



Bigger Picture

2021 Sustainability Report TCFD Appendix



Approach

As Australia’s leading telecommunications and technology company, and a large user of energy, Telstra has an important role to play in addressing climate change and the many urgent environmental challenges we face. We recognise that climate change and environmental sustainability are the defining challenges of the decade and we have a responsibility to act. We are committed to leading by example and using our scale and voice to help drive better environmental outcomes.

Our latest Environment Strategy is aimed at accelerating our ambition to tackle climate change by offsetting and ultimately reducing our emissions, and creating a more sustainable future by using resources more sustainably and efficiently. We are also driven by the opportunity to make a difference beyond our business by encouraging and enabling our customers, suppliers and communities to do the same.

Governance

Maintaining clear oversight of our environment risks (including climate change) is one of our sustainability governance priorities.



Board and Audit & Risk Committee

The Board is responsible for overseeing Telstra’s approach to sustainability (including environment) and monitoring its performance, including overseeing the way in which Telstra gives appropriate consideration to the interests of stakeholders, and approving Telstra’s key external environmental targets and disclosures under the TCFD (Task Force on Climate-related Financial Disclosures) framework. During FY21, the Board received progress updates on the implementation of our Strategy and assessment of our resilience to climate change impacts. The Board also approved our new resource efficiency targets and Telstra entering the energy retail market. The Audit & Risk Committee (ARC) reviews reports from management on Telstra’s climate-related risks and the risk management plans management has put in place to deal with those risks, and makes recommendations to the Board on Telstra’s key external environmental targets and disclosures under the TCFD framework.

Executive management

The CEO, together with the senior management team (collectively the CEO Leadership Team, or CEOLT), is responsible for the development and implementation of our Environment Strategy. The Environment Executives Group provides leadership on Telstra’s environmental ambition, determines key priorities, and executes management decisions on environment-related matters. This includes making recommendations to the CEOLT.

Environment risk work groups

Environment risk work groups provide quarterly updates to the Environment Executives Group on status and management of environmental risks. They identify, assess and monitor environmental risks (including climate-related risks and opportunities) likely to impact our business.

Environmental risk management

Environmental risks (including climate change risks and opportunities) are identified, assessed and managed using our risk management framework. This is consistent with the way we manage other material risks that may impact delivery of our strategic objectives.

We continue to monitor and assess both current and emerging environmental risks opportunities and incorporate risk mitigations into our business planning. Climate change is a material topic for Telstra and our Environment Strategy includes our response to mitigate and adapt to its impacts.

For more information on our risk management framework and how we manage risk, see the [FY21 Corporate Governance Statement](#).

Adapting to climate impacts

Risks associated with the physical impacts of climate change can be acute (arising from changes in the severity and frequency of weather events) or chronic (longer-term shifts in climatic patterns such as rising sea-levels). The physical impacts of climate change have the potential to damage our physical assets and affect our supply chain and/or disrupt services to our customers. Transition risks are those arising from policy, legal, technology, market and reputational changes associated with the transition to a low-carbon economy, or the failure to achieve this transition.

Decarbonising the global economy is likely to require a world that is more interconnected, digitised and decentralised, providing Telstra with opportunities to develop new solutions for customers and support emerging industries.

An overview of the climate-related risks and opportunities identified as having potential financial or strategic impact to our business and our response is summarised in the table below.

Climate-related risks and opportunities

	Risks	Opportunities	Response
Transition Policy	Emerging changes in policy and regulation can have cost impacts associated with meeting increased regulatory requirements.	Policies supporting the development of net zero emissions and circular economies will create demand for ICT technologies and services.	We actively monitor the emerging policy and regulatory landscape and contribute to policy development, for example via industry forums or via making submissions.
Transition Market	Shifts in sectoral growth and changing consumer behaviour can disrupt demand for existing market offerings.	Higher demand for more sustainable products and services will increase market offerings and innovation in the ICT sector, driving revenue growth for the sector.	We monitor emerging technology and customer trends to inform our product and technology, value proposition and marketing roadmaps, our strategy, and Telstra's investment plans.
Transition Technology	Uncertainty in technology development and deployment can lead to products and services that fail to compete, and may be phased out in the transition to a low carbon economy.	Decarbonisation will drive innovation in technological development in the ICT sector for digitised solutions particularly in the energy, resource, transport and agricultural sectors, and we can play a role in enabling our customers to reduce their environmental impacts (including greenhouse gas emissions).	We actively manage the lifecycle of our products and services: defining, building and retiring products. This requires us to harness opportunities, anticipate and understand what our customers want and how we can leverage technology to realise these opportunities to better serve our customers.
Transition Reputation	Community reliance on telecommunications services is increasing, and this presents a risk given expectations of service continuity.	Integrating climate in our planning enables us to make climate-informed decisions to improve network resilience, better serve our customers and positions us well as a provider of choice.	The majority of our network facilities are dependent on mains electricity for normal operation. We continue to monitor our power resilience arrangements and work with electricity providers to reduce impacts to our networks from mains electricity outages.
Physical Acute and chronic	Disorderly transition to a decarbonised energy grid presents a risk to reliable energy supply and may be a compound risk in extreme weather events.	Increased growth in ICT sector for early warning systems and demand for connectivity.	We continue to build on our Network Resilience and Business Resilience programs, which focus on reducing service disruptions and delivering a better usage experience for our customers.

