

Vodafone Group Plc

Task Force on Climate-related
Financial Disclosures ('TCFD')
Report 2021



Overview

About the Task Force on Climate-related Financial Disclosures

The aim of the Task Force on Climate-related Financial Disclosures (TCFD) is to improve transparency of organisations' climate-related risks and opportunities so that investors can make informed decisions on where to deploy their capital. In June 2017, the TCFD published recommendations for voluntary and consistent climate-related financial disclosures for use by companies, investors, and other financial stakeholders to provide high-quality information in their mainstream filings.

The TCFD structures the recommendations around four thematic areas that are core elements of how organisations operate as shown in Figure 1. Under the core elements are a total of 11 recommendations setting out the information that companies should disclose to provide transparency and stability in the face of climate-related risks and opportunities.

We recognise that climate change poses physical and transitional risks, as well as opportunities for our business. We routinely consider the effects of climate change in our strategic and financial planning so that we can maximise the value we bring to our customers, investors and the communities where we operate. This includes both physical risks caused by the increased frequency and severity of climate and weather events, and transitional risks associated with economic, technology or regulatory changes related to the move towards a greener economy. We also monitor changes in the business landscape and markets to understand where there may be opportunities resulting from the transition to a low carbon economy.

In this report we have adopted the structure from the TCFD guidance to share our progress. We also share how we have overcome common challenges when responding to climate-related risks. We have included practical case studies that show how we have approached understanding climate impact and assessment as part of our enterprise risk management and decision-making processes. In addition, we detail the steps that we will take to further strengthen our approach.

Prior to the TCFD publishing recommendations for the climate-related disclosures, we were already progressing through a multi-year plan to respond to climate change as part of our Planet agenda, one of the three pillars of Vodafone's purpose. Together with Carbon Intelligence, an independent sustainability consultancy, we have taken several steps to incorporate the TCFD guidance into our Planet agenda and business activities.

Figure 1
Core elements of recommended climate-related financial disclosures



Recommendations of the Task Force on Climate-related Financial Disclosures, June 2017

Contents

Overview

- 1** About the Task Force on Climate-related Financial Disclosures
- 2** A message from our Chief Executive
- 3** Our progress on climate strategy

4 Governance

The governance around climate-related risks and opportunities

6 Risk Management

The processes used to identify, assess, and manage climate-related risks

9 Strategy

The actual and potential impacts of climate-related risks and opportunities on the organisation's business, strategy, and financial planning

16 Metrics and Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities

A message from our Chief Executive

Meeting the challenge of climate change



Nick Read
Chief Executive

We believe that urgent and sustained action is required to address climate change.

We are aware that climate change poses risks to our business and industry, as well as broader society. As part of our commitment to operate ethically and sustainably, we are dedicated to understanding climate-related risks and opportunities and embedding responses to these into our business strategy and operations.

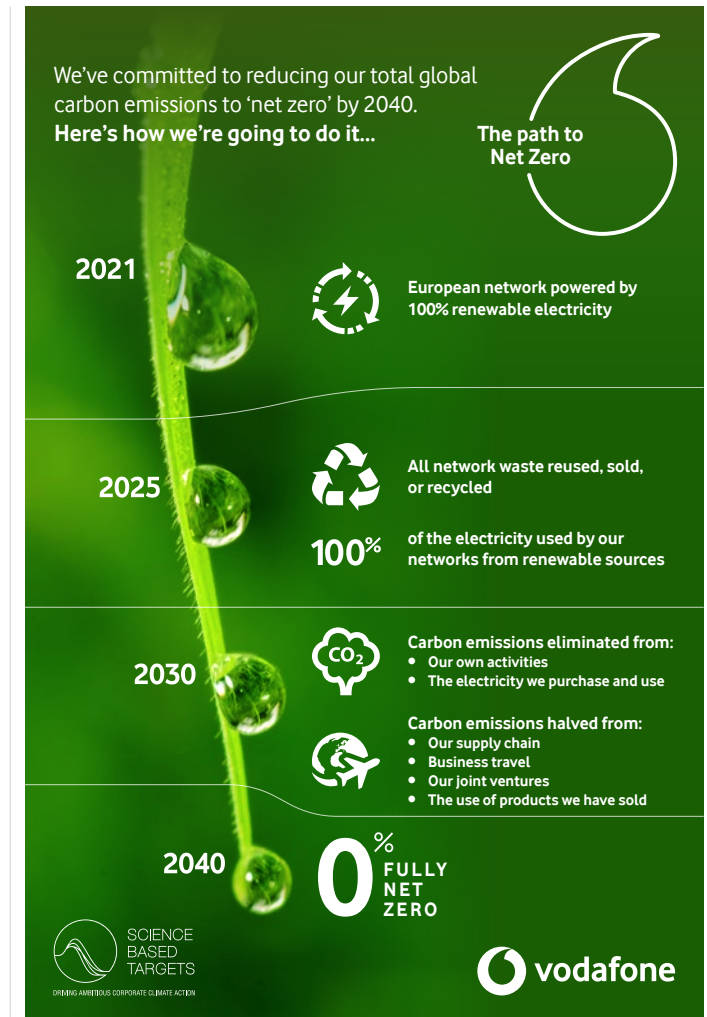
We recognise the key role our digital networks and technologies play in addressing the climate issues we face today. Digitalisation is key to saving energy, using natural resources more effectively, driving efficiencies and creating a circular economy. We will continue to invest in connectivity, and work together with others in the industry and policymakers to play our part.

This year, we have made ambitious commitments to reduce the impact that our own operations have on the environment as well as enable our business customers to reduce their own carbon footprint. Moving forward we will continue to collaborate with our customers, suppliers and partners to minimise the collective impact we have on the environment.

We are proud of the strong progress we have made in our responsiveness and resilience to climate change, while being mindful that there remains an urgent and ongoing need for sustained action as we transition to a low carbon global economy.

As part of our commitments, we have opted to share our progress towards meeting the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) in our first standalone TCFD report.

Nick Read
Chief Executive



Our progress on climate strategy

Evolving our approach to TCFD

The timeline below shows a summary of how we have integrated the TCFD programme into our Planet strategy. As part of the progress to date, we have established iterative processes to identify, measure, manage, assure and report on climate-related risks and opportunities. In this report we also set out the identified next steps required to further enhance our alignment across each of the four elements.

This TCFD report should be read in conjunction with our other disclosures on climate change and wider environmental, social and governance ('ESG') commitments in the Annual Report and ESG Addendum.

 [Click to read our Annual Report
vodafone.com/ar2021](https://www.vodafone.com/ar2021)

 [Click to read our ESG Addendum
investors.vodafone.com/esgaddendum](https://investors.vodafone.com/esgaddendum)

Figure 2


Vodafone's climate journey

TCFD gap analysis undertaken

We undertook a gap analysis of Vodafone's readiness to disclose in line with the TCFD recommendations which highlighted key areas for improvement. The outputs formed the basis of our TCFD programme.

