



# Mobile Net Zero

State of the Industry on  
Climate Action 2021





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The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with almost 400 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com)

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# Foreword

In addressing the climate crisis, we recognise that the mobile industry has a unique role to play.

Like all sectors, we must rapidly reduce our emissions and we are taking significant steps to do so. Beyond the mobile industry's own footprint, we provide solutions to help other sectors reduce their emissions through digitisation.

As we embark on a fairer, greener recovery from the Covid-19 pandemic, digitisation and climate action will increasingly be two of the biggest global drivers of change. The European Green Digital Coalition, launched in March 2021 by the European Commission, is aimed at supporting decarbonisation through digitisation. Of its 26 founding members, half were from the mobile sector.

The mobile industry has long been a leader on climate action. In February 2016, we were the first industry to commit fully to the 17 United Nations Sustainable Development Goals. Since then, we have been contributing toward achieving every one of the goals while focusing particularly on SDG13 – Climate Action.

In February 2019 the GSMA Board set an ambition on behalf of the industry to reach net zero carbon emissions by 2050 at the latest. This report is the first annual

assessment of how we are doing against this ambitious target. We have come a long way since the Paris Agreement, with 80 per cent of the industry now disclosing to the Carbon Disclosure Project (CDP), but we acknowledge there is still more to do.

The GSMA invites all of our members to disclose to CDP and align with the UN-backed Race To Zero – especially in the run-up to COP26. We are proud to have been recognised by Race To Zero as one of the sectors first to 'Breakthrough' with 36 per cent of the industry, by total revenue, committed to net zero.

We all have a role to play if we are going to meet the challenges of the global climate crisis. This report sets out what we – the mobile industry – are doing and provides case studies to help others along the path to net zero. As we strive to do our part in countries around the world, we also call on those governments to align their carbon reduction targets to net zero by 2050 at the latest and to create suitable energy market frameworks for businesses to access renewable electricity at competitive prices.



**John Giusti**  
Chief Regulatory Officer, GSMA

# Foreword

The mobile industry showed outstanding leadership in being one of the first to align itself to the goals of the Paris Climate Agreement. Rarely has an entire global industry shown such common purpose on climate action. Having over a third of all the world's mobile operators by revenue committed to net zero and science-based targets places it at the highest levels of private sector ambition. We congratulate all in the industry that have already joined this Race To Zero, and invite all those that haven't yet to join us now in a powerful demonstration to national governments of the readiness of the real economy to transform.

However, ambition is just the start. This report and its numerous case studies show that the industry knows how to get there. We can feel its relentless drive for energy efficiency matched with an industry-wide switch to decarbonised and renewable energy supply. These twin efforts can deliver up to 80 per cent of the sector's decarbonisation, not only in operators' operations but also through their supply chains. This is why, as Climate Champions, we applaud the mobile sector pushing for net zero, setting targets aligned to 1.5C warming. And we have set the challenge for the industry to achieve a crucial Breakthrough in the

Race To Zero emissions by 2030: to secure at least 70 per cent of all its electricity globally from decarbonised or renewable electricity sources.

The world is already warmer. This industry knows first-hand the impact of increasing extreme weather events and rising sea levels: from more storms in the global north to flooding and drought in the south. Business continuity has always been a priority for this industry, connecting billions of people, growing numbers of enterprises and the internet of things. Never was this more evident than during the global Covid-19 pandemic, and this report shows how the industry is delivering greater resilience, even as it decarbonises.

The benefits of this sector go beyond the obvious. We recognise that the mobile industry can positively impact resilience and decarbonisation in sectors other than its own and across society. It is powerful. It can lift much more than it weighs.

We welcome the evidence of ambition and action that this report demonstrates, and we are looking forward to seeing exponential progress through COP26 and beyond.



**Gonzalo Munoz**  
UN High Level Climate  
Champions for COP25



**Nigel Topping**  
UN High Level Climate  
Champion for COP26

# Executive Summary

**In February 2019, the GSMA Board comprising members from the largest mobile network operators in the world, set a milestone ambition – to transform the mobile industry to reach net zero carbon emissions by 2050, at the latest.**

To support our climate action journey, the GSMA first created a Climate Action Taskforce with the largest operator groups globally, and then worked with the taskforce on the following three steps:



Climate disclosure has grown significantly in recent years with 60 operator groups covering around 70 per cent of connections disclosing in 2020. For the ICT sector pathway, this was approved and launched in February 2020, along with clear, step-by-step guidance for operators to align carbon reduction targets to the new pathway.

## Net Zero Breakthrough

As of April 2021, operators covering 50 per cent of global mobile connections and 65 per cent of industry revenues have committed to science-based targets. A significant proportion of operators have also committed to Net Zero targets by 2050 or before: 31 per cent of global mobile connections and 36 per cent of the industry by revenue has a net zero target, making the mobile sectors one of the first to break through the 20 per cent target as set by the UN Race To Zero campaign.

Recent calculations of the mobile industry's carbon emissions estimate them to be around 220 million

tonnes carbon dioxide equivalent (Mt CO<sub>2</sub>e) per year or approximately 0.4 per cent of total global carbon emissions.

The roll-out of a new 5G network will create upwards pressure on operators' energy usage to power the new equipment. Data will be transferred using up to 90 per cent less energy though, and with the use of artificial intelligence to power down networks during quiet periods and the retirement of legacy equipment, it is possible to avoid significant increases in energy consumption.

## Digitisation Enabling Decarbonisation

The biggest contribution the mobile sector can make to climate action, however, is to help other sectors of the economy reduce their carbon emissions through digitisation. Research conducted by the GSMA with the Carbon Trust in 2019 found it enables carbon reductions in other sectors that are 10 times larger, equivalent to approximately 4 per cent of global emissions.

GSMA members were among the first companies in the world to embrace renewable electricity. Today nine operator groups are members of the global RE100 campaign and many more operators have renewable electricity targets. There are still challenges around accessing renewables in many countries though, which is slowing the switch.

This report is the first analysis by the GSMA of how the mobile industry is progressing against the industry net zero target.



**In the run-up to COP26 and beyond, the GSMA is calling on all governments to align their carbon reduction targets to net zero by 2050 at the latest, and to create suitable energy market frameworks for businesses to access renewable electricity at competitive prices**



3

## Net zero ambition



In February 2019, the GSMA Board comprising members from the largest mobile network operators in the world, set a milestone ambition – to transform the mobile industry to reach net zero carbon emissions by 2050, at the latest.

This action by the mobile industry not only made it one of the first sectors in the world to set such an ambitious target, it also put it ahead of all major world economies<sup>1</sup>. It is not the first time the sector has shown leadership in sustainable development. In 2016, the mobile industry was the first sector to commit to the United Nations 17 Sustainable Development Goals (SDGs). When the UN Global Compact was created in July 2000, its founding members included BT Group, Deutsche Telekom, Ericsson and Orange.

To support our climate action journey, the mobile industry started by taking the following three steps:



Climate disclosure has grown significantly in recent years with most of the industry by connections now disclosing their climate impact through. In 2019, 57 operators (67 per cent of the industry by connections) disclosed; in 2020, this increased to 60 operators (69 per cent of the industry by connections and 80 per cent by revenue). This year, the GSMA is working to support even more operators to disclose.

The next stage was to agree the pathway for reaching net zero carbon emissions by 2050. This required the GSMA to collaborate with the Global e-Sustainability Initiative (GeSI), the International Telecommunication Union (ITU) and the Science Based Targets Initiative (SBTi) to calculate and consult on a science-based carbon reduction pathway for not only the mobile sector but for the entire ICT sector. The pathway was approved and launched by the SBTi in February 2020<sup>2</sup> along with clear, step-by-step guidance for operators to align their carbon reduction targets to the new pathway<sup>3</sup>.

The third stage in the start of our climate action journey has been to help our members align their targets to the new ICT sector pathway and the UN Global Compact Business Ambition for 1.5°C<sup>4</sup>. 50 per cent of the industry by mobile connections has committed to SBTs and 31 per cent has a net zero target of 2050 or earlier.

Not all operators are able to set net zero targets, however. The main hurdles are a lack of equivalent ambition by the countries in which they operate and a lack of access to renewable electricity through national energy grids, which our members rely on to power their networks.

In the run-up to COP26 and beyond, the GSMA is calling on all governments to align their carbon reduction targets to net zero by 2050 at the latest, and to create suitable energy market frameworks for businesses to access renewable electricity at competitive prices.

This report is the first analysis by the GSMA of how the mobile industry is progressing against the industry net zero target.

1 <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>  
2 <https://www.gsma.com/newsroom/press-release/ict-industry-agrees-landmark-science-based-pathway-to-reach-net-zero-emissions/>  
3 <https://www.gsma.com/betterfuture/setting-climate-targets>  
4 <https://unglobalcompact.org/take-action/events/climate-action-summit-2019/business-ambition>

## Of the industry...

69%  
by connections



...and  
80%  
by revenue...

...disclose their  
climate impacts

50%  
by connections



...and  
65%  
by revenue...

...have  
committed to  
Science Based  
Targets

31%  
by connections

...and  
36%  
by revenue...

...are  
aligned to  
the Race To  
Zero pledge



### Target Setting

Science-Based targets (SBTs) - as defined by the Science-Based Targets Initiative to set carbon reduction targets in line with limiting global heating to below 2C. For guidance see:

[gsma.com/betterfuture/setting-climate-targets](https://www.gsma.com/betterfuture/setting-climate-targets)

**Carbon Neutral** - refers to reducing and offsetting carbon emissions from own operations (Scope 1 and 2 emissions). For operators the largest source of Scope 1 and 2 emissions are electricity use for networks and diesel fuel use for transport and generators.

**Net Zero** - refers to the criteria used by the UN Race To Zero campaign, which includes reductions in Scope 3 emissions across the whole value chain. See [unfccc.int/climate-action/race-to-zero-campaign](https://unfccc.int/climate-action/race-to-zero-campaign)

The GSMA advises all companies within the mobile sector to set SBTs and Net Zero targets as they are aligned to rigorous internationally-approved methodologies.