Developing climate scenarios

We use climate scenarios to help us understand what future trends, opportunities and risks may emerge as a result of climate change, to better understand our resilience and vulnerabilities to climate change. Scenarios are not a forecast or prediction of what will happen in the future, rather they are hypothetical constructs intended to highlight key aspects of a plausible future and key factors that will drive future developments.

We have developed three divergent, climate driven scenarios in line with the Task-force on Climate-related Financial Disclosure (TCFD) recommendations, to stress test our business strategy and the resilience of our physical infrastructure across a variety of time horizons, ranging from short (up to three years), medium (three to ten years) and longer term (greater than ten years).

Our approach to scenarios

Climate driven future scenarios need to consider both emissions projections and socio-economic trends (such as population, consumption, economic growth, behaviour, technology and institutions) for all sectors and all regions. This allows consideration of the key linkages between global, regional and local socio-economic outlooks and their implications for future emissions.

These scenarios are aligned with international best practice, drawing upon the latest peer-reviewed scientific and academic research. Key elements of each scenario were developed referencing research produced for the Intergovernmental Panel on Climate Change (IPCC) including:

- Representative Concentration Pathways¹ (RCPs), which describe how much heat is trapped in the atmosphere associated with varying levels of greenhouse gas emissions¹
- Shared Socio-economic Pathways² (SSPs), which describe future global socio-economic conditions
- Integrated Assessment Models³ (IAMs), which combine these physical and socio-economic constraints into technically and economically plausible pathways
- Shared Policy assumptions⁴ (SPAs), which describe global climate policy and how it evolves over time.

1 Representative Concentration Pathways (RCPs) model the increase in atmospheric GHG concentrations over the 21st century and form the basis for understanding the type and scale of physical impacts of climate change in global climate models.

2 Shared Socio-economic Pathways (SSPs) describe future global socio-economic conditions. They include narratives and quantification of demographic, political, social, cultural, institutional, lifestyle, economic and technological variables and trends.

3 Integrated assessment models (IAMs) are a diverse set of models ranging from partial equilibrium energy-land models to computable general equilibrium models of the global economy that explore whole system transformation.

4 Shared Policy Assumptions are pathways that describe key policy attributes including those that promote or hinder mitigation and adaptation efforts.

From the global climate context, we referenced the Australian National Outlook (ANO) scenarios developed by Commonwealth Scientific and Industrial Research Organisation (CSIRO) to explore the relationship between the economy and natural resource use in Australia, and issues pertinent to the future success of Australia's economy.

With regard to the decarbonisation of the Australian electricity grid, we used Australian Energy Market Operator (AEMO) scenarios to understand the proportion of renewable generation from now to 2040. Noting that AEMO has

aligned their scenarios with the IPCC RCP outcomes, we extrapolated AEMO's forward-looking trajectories for the National Energy Market (NEM) to Western Australia and other areas outside of the NEM. Beyond AEMO's forecast period (2041-2050), we used the proposed shutdown of coal-fired generation to drive renewable energy generation in line with AEMO's projected generation mix in the previous decade.

This resulted in three Telstra climate scenarios being developed specifically to test the resilience of our business and our network infrastructure.



