emissions: Helping business drive innovations and scale solutions towards Net Zero. WBCSD. <https://www.wbcsd.org/Imperatives/Climate-Action/Resources/Guidance-on-Avoided-Emissions>
66. The 5th P (Persuade) Handbook. Race to Zero. <https://climatechampions.unfccc.int/wp-content/uploads/2023/06/Race-to-Zero-5th-P-Persuade-Handbook.pdf>

# AUTHORS AND CONTRIBUTORS

## IDEA, CONCEPT AND LEAD AUTHOR

**Johan Falk**, Exponential Roadmap Initiative

## CONTRIBUTING AUTHORS AND REVIEWERS

**Pernilla Bergmark**, Ericsson  
(contributing author and expert panel)  
**Claire Wigg**, Exponential Roadmap Initiative  
**Owen Gaffney**, Potsdam Institute for  
Climate Impact Research, Stockholm  
Resilience Centre  
(contributing author and expert panel)  
**Göran Erselius**, 2050 Consulting  
(contributing author and expert panel)  
**Dennis Pamlin**, MI, RISE  
(contributing author)  
**Johan Widheden**, WWF  
(contributing author and expert panel v.1)  
**Johanna Myrman**, WWF  
(contributing author and expert panel v.1)  
**Magnus Jiborn**, Lund University  
(expert panel v.1)  
**Jannike Hising**, 2050 Consulting  
(contributing author)  
**Avit K. Bhowmik**, Karlstad University  
(contributing author)  
**Stefan Henningsson**, Nordea Group,  
previously WWF (contributing author v.1)  
**Daniel Hägglund**, Exponential Roadmap  
Initiative (contributing author v.2)  
**Anthony Pearce**, WWF  
**Emelie Öhlander**, Ericsson  
**Mats Pellbäck Scharp**, Ericsson  
**Louise Reh binder**, Ericsson  
**Mark Griffiths**, WWF  
**Nina Ekelund**, Haga Initiative  
**Carl-Henrik Josephson**, Inter IKEA group  
**Majda Dabaghi**, Climate policy expert  
**McKenzie Wilson**, Mission 2020  
**Janne Peljo**, Sitra, the Finnish Innovation Fund  
**Markus Terho**, Sitra, the Finnish  
Innovation Fund  
**Nick Gaskell**, Urgentem  
**Jakob Trollbäck**, The New Division  
**Alberto Carrillo Pineda**, SBTi/CDP  
**Markus Robèrt**, KTH Royal Institute of  
Technology and CERO  
**Maria Mendiluce**, The We Mean Business Coalition

**Erwan Saouter**, WBCSD  
**Cecilia Valeri**, WBCSD  
**Diane Buzea**, WBCSD  
**Hannah Loake**, WBCSD  
**Kajsa Kramming**, Uppsala University  
**Cecilia Lindén**, GoClimate  
**Kaj Török**, Max Burgers  
**Robert Sabelström**, Climate Hero  
**Kristian Rönn**, Normative  
**Christian Patay**, Tricorona  
**Peter Sandahl**, Nordea Life & Pension  
**Nexhi Deti**, Microsoft  
**Mattias Höjer**, Royal Institute of Technology (KTH)  
**Kalle Nilver**, GoClimate  
**Ingemar Jansson**, Knowit  
**Carolina Brändholm**, Trossa  
**Clara Hamrén**, Trossa  
**Mia Barkland**, Trossa  
**Mats Risberg**, Exponential Roadmap Initiative  
**Ingmar Rentzhog**, We Don't Have Time  
**Peter Sandahl**, Nordea  
**Alexia Kelly**, Netflix  
**Emma Stewart**, Netflix  
**Caitie Reck**, Netflix  
**Greg Carlock**, Netflix  
**Sarah Penndorf**, Google  
**Robert Höglund**, Marginal Carbon  
**Vera Söderberg**, Trossa  
**Linda Strindevall**, AFRY  
**Kaya Axelsson**, Oxford Net Zero  
**Milan Kooijman**, WWF  
**Johanna Myrman**, WWF  
**Jesica Andrews**, UNEP FI  
**Luke Pritchard**, We Mean Business  
**Fiona Macklin**, UN backed Race To Zero campaign  
**Alva Jonevret**, Exponential Roadmap Initiative  
**Erik Huss**, Husustainability  
**Paul Moinester**, The Outdoor Policy Outfit  
**Rebecka Carlsson**, Heureka Ventures  
**Per Espen Stoknes**, BI Norwegian Business School  
**Sara Nordbrand**, Telia  
**Madeleine Nordqvist**, Telia  
**Heidi Östlund**, Semcon  
**Evan Eskilsson**, Exponential Roadmap Initiative