**Figure 2 Climate targets by operator**

Source: SBTi, UNGC and operator websites

 <b>MOBILE NETWORK OPERATOR</b>	 <b>SCIENCE-BASED TARGETS</b>	 <b>CARBON NEUTRAL TARGET YEAR</b>	 <b>NET ZERO TARGET YEAR</b>
A1 Telekom	1.5°C	2014	
America Movil	1.5°C		2050
AT&T	2°C	2035	
Airtel (Bharti)	Committed Aug 2019		2050
Bell (Canada)		2025	
BT (EE)	1.5°C		2045
Deutsche Telekom	1.5°C	2025	2040
Elisa	1.5°C	2020	
Far EasTone	2°C		
Iliad Group		2035	
JT Global		2030	
KPN	1.5°C	2015	2040
Liberty Global	1.5°C		
LG Uplus		2030	
Magyar Telekom	1.5°C	2016	2050
MTN Group	1.5°C (pending)		2040 (pending)
NTT DOCOMO	<2°C		
Orange	Committed May 2018		2040
Proximus	<2°C	2016	2050
Reliance Jio	Committed Aug 2019		2050
Safaricom	<2°C	2050	2050
STC	Committed Mar 2020		2050
Singtel	<2°C		2050
SK Telecom	Committed Feb 2020	2050	
Swisscom	1.5°C	2020	2050
Taiwan Mobile	2°C		
TDC	Committed Jul 2019	2028	2050
Tele2	Committed Jan 2020	2020	
Telefónica	1.5°C		2025/2040*
Telenor Group	Committed Feb 2020	2030**	
Telia	1.5°C	2020	2030
Telstra	Committed Feb 2020	2020	2050
Telus	Committed Jan 2021	2030	2050
Verizon	Committed Aug 2019	2035	2040
Vodafone	1.5°C	2030	2040

\* 2025 in its four main markets. 2040 including all operations and value chain.

\*\* Nordic operations

Science-based targets - see <https://sciencebasedtargets.org/companies-taking-action/>

Carbon neutral refers to reducing and offsetting carbon emissions from own operations (all Scope 1 and 2 emissions)

Net zero refers to the criteria used by the UN Race To Zero campaign: <https://unfccc.int/climate-action/race-to-zero-campaign>



## 3.1 Case study: MTN on climate commitment

As the global demand for energy increases, the world is simultaneously experiencing the impacts of climate change. Scientists and policymakers largely agree that Africa's population is more vulnerable to the effects of climate change than other regions.

MTN believes in the benefits of a healthy planet therefore has set ambitious targets to combat climate change. The first being a science-based target of 1.5°C which is in line with an ICT sectoral target-setting approach recently developed through a collaboration between the Global Enabling Sustainability Initiative (GeSI), the GSM Association (GSMA), the International Telecommunication Union (ITU) and the Science Based Targets Initiative (SBTi). These targets support the Paris Agreement's central aim of strengthening the global response to the threat of climate change.

MTN also aims to achieve a 47 per cent average reduction in absolute emissions (tCO<sub>2</sub>e) for scope 1, 2 and 3 by 2030 and announced a commitment to achieve net zero emissions by 2040.

### Project Zero

To realise its targets, MTN has launched its Project Zero programme to leverage the latest technologies and service partners to enable business sustainability via greater energy efficiencies, low carbon emissions, risk reduction and cost control. The programme prioritises renewable solutions, efficient emerging technologies and energy storage.

- **Infrastructure** - MTN's strategy is to continually seek opportunities to extract greater efficiencies from our technical infrastructure, and replace inefficient and old products with more efficient solutions to reduce energy use and greenhouse gas emissions.
- **Renewable energy** - MTN also invest in renewable energy sources. Our strategy is to continually seek opportunities to extract energy efficiencies where possible and to maintain investment in renewable sources of energy to mitigate our climate impact. Other initiatives such as those related to the IoT and prepaid solar energy systems for customers also allow us to leverage digital technologies to support the growth of green economies.
- **Transparency and disclosure** - MTN participates in the carbon disclosure project on an annual basis, which is in line with the taskforce recommendations on climate-related financial disclosures.

### Challenges

Close to half of MTN's energy use and greenhouse gas emissions is not within our control, as a result of our network tower outsourcing strategy. Infrastructure partners are therefore critical in helping us to reduce our energy use directly (for energy on MTN owned or controlled infrastructure) and indirectly (on leased infrastructure). We continually engage with vendors to manage consumption and emissions by undertaking energy management trials.





## 3.2 Case study: Vodafone on the net zero roadmap

We've committed to reducing our total global carbon emissions to 'net zero' by 2040. Here's how we're going to do it...

The path to Net Zero

2021



European network powered by 100% renewable electricity

2025



All network waste reused, sold, or recycled

100%

of the electricity used by our networks from renewable sources

2030



Carbon emissions eliminated from:

- Our own activities
- The electricity we purchase and use



Carbon emissions halved from:

- Our supply chain
- Business travel
- Our joint ventures
- The use of products we have sold

2040

0% FULLY NET ZERO



SCIENCE  
BASED  
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION





## 3.3 Case study: AT&T on committing to carbon neutrality

At Climate Week NYC 2020, AT&T unveiled one of its boldest goals, announcing its commitment to achieving net zero Scope 1 and 2 emissions across its entire global operations by 2035. While the announcement marked the start of its journey towards carbon neutrality, it was also the culmination of a yearlong effort to overcome a major challenge in setting the goal in the first place.

Well over a century old, AT&T is one of the world's largest modern media companies, with infrastructure across the United States and worldwide. Setting companywide goals means factoring in every aspect of its business and securing buy-in from many individuals and business units.

When AT&T's Global Environmental Sustainability team first proposed setting this ambitious goal, it knew that it would have to propose a pathway to success that factored in the unique aspects of the company and present that to unit leaders responsible for its implementation. The company determined that it could achieve carbon neutrality by accelerating network optimisation and energy efficiency projects, virtualising many network functions, transitioning to a low-emissions fleet, expanding sustainable media production and supporting the renewable energy marketplace.

When presenting the plan to each unit, AT&T knew it must demonstrate two things: how it could contribute to the goal; and how achieving this goal was important to its groups as well as the company overall.

From the beginning, it worked directly with each unit, using AT&T's data and forecasts in its analysis rather than outside parties. In doing so, the company was able to reassure them that it was not being overly optimistic or cherry-picking figures to support its case. It also illustrated how carbon neutrality connected to

AT&T's broader objectives. For example, one business priority is network virtualisation. Eliminating significant portions of energy-intense network equipment and relying instead on low-cost, energy-efficient hardware can virtualise the functions of the network equipment. As a result, AT&T can deploy new capabilities faster at a lower cost, utilise less energy and lessen its carbon footprint.

The strategy was successful in overcoming internal obstacles and ultimately gaining approval. Meeting ambitious goals requires every part of the company to play its role. When AT&T announced its net zero commitment, it was able to say with confidence that it had a pathway for success. In securing buy-in across the business and aligning its work with business objectives, it had the strength and support to reach its goals and help change the world along the way.



Our network is tested by climate change and natural disasters every year. We recognise the long-term impact these commitments can have, and we owe it to the millions of customers who rely on our services to create the most resilient and sustainable business we can.

John Stankey, Chief Executive Officer, AT&T





**4**

**Climate Action Taskforce**

Progress towards the net zero ambition has been strengthened and accelerated through collaboration between operators across the sector. To provide a forum for this collaboration, the GSMA created a Climate Action Taskforce in 2019.

The taskforce has grown rapidly over the last two years and now has almost 50 members, with networks in most countries globally.

The taskforce has four main purposes:

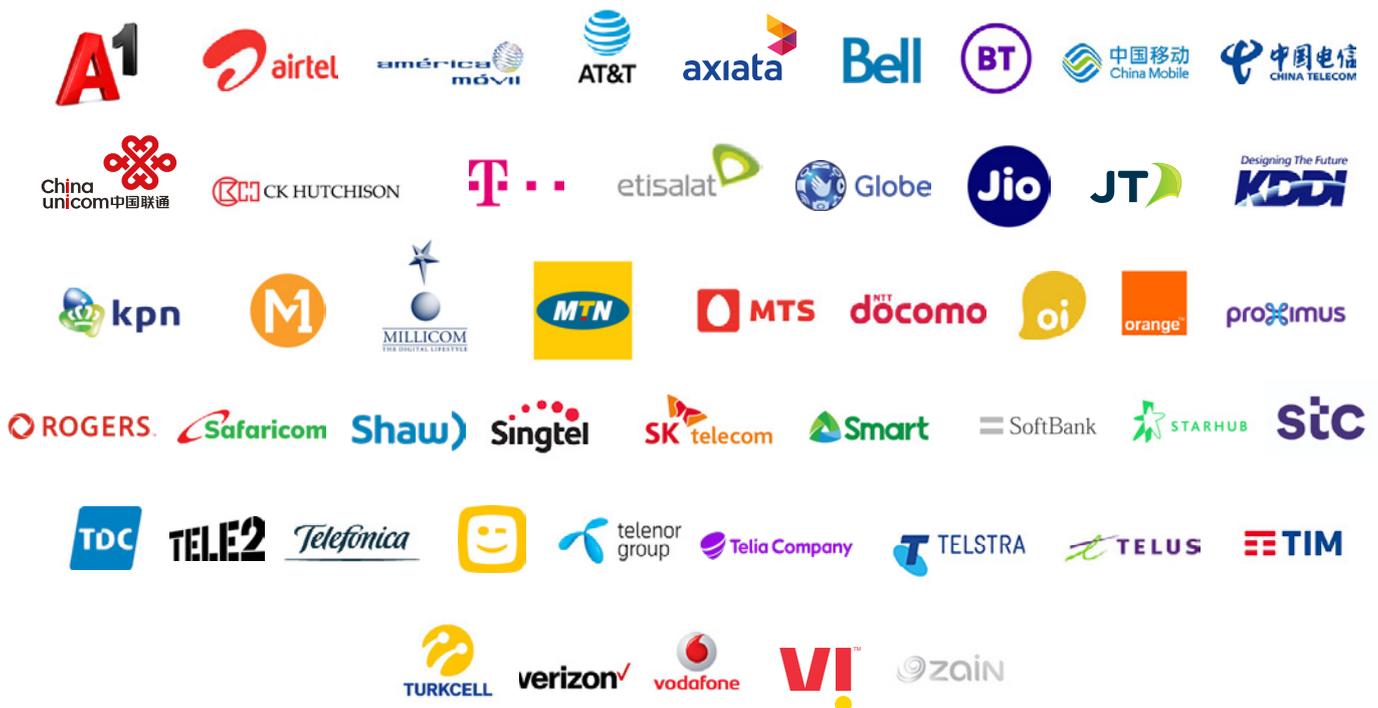
- To promote and encourage leadership on climate action to move the industry towards net zero carbon emissions by 2050.
- To agree climate policy frameworks and advocacy engagement to gain support from governments and other stakeholders for a fair and equitable net zero transition.
- To share best practice on climate action so operators support each other to raise their ambition; and
- To create thought leadership and research on how mobile technologies support climate mitigation and adaptation.