Initial identification and assessment of climate-related risks and opportunities

We performed an initial exercise to identify climate-related risks and opportunities for Vodafone, assessed their materiality and conducted initial high-level qualitative scenario analysis.


 [More information on the results can be found on page 10.](#)

First TCFD disclosure

Our 2020 Annual Report included a summary of the TCFD alignment and stated our intention to be fully aligned by 2022.

Climate scenario analysis and financial impact modelling

We completed climate scenario analysis for a subset of our material risks to understand the financial impact under three different climate scenarios.

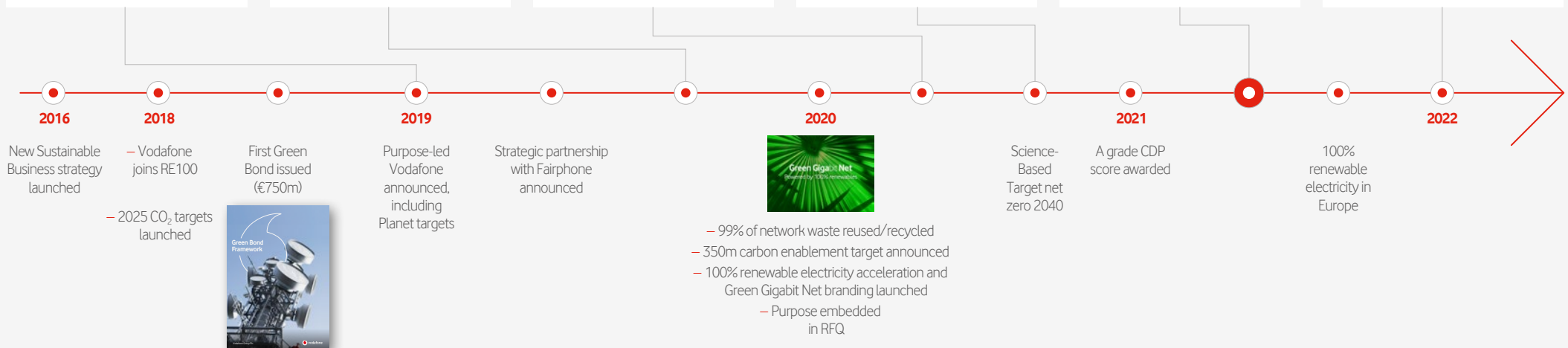
 [More information on this can be found on pages 12-14.](#)

First TCFD report

This year, we have published our first standalone TCFD report to detail the progress made to date to align with the TCFD recommendations, with a breakdown of each TCFD element.

TCFD mandatory in the UK

Companies with a premium listing on the London Stock Exchange ('LSE') will be required to make climate-related disclosures by 2022 on a 'comply or explain' basis. Separately, the UK Government has indicated its intention to make TCFD-aligned disclosures mandatory by 2025. We are working to be fully aligned to the TCFD recommendations ahead of these compliance requirements.



Governance

Ensuring accountability and responsibility for climate-related risks and opportunities

Governance is defined in the TCFD recommendations as “a set of relationships between an organisation’s management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the objectives of the organisation are set, progress against performance is monitored, and results are evaluated.” It is recommended that organisations establish and disclose appropriate internal governance processes for climate-related risks and opportunities.

Board oversight

The Board approves the strategy and as part of this, has reviewed Vodafone’s purpose and Planet commitments to reduce our environmental impact, such as reaching ‘net zero’ emissions by 2040. The Board oversees progress against our strategic targets on an ongoing basis and approves disclosures contained in the Annual Report.



Click to read more about Planet at
vodafone.com/our-purpose/planet

The Board has responsibility for the Group’s objectives, annual budget and funding strategy. We continue to track and report on our capital expenditure on energy efficiency across our business, and the positive impact achieved through investment of our €750m Green Bond, which is discussed further in the case study on page 15.

To ensure the Board has sufficient oversight of Vodafone’s sustainable business strategy and performance, including climate-related targets, the Board has approved the establishment of an ESG Committee. The Committee will be chaired by Maria Amparo Moraleda Martinez, a Non-Executive Director.

The Group External Affairs Director leads the Planet agenda as part of our purpose-led strategy and has overall accountability for climate change action, which includes providing updates to the Board on the progress towards our climate-related goals. The Group External Affairs Director reports directly to the Chief Executive and is a member of the Group Executive Committee (‘ExCo’).

On an annual basis, the proposed principal risks, risk watchlist and emerging risks are reviewed and approved by our ExCo before being submitted to the Audit and Risk Committee (‘ARC’) and the Board. In line with our Group risk management framework, the ARC meets quarterly to receive updates on how our principal and watchlist risks are being managed across Vodafone.



Further details on our governance structures in relation to risk management can be found in the Annual Report.
vodafone.com/ar2021

“Since joining the Board in 2020, it has been very clear that Vodafone’s management take their responsibilities to the environment seriously. Given the importance of this matter to Vodafone, our customers and the societies in which we operate, I am supportive of Board oversight and the integration of material environmental, social and governance (‘ESG’) themes within Vodafone’s strategy.”

Jean-François van Boxmeer
Chairman

TCFD disclosure recommendations: Governance

- Describe the board’s oversight of climate-related risks and opportunities.
- Describe management’s role in assessing and managing climate-related risks and opportunities



Members of our Board are engaged on the topic of climate change externally. For example, this year:

- Dame Clara Furse DBE became Chairman of the UK Voluntary Carbon Markets Forum, establishing a group that aims to operationalise a global, high integrity market for voluntary carbon offsets, an essential component of an accelerated and economically productive transition to net zero.
- Our Chief Executive, Nick Read, joined the EU Green Digital Coalition as a founding member and was appointed to International Telecommunications Union’s Broadband Commission for Sustainable Development. Both bodies have climate change as a significant consideration.

Governance continued

Management's role

Reporting to the Group External Affairs Director is the Group Director, Sustainable Business & Foundation, who has accountability for the sustainable business strategy, including the UN Sustainable Development Goals ('SDG') agenda. The Head of Sustainable Business is responsible for developing and executing the strategy and providing weekly updates that include any climate-related issues of relevance to the Company that can be communicated to the Group Executive Committee when relevant.

The Head of Sustainable Business manages the Sustainable Business team that includes the Environment Manager, whose responsibilities include creation, monitoring and reporting on climate change programmes and targets, such as the carbon reduction goals, Science Based Targets commitment, and Planet agenda actions.

Given energy usage is a material part of our climate change impact, the Chief Technology Officer has the responsibility for energy use and managing the performance of the network, including overseeing energy efficiency improvements.