Scenario 1
Accelerated action
Less than 2°C

Global co-operation to decarbonise driving low emissions, innovation and technological solutions



Scenario 2
Divided world
2-3°C

Fragmented decarbonisation and low economic growth with trade barriers and regional conflict



Scenario 3
Changed climate
Greater than 4°C

Limited decarbonisation most challenging to adapt, economic and social development continue to heavily rely on fossil fuel resources

Telstra scenarios	Scenario 1 Accelerated action Less than 2°C	Scenario 2 Divided world 2-3°C	Scenario 3 Changed climate Greater than 4°C
RCP Representative Concentration Pathways	RCP 2.6	RCP 4.5	RCP 8.5
SSP Shared Socio-economic Pathways	SSP1 Sustainability (Taking the Green Road)	SSP3 Regional Rivalry (A Rocky Road)	SSP5 Fossil-fuelled Development
ANO CSIRO Australian National Outlook	Green and Gold	Slow Decline	Thriving Australia
AEMO Australian Energy Market Operator	Step Change	Fast Change	Slow Change

Key framework and parameters for scenario analysis



Telstra scenarios	Scenario 1 Accelerated action Less than 2°C	Scenario 2 Divided world 2-3°C	Scenario 3 Changed climate Greater than 4°C
Representative Concentration Pathways⁵	RCP 2.6	RCP 4.5	RCP 8.5
Global temperature range (2100)	1.5°C to 2°C	2°C to 3°C	More than 4°C
Australian temperature range (2050)	~1°C	~1.5°C	~2°C
Australian GDP (2050)	~5 trillion	~2.8 trillion	~8.8 trillion
Australian GDP growth (average 2020-2050)	2%	1.3%	Greater than 3.6%
Australian population (2050)	36.6 million	28.5 million	42.2 million
Global emissions	Peak as soon as possible and decrease to net zero by 2050	Global peak by 2040	Continue to increase
Renewable generation by 2050 (AEMO)	98%	97%	65%
Extreme weather events	Small increase	Moderate increase	Large increase
Energy systems	Renewable with battery, pumped with hydro and renewable hydrogen	Renewables with peaking gas	Energy mix with coal, gas
Digitisation	High uptake of digitisation, automation and energy efficiency measures	Convenience and security drive innovation and is constrained by low economic growth	Globalisation and improvement in living standards drive innovation in the digital world.
Challenges in this scenario	Fastest decarbonisation with highest carbon price	Lowest economic development and globalisation	High adaptation cost from physical climate change impacts

We developed these scenarios to examine the range of plausible future climate states and the uncertainty we face in a changing climate. Our scenario analysis examines the potential implications climate impacts have on our business in three areas – infrastructure and assets, supply chain and our customers.

⁵ Representative concentration pathways from the Intergovernmental Panel on Climate Change 5th Assessment Report

Infrastructure and assets

Key parameters and assumptions for scenario analysis

Our assessment is based on best practice guidance, supported by climate science experts at CSIRO and data from the Bureau of Meteorology (BOM). The assessment considers timeframes of 2030 and 2050 for scenario analysis. There is little divergence in the scenarios to 2040 because the physical response over that timeframe is driven by greenhouse gas emissions already absorbed by the climate system. As such, the 2030 timeframe is relatively independent of any emissions mitigation actions that may be undertaken, emphasising on the need for adaptive measures under all scenarios. By 2050, there is divergence between scenarios, with RCP2.6 providing the lowest challenge to successfully adapt, and RCP8.5 the highest.

We identified five climate hazards which could cause disruption to our network and operations: bushfires, coastal inundation and flooding, cyclones, increasing temperature, and urban flash flooding. The appropriateness of these climate drivers was reviewed against the availability of climate projections from Climate Change in Australia (CCiA) datasets⁶. This formed the basis of our forward-looking physical climate risk assessment.

Climate hazard	Availability of climate data			Selected climate driver	Methodology
	RCP 2.6	RCP 4.5	RCP 8.5		
Bushfire	✓	✓	✓	Number of days above average Forest Fire Danger Index (FFDI) for each region	Climate Measurement Standards Institute (CMSI) change factors applied to project change in extreme fire weather day.
Coastal inundation & flooding	✓	✓	✓	Coastal inundation	Based on CMSI projections, exposure to possible impacts from coastal inundation is based on proximity to the coast and elevation above sea-level.
Cyclones⁷				Tropical cyclones	Analysis is limited to wind exposure using location of cyclonic regions based on Australian Standard AS1170.2.
Increasing temperature	✓	✓	✓	Chronic increase in ambient air temperature	Equipment exposure to potential impacts of rising temperature when more than 30 days per annum of elevated temperature is experienced.
Urban flash flooding⁸			✓	Change in 1 in 20 year rainfall	Design rainfall standards and CMSI change factors applied to the 1 in 20 year 1hr and 24hr events. Projected 1 in 20 year event values were then compared to current design standards.

⁶ The Climate Change in Australia (CCiA) web portal is the result of a collaboration between CSIRO and the Bureau of Meteorology. The portal provides projections of the Australian climate system through high resolution downscaling based on 40+ global climate models. Data outputs from the portal include data for selected models, years, climate variables and emission scenarios. Projections are presented for 20-year periods, where the year 2030 represents the 20-year average climate between 2020 and 2040. Where data output is represented as a change, climate data from the years 1986 to 2005 is used as the reference climate.