Through knowledge sharing and industry collaboration, the Climate Action Taskforce supports operators on:

- Improving energy efficiency in networks and buildings.
- Increasing access to, and use of, renewable electricity.
- Engaging with mobile industry suppliers on climate action.
- Improving the environmental sustainability of mobile devices and equipment.
- Adapting infrastructure and managing extreme weather events in a rapidly changing climate; and
- Using mobile connectivity to reduce carbon emissions through smart technologies.



The **Climate Action Taskforce** welcomes new members. Please contact the GSMA if you would like to join [betterfuture@gsma.com](mailto:betterfuture@gsma.com).





## 4.1 Case study: Globe Telecom – Taskforce Member

Globe Telecom in the Philippines strives and commits to contribute to climate change mitigation by integrating green practices in its operations. Located in one of the most vulnerable countries to climate change, it understands the challenges of climate-related risks and recognises the need for sustainability-driven operations.

To support its drive for sustainability and going beyond regulatory compliance, Globe Telecom is certified by BSI Singapore for Integrated Management System, which includes ISO 140001, enabling it to implement environmental management seamlessly across its operations.

It also started sustainable power purchasing and enhancing clean energy procurement by buying power bundled with verified carbon offsets sourced from renewable energy plants. In December 2020, it achieved carbon neutrality for electricity consumption in seven of its corporate offices and critical facilities. Its headquarters earned the Gold Standard Verified Emission Reductions for 100 per cent offsetting of carbon emissions associated with electricity consumption.

It has also deployed 6,948 green network solutions, including fuel cell systems, direct current hybrid generators, free cooling systems and lithium-ion batteries, to achieve energy efficiency in its cell sites.

To engage the public, the company set up more than 100 electronic waste collection points nationwide to encourage the proper disposal of obsolete electronic devices. Most of the items collected are processed by an accredited operator with proceeds used to help disadvantaged communities.

On 5 June 2020, Globe Telecom began its commitment to reduce its carbon footprint by supporting the Race To Zero campaign spearheaded by the United Nations Framework Convention on Climate Change (UNFCCC) and COP26 Presidency and backed by the GSMA.

Then, on 21 September 2020, it once again demonstrated its commitment in upholding the 10 Principles of the UN Global Compact (UNGC) and the UN Sustainable Development Goals by joining more than 1,200 companies from 100 countries in supporting the UNGC's call for an inclusive alliance across different nations, sectors and generations to address the various global challenges.

Globe Telecom also strengthened its commitment to environmental transparency by disclosing its environmental impact through the Carbon Disclosure Project, receiving a B rating in 2020 for its commitment to continuously manage and fight climate change. It also became a supporter of the Task Force on Climate-related Financial Disclosures in 2021, demonstrating its belief that incorporating climate-related risks and opportunities in its business will enable it to make better decisions and plan strategically for a sustainable future.



We are one with global mobile operators in helping the mobile industry achieve net zero carbon emissions by 2050. We acknowledge that this requires a collective effort to realise large-scale positive impact.

Ernest Cu, Globe President and CEO





**5**

**Understanding climate risks and opportunities**

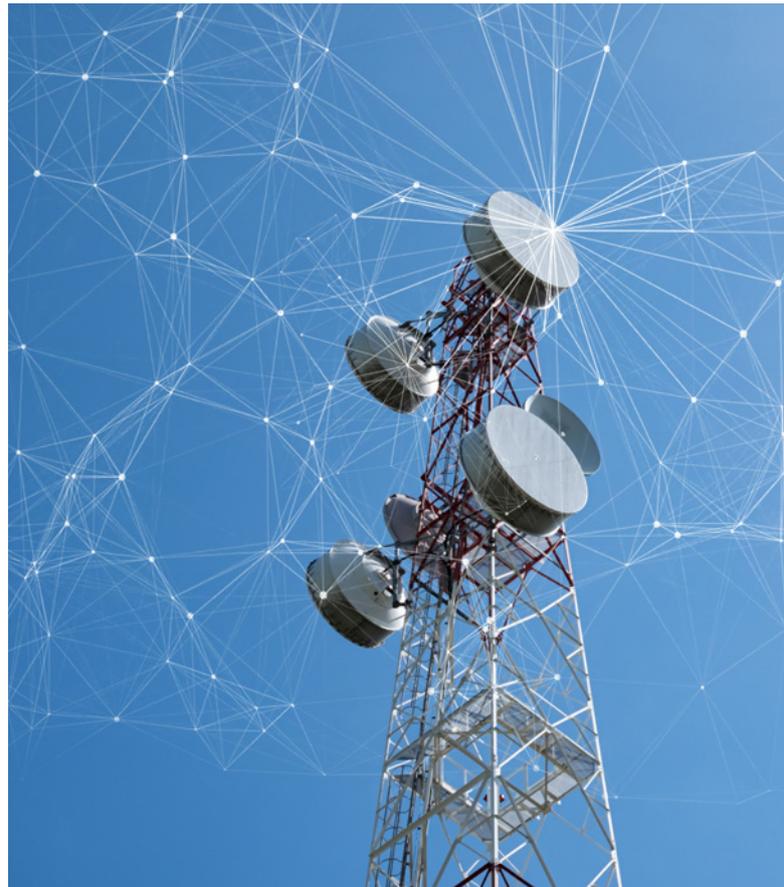
Since it was created in 2000 as the Carbon Disclosure Project, the CDP has created a global reporting system for greenhouse gas emissions, and detailing climate risks and opportunities. Based on the adage that ‘you can’t manage what you don’t measure’, the CDP now has more than 10,000 companies, cities, states and regions disclosing their carbon emissions every year.

By 2020, 60 mobile operators providing 69 per cent of the world’s mobile connections disclosed their climate impacts, risks and opportunities to CDP. This is up from 57 operators covering 66 per cent of connections in 2019. Not only are more mobile operators disclosing, but those that do disclose are providing more information, leading to higher scores.



In 2018, CDP aligned its reporting platform with the Taskforce on Climate-related Financial Disclosures. It requires companies to consider the likely financial costs and benefits of climate change on their business operations.

Mobile operators are beginning to use the TCFD recommendations in their responses to CDP. The



feedback from the Taskforce is that implementing the recommendations is a mid to long term process that requires detailed consideration from the business. This is because TCFD requires an evaluation of how climate change scenarios are expected to affect business operations from the perspective of both risks and opportunities.

Mobile operators are in a unique position with regards to climate risks and opportunities. On the one hand, as infrastructure businesses, they are at risk of extreme weather events and changing climate patterns. These can lead to network service disruption. But mobile networks are also vital for communications in the aftermath of natural disasters, to support humanitarian response.

On the other hand, connected digital technologies will enable economies to move towards decarbonisation. The deployment of connected technologies generally leads to greater efficiency and a better use of resources, both of which are vital for the low-carbon transition.



## 5.1 Case study: MTS on disclosing to CDP for the first time

### GSMA Climate Change commitment

In February 2019, Mobile Telesystems (MTS) as part of the GSMA Board agreed to work towards the mobile industry commitment of achieving net zero carbon emissions by 2050. MTS's first step on this path was to start disclosing its climate impacts via the CDP. Among the key challenges was the need to transition to GHG Protocol standards and to collect the scope of information required by CDP. At that stage, MTS had only reported Scope 1 emissions and had limited climate-related risks assessment framework.

### First steps

MTS engagement in climate change events and working groups, such as GSMA's Climate Action Task Force and JAC's Climate Change workstream, was crucial in gaining experience and guidance.

With additional advice from CDP and collaborative efforts from various MTS departments, the company successfully disclosed its Scope 1 and Scope 2 emissions and climate-related achievements and initiatives in its first CDP questionnaire.

In 2018, MTS saved 1,627 tonnes of CO<sub>2</sub>e through energy-saving projects in its office buildings; reducing its car fleet by 5.5 per cent. MTS also launched an eco-office initiative aimed at growing an environmentally conscious culture among employees. Furthermore, it won the top eco-packaging award at Russia's ECO BEST AWARD 2018.

For its first CDP disclose, MTS received a C rating, placing it in the top 10 Russian companies disclosing via CDP.



### Rapid improvements in a year

Gaining experience and receiving feedback from its first CDP disclosure helped the company to identify areas of improvement. A cross-functional carbon management working group was established to develop a strategy on climate change and establish carbon reduction targets. With the help of external consultants, MTS started a company-wide inventory of greenhouse gas emissions and developed a map of climate-related risks. Its procurement team helped calculate its Scope 3 emissions. Furthermore, it was able to identify carbon emissions reduction opportunities for its clients enabled by MTS services, such as IoT solutions.

In 2020, the company made swift improvements in all aspects of its climate agenda, which was recognised by CDP. In just one year, it improved its CDP score from C to B, placing it among the top seven Russian companies disclosing via CDP in 2020.

### Next phase of the journey

MTS plans to continue its work to finalise its climate change strategy and set targets, although it faces challenges. The company operates in markets where they are still developing a climate change regulatory framework, with limited available for realising carbon reduction commitments. Nevertheless, MTS will continue to look for opportunities to collaborate with local regulators on climate change issues and to use its leadership status in environmental policy and practices to inspire further change.



## 5.2 Case study: Singtel Optus on progressing TCFD to asset-level analysis

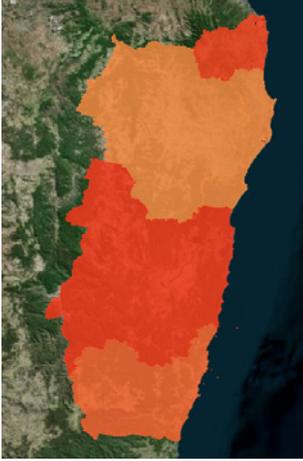
The Singtel Group first undertook a climate scenario assessment and adaptation exercise in 2015 for its Singapore and Australian operations following its 2014 stakeholder engagement exercise, which first showed climate risk as a priority for its stakeholders. Given limited climate modelling available at that time, it worked with CSIRO, the Australian government agency responsible for scientific research including climate change, to extrapolate the global climate models down to macro regional level scenarios, enabling the business to undertake its first assessments of the mid- to long-term physical risks for network planning and adaptation.