At the 2020 AGM, shareholders approved the current remuneration policy which incorporates our ESG priorities in the executive long-term incentive plan. For FY21, this measure included a specific greenhouse gas ('GHG') reduction ambition linked to the previous 2025 target of reducing our emissions by 50% from the FY17 baseline.

Covering the climate impacts to our business, the Group Head of Risk has led the TCFD programme of work that is discussed throughout this report. Climate change risk and progress on the TCFD work has been reported to the Executive Committee and other key stakeholders through our annual principal risk assessment process and through meetings with the sponsoring executives.

The materiality assessment, a part of the TCFD programme, this year included collaboration with the local risk and sustainability experts in five of our largest operating subsidiaries. The work was conducted using the overarching Group risk management framework, enabling effective governance and management team oversight at Group and in our local markets.

Next steps in our TCFD programme:

- We will continue to disclose our risk management process and key roles and responsibilities for oversight relating to climate-related risks and opportunities;
- We will continue to consider how we can capture, quantify and consider climate-related issues in reviewing major capital expenditures, acquisitions and divestitures;
- We will continue to learn from and implement best practices from other organisations and third parties with expertise in climate change;
- We will continue to consider how the Board includes climate-related issues in decision making on strategy and performance objectives.

Initial challenges in our TCFD programme: Internal stakeholder engagement

Description of the challenge

Given our multi-country footprint, we engaged a broad set of internal stakeholders from across our organisation.

When we began our TCFD programme, we engaged with colleagues in our Group and subsidiary companies to ensure we had a common understanding of climate risk to enable mitigation and resilience measures to be introduced. It was also important that we used appropriate and accurate data for scenario analysis and risk analysis modelling.

Key stakeholder involvement and engagement throughout the process required significant coordination of a team that operates across multiple functions and countries, each needing to commit appropriate resources and time.

Our steps to manage the challenge

Colleagues in our operating subsidiaries from both the risk management and sustainability teams were invited to milestone meetings to understand the key tasks and steps of the programme relevant to them, as well as how to best interpret the results of the analysis. The Group risk team and sustainability team have regular engagements across the business to answer queries and update on the project progress.

Risk Management

Embedding climate into our risk management framework

Risk management is defined in the TCFD recommendations as “a set of processes that are carried out by an organisation’s Board and management to support the achievement of the organisation’s objectives by addressing its risks and managing the combined potential impact of those risks.” It is recommended that organisations disclose their processes for identifying, measuring and managing climate-related risks, as well as describing how these processes are integrated into the organisation’s overall risk management.

Figure 4
Vodafone’s risk management process



Year-on-year increase in climate impact understanding and quality of stakeholder engagement

Integration of climate-related risks into our risk management processes

We have taken several steps to establish an iterative process for the continuous improvement of our climate-related risk management. This process is outlined in Figure 4. We have aligned it to our Group risk management framework stages: Identify, Measure, Manage, Assure and Report. We applied these activities to the three scenarios and three time horizons as set out in this section.

Our disclosures consider the potential financial and strategic impacts on our business as a result of climate-related events. Our efforts to address these have been recognised externally. CDP, a global environmental non-profit organisation, acknowledged Vodafone as a leader and awarded us an A grade for our actions and transparency in 2020. In this report, we have combined our prior work relating to climate-related risks included in the CDP disclosure with the outputs of the TCFD programme.

1. Identify: Update materiality assessment

This year, we used the following sources to identify potential climate-related risks and opportunities and conduct a materiality assessment:

1. Climate change publications and data
2. Relevant sector literature outlining potential impacts of climate change on the telecommunications industry
3. TCFD guidance on potential risks and opportunities
4. CDP data and disclosures from other ICT sector companies
5. Existing climate-related risks and opportunities identified by Vodafone and disclosed in our Annual Report and our CDP submission

TCFD disclosure recommendations: Risk Management

- a. Describe the organisation’s processes for identifying and assessing climate-related risks.
- b. Describe the organisation’s processes for managing climate-related risks.
- c. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation’s overall risk management.

After the list of potential risks and opportunities was put together and updated based on the progress made, we evaluated the materiality of each by assessing their likelihood and impact using our Group risk management framework. This materiality assessment will be conducted each year to ensure the implications of all risks and opportunities are appropriately understood in the context of the ever-changing business and physical environment. We will update the risk scores as necessary due to the changing circumstances or as improved data or modelling for these risks and opportunities becomes available.

“As a large owner and operator of infrastructure assets, climate change is a critical long-term risk for Vodafone. We are committed to understanding the extent and impact of the risk to be able to mitigate the challenges that climate change brings. We are focused on getting better qualitative and quantitative data to respond actively to the threats identified and manage the transitions that are required.”

David Nish
Non-Executive Director, Chairman of the Audit and Risk Committee

Risk Management continued

2. Measure: Update & improve scenario analysis

We chose three climate scenarios described in Figure 5 to explore and assess the resilience of our business to climate change. We then conducted scenario analysis to model how the impact and likelihood of our material risks and opportunities might change in each scenario, where material risks are those listed on page 10. We also analysed the risks across each of the three time horizons listed below.

Time horizons

We chose three time horizons between 2020 and 2050:

1. Short-term (2020-2025)
2. Medium-term (2026-2035)
3. Long-term (2036-2050)

We used external datasets on climate drivers and internal datasets on our business activities to model a timeseries for the potential financial impact of material risks under each scenario between 2020 and 2050.

Climate change is an issue that spans decades and we recognise that different time horizons need to be applied for our climate impact modelling, particularly compared to our usual business cycle modelling and risk management framework. We have also aligned the longer time horizons to what we use in the wider climate change strategy under our Planet pillar.

This year, we focused on seven risks for advanced financial impact scenario analysis and modelled these for Germany, Italy, the United Kingdom, Spain and Vodacom (South Africa) in addition to the overall Group. We selected which risks to model based on the materiality assessment during the identification phase. The qualitative, high-level scenario analysis has enabled us to communicate climate-related risks and opportunities in a consistent way across the Group and in local markets.

Figure 5

Vodafone's climate scenarios

1. Early policy action: <2 °C Smooth transition

What it means?

- Early decisive action by society to reduce global emissions
- Coordinated policy action towards low-carbon economy
- Actions sufficient to limit global warming well-below 2°C in line with the Paris Agreement

What is the impact?

- High level of transition risks compared to business as usual scenario
- Physical risks are limited compared to business as usual scenario

2. Late policy action: <2 °C Disruptive transition

What it means?

- Delay in the policy response needed to reduce global emissions
- Severe policy changes required to compensate late start
- Ultimately, global warming is limited to 2°C
- Late, sudden action means that risk velocity is greater

What is the impact?