⁷ Cyclone tracks are expected to remain broadly similar over the period to 2050 with the frequency of events anticipated to remain static or even decrease slightly. There are low confidence long-term (2090) projections which suggest cyclones may track further south, and as such not considered in this assessment.

⁸ Climate data for future extreme rainfall events is low confidence, the following analysis was undertaken to give an indicative view of future trends.

Scenario analysis outcomes

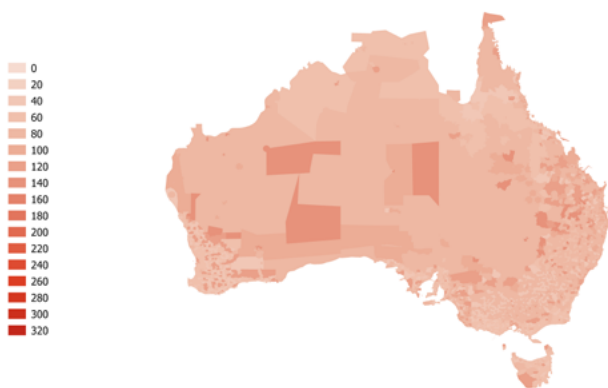
At Telstra we operate significant physical assets including telephone exchanges, mobile towers, data centres, fibre network and subsea cables. These are located in city centres as well as urban and regional areas, with many exposed to physical weather conditions. Increased frequency and severity of extreme weather events can damage and disrupt our operations and service delivery.

We identified five climate hazards that could cause disruption to our network and operations: bushfires, coastal inundation and flooding, cyclones, chronic increase in average annual temperature, and urban flash flooding. These climate hazards are projected to increase over time across all three scenarios, with the most change projected in the Changed Climate scenario.

Areas of heightened risk indexed based on network importance and climate risk (extreme rain, annual and extreme temperatures, fire danger weather and extreme wind) in 2050 under Accelerated action and RCP 2.6



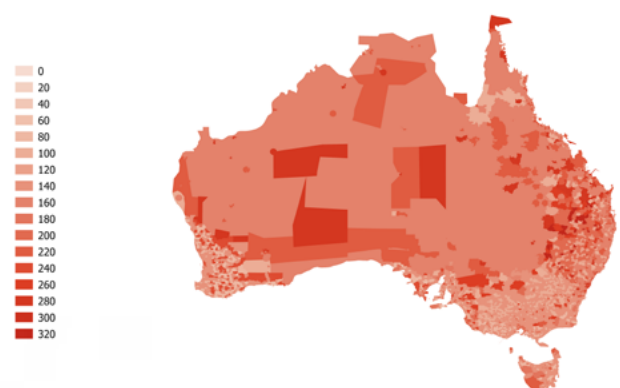
Areas of heightened risk indexed based on network importance and climate risk (extreme rain, annual and extreme temperatures, fire danger weather and extreme wind) in 2050 under Divide world and RCP 4.5



Higher risk areas include Victorian bushfire prone areas, as well as the Queensland and Western Australian coasts, due to coastal inundation and storm surges. Planning and preparing for future climate hazards will not only require greater investment to safeguard the resilience of our network, but will also likely incur increased operating and maintenance costs for our assets. This is because more frequent and/or severe climate hazards may result in service disruptions for our customers, higher costs for repair or replacement of assets, and delays in our ability to respond and recover quickly from disruptions.

Based on our initial analysis of our key assets, approximately 35 per cent⁹ of those assets analysed are currently exposed to at least one climate hazard. This percentage is expected to increase in the future. Under the Changed climate scenario, it is expected to increase to 55 per cent by 2050. In addition, these assets may also become exposed to more than one hazard. Currently only five per cent of assets are exposed to more than one hazard, but this is forecast to increase to 15 percent under the Changed climate scenario. The following maps are an overlay of our Exchange Service Areas (ESAs) with projected change in climate exposure for the three climate scenarios out to 2050. The maps illustrate the areas of potential heightened climate exposure for our exchange service areas with the Changed climate scenario expected to experience the most change.

Areas of heightened risk indexed based on network importance and climate risk (extreme rain, annual and extreme temperatures, fire danger weather and extreme wind) in 2050 under Changed climate and RCP 8.5



⁹ Percentages in this section are rounded to the nearest 5% and based on initial analysis, hence are subject to change following future analysis.