When the Task Force on Climate-related Financial Disclosures (TCFD) framework and guidelines launched in 2017, Singtel was an early adopter, using it to guide its governance, strategy, risk management and target setting.

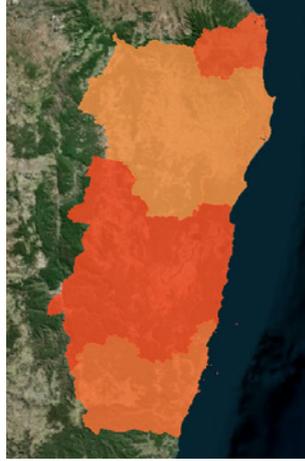


**Figure 4** Average Technical Insurance Premium (TIP) heatmap using SA3 and asset level – 2030, 2050 and 2100, at RCP 8.5<sup>5</sup>

Site Shelter 2030

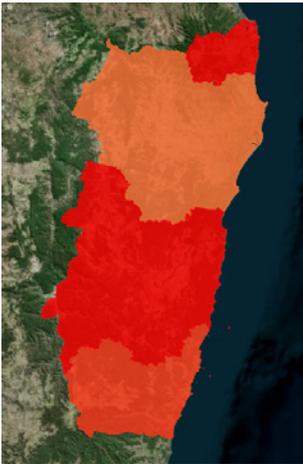


Site Tower 2030



Source: xxxx

Site Shelter 2050



Site Tower 2050



Site Shelter 2100



Site Tower 2100



### Current ‘Bottom-up’ Project

As the next stage of its TCFD development, Singtel/Optus is currently undertaking a detailed bottom-up ‘asset level’ risk and design assessment using the latest climate models, combined with other actuarial models used by the insurance industry to identify the short-, medium- and long-term impacts across physical and transitional risks based on the climate warming scenarios. The upper scenario of 4 degrees Celsius is used for the purpose of physical risk modelling and the lower below 2 degrees Celsius is used for its transitional risks.

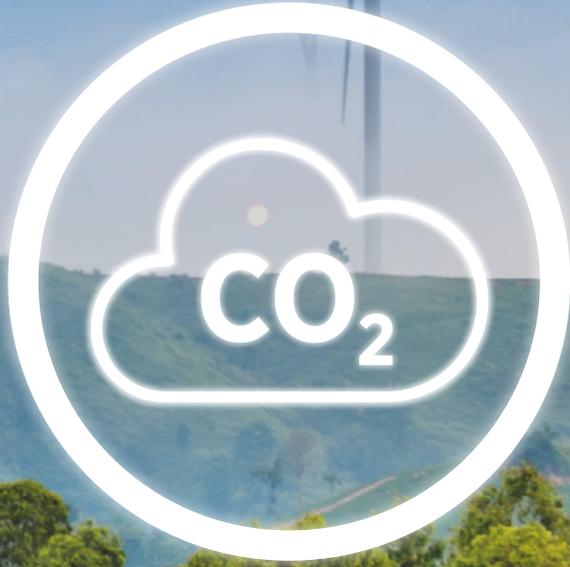
Due to the sheer size of the infrastructure and footprint in Australia, Optus is using a staged ‘bottom-up’ approach on a pilot region in northern New South Wales to refine the physical impact financial modelling and validate the most material drivers and assumptions that will impact the company’s financials before this is expanded to a national level study over the 2021-2022 period.

Under the extreme RCP 8.5 warming scenario, it was identified that up to 12 per cent of sites in the pilot area can experience an average Technical Insurance Premium (TIP) increase of up to five times without any form of mitigation and adaptation over the coming decades.

### Insights and learnings

Undertaking the TCFD economic and financial modelling is an iterative process needing both top down and bottom-up analysis. The top-down exercise of 2015 was important to begin engaging stakeholders to think of macro design, standards, adaptation and interdependencies (e.g. with power and transport infrastructure), which translated into interventions in network designs, standards and infrastructure resilience. The current bottom-up exercise will help planning at asset-level, facilitate the business case for adaptive investments, as well as complete the financial impact modelling for the different scenarios and decisions that could result from both physical as well as transitional risks, such as climate policies and regulations.

In addition, the work has facilitated collaboration beyond networks, finance and risk colleagues and has now included the data analysis teams to integrate the results and models of the project into an easy-to-use tool for subsequent use by the network design and deployment team



6

## Carbon emissions of the industry

With the mobile industry ambition to achieve net zero carbon emissions by 2050, the first question to ask is: what are the emissions of the industry now, in 2021? This is easier to ask than answer, with three main challenges:

**1 How to define what constitutes mobile operator emissions.**

Many operators have fixed line, data centre, media and other ICT operations. Some are part of multi-sector conglomerate corporations. It can be difficult to separate which emissions are specifically related to mobile operations.

**2 How to measure emissions from mobile operators.**

While disclosure of emissions has been rising steadily over the last decade, there are still operators with around 30 per cent of connections who do not publicly disclose their climate impact. To improve the data available, the GSMA will continue to encourage and help more of them to disclose. More detailed data disclosure will also help with the first challenge.

**3 How to measure emissions from mobile operators' supply chain and from customers.**

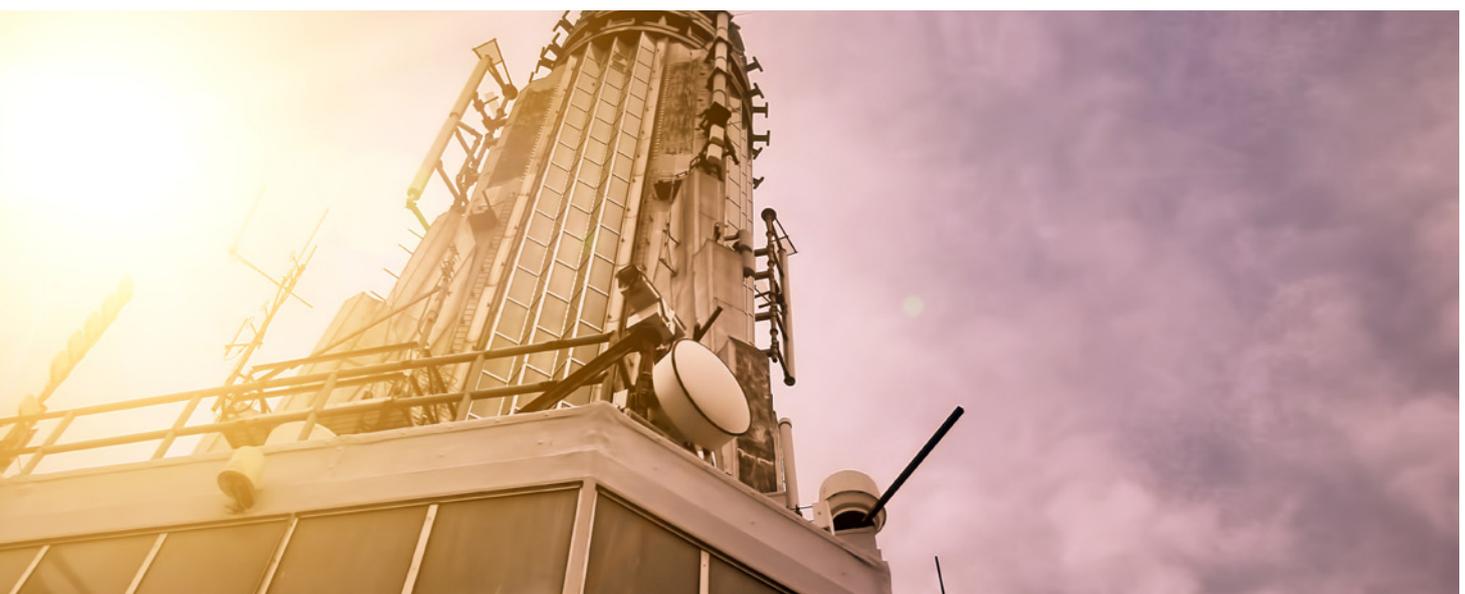
This currently involves complicated estimate scenarios, usually based on carbon intensities of economic spend data, sometimes combined with supplier and customer specific data, if available.

To help understand and reduce supplier emissions, the GSMA works with the Climate Action Taskforce and supplier associations, such as the Joint Audit Cooperation, to encourage more suppliers to disclose their environmental impact to the CDP and to set science-based carbon reduction targets.

Despite the challenges with measurement, recent calculations of the mobile industry's carbon emissions estimate them to be around 220 million tonnes of carbon dioxide equivalent (Mt CO<sub>2</sub>e) per year, or approximately 0.4 per cent of total global carbon emissions<sup>6</sup>.

This forms part of the carbon emissions of the global ICT sector, which is estimated at 700 Mt of CO<sub>2</sub> per year, or approximately 1.4 per cent of global emissions and around four per cent of global electricity use. While total electricity consumption has increased by approximately five per cent since 2015, the carbon emissions of the ICT sector have dropped from around 730 Mt of CO<sub>2</sub> due to higher levels of renewable electricity use both globally and from specific investments by ICT companies, including mobile operators<sup>7</sup>.

The ambition is to accelerate the low-carbon transition across the sector, with further significant investments in renewables, combined with engagement with suppliers to drive circular economy principles that will reduce resource extraction as well as lifecycle energy and carbon emissions.



6 <https://www.gsma.com/betterfuture/climate-action/climate-handbook>  
7 <https://www.gsma.com/betterfuture/climate-action/climate-faqs>



## 6.1 Case study: BT Group on corporate climate action

The BT Group has a long-standing track record on corporate climate action – leading the way for over 28 years. It was one of the first companies in the world to set a carbon reduction target and, in 2008, set its first science-based target, achieving it four years early and reducing the carbon intensity of its operations by 80 per cent in 2016.