- Highest level of transition risks compared to other scenarios
- Physical risks are limited compared to business as usual scenario

3. No policy action: >3 °C Business as usual

What it means?

- Governments fail to introduce further policies to address climate change beyond those already known and in place
- Global temperatures increase above 3°C

What is the impact?

- Limited transition risks compared to other scenarios
- Physical risks are highest under this scenario

These scenarios were selected because they:

- Meet the TCFD recommendations to assess business resilience under different climate-related scenarios, including a 2°C or lower scenario
- Are aligned to the Bank of England's reference climate scenarios that are used to stress test the UK financial system against climate change
- Are modelled to a 30 year timespan to 2050 that aligns to the Paris Agreement and other governmental net zero 2050 targets
- Are referenced by the International Energy Agency (IEA) that uses policy pathways in its analysis of climate scenarios
- Consider macroeconomic impacts of physical and transition risks with some granularity
- Are applicable to a business context



Further details on the assumptions and input parameters on each of our scenarios are outlined in Appendix 2 of this report.

Risk Management continued

3. Manage: Develop & implement risk management controls

At the time of writing this report we were reviewing each material risk and determining the response strategy to improve climate resilience. We will use this review to define controls and monitoring metrics. This will ensure that the appropriate decisions on mitigating, transferring, accepting, or controlling the climate-related risks are made.

4. Assure: Monitor and improve risk management controls

Each year, the scenario analysis will be used to assess whether our current climate-related risk management controls are sufficient, and as part of this we will continue to upskill internal stakeholders on the impacts of climate change.

5. Report: Integration into overall risk management framework

When considering both physical and transitional climate risks, we benefit from the enterprise risk management framework already in operation. The framework is defined centrally and implemented in each of our markets. This approach allows risk management and reporting to balance the importance of having consistency of approach, measurement, and risk categorisation across the organisation, together with the value of having local expertise and risk action plans.

In the context of a fast-paced industry, our framework uses a likelihood scale that measures a percentage chance of a risk materialising within three years. For the purpose of this exercise, we adapted the time horizon for the climate-related risks as these span 2020-2050.

We understand and recognise that there are limitations to climate scenario modelling as there are no precise or exact forecasted calculations readily available. The modelling applied incorporates the parameters set out in Appendix 2. The climate modelling allowed risks to be plotted against an impact and likelihood scale, which enabled us to consider climate change impacts under different climate scenarios and timeframes in a format which our global business is familiar with.

The risk management framework is used to inform our principal, watchlist and emerging risks. Climate change was added to the risk watchlist in 2019 and then moved to our emerging risk list in 2020.



Further information on our risk management process associated with those risks can be found in the Annual Report.
[vodafone.com/ar2021](https://www.vodafone.com/ar2021)

Initial challenges in our TCFD programme: Risk framework alignment

Description of the challenge

Climate-related risks are considered in our Enterprise Risk Management ('ERM') framework, as well as in CDP and TCFD disclosure frameworks. We were challenged by the conflicting definitions of climate-related risks under each framework which increased the difficulty in streamlining our disclosures between each.

Our steps to manage the challenge

As CDP was initially used for sector mapping and impact identification, our climate-related risks and opportunities are mapped to CDP categories. However, we have applied our own definitions of impact and likelihood ratings from our ERM framework in order to be able to embed climate risk into our risk management processes. This allows us to assess climate-related risks relative to other risks within the risk universe and via the existing tools and community of local risk experts, while still satisfying CDP disclosure requirements.

Next steps in our TCFD programme:

- We are in a process of documenting relevant controls and processes that are in place to effectively manage and mitigate climate-related risks, and identify new climate-related opportunities;
- We are formalising risk action plans with our operating companies for each material climate-related risk;
- We will continue to embed climate-related risk and opportunity understanding into our Group risk management framework risk hierarchy and tools;
- We will look to establish key risk indicators (KRIs) to track movements against the tolerance levels. This is linked to the following section, Metrics and Targets.

Case Study:

Emerging risk processes/embedding climate risk into risk taxonomies

We have a dedicated project, which we will continue to work on throughout the next year, to increase the maturity and alignment of our approach to identify, measure and respond to emerging risks in each of our markets and the Group.

There are ongoing efforts to determine how we can be more dynamic in identifying emerging, including climate-related, risks and more seamlessly addressing them and their potential impact to the organisation in the short-term (< three years) and long term (>three years). We are also exploring how we better utilise our enterprise risk management tools to share climate-related emerging risk insight throughout the Group.

Strategy

Building climate resilience into our business strategy

Strategy is defined in the TCFD recommendations as: “an organisation’s desired future state. An organisation’s strategy establishes a foundation against which it can monitor and measure its progress in reaching that desired state. Strategy formulation generally involves establishing the purpose and scope of the organisation’s activities and the nature of its businesses, taking into account the risks and opportunities it faces and the environment in which it operates.” It is recommended that organisations disclose the nature and impact of their material climate-related risks and opportunities, as well the resilience of their strategy under each climate scenario chosen.

We recognise that both climate-related risks and opportunities have the potential to impact our business. We are therefore taking the necessary steps recommended by the TCFD to assess the potential severity of the risks, and the potential value of the opportunities, so we can maximise the positive impacts and minimise the negative impacts on our business.

We have identified 11 climate-related risks and three climate-related opportunities that we have assessed to have the potential to materially impact our business, as listed in Figure 6. Material risks are those that could have a significant effect on our operations, strategy, and financial planning if they are not managed appropriately. Material opportunities, when taken, will improve not just our financial performance, but also reduce our impact on the planet.

We have carried out high-level scenario analysis to assess the impact and likelihood of our material climate-related risks and opportunities at a Group level for each time horizon and scenario. We have also carried out more advanced financial scenario modelling for the potential impact of seven of these risks in Germany, Italy, the United Kingdom, Spain and Vodacom (South Africa). This process is outlined in more detail in the Risk Management section and a list of top risks across these markets is outlined in Figure 7.

The comprehensive modelling conducted will allow us to be more targeted in building resilience and developing the right mitigation strategies at the Group as well as in our local markets. Figures 8, 9 and 10 highlight, at the Group level, the magnitude of each risk and opportunity and how they respond under the different scenarios and different time horizons.

“At Vodafone, we recognise the importance of addressing climate change risks to ensure our business is resilient and sustainable for the future. The TCFD approach has been valuable in guiding that work. We also see a huge opportunity in helping to deliver a twin digital and green transformation and support climate action through our digital networks and technologies.”