Strategic business response

To adapt to climate hazards, we have put resilience strategies in place. For example we have updated our climate exposure threshold criteria to determine the natural disaster risk exposure for network sites, we are revising our building standards to improve the resilience of new mobile huts¹⁰, have reviewed our battery lifecycle replacement program to better consider disaster prone locations, and are increasing stocks of temporary mobile infrastructure. In addition, our lifecycle replacement and upgrade programs will consider climate risk exposure with new assets designed to improve resilience.

Continuous improvement of our network remains a priority. Our ongoing focus is on providing simplified and resilient infrastructure, identifying and where possible removing single points of failure, replacing end-of-life equipment and increasing automation, leading to improved network resilience and recovery. We will also continue to review our strategy in light of the implementation of recommendations from the Royal Commission into National Natural Disaster Arrangements and outcomes from other inquiries. For example, this includes greater information sharing between government agencies and telecommunications providers for the purpose of preparing for and responding to natural disasters, as well as proposed nationally harmonised disaster risk assessments.

The risk of disruption to services is mitigated in a number of ways, such as diverse paths for critical transmission links, temporary infrastructure and site-specific power resilience strategies which may include permanent generators, temporary generators and/or battery backup. However we know that the external risk profile is shifting. With that, new risks and opportunities are emerging. As such, we are continuing to evolve and enhance our understanding of future climate impacts to continue building adaptation into our business planning and strategy.

Supply chain

Key parameters and assumptions for scenario analysis

The scenario analysis identified that physical climate risks (such as cyclones, flooding, heat stress and water stress) are concentrated in the Asia region. Majority of our strategic suppliers and our critical suppliers¹¹ supply chains (relevant to Telstra) are located in Asia. Where these suppliers are impacted by climate-related events, we may experience indirect impacts through a delay in, or unavailability of goods and services, disruption to services, or increased prices. Although these impacts are indirect, compounding and/or coinciding events could potentially result in significant impacts on business continuity.

To assess the vulnerability of our supply chain, we considered the impacts of the three climate change scenarios on our devices and network equipment supply chain, as well as on our services-related supply chain. This assessment identified that under the Accelerated action scenario there may be smaller, less frequent supply chain shocks. These may impact productivity, but typically suppliers could absorb them. However, under the Divided world and Change climate scenarios, suppliers' capacity to withstand the increasing severity of shocks is reduced, resulting in decreased supply chain reliability.

Due to limitations in global climate data modelling, we used shock scenarios to explore and stress test our supply chain. The purpose of this approach was to:

- Use stressors to explore what changes in the risk profile may look like under our three climate scenarios;
- Understand the magnitude of the indirect impacts where only one event may be sufficient to result in an impact, compounding or coincident events would increase the impact;
- Explore the conditions under which our business continuity strategy may be put under stress; and
- Identify and prioritise supply chain adaptation options.

¹⁰ Mobile huts are building structures located at mobile towers which house equipment essential to the continued connectivity and function of our towers.

¹¹ Strategic suppliers include large, complex and global suppliers that provide multi-value creation and a source of competitive strategic advantage. Critical suppliers: Include high spend and/or strategically significant suppliers that are critical in enabling Telstra to achieve the T25 ambitions.

Basis for test scenarios

	Climate hazard	Climate driver	Region selected	Future plausibility
Devices and network equipment test scenarios	Chronic risk	Cumulative impacts of flooding/erosion/land-slides and erratic rainfall have implications for food and water security	Production of electronics and communication equipment is dependent on 3TG ¹² and cobalt. These minerals are heavily concentrated in the south east of the Democratic Republic of the Congo (DRC) and north west Zambia.	Both DRC and Zambia are highly vulnerable to any kind of climate variability.
	Cyclones	Severity of cyclones is expected to increase	Critical sophisticated componentry manufacturing facilities used in processor chips are concentrated in the South China Sea region.	A cyclone track or multiple events simultaneously affecting all or most logistics in the region.
	Flooding	Extreme rainfall events associated with disease outbreaks	Red River Delta is a growing advanced manufacturing centre for devices and network equipment with low climate resilience.	The Red River Delta is expected to see an increase in flooding.
	Fire	Large-scale fire events are likely to recur	The critical distribution centre is in Sydney.	Severity and likelihood of bushfires is increasing, along with a longer fire season, making coincident events plausible in the future.
Services and workforce test scenarios	Heat stress	Extreme heatwaves with implications for human health are already occurring regularly in northern India and Pakistan	Concentration of workforce resources in India.	Heatwaves are expected to increase in duration and intensity over the coming decades regardless of emissions trajectory.
	Fire & Water stress	Bushfire/wildfire is a hazard increasing in likelihood in several regions, including Australia and Western USA. Water stress is increasing in most regions, partly due to increasing demand	Key contact centres in Australia with plan to bring more services onshore.	Severity and likelihood of bushfires is increasing, along with a longer fire season, making coincident events plausible in the future.