BT now aims to be a net zero carbon emissions business by 2045, reducing the carbon intensity of its business by 87 per cent and its supply chain carbon emissions by 42 per cent by fiscal year-end. Its science-based targets are in line with keeping global warming to 1.5 degrees Celsius above pre-industrial levels.

It is making good progress, having reduced its operational carbon emissions by 42 per cent since 2016/17 and its supply chain carbon emissions by eight per cent over the same period.

In the future, BT faces two main challenges in decarbonising its operations: switching to 100 per cent renewable electricity worldwide and decarbonising its fleet.

On the first challenge, the company hit a new milestone last year when it announced it is sourcing 100 per cent renewable electricity worldwide. While challenges remain in sourcing renewable electricity in some countries,



BT now aims to be a net zero carbon emissions business by 2045, reducing the carbon intensity of its business by 87 per cent and its supply chain carbon emissions by 42 per cent by fiscal year-end.



collaboration with members of the RE100, the global renewable energy campaign initiative, is helping to improve supplies. Its transition to renewable electricity has been delivered through stimulating the UK supply of renewable energy, power purchase agreements (for 16 per cent) high-quality green energy tariffs and renewable energy certificates.

Decarbonising its fleet is its second challenge. The group has the second-largest commercial fleet in the UK, with 33,000 vehicles accounting for approximately two-thirds of its direct operational emissions. In a bid to reduce emissions, Openreach has committed to upgrade all its 27,000 vehicles to electric by 2030.

It has also joined forces with the Climate Group to launch the UK Electric Fleets Coalition. This group of 29 companies is communicating the benefits of switching to electric transport and has called for supportive policy measures to achieve 100 per cent electric car and van sales by 2030.

While BT is delighted with the UK Government's announcement to ban the sale of petrol and diesel vehicles in 2030, it still thinks there is more to do. Find out more here: [UK Electric Fleets Coalition](#) | [The Climate Group](#)



7

## Digitisation and enablement

Although the mobile sector is taking action to be net zero by 2050, this is not the biggest contribution we can make to climate action. The biggest potential is to help other sectors of the economy reduce their carbon emissions through digitisation.

Research conducted by the GSMA with the Carbon Trust in 2019<sup>8</sup> found out that, while the mobile industry is currently responsible for around 0.4 per cent of carbon emissions globally, it enables carbon reductions in other sectors that are 10 times larger, equivalent to approximately four per cent of global emissions<sup>9</sup>.

These reductions are from two mobile technologies:

- 1 Smartphone users
- 2 Smart connected IoT devices

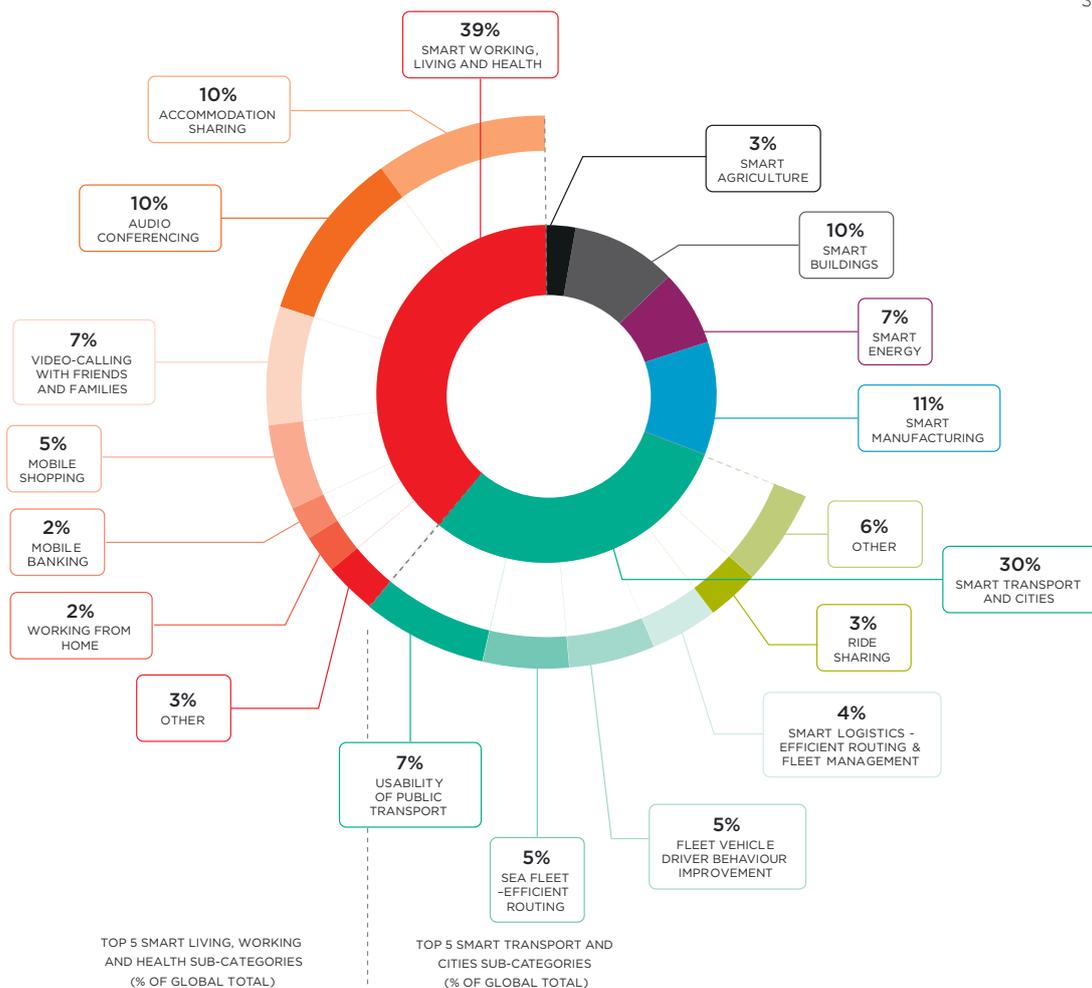
The areas of carbon reduction are across all sectors and can be seen in figure 5.

Based on current projections for the increase in smartphone users and the rise in smart connected IoT devices, this enablement effect could double by 2025. However, this will require innovation and investment across sectors to accelerate digital transformation to support decarbonisation.

A powerful example is in the energy sector. Most electricity grids are heavily centralised with many large-scale energy-generation facilities, often powered by coal, gas or nuclear energy. These are largely analogue-controlled, with facilities brought online manually at times of peak demand.

**Figure 5 Enabled avoided carbon emissions by category in 2018**

Source: GSMA



<sup>8</sup> <https://www.gsma.com/betterfuture/resources/the-enablement-effect>

<sup>9</sup> <https://www.gsma.com/newsroom/press-release/mobile-technologies-enabling-huge-carbon-reductions-in-response-to-climate-emergency>

Achieving net zero will require widespread renewable energy use, which will be decentralised and mean buildings are no longer just consumers of energy, but also producers: prosumers.

Prosumers will need to more closely manage the supply of, and demand for, energy. Renewable energy may be reliable and predictable, but it is not always available. It will need to be managed with battery storage and by smoothing the energy demand curve. Central to this will be mobile connectivity, along with cloud services and platforms to create smart energy systems.

Research conducted in 2021 by the GSMA with specialist energy consultancy Rethink Research found that smart energy systems could prevent an overbuild of capacity worth 16,000 terawatt hours of annual generation which, based on today's electricity prices, could save \$1.9 trillion per year by 2050. More importantly, compared to today's energy mix, it could save 7.7 billion tons of CO<sub>2</sub> emissions, equivalent to more than 23 per cent of global decarbonisation<sup>10</sup>.

“

While the mobile industry is currently responsible for around 0.4 per cent of carbon emissions globally, it enables carbon reductions in other sectors that are 10 times larger, equivalent to approximately four per cent of global emissions

”

10 <http://www.gsma.com/betterfuture/SES>



## 7.1 Snapshot: European Green Digital Coalition

In March 2021, the European Commission launched the new European Green Digital Coalition to promote digitisation that supports decarbonisation. Of the 26 founding members that signed up to a declaration, half were from the mobile sector<sup>11</sup>. The signatories committed to:

- 1 Invest in the development and deployment of green digital solutions with significant energy and material efficiency that achieve a net-positive impact in a wide range of sectors;
- 2 Engage with relevant organisations to develop standardised, credible and comparable assessment methodologies for the net impact of green digital solutions on the environment and climate in priority sectors such as energy, transport, manufacturing, agriculture and the building sector; and
- 3 Promote cross-sectoral dialogue and contribute to the development of guidelines and recommendations for the deployment of green digital solutions in different sectors, and encourage workforce upskilling.

The GSMA looks forward to working with our members and the European Commission to realise these three goals and to show the potential of the findings of The Enablement Effect report.



## 7.2 Snapshot: Exponential Roadmap Initiative

The Exponential Roadmap Initiative<sup>12</sup> was formed by founding partners including the WWF, the Stockholm Environment Institute and Ericsson. Bringing together innovators, scientists, companies and NGOs, its mission is to halve emissions before 2030 through exponential climate action and solutions.

The roadmap explains that the global economic benefit of a low-carbon future is estimated at \$26 trillion by 2030 compared with staying on the current high-carbon pathway. Through illustrations for energy, transport, buildings, transport, food and nature, it shows how each sector can achieve the carbon reductions we need to limit global heating to 1.5 degrees Celsius.

To achieve the transformation needed, it identifies exponential technology as a key enabler. Digital services have the potential, tenfold their footprint, to reduce energy and materials across the economy and could directly enable a third of the emissions reductions needed by 2030.

Digital services can both help drive demand for low-carbon consumption and investment, as well as fundamentally rewire the energy- and material-intensive economy to rely more on data flows than the movement of people, goods and energy.

**EXPONENTIAL  
ROADMAP** INITIATIVE

<sup>11</sup> <https://ec.europa.eu/digital-single-market/en/news/companies-take-action-support-green-and-digital-transformation-eu>

<sup>12</sup> <https://exponentialroadmap.org>



8

## Energy efficiency and mobile connectivity

Energy use has always been important for mobile operators because it is a significant cost: each year, operators globally spend approximately \$17 billion on energy<sup>13</sup>. Energy consumption is responsible for 15-40 per cent of OPEX for mobile operators, and mobile networks are expected to transfer more data going forward. More than 90 per cent of network costs are spent on energy, consisting mostly of fuel and electricity consumption<sup>14</sup>.