Joakim Reiter
Group External Affairs Director

TCFD disclosure recommendations: Strategy

- Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term.
- Describe the impact of climate-related risks and opportunities on the organisation’s businesses, strategy and financial planning.
- Describe the resilience of the organisation’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

Strategy continued

Figure 6

Vodafone's material climate-related risks and opportunities

Category	Category overview	Climate factor	Risk/Opportunity impact	
Transition Risk	Growing external pressures and demands for action negatively impact revenues from those companies late to react, and trigger an increase in taxation and energy prices.	Consumer preferences	Changing consumer preferences – Change in sales due to new/lost customers as a result of change in environmental performance	●
		Temperature	Increase in temperature – increases in temperature leading to an increase in the consumption of energy and water for cooling infrastructure, data centres and offices	●
		Offsets	Change in carbon pricing – increasing carbon offset pricing impacting Vodafone's cost to meet its net zero target	●
		Litigation	Increasing risk of litigation – increase in stakeholder class actions against companies due to lack of climate action	●
		Carbon taxation	Increase in taxation & price of purchased products – increasing carbon taxes on purchased products (border carbon adjustments/higher production costs)	●
		Regulation	Change in regulations – change in regulations covering infrastructure efficiency leading to increasing compliance requirements	●
Physical Risk	Increase in temperature and frequency of extreme weather events (e.g. heatwaves, storms) leads to higher energy consumption for cooling and affects the quality of radio frequency and wireless transmission, in addition to damaging equipment and harming people's wellbeing.	Fire	Increase in wildfires – increase in wildfires frequency and severity therefore increasing damage to infrastructure	●
		Flooding	Increase in flooding – increase in flooding frequency and severity therefore increasing damage to infrastructure	●
		Sea level	Rising sea level – increase in sea level leading to flooding and damage of infrastructure	●
		Sea surface temperature	Increase in sea surface temperature – increase in storms frequency and severity therefore increasing damage to infrastructure	●
		Precipitation	Increase in precipitation – increase in precipitation leading to interruption to or reduction in quality of wireless service	●
Opportunity	A shifting business landscape in a net zero world opens new opportunities to capture new market and investment opportunities.	Market valuation	Improvement in Vodafone's share price – improvement in market valuation as a result of changing investor expectations with regard to climate change and Vodafone's ESG performance	●
		Sustainable financing	Improved access to capital – change in the availability and cost of capital due to sustainability performance	●
		Environmental performance	Improvement in energy efficiency – increasing consumer attractiveness and ability to meet net zero through increased energy efficiency of products and services	●

Key: ● advanced financial scenario modelling ● high level analysis

Strategy continued

Figure 7

Vodafone's climate-related risks and opportunities by market

This page highlights the top material climate-related risks and opportunities under a business as usual scenario across the Group and the five markets reviewed as part of the climate modelling project. This is the current climate trajectory and represents risks under a worst impact to Vodafone scenario.

Top Group risks

Target failure compliance cost

Top Group opportunities

Improvement in Vodafone's share price as a result of sustainability performance

Change in cost of carbon offsets

Change in availability and cost of capital as a result of sustainability performance

Damage to/ loss of infrastructure from sea level rise

Improvement in energy efficiency of products

UK:

Top Risks

Damage to/ loss of infrastructure from sea level rise (high level analysis only)

Change in energy consumption in infrastructure

Damage to infrastructure from flooding

Damage to infrastructure from fire

Top Opportunities

Improvement in energy efficiency of products

Development of new product lines enabling customers to better manage climate-related impacts

Spain:

Top risks

Damage to/ loss of infrastructure from sea level rise

Change in energy consumption in infrastructure

Damage to infrastructure from fire

Damage to infrastructure from flooding

Top opportunities

Improvement in energy efficiency of products

Development of new product lines enabling customers to better manage climate-related impacts

Germany:

Top risks

Damage to/ loss of infrastructure from sea-level rise

Change in energy consumption in infrastructure

Damage to infrastructure from fire

Damage to infrastructure from flooding

Top opportunities

Improvement in energy efficiency of products

Development of new product lines enabling customers to better manage climate-related impacts

South Africa:

Top risks

Damage to infrastructure from fire

Damage to infrastructure from flooding

Change in energy consumption in infrastructure

Damage to/ loss of infrastructure from sea level rise (high level analysis only)

Top opportunities

Improvement in energy efficiency of products

Development of new product lines enabling customers to better manage climate-related impacts

Italy:

Top risks

Damage to/ loss of infrastructure from sea level rise (high level analysis only)

Damage to infrastructure from fire

Damage to infrastructure from flooding

Change in energy consumption in infrastructure

Top opportunities

Improvement in energy efficiency of products

Development of new product lines enabling customers to better manage climate-related impacts



Strategy continued

Figure 8

Transition risk impact on Vodafone by time horizon and climate scenario

	Climate factor	Risk	Scenario	Time horizons		
				Short-term (2020-2025)	Medium-term (2025-2035)	Long-term (2035-2050)
Risk: Transition	Consumer preferences	Loss of customers	1	●	●	●
			2	●	●	●
			3	●	●	●
	Temperature	Cooling utilities consumption	1	●	●	●
			2	●	●	●
			3	●	●	●
	Offsets	Emissions offset cost	1	●	●	●
			2	●	●	●
			3	●	●	●
	Litigation	Climate litigation	1	●	●	●
			2	●	●	●
			3	●	●	●
	Carbon taxation	Carbon taxation	1	●	●	●
			2	●	●	●
			3	●	●	●
	Regulation	Energy efficiency regulation	1	●	●	●
			2	●	●	●
			3	●	●	●

As a technology-based business, transition risks pose a significant threat to our organisation and as a result, we need to ensure we maintain pace in the transition to a low-carbon world. Scenario analysis highlighted the increased risk of failure to comply with emerging regulation and carbon taxation as well as litigation risk in the event of failing to meet our net zero targets. These risks are the highest under our Scenario 1 (Early policy action: Smooth transition) and Scenario 2 (Late policy action: Disruptive transition). This is driven by the heightened likelihood of stricter regulations around carbon and energy as well as the increased scrutiny of target achievements through increased market and consumer pressure.

Given the nature of transition risks, the materiality of them is low under Scenario 3 (No policy action: Business as usual) as there is projected little or no change to current regulation and litigation pressures. Using the results of our scenario analysis, we are currently working to build treatment plans against each material risk and understand the level of mitigation we need to implement to build further resilience.