Note: Regional adaptive capacity is represented by an adjusted Human Development Index (HDI) where regions classified as highly developed see a downward moderated index value while lesser developed regions are modified upward.

¹² Tin, tantalum, tungsten and gold are metals are collectively referred to as 3TG used in electronics, aerospace, communication, automotive, jewellery, healthcare devices and industrial machinery.

Scenario analysis insights and outcomes



Scenario 1 Accelerated action Less than 2°C

Scenario 2 Divided world 2-3°C

Scenario 3 Changed climate Greater than 4°C

Telstra scenarios	Scenario 1 Accelerated action Less than 2°C	Scenario 2 Divided world 2-3°C	Scenario 3 Changed climate Greater than 4°C
Devices and Equipment	Upstream supply shocks (smaller and infrequent), typically within the capacity of suppliers to absorb.	Lower global resilience and increased severity of shocks exceed the capacity for suppliers to buffer.	Likely decreased reliability in supply chain, worsening with time.
Services and workforce	Intermittent events may impact productivity in localised areas.	Workforce productivity impacted by events affecting base human necessities.	Increased adaptive capacity and high levels of global cooperation sees extreme impacts moderated.

Strategic business response

Telstra's supply chain has been assessed as resilient because of the existing measures we have in place such as business continuity plans, alternative suppliers, a high stock on-hand threshold for devices and network equipment, and in-sourcing of critical work. In addition, our critical and strategic suppliers have their own measures in place such as alternative production regions, alternative logistics solutions and mobility of service workers. For example, our service partners can be at the mercy of the environment, with the Philippines in particular being vulnerable to volcanoes and typhoons. We review and test our contact centre business continuity plans (BCPs) annually. Telstra benefits by having partners in different locations across the world including the Philippines, India and Australia. This allows work to be moved around as our partners have common skills, tools and systems.

Our Business Resilience Program is key to how we maintain resilience. For suppliers that provide critical goods or services to Telstra, we consider their geographical location and engage with them to mitigate risks and enhance their adaptive capacity. Where appropriate, we may also consider supplier diversification. To continuously improve the preparedness of our supply chain for future climate risks, we use the climate scenario outputs to engage with suppliers to understand their climate resilience and preparedness and to inform decision making when engaging new suppliers.

To assist suppliers with managing and reducing their emissions, we have signed up to the CDP Supply Chain Program to help our top 100 suppliers disclose their Greenhouse Gas (GHG) emissions. To begin the transition to a low carbon economy, we have developed a project with the CDP to help suppliers calculate and set emissions reduction strategies. For more information, refer to scope 3 section above.

Transition impacts

Modelling transition impacts

While the transition towards a low-carbon economy is having an economy-wide transformative effect, it is important to understand the range of risks and opportunities it presents for our business. As detailed in the Climate-related risks and opportunities table, we continue to monitor and manage the key transition risks (policy, market, technology and reputation). For our scenario analysis, we wanted to further examine how the impacts of climate change could evolve the needs of our enterprise customers and consumers in the longer term, and how we can integrate these considerations in our business planning and strategies.

We used the Global Trade and Environment Model¹³ (GTEM-C) to stress test the economy and how this impacts Telstra under each of the three climate scenarios. The GTEM-C is

CSIRO’s variant of a global general equilibrium model used to model climate impacts on the Australian economy, including its impact on sector growth and labour requirements. The GTEM-C model overlays the impact of an emissions budget on the Australian economy, to determine sectors that are likely to grow and decline, with and without an emissions budget. The carbon budget is the most stringent in the Accelerated action scenario, while the Climate change scenario, presents how the economy responds in the absence of an emissions budget. For each scenario, we analysed the impact of shifts in economic sectors on our current customer base, the ability of the Telstra brand to meet consumer demands, sectoral opportunities available and shifts in customer spend on communications.