This cost pressure has driven energy efficiency programmes across the mobile industry for many years. According to the latest 2020 CDP data, operators saved around \$400 million in the previous year from emissions reduction projects. These projects are likely to relate to energy efficiency measures.

With the roll-out of new 5G networks, there is again upward pressure on operators' energy usage to power the new equipment. But the characteristics of 5G are different to previous generations. It has been built with network energy efficiency in mind, with 5G's specification calling for a 90 per cent reduction in the energy use to transfer each bit of data<sup>15</sup>.

Matching the theoretical and real-world performance of 5G has been demonstrated in a joint study between Telefonica and Nokia<sup>16</sup>. This focused on the power consumption of the RAN (Radio Access Network), where most of the energy is consumed. Over three months, the research found Telefonica's 5G network is up to 90 per cent more energy efficient per unit of traffic than legacy networks.

All RAN equipment suppliers are addressing energy efficiency as a priority. Ericsson is focussed on 'Breaking the Energy Curve'<sup>17</sup> to avoid continuous increases in energy use. Its strategy includes energy-saving software and sunsetting less energy-efficient legacy networks, which their customer case studies have shown can provide energy savings of up to 30 per cent.

Huawei promotes its PowerStar Solution to mobile operators, which won the GSMA's 2020 GLOMO for 'Best Innovation for Climate Action' award, while ZTE has developed PowerPilot, which introduced AI-powered service-awareness energy saving and is the result of green 5G innovation patent applications

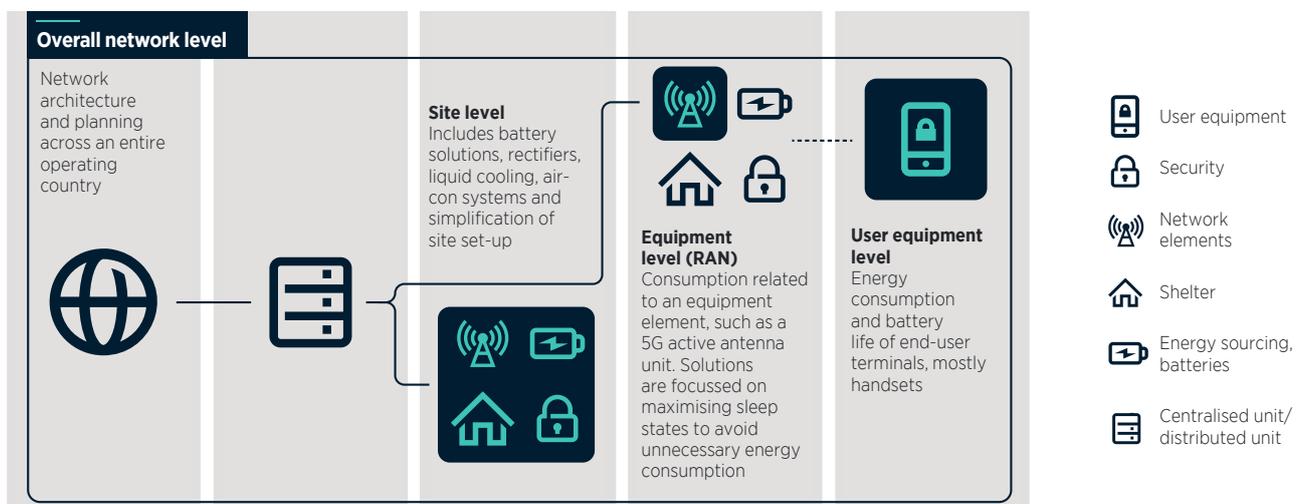
The phased retirements of legacy 2G and 3G networks, which are less energy-efficient than 4G or 5G standards, have started to feed through to OPEX savings. Looking ahead, however, as LTE and 5G progressively account for larger shares of the overall global user base, data traffic rises are inevitable – and with this comes the pressure on energy consumption.

This will require more inventive approaches to energy efficiency, and there are a number of initiatives and projects being deployed by operators. Energy-saving methods generally fall into one of three levels: site level; radio access network (RAN) equipment; and network planning.

The GSMA will continue to play a key role in promoting best practice across the industry to encourage energy efficiency features and strategies to be deployed by operators.

**Figure 5** Energy-saving methods differ between site level, RAN equipment and network planning

Source: GSMA Intelligence



13 <https://www.gsma.com/betterfuture/climate-handbook>  
 14 <https://data.gsmaintelligence.com/research/research/research-2020/energy-efficiency-in-the-5g-era-going-lean-going-green>  
 15 [https://www.gsma.com/wp-content/uploads/2019/04/The-5G-Guide\\_GSMA\\_2019\\_04\\_29\\_compressed.pdf](https://www.gsma.com/wp-content/uploads/2019/04/The-5G-Guide_GSMA_2019_04_29_compressed.pdf)  
 16 <https://www.nokia.com/about-us/news/releases/2020/12/02/nokia-confirms-5g-as-90-percent-more-energy-efficient>  
 17 <https://www.ericsson.com/en/about-us/sustainability-and-corporate-responsibility/environment/product-energy-performance>



## 8.1 Case study: Reliance Jio on energy efficiency

### Reliance Jio's energy efficiency projects and measures

Reliance Jio's energy efficiency project is an important part of achieving its carbon reduction goals and net zero emissions milestone. As a fast-growing telecommunications company in India, it has introduced initiatives and measures to optimise energy consumption at all facilities. These include:

- **Smart lighting system**

The installation of motion sensors on every floor of the server halls has resulted in an annual saving of 1,600 tonnes of CO<sub>2</sub>e.

- **Energy-saving**

The company is turning off radios of certain frequencies for all the towers across India during 02:00 and 05:00. This has reduced power consumption by three per cent and saved 32,641 tonnes of CO<sub>2</sub>e.

- **Diesel generator mitigation by using Li-ion batteries**

Lithium-Ion batteries have significantly reduced the need for diesel generators, which are needed for emergency power. So far, 3,082 underutilised diesel generators have been

demobilised, resulting in a reduction of 7,571 tonnes of CO<sub>2</sub>e per year.

- **Enhanced DG operation philosophy**

The company has enhanced its DG (diesel generators) operation philosophy for its DG sites. Each site runs on electron beam (EB) power supply. Once the EB supply is off, a lithium-ion battery caters the electronics load. The battery is allowed to drain up to 60 per cent of its capacity. Once DG starts, DG power feeds the electronics load. However, the battery is charged through EB only. This change in the operation philosophy has reduced the DG operating hours by two to three hours per incident (EB outage) per site. The annual CO<sub>2</sub>e reduction on account of delaying DG start on an average for total 99,810 DG small sites is 303,348 tonnes of CO<sub>2</sub>e per year.

All of the initiatives cited above have helped the company reduce emissions by 345,160 tonnes of CO<sub>2</sub>e per year as well as corresponding cost savings. Its efforts will also be scaled up to reduce carbon emissions and improve savings. Additional areas of work include solar panel farms, fuel cells and wind energy.



**9**

# Transitioning to renewable electricity

## Mobile Net Zero

Transitioning to renewable electricity

Renewable energy (RE) will play an essential role in the mobile industry reaching net zero carbon emissions. Most emissions within the direct control of operators are from electricity and diesel consumption by power networks.

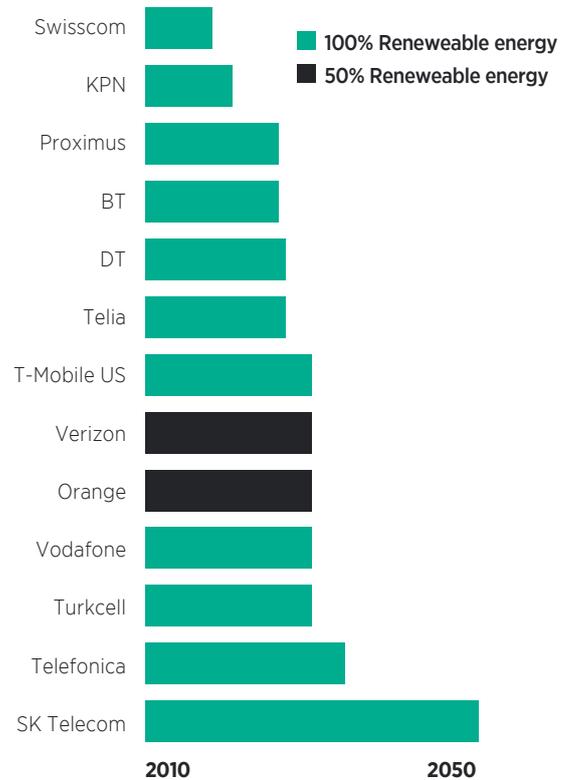
There is still a significant minority of emissions from diesel generators across networks. For example, in off- and bad-grid locations in low- and middle-income countries, emissions from diesel generators used to power mobile towers accounted for three per cent of the industry's total emissions in 2020<sup>18</sup>.

GSMA members were among the first companies in the world to embrace renewable electricity. In the run-up to the Paris Agreement in 2015, BT Group, KPN and Proximus all committed to switching to 100 per cent renewable electricity by 2020 through the global RE100 campaign<sup>19</sup>.

Since Paris, more operators have made renewables commitments, with some already using 100 per cent renewable electricity. Today, nine operators are RE100 members<sup>20</sup> and even more have made commitments to increase their use of renewable electricity.

Figure 6 Renewable energy targets for mobile networks

Source: GSMA



18 <https://www.gsma.com/mobilefordevelopment/resources/renewable-energy-for-mobile-towers-opportunities-for-low-and-middle-income-countries>

19 <https://www.there100.org/our-work/news/re100-companies-half-way-100-renewable-electricity-goals-annual-report-news>

20 <https://www.there100.org/re100-members>

Operators can switch to renewable electricity in several ways, with three of the most common ones being:



**Renewable energy certificates**

that guarantee each unit of electricity is purchased from a renewable energy generator are now available in many countries.



**Power purchase agreements** allow businesses to enter into a long-term agreement directly with a renewable energy generator to purchase their electricity for a fixed period.



**Operator onsite solutions** including alternatives to diesel generators. These usually focus on lithium battery solutions combined with solar panels or energy cells to power the site.