Our climate scenarios

1. Early policy action: <2 °C
Smooth transition

2. Late policy action: <2 °C
Disruptive transition

3. No policy action: <3 °C
Business as usual

Read more
on page 7

Increasing magnitude of risk before mitigation activities

Strategy continued

Figure 9

Physical risk impact on Vodafone by time horizon and climate scenario

	Climate factor	Risk	Scenario	Time horizons		
				Short-term (2020-2025)	Medium-term (2025-2035)	Long-term (2035-2050)
Risk: Physical	Fire	Wildfires	1	●	●	●
			2	●	●	●
			3	●	●	●
	Flooding	Flooding	1	●	●	●
			2	●	●	●
			3	●	●	●
	Sea level	Sea level rise	1	●	●	●
			2	●	●	●
			3	●	●	●
	Sea surface temperature	Storms	1	●	●	●
			2	●	●	●
			3	●	●	●
	Precipitation	Rainfall	1	●	●	●
			2	●	●	●
			3	●	●	●
	Precipitation	Service quality	1	●	●	●
			2	●	●	●
			3	●	●	●

Our climate scenarios

1. Early policy action: <2 °C
Smooth transition2. Late policy action: <2 °C
Disruptive transition3. No policy action: <3 °C
Business as usual
 Read more
on page 7


We are a large owner of infrastructure across all of our markets. This increases exposure to the physical risks of climate change due to the increased risk of asset damage or loss. As part of the climate impact identification and materiality assessment work, we identified the key climate drivers most likely to impact our assets and infrastructure. These are shown in Figure 9.

In contrast to transition risks, physical risks are most severe under Scenario 3 (No policy action: Business as usual) given this scenario sees a world where warming exceeds a 3°C threshold. Based on the latest scientific studies, we know this is the scenario under which physical climate-related events will be more frequent and severe therefore increasing the impact on Vodafone. However, we still observe some impacts of physical climate risk given there is a 1.5°C-2°C level of warming under Scenario 1 (Early policy action: Smooth transition) and Scenario 2 (Late policy action: Disruptive transition).

Through the scenario analysis conducted, we are able to understand and locate the areas within our key markets where assets are likely to be most affected and it enables us to build on our resilience planning and investment to cover the range of best to worst case scenario outcomes in a targeted manner.

Strategy continued

Figure 10

Opportunity impact on Vodafone by time horizon and climate scenario

	Climate factor	Opportunity	Scenario	Time horizons		
				Short-term (2020-2025)	Medium-term (2025-2035)	Long-term (2035-2050)
Climate-related opportunities	Market valuation	Share price	1	●	●	●
			2	●	●	●
			3	●	●	●
	Sustainable financing	Sustainable financing	1	●	●	●
			2	●	●	●
			3	●	●	●
	Environmental performance	Product efficiency	1	●	●	●
			2	●	●	●
			3	●	●	●

Our climate scenarios

1. Early policy action: <2 °C
Smooth transition2. Late policy action: <2 °C
Disruptive transition3. No policy action: <3 °C
Business as usual
 Read more
on page 7


Increasing magnitude of risk before mitigation activities

We have identified three key opportunities for our business relating to climate change. These opportunities are enabled by the transition to a low carbon economy and therefore the potential positive impact is the highest under Scenario 1 (Early policy action: Smooth transition) and Scenario 2 (Late policy action: Disruptive transition).

We continue to communicate and engage with investors on the ESG strategy through our comprehensive ESG reporting suite (Annual Report, ESG Addendum, TCFD Report, press releases and website), as well as direct engagement at meetings, roadshows and conferences. Vodafone already performs well against external ESG benchmarks used by investors, however we continue to focus on ensuring our ESG strategy and the impact it has on our financial performance is well understood. We recognise that the availability and cost of capital provided by investors is, in part, dependent on our ESG performance.

Strategy continued

Strategy resilience

Given the uncertainty of the transition to a low-carbon economy and the temperature increase limits achieved, the results of the scenario analysis, summarised in Figures 8, 9 and 10, enable us to better understand and build resilience to prepare for the potential worst case impacts of climate change. From our analysis we know that transition risks could potentially be most significant under Scenario 1 (Early policy action: Smooth transition) and Scenario 2 (Late policy action: Disruptive transition) though there are differences in their timings and materiality of financial impacts. On the other hand, Scenario 3 (No policy action: Business as usual) could have the biggest financial impact due to the physical climate-related risks.

We are in the process of reviewing internal processes and current controls to understand the residual level of the climate-related risks under each scenario. To ensure we are building long-term resilience as a business, we will use the outputs of this phase of the TCFD programme to improve our processes and decision making.

Additionally, whilst the telecommunications industry is a large consumer of energy, we consider ourselves well placed to help mitigate climate-related risks. Our connectivity solutions can help our customers and wider society to achieve energy and resource efficiency improvements through the use of Internet of Things (IoT) and connected solutions. We are committed to working closely with other ICT sector companies to drive investment in, and implementation of, digital solutions in action against climate change.

Challenge: Data management

Description of the challenge

To achieve reliable financial modelling of climate-related risks and opportunities, high-quality data is required. Due to the nature of the subject, the required data is sometimes not available, and this can limit the modelling of financial impacts.

Our improvement to manage the challenge

As part of our roadmap, we continuously track the quality of data used for modelling. We will continue to highlight where efforts to improve data standards are required with the aim of improving the accuracy of our scenario analysis. We have placed some impacts on a watchlist where the data is not yet sufficient. We will continue to improve the quantity and quality of data, to allow us to model the impact in the future.

Next steps in our TCFD programme:

- As outlined in the risk management section, we will continue to improve the coverage and standard of our climate scenario modelling for both risks and opportunities. This will be driven by the advancement of our data modelling and stakeholder engagement;
- We will continue to disclose climate-related risks and opportunities each year.

Case Study: Vodafone's Green Bond Programme

In 2018, Vodafone released its Green Bond Framework and in May 2019, we raised €750 million with our first Green Bond. This financed or refinanced projects that help us to manage climate risks and ultimately meet our Planet objectives.

In summary, our Green Bond Principles require that projects align with one of these categories:

1. Energy efficiency

- Improving energy efficiency of network infrastructure
- Energy optimisation and other projects using energy-saving technology
- IoT that supports and provides low-power methods of connecting devices for applications such as smart meters, smart cities and smart logistics

2. Renewable energy

- Installation of onsite renewable energy (solar or wind) to reduce electricity consumed from the grid

3. Green buildings

- Upgrades to buildings to deliver significant energy savings

Vodafone's evaluation, selection, management and reporting process aligns with market practice. An internal Green Bond Committee has been established, comprising of members of the Company's Treasury, Investor

Relations, Sustainable Business, Energy Performance teams and other parties nominated as subject matter experts. The Committee approves eligible projects which then form a portfolio to which funds are allocated.

Allocation to the Eligible Green Project Portfolio strives to match or be greater than the balance of net proceeds from the issuance of Green Bonds. Unallocated proceeds were held in cash and/or invested in other short-term liquid instruments with an ESG screen.

We report the allocation of proceeds on our corporate website, as required. In addition, we are committed to reporting, on a best effort basis, the impact metrics as recommended by the TCFD. In our Green Bond Report, released in 2020, we indicated the direct and indirect abatement of GHG emissions (0.749m Tonnes CO₂e and 6.9m Tonnes CO₂e respectively), as well as 57,000 m² LEED certified floor space.