Key characteristics for each scenario



Scenario 1
Accelerated action
Less than 2°C

Scenario 2
Divided world
2-3°C

Scenario 3
Changed climate
Greater than 4°C

Telstra scenarios	Scenario 1 Accelerated action Less than 2°C	Scenario 2 Divided world 2-3°C	Scenario 3 Changed climate Greater than 4°C
Sectoral challenges	Seeking low emissions alternatives for core business to limit carbon price exposure and maintaining social license to operate	Seeking low emissions alternatives in the absence of technological innovation advances and at a low cost to limit exposure to carbon price	Maintaining and sustaining high output growth to meet high demand for resources driven by resource intensive consumption, whilst building resilience to a harsh physical climate
Sectoral adoption of digital solutions	To meet sector emissions reduction targets and implement circular economy initiatives	To maximise sector growth at a limited cost	To be at the forefront of innovation and building resilience to the physical climate
Customer product expectation	Low carbon and sustainable solutions	Low cost and efficient solutions	Adaptation solutions to maintain lifestyle
Brand expectations	Strong ESG values reflecting customers purchasing decision and brand selection	ESG values underpinned by clear evidence	A global brand with the most innovative solutions

¹³ Global Trade and Environmental Model (GTEM) is a dynamic global general equilibrium model with the capability to address total, sectoral resource allocation. GTEM captures the impact of policy changes on large numbers of economic variables in all sectors of the economy, including gross domestic product, prices, consumption, production, trade, investment, efficiency, competitiveness, and greenhouse gases. GTEM has been used to analyse a range of issues such as the climate mitigation policies under the Kyoto Protocol and Paris Agreement, trade reform under the World Trade Organisation, and trends and issues in international commodity and energy markets.

Scenario insights and outcomes



Scenario 1 Accelerated action

Less than 2°C

Scenario 2 Divided world

2-3°C

Scenario 3 Changed climate

Greater than 4°C

Telstra scenarios	Scenario 1 Accelerated action Less than 2°C	Scenario 2 Divided world 2-3°C	Scenario 3 Changed climate Greater than 4°C
Challenges in the market	Competitive environment with all competitors having strong brand ESG credentials making brand differentiation difficult for customers	Limited capital availability resulting in limited investment in innovation to develop solutions for customers	Highly competitive market forces innovation to occur at a rapid rate with numerous niche competitors
Challenges to Telstra in meeting customer expectations	Decline of market share for customers with a high emissions intensity and/or high brand expectation on climate action	Customers demanding solutions at a low cost	Customers expect large investments in technology
Challenges to Telstra's costs	High carbon costs make building a low carbon brand costly	High carbon costs due to slow decarbonisation of the grid makes it difficult to meet emissions goals	In the absence of an emissions budget, sustainable brands are not competitive in a market that does not value ESG principles

Our scenario analysis considered drivers which could influence the needs of our enterprise and consumer customers. For our enterprise customers, economic modelling was used to understand how emissions constraints could influence the Australian economy.

The analysis indicated which sectors are likely to experience growth, which could decline and how these could impact Telstra. As the world transitions to a low carbon economy, enterprise customers with relatively low emissions, may be shielded from emissions constraints and grow. Some high emissions intensive enterprise customers may contract, resulting in reduced demand for our services.

We also qualitatively assessed how the needs and expectations of consumers may change under each scenario, by assessing shifts in brand attributes and comparing these to current consumer perceptions on brand performance. As consumers experience the physical impacts of climate change, they expect higher sustainability credentials across the market and are increasingly seeking a responsible and trusted brand.

We considered policy implications, such as an increase in carbon offset prices, and the cost of meeting our climate change targets under each scenario. One of the transitional risks for Telstra is reputational, which is associated with our ability to successfully manage the physical impacts of

climate change, our ability to minimise disruption to services, and continuing to meet the expectations of our stakeholders and customers.

Strategic business response

Insights from the analysis indicate that our business remains resilient in all three climate scenarios. However, as community and stakeholder expectations continue to rise, we are committed to making ongoing investments to build capability for the future and strengthen our network leadership. We continue to drive network leadership through our Network Resilience program and investment in the Networks for the Future program.

Expectations regarding our sustainability credentials will also continue to increase as climate impacts become more evident. Our increased environmental ambition to reduce our emissions footprint, adapt to climate impacts and achieve circular economy outcomes, positions us well to navigate climate transition impacts.

Telstra is focusing on offering unique value propositions for key industry sectors, including mining and energy, agribusiness, retail, and supply chain customers. We continue to build our sustainability credentials by driving Telstra's end-to-end product accountability, profitability, and experience.

For example, we have partnered with Queensland Department of Agriculture and Fisheries (DAF), Pessl Instruments and the Bureau of Meteorology (BoM) on a project. This is a pilot plan to help agribusinesses better understand and forecast hyper-local weather¹⁴ using our Internet of Things (IoT) mobile network which covers four million square kilometres of Australia’s landmass. Another example is our adoption of sustainable packaging design principles for Telstra branded products.

Carbon costs

We are proud that our network and operations are certified as carbon neutral under the Commonwealth Government’s Climate Active program. However, we recognise that the cost of carbon offsets could vary under different climate scenarios and this is an emerging exposure we continue to manage. We used the scenario analysis to examine what our carbon offset exposure would be under the three climate scenarios.