However, there are challenges in sourcing renewable electricity in many countries. For some, it may be due to centralised market control and a lack of appropriate financial and legal structures to support investment in renewables. Some countries lack access to sufficient renewable electricity sources, and in some there is a shortage of capital to implement renewable energy solutions and a lack of data and case study examples to support operators to create the business cases for using renewable energy.

The GSMA ClimateTech programme is working with operators in low- and middle-income countries to support the transition to renewables. Published in September 2020, the Renewable Energy for Mobile Towers report<sup>21</sup> looked at the global mobile tower landscape and identified the key trends and barriers influencing the deployment of renewables at bad-grid and off-grid sites.

To help mobile network operators switch to renewables, the GSMA is calling on governments to:

- Grow renewable energy capacity to support the transition from a fossil fuel economy;
- Support industry access to renewable energy by removing regulatory barriers and implementing stable frameworks;
- Integrate climate policy into energy policy frameworks to ensure climate targets are met and synergies maximised; and
- Improve access to finance for renewables, particularly in developing countries.



21 <https://www.gsma.com/mobilefordevelopment/resources/renewable-energy-for-mobile-towers-opportunities-for-low-and-middle-income-countries>



## 9.1 Case study: Turkcell's new 100 per cent renewables target

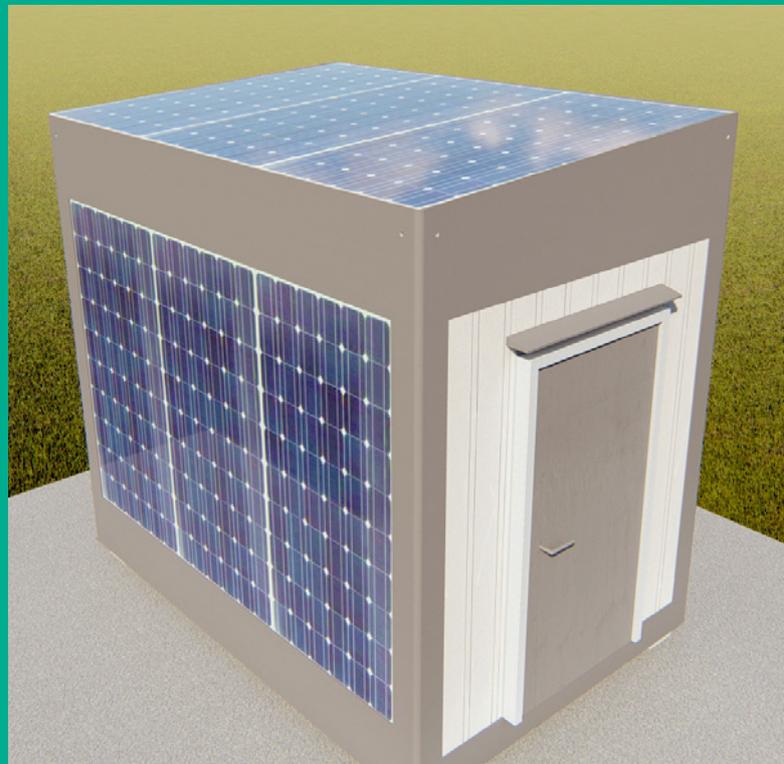
Turkcell Solar Applications has set a new target to meet its electricity consumption from renewable sources by 2030. To reach this goal, it has installed solar panels on its base station, which has brought many benefits. In the daytime, while solar panels are producing electricity, the operator consumes less electricity from the grid, which delivers OPEX savings. Solar panels also increase site availability since the operator has a secondary energy source and the base station is less affected by a grid failure. Batteries are discharged less in case of a grid outage, so battery lifetime will be longer. Additional shading provided by solar panels prevents direct sunlight going onto the shelter, so reducing the consumption of energy to power air conditioning.

In order to benefit from these advantages, the company is increasing the number of solar panel installations at its base stations. As seen in the photo below, it uses two different installation types. In both versions, the telecoms equipment uses the electricity produced by the solar panel first; any remaining energy needed is supplied from the grid.

In the first installation type, six solar panels are installed next to its base station site. The number of solar panels may vary depending on the energy need in the base station and the space available to install them around the shelter. In 2020, the company installed the six-solar-panel type to 50 of its base stations.

For its second type of installation, the company designed a shelter with integrated solar panels on the roof and on one side. There are two versions of the shelter: one with six panels and the other with four panels. Inside the shelter, the solar panels are integrated into the company's power system. In 2020, it finalised the designs and made a patent application before developing the first prototype and installing it on one of its base stations. Since then, it has been evaluating the performance of the prototype.

In 2021, it plans to install 50 new shelters with integrated solar panels and so increase the use of renewable energy in its network.





## 9.2 Case study: Orange group on renewables

The challenge for the Orange group was to increase the sourcing of electricity coming from renewable sources in the countries the group operates. Increasing renewable electricity sourcing is an important part of the group's overall strategy to achieve its net zero target in 2040, on Scopes 1, 2 and 3.

In particular, to reduce its Scope 2 emissions, it has set a goal to have at least 50 per cent of its electricity come from renewable sources in 2025, in alignment with the sector guidance created jointly by the ITU, the GSMA, GeSI, the IEA and SBTi.

With the increasing awareness about climate change and a growing number of companies setting objectives to reduce carbon emissions, the renewable energy market has become very competitive – especially in Europe. As a result, the group has found sourcing renewable electricity a real challenge the past few years.

To overcome this challenge, Orange has chosen to adapt its strategy to the regions where it operates.

In the Middle East and Africa region, for example, it has implemented three solar farms in Jordan, which

are now fully operational. The group also relies upon the development of partnerships with Energy Services Companies (ESCO) in several countries of the region.

In Europe, Orange has successfully negotiated power purchase agreements (PPAs) in France, Poland and Spain. Orange Spain has signed a PPA contract with Iberdrola, relying upon a new-built photovoltaic asset with an installed capacity of 328 MW which has been operational since 2020. In France, Orange is joining forces with ENGIE, the leading developer of solar and wind power.

Thanks to the three solar farms, Orange Jordan is sourcing 70 per cent of electricity from renewable sources. The ESCO programme has already been implemented in eight countries in the Middle East and Africa region.

For Orange Spain, renewables make up 100 per cent of electricity, with half of that coming from PPAs. These contracts are a way to secure a long-term competitive fixed price against volatility from the market and to contribute to the objectives of reducing greenhouse gas emissions.

*One of three Orange Solar Farms in Jordan*





## 9.3 Case study: Telenor on replacing diesel with solar

In Telenor's work to reduce its greenhouse gas emissions, there are two main mechanisms. The first is to increase the energy efficiency of its services, a work that has been a continuous focus for the company. Its energy efficiency efforts have succeeded in de-coupling the energy consumption curve, relative to data transfer. The group's energy consumption decreased 1.5 per cent in 2020 despite a strong increase in data traffic.

This is a result of a two-part strategy adopted in 2020 focuses on both the demand and supply sides of site operations. On the demand side, network nodes were optimised by enhanced use of energy-saving features and continued network modernisation processes, removing all non-value-adding loads. These efforts will be continued by introducing artificial intelligence and machine-learning capabilities to further optimise site operations. The efficient use of batteries, connecting sites to grid-based power and solar deployments, improved the supply side of energy.



The group's energy consumption decreased 1.5 per cent in 2020 despite a strong increase in data traffic.



The key to improvement was to segmentise the energy consumption areas in operations and then work thoroughly to optimise the high consumption areas.

At locations where there is no available electricity grid, telecoms companies such as Telenor use a decentralised energy supply, historically in the form of diesel generators. In order to reduce emissions, and in many cases also cut costs, it has worked for years to replace diesel generators with solar- and battery-based energy supply units. In 2020, the growth was an impressive 27 per cent and close to 800 additional solar sites were added. The total solar rollout involves a saving of more than 10 million litres of diesel annually.

In order to meet its climate ambitions, Telenor depends primarily on grid-supplied electricity. Renewable electricity is available in the Nordics, either in the form of Energy Attribute Certificates, or in the form of power purchase agreements. In the company's Asian operations, the availability of renewable power is currently limited. Telenor will work with its peers in the industry, as well as international associations, to engage with national regulators to increase access to new capacity of renewable grid electricity.



10

# Mobile industry supply chain

## Mobile Net Zero

Mobile industry supply chain

The biggest source of emissions in the mobile sector is not from electricity consumption but from emissions arising from the industry's supply chain, in particular the manufacture and use of devices and equipment.

Around 50 million tonnes of e-waste are produced every year, a figure that is rising rapidly. Although mobile phones form a small proportion of overall e-waste by weight, they are more valuable than some other waste streams because of the rare earth minerals and metals within them<sup>22</sup>.

Mobile companies are actively engaging with and supporting new e-waste policies and legislation around the world and creating new reverse logistics supply chains to manage the flow of equipment for recycling. The GSMA ClimateTech Programme<sup>23</sup> that has created an E-Waste Legislative Framework Map<sup>24</sup> to bring together summaries of e-waste policies for 76 countries and the GSMA We Care Initiative<sup>25</sup> are both examples of industry-led action to improve the management of e-waste.



## FAIRPHONE

**A circular economy 'closes the loop' by reusing and recycling components and materials instead of wasting products at the end of their life. Fairphone shows how a circular mobile handset is possible with its design for longevity, easy repair and modular upgrades. It has been awarded a gold medal by EcoVadis for sustainability and iFixit rates their Fairphone 3 handset as 10/10 for repairability – the only smartphone to be awarded a perfect score.**



**Mobile industry suppliers are starting to set ambitious goals to reduce their environmental impacts. Apple is carbon neutral for its own operations and aims for all its products to be carbon neutral too by 2030. The main route for it to achieve this goal is to switch its manufacturing suppliers to 100 per cent renewable electricity by 2030. The company also has an ambition to make its products and packaging from 100 per cent recycled and renewable materials, with a date to be set.**

The industry is also working with suppliers to evaluate their level of sustainability and support them to manage and reduce their carbon emissions. Take the operator-led Joint Audit Co-operation (JAC)<sup>26</sup>, formed of 17 operators, which works with around 200 Tier 1 suppliers on sustainability across the mobile industry.