This Vodafone Green Bond Programme has been reviewed by Sustainalytics, which has issued a Second Party Opinion.



More information can be found via investors.vodafone.com/debt-investors/green-bond-framework

Metrics and Targets

Measuring and managing climate impact

Metrics and targets are used to assess and manage material climate-related risks and opportunities. The TCFD recommends that organisations disclose the metrics and targets they use to assess and monitor climate-related risks and opportunities, including their Scope 1, 2 and, if appropriate, 3 emissions.

Climate-related risks and opportunities are engrained in our financial, operational, technological, and wider ESG performance, and we therefore use a wide variety of metrics to measure its current and potential impact.

“Climate action is a core part of our purpose as we believe business success should not come at a cost to the planet. We also strongly believe that our ambitious but credible environmental targets are good for business. We are winning more business as a result of our own goals, as well as the products and services that can help our customers reduce their own carbon footprint.”

Margherita Della Valle,
Group CFO

Greenhouse gas emissions

We are committed to measuring and reducing our share of global greenhouse gas emissions in line with the Paris Agreement and have been reporting on energy and carbon emissions since 2001. Our latest emissions footprint and targets can be found in Figures 11, 12 and 13 and in the latest ESG Addendum.

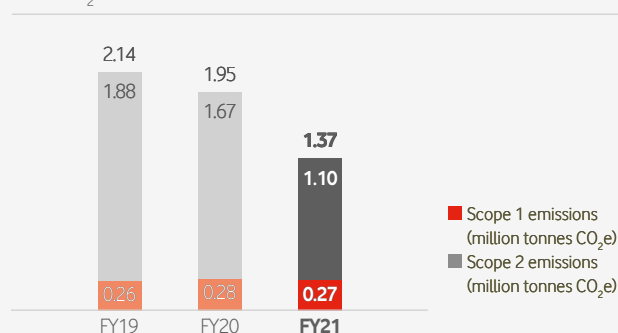
 [Click here to read more in our ESG Addendum
investors.vodafone.com/esgaddendum](https://investors.vodafone.com/esgaddendum)

Figure 11

Our targets

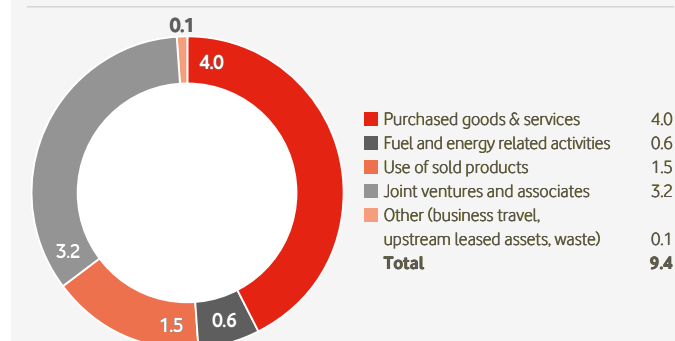
2030 Target	Eliminate all carbon emissions ('net zero') from our own activities and from energy we purchase and use (Scope 1 and 2)
	Halve carbon emissions from our carbon footprint (against a 2020 baseline), including joint ventures, all supply chain purchases, the use of products we have sold and business travel (Scope 3)
2040 Target	Eliminate Scope 3 emissions completely to reach 'net zero' across our full carbon footprint

Figure 12

Scope 1 and 2 GHG emissions
(mn tCO₂e)TCFD disclosure recommendations:
Metrics and targets

- Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.
- Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
- Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.

Figure 13

Scope 3 emissions sources
(mn tCO₂e)

Metrics & Targets continued

Case Study: Our journey to net zero GHG emissions 2017 to 2021

Current targets – 2030 SBTi-approved Science Based Target (SBT) and full net zero by 2040

Last year, we announced our 2030 SBT aligned to 1.5°C and our ambition to reduce our global carbon emissions to 'net zero' by 2040, 10 years earlier than what we had previously committed to. To fulfil these commitments, we will:

- Eliminate carbon emissions from our own activities and purchased energy by 2030
- Halve our Scope 3 emissions from joint ventures, supply chain purchases and the products we sell by 2030
- Reduce remaining Scope 3 emissions to zero by 2040

Our 2030 targets have been approved by the Science Based Targets initiative (SBTi), a partnership involving the United Nations Global Compact (UNGC), the World Resources Institute (WRI), CDP and WWF. SBTi encourages the private sector to set targets in line with the Paris Agreement.

We are on track to power our European network with 100% renewable electricity by July 2021, and our global network by 2025. Finally, we have committed to enable our customers to reduce their carbon emissions by 350m tonnes CO₂e between 2020-2030, which is greater than the emissions of Italy in 2019.

Our journey to net zero

2017-2025 target aligned to a 2°C reduction pathway

In 2017, Vodafone set a 2025 Scope 1 and 2 emission target aligned to a 2°C decarbonisation pathway. Our initial 2025 target was a short-term target intended to focus our efforts on reducing our emissions as needed to maintain warming to 2°C, aligned to the Paris Agreement.

This target was determined by comparing our 2010 GHG emissions against the 40-year 2°C aligned reduction trajectory to 2050, using the European 66% emission mitigation scenario (2010-50 Representative Concentration Pathway (RCP) 2.6). In 2017, there was no telecommunications industry standard or specific reduction pathway. However, through aligning to the higher European decarbonisation requirement, the 2025 target meant Vodafone would decarbonise at the rate needed to keep global warming at 2°C or below, which equated to a 40% reduction by 2025.

2018 – updated 2025 target to a 1.5°C pathway

After we set the 2017 target, the Intergovernmental Panel on Climate Change (IPCC) released an updated assessment that found that 1.5°C warming above pre-industrial levels would have significantly lower impacts than 2°C. We therefore updated our Planet strategy based on the latest scientific understanding and recalculated our trajectory under a 1.5°C scenario using the same method. The overall result was increasing our GHG reduction commitment to 50% by 2025 from a 2017 baseline. This commitment was incorporated into our wider business strategy.

2019 – SBT commitment and ICT pathway

Recognising the need for a credible long-term ambition, covering all three scopes of emissions, we committed to setting a SBT reaching full value chain net zero by 2050, as part of the UN Business Ambition for 1.5°C pledge. We worked with industry partners and the SBTi to create an ICT specific reduction pathway against which we could model our 1.5°C SBT and net zero ambition. This was completed in 2020 and was used to set our current targets.

Environmental metrics

Underpinning our net zero emissions target, we have targets to reduce the impact of our emissions-generating activities. Reductions in emissions are also part of our climate-related risk and opportunity management. For example, increasing the energy efficiency of our infrastructure reduces both GHG emissions and lessens the potential impact of increasing infrastructure cooling costs as average ambient temperatures increase due to global warming. Figure 14 provides a summary of the environmental targets set.