## DESIGN

The New Division by Trollbäck  
Jerker Lokrantz/Azote

## LAYOUT

Jerker Lokrantz/Azote

## EDITORS

Duncan Geere  
Zoë Wildsmith, The Content Creation Company

## CONTRIBUTING AND SUPPORTING ORGANISATIONS AND PROJECTS\*

Potsdam Institute for Climate Impact  
Research (PIK)  
World Wide Fund for Nature (WWF)  
UN-Backed Race to Zero Campaign  
KTH Royal Institute of Technology  
Stockholm Resilience Center (SRC)  
The We Mean Business Coalition (WMB)  
World Business Council for Sustainable Development  
(WBCSD)  
International Chamber of Commerce (ICC)  
Ericsson  
Scania  
Google  
IKEA  
Microsoft  
Netflix  
Mastercard  
Nestlé  
Spotify  
Telefonica  
Oracle  
Scan Global Logistics  
Polestar  
Ørsted  
Tech Mahindra  
Accenture  
Polestar  
Haga Initiative  
Telia Company  
We Don't Have Time  
Skanska  
Normative  
Futerra  
Mission 2020  
Max Burgers  
Sitra, the Finnish Innovation Fund  
Climate View  
2050 Consulting

AFRY  
Ramboll  
Houdini  
Alfa Laval  
Knowit  
Ragn-Sells  
Sweco Sweden  
Advania Sweden  
Icebug  
Investor  
Fossil Free Sweden  
Formica Capital  
The New Division  
CDP  
The Swedish Textile Initiative for Climate  
Action (STICA)  
Climate Hero  
Cero  
Climate Leadership Council  
Trossa  
Cradlenet  
Mistra SAMS  
GoClimate  
Icebug  
Doconomy  
Tele2  
H2 Green Steel  
Swedish Space Corporation  
Deedster  
Atea  
Castellum  
BT Group  
Tricorona Climate Partner  
Unilever  
Qlik  
Semcon  
Vinnova  
Digitaliseringskonsulterna

\* The Exponential Business ecosystem is continuously growing and this list was compiled in September 2022.

## WE WELCOME YOUR FEEDBACK AND SUGGESTIONS

[businessplaybook@exponentialroadmap.org](mailto:businessplaybook@exponentialroadmap.org)





**“The 1.5°C Business Playbook is a framework for company strategy and action, that we use, to help our supply chain business partners to set 1.5°C aligned targets. We need all companies to be bold and join this journey towards a more sustainable and connected world.”**

***Börje Ekholm***  
*CEO and President, Ericsson*

**“Now is the time for businesses to step up and take bold climate action for the future of humanity. ICC is proud to support the 1.5°C Business Playbook to provide companies of all sizes with a tool for actionable and ambitious climate policies that will accelerate the adoption of net-zero emissions targets across the private sector.”**

***John W. H. Denton***  
*AO, ICC Secretary General*

**”The world needs exponential climate action. At Telia we enable a better future through connectivity and digital solutions that can speed up the transition into a resilient, low-carbon and circular economy. We work to reach zero CO<sub>2</sub> & zero waste by 2030, including the ambition for a climate neutral value chain, and the 1.5°C Business Playbook is an excellent tool when inviting our customers, suppliers and other partners to join us. The knowledge and the necessary technology exist: so let’s make the 2020s a decade of action that matches the urgency of the situation.”**

***Allison Kirkby***  
*President and CEO, Telia Company*

**“The science makes clear that we need a fundamental reshaping of business and finance. Every board and every company must show a credible strategy to align with 1.5°C. This Playbook is an excellent guide for the necessary journey to net-zero emissions, to prepare business for the fastest economic transition in history and help them drive it. It’s a guide for preserving a more liveable planet for future generations.”**

**Christiana Figueres**

*Former head of the United Nations Framework  
Convention on Climate Change, Convenor of Mission 2020*

**“This Playbook is aligned with the target to limit global warming to just 1.5°C. The only pathway left is massive emissions reductions across all business sectors in the next decade. We show that this is achievable.”**

**Johan Rockström**

*Co-director, Potsdam Institute for Climate Impact Research,  
Executive Director, Stockholm Resilience Centre, Co-chair, Future Earth*

**“The 1.5°C business playbook provides a great framework aligned with the Race to Zero campaign, available today for companies to use. Focusing on simplicity and speed, it will help companies to halve emissions by 2030 towards net-zero well before 2050.”**

**Nigel Topping**

*High Level Champion for Climate Action COP26*

ISBN 978-91-986090-9-7



**[www.exponentialbusiness.org](http://www.exponentialbusiness.org)**

**Citation**

J. Falk et al., The 1.5°C Business Playbook. (2023)