From the analysis, we expect:

- Carbon offset costs to increase over the medium and long term due to increased demand in emissions constrained economies
- Likely standardisation of carbon offset units (further to Article 6 of the Paris Agreement)
- Increased regulatory and stakeholder scrutiny over the transparency and integrity of carbon offsets and
- Increased community scrutiny of our use of some international carbon credits, which may lead to reputational risks.

Our carbon neutral strategy guides the active management of our carbon cost exposure and the integrity of the offset we are purchasing. Our carbon neutral strategy is consistent with the Climate Active program guidelines and includes our criteria to assess the social and environmental integrity of projects we invest in. To help contribute to our carbon neutrality goal and also achieve our goal of reducing our absolute emissions by at least 50 per cent by 2030, we are continuing to actively work to improve the energy efficiency of our network sites and exchanges, and data centres.

Key assumptions for voluntary carbon offset price



Telstra scenarios	Scenario 1 Accelerated action Less than 2°C	Scenario 2 Divided world 2-3°C	Scenario 3 Changed climate Greater than 4°C
Key assumptions	2020 to 2025: Carbon offset price grows steadily at the rate of the global carbon price. 2025 to 2030: Carbon offset price converges to the global carbon price.	As climate becomes increasingly important on global agenda there are higher quality criteria for offsets to ensure additionality. This results in the market converging as all producers of offsets are forced to meet this quality criteria	In the absence of an emission constraint there is no carbon price. With no drivers for demand, the voluntary offset price stays constant
Voluntary carbon offset price in 2050 (AUD\$/tCO₂-e)	191	124	8

Note: Global prices are from peer reviewed economic models. All scenarios assume a starting carbon offset price of \$3/tCO₂-e in 2020. Grid decarbonisation using AEMO’s scenario has been applied to Scope 2 emissions. In Scenario 3 although there is \$0 compliance cost of carbon, purchasing offsets or being carbon neutral in this scenario would come at a cost. We assume a voluntary price of domestic offsets (ACCU) of \$8/tCO₂e to reflect establishment, maintenance and audit costs for offset generation.

¹⁴ Hyper-local forecasting demands a far more granular net of robust weather data and needs to function differently economically to be viable.

TCFD Index

Our response to the recommendations of the TCFD and the location of these disclosures are summarised in the table below.

TCFD recommendations	Reference	Report	Location
Governance			
Disclose the organisation's governance around climate-related risks and opportunities			
a) Describe the board's oversight of climate-related risks and opportunities	Governance	2021 Bigger Picture Sustainability Report	Environmental action
	Governance and compliance	Board Charter	Board reserved powers and responsibilities
	Managing our risks	2021 Corporate Governance Statement	Assurance and risk management
b) Describe management's role in assessing and managing climate-related risks and opportunities	Governance	2021 Bigger Picture Sustainability Report	Environmental action
	Managing our risks	2021 Corporate Governance Statement	Assurance and risk management
Strategy			
Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material			
a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term	Adapt to climate impacts	2021 Bigger Picture Sustainability Report	Environmental action TCFD Appendix
b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	Adapt to climate impacts	2021 Bigger Picture Sustainability Report	Environmental action TCFD Appendix
c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Adapt to climate impacts	2021 Bigger Picture Sustainability Report	Environmental action TCFD Appendix

TCFD recommendations	Reference	Report	Location
Risk management			
Disclose how the organisation identifies, assesses, and manages climate-related risks			
a) Describe the organisation's processes for identifying and assessing climate-related risks	Risk management	2021 Bigger Picture Sustainability Report	Environmental action
	Environmental risk management	2021 Bigger Picture Sustainability Report	TCFD Appendix
	Managing our risks	2021 Corporate Governance Statement	Assurance and risk management
b) Describe the organisation's processes for managing climate-related risks	Adapt to climate impacts	2021 Bigger Picture Sustainability Report	Environmental action TCFD Appendix
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management	Risk management	2021 Bigger Picture Sustainability Report	Environmental action
	Environmental risk management	2021 Bigger Picture Sustainability Report	TCFD Appendix
	Managing our risks	2021 Corporate Governance Statement	Assurance and risk management
Metrics & targets			
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material			
a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.	Progress	2021 Bigger Picture Sustainability Report	Environmental action
b) Disclose Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	Climate change & energy use	2021 Bigger Picture Sustainability Report	Environmental action
c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets	Climate change & energy use	2021 Bigger Picture Sustainability Report	Environmental action
	Resource efficiency	2021 Bigger Picture Sustainability Report	Environmental action