 More detail can be found in the Annual Report.
[vodafone.com/ar2021](https://www.vodafone.com/ar2021)

Figure 14

Vodafone's environmental targets

Our energy

We monitor how efficiently we use energy, and where the energy is sourced from. In 2018, we joined RE100, and committed to purchasing 100% of the electricity we consume from renewable sources by 2025. We prioritise the following actions that will allow us to reach our energy target:

1. Energy efficiency
2. On-site renewables
3. Power-purchase agreements (PPA)
4. Renewable electricity certificates (REC)

Target: Consume 100% renewable electricity by July 2021 in Europe and by 2025 in all markets

Our waste

Since 2013, Vodafone's Waste Policy has prioritised reuse, recycling and responsible disposal of all network waste. We minimise our environmental impact by:

1. Keeping resources in use as long as possible and extracting the maximum value from items
2. Using only certified specialist waste contractors
3. Encouraging customers to repair/return their old devices and routes

Target: Reuse, resell or recycle 100% of our network waste by 2025

Our products & services

Our biggest contribution to mitigating climate change is the way our products and services are helping our customers to reduce their own environmental impact. For example, we are helping our customers to manage energy more efficiently and reduce their emissions via the following IoT services:

1. Smart Logistics & Fleet Management
2. Smart Metering
3. Health Care
4. Smart Cities

Target: Help customers reduce their own carbon emissions by a cumulative total of 350 million tCO₂e between 2020 and 2030

This summary does not include our GHG emissions targets, which are displayed in Figure 11

Next steps in our TCFD programme:

- We will continue to assure key carbon data and metrics and targets;
- We will continue to improve the quality of our scenario modelling and climate data in line with any current and new standards from the IPCC and TCFD;
- We will review climate-related risk tolerance metrics as we continue to embed climate risk into our overarching risk management framework.

Appendices

Appendix 1: TCFD content index

Core elements	Recommendations	Page reference
Governance	a. Describe the board's oversight of climate-related risks and opportunities	4
	b. Describe management's role in assessing and managing climate-related risks and opportunities	5
Risk Management	a. Describe the organisation's processes for identifying and assessing climate-related risks	6, 7
	b. Describe the organisation's processes for managing climate-related risks	8
	c. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management	6, 8
Strategy	a. Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term	10
	b. Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning	12-14
	c. Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	15
Metrics and Targets	a. Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process	16, 17
	b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	16
	c. Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets	16, 17

Appendices continued

Appendix 2: Climate scenario parameters

			Early, smooth transition <2 °C	Late, disruptive transition <2 °C	Business as usual, no additional action >3 °C
Overview			Transition to a carbon-neutral economy starts early and the increase in global temperatures stays well below 2 degrees, in line with the Paris Agreement.	Global climate goal of keeping temperatures well below 2 degrees is met but the transition is delayed and must be more severe to compensate for the late start.	Where no policy action beyond that which has already been announced is delivered, resulting in above 3 degrees of warming. Therefore, the transition is insufficient for the world to meet its climate goal.
Assumptions			There is early and decisive action to reduce global emissions in a gradual way, with clearly signposted government policies implemented relatively smoothly.	To compensate for the delayed start a deeper adjustment is required, as evidenced in a steeper increase in global carbon prices in a late attempt to meet the climate target. Under this scenario, physical risks rise more quickly than in the early policy action scenario and transition risks are severe.	This scenario tests organisation's resilience to both chronic changes in weather (e.g. rising sea levels), as well as more frequent and extreme weather events (e.g. flash floods). Therefore, under this scenario, there are limited transition risks, but physical risks are significant.
Parameters	Physical	Global & regional temperature trends	Global temperatures increase to between 1.5-2 -degrees above pre-industrial levels	Global temperatures increase to between 1.5-2 -degrees above pre-industrial levels	Global temperatures increase to over 3 degrees above pre-industrial levels
		Frequency & severity of climate-related physical impacts e.g. extreme weather, humidity etc.	Increase in physical climate-related impacts	Increase in physical climate-related impacts	Significant increase in physical climate-related impacts resulting in damages, displacement and economic instability
	Transition	Carbon price pathway	Estimated range – \$135-\$6,050 USD/tCO ₂ e in 2030, \$245-\$14,300 USD/tCO ₂ e in 2050 (IPCC SR1.5)	Estimated range – \$135-\$6,050 USD/tCO ₂ e in 2030, \$245-\$14,300 USD/tCO ₂ e in 2050 (IPCC SR1.5)	Estimated range – \$15-\$220 USD/tCO ₂ e in 2030, \$45-\$1,050 USD/tCO ₂ e in 2050 (IPCC SR1.5)
		Carbon-related policy/regulation	Early global policy response. Increase in carbon price	Delayed and disjointed policy response. Lack of certainty for businesses. Significant jump in carbon price beyond 2030	No further policy action. Current country level commitments are maintained.
		Emission pathway	Global emissions decline 45% by 2030, reaching net zero by mid-century	Global emissions continue to increase, before rapidly decreasing in order to reach net zero by 2050	Global emissions continue to increase, before rapidly decreasing in order to reach net zero by 2050
		Commodity and energy prices	Significant increase in energy prices	Significant increase in energy prices. Likely that changes will be sudden and disruptive.	Energy prices maintained
		Energy mix	Significant increase in renewable energy mix by 2050 – nearly all fossil fuels replaced	Significant increase in renewable energy mix by 2050 – nearly all fossil fuels replaced	Share of renewable energy mix increases but fossil fuels remain the largest source of energy.
		Technology	Rapid increase in investment in mitigation technologies (e.g. energy efficiency, demand management)	Increase in investment in mitigation technologies (e.g. energy efficiency, demand management)	Modest investment in mitigation technologies. Greater investment in adaptation technologies.
		Consumer preferences	Consumer preferences continue to shift towards low-carbon products and services	Consumer preferences continue to shift towards low-carbon product and services	No change in demand for low-carbon goods and services. Increase in adaptation services required.
	Underlying climate models used		Transition risk modelling: REMIND-MAGPIE 1.7-3.0 – Immediate 1.5C with CDR (Orderly, Alt) Physical risk modelling: CMIP5 mean model from the World Meteorological Organisation – RCP 2.6	Transition risk modelling: REMIND-MAGPIE 1.7-3.0 – Delayed 2C with CDR (Disorderly, Alt) Physical risk modelling: CMIP5 mean model from the World Meteorological Organisation – RCP 2.6	Transition risk modelling: REMIND-MAGPIE 1.7-3.0 – Nationally determined contributions (NDCs) (Hot house world, Alt) Physical risk modelling: CMIP5 mean model from the World Meteorological Organisation – RCP 8.5