The GSMA has been participating in the CDP supply chain programme on behalf of the mobile industry to encourage key suppliers to disclose their carbon emissions. The intention is to emulate the impact of the mobile operators' climate action commitment. This means first creating a better understanding of climate impacts across suppliers, encouraging target-setting in line with the net zero by 2050 ambition, and subsequently driving rapid emissions reductions.

A joint GSMA-JAC collaboration in March 2021 saw letters being sent to leaders of 30 of the most significant industry suppliers, inviting them to align their company targets to net zero.

<sup>22</sup> <https://www.gsma.com/mobilefordevelopment/blog/understanding-the-mobile-waste-management-efforts-of-mnos-in-emerging-markets>

<sup>23</sup> <https://www.gsma.com/mobilefordevelopment/cleantech>

<sup>24</sup> <https://www.gsma.com/mobilefordevelopment/climatetech/e-waste>

<sup>25</sup> <https://www.gsma.com/betterfuture/we-care>

<sup>26</sup> <http://jac-initiative.com>



## 10.1 Case study: Deutsche Telekom on green device supply chain management

Deutsche Telekom believes that the ICT industry has a substantial social responsibility to contribute to climate and environmental protection targets. In pursuit of this objective, Deutsche Telekom strives to lead in sustainability. This will only be possible in a close partnership across the whole supply chain, particularly with device vendors.

Therefore, Deutsche Telekom has included several requirements to make the device business more sustainable into its technical specifications. Such requirements foster, among other things, circular economy, avoidance of harmful substances and plastic-free packaging, which also result in fewer CO<sub>2</sub> emissions.

These requirements are consciously ambitious because Deutsche Telekom believes the necessary technology is already there waiting to be applied. The compliance process to these requirements triggers an inspirational dialogue across the supply chain to motivate partners to apply more sustainable design principles and, where knowledge is also conferred, fill any gaps.

The initial result is that most of its partners have changed their packaging or are in the process of doing so. They have stopped using plastic and the percentage of post-consumer fibre used in the cardboard has increased. Another success relates to the limitation of several harmful substances beyond those regulated by law. Ambition does not stop here and Deutsche Telekom is looking for even more successes.

There is an even stronger indication that consumers are increasingly looking for sustainable choices. However, when it comes to smartphones, they are not turning their desire into behaviour. Therefore, Deutsche Telekom has decided to become one of the founding members of the eco-rating consortium. Its aim is nothing less than an industry-wide standardised methodology to gauge the ecological performance of smartphones and present it in a simple, consumer-friendly way. Sustainable design features are turned into a competitive advantage by increased visibility in a market lacking other differentiators.

The implementation of sustainable design features will therefore be done increasingly out of an intrinsic motivation. Individual initiatives, such as Deutsche Telekom's sustainability requirements, and joint ones, such as Eco-rating, will play an important role in transforming the industry to meet changing public opinion and consumer behaviour.

This industry must provide what society expects. Societal acceptance is a fundamental basis for success in business.



Deutsche Telekom is one of the founding members of the eco-rating consortium. Its aim is an industry-wide standardised methodology to gauge the ecological performance of smartphones



## 10.2 Case study: Telefónica on reducing supply chain emissions

During the last year, Telefónica has taken on the challenge of tackling climate change by reducing emissions across its entire value chain. Having set an ambitious goal of lowering its value-chain carbon emissions by up to 39 per cent in 2025 and achieving net zero in 2040, it is proactively influencing its suppliers' emissions management in line with the Paris Agreement.

In 2020, these emissions dropped 26.8 per cent compared to 2016, totalling 1,909,321 tonnes of CO<sub>2</sub>e. Telefónica's main Scope 3 emissions (56 per cent) originate from supply chain purchases (both goods and services and capital goods) and its customer products and services (35 per cent).

Telefónica's Supplier Engagement Program and the 1.5°C Supply Chain Leaders Program constitute the company's most recent and impactful initiatives towards reaching these goals.

During the last two years, the company has worked closely with its most relevant suppliers to set more ambitious reduction targets. Each supplier could define targets related to managing their footprint in diverse areas. In addition, Telefónica continued supporting suppliers that had already committed to emissions reductions in order to reach their goals and started new joint projects.

Similarly, in 2020, Telefónica created a working group within the Joint Audit Cooperation initiative to drive climate action in the Telco supply chain. As a result, 26 strategic suppliers have been assessed on their maturity on climate action and several workstreams have been created to increase their level of ambition. In addition, in collaboration with the GSMA and the Carbon Disclosure Project (CDP), training has been provided to the most relevant suppliers.

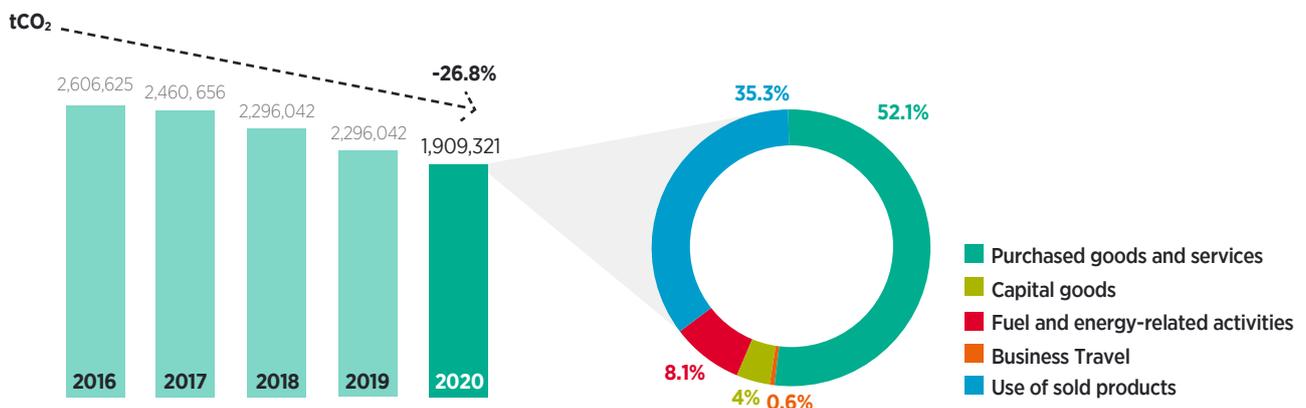
Telefónica is also working to reduce emissions from its products and services, particularly the power consumption of routers and TV set-top boxes. That's why it will continue to promote the eco-design of its equipment. Its Smart Wi-Fi router has already delivered a reduction in energy consumption of 30 per cent compared to previous FTTH technology.

Another relevant action in 2020 was to join the 1.5°C Supply Chain Leaders initiative, which advocates the reduction of emissions by small- and medium-sized companies that are part of Telefónica's value chain. This programme will enable it to strengthen its role in accelerating the decarbonisation of the global economy.

These recent efforts have led Telefónica to join CDP's Supplier Engagement Leaderboard 2020 in order to join forces towards driving the transition to a net zero emissions society.

Figure 7 Scope 3 Emissions

Source: Telefónica





## 10.3 Case study: TDC on supplier engagement

TDC takes its responsibility to deliver its services in a sustainable manner seriously. With this in mind, it has set internal goals and made external commitments, including to be CO<sub>2</sub> neutral by 2028 target for its Scope 1 and 2 emissions, as well as signing the UN's Business Ambition for 1.5°C pledge. As part of this initiative, it will set a science-based target in line with the protocols of the Science-Based Targets Initiative (SBTi) by September 2021. This includes a target for its Scope 3 emissions.

In 2020, it had a busy year preparing to meet these commitments, focusing on delivering a governance structure and roadmap to CO<sub>2</sub> neutrality, and conducting its first Scope 3 inventory.

Its Scope 3 work uncovered in detail its indirect upstream and downstream emissions and demonstrated the true climate impact of its operations, which span 11 emission categories. It was clear that the scale of its emissions are more than three times greater than its direct operations. It also identified its biggest emitters: purchased goods and services, capital goods and the use of the goods it sold. These are directly linked to the huge investment it is making in its network through its fibre expansion and 5G roll-out.

This inventory provides it with the critical baseline to set its SBTi Scope 3 target, while also highlighting the levers available to influence emissions. A great example of how this new insight is helping it reduce its climate impact is employee commuting. It has a baseline that can be used to see how different internal policy options can affect its total carbon footprint. For example, in June 2020 TDC NET launched the Pioneering Digital Collaboration, an initiative that gives employees more freedom to work anywhere, anytime. The company anticipates that employees will work from home more, even after the Covid-19 lockdowns lift, and its modelling shows that this could result in a decrease of over 1,433 tonnes of CO<sub>2</sub>e.

TDC has also identified the suppliers with the largest emissions and estimated the emissions of key suppliers that are not fully transparent. The inventory will be critical in informing its supplier engagement programme, supported by increased organisational focus and resourcing. Working within a framework of supplier relationship management, it expects to identify the potential for reducing emissions, while also conveying the importance of emission data quality and disclosure to its suppliers.



In 2020, TDC delivered a governance structure and roadmap to CO<sub>2</sub> neutrality, and conducted its first Scope 3 emissions inventory





**11**

# Adaptation and resilience

As climate change results in rising sea levels, more hurricanes, tornados and other extreme weather events, mobile operators' networks will be damaged with greater frequency, resulting in more service interruption for customers and greater financial risks for operators.

Operators are therefore under increasing pressure to make their networks as robust as possible so they can withstand extreme weather and be restored quickly. At the same time, mobile technology is uniquely positioned to provide and enable tools for climate change mitigation, adaptation, weather disaster response, pollution and environmental monitoring<sup>27</sup>.

### Adaptation

AT&T is an example of an operator that is looking to manage climactic risks through its Climate Change Analysis Tool. The tool was developed with the US Department of Energy's Argonne National Laboratory, and helps to anticipate potential impacts of climate change on its network infrastructure and business operations 30 years into the future<sup>28</sup>.

As the south-east of the United States is prone to hurricanes, AT&T's tool focuses on understanding how that area will be affected by coastal flooding, inland flooding and wind speeds in the future. This allows for internal planning to improve resilience, and AT&T will share the climate data publicly for external parties who wish to use it.

AT&T and Argonne are exploring the potential expansion of the existing tool. Geographically, the tool could expand to include the East Coast, Gulf Coast, and West Coast regions of the U.S. Expansion of the tool could also include other climate change impacts such as wildfires and droughts. The largest and deadliest wildfires in California's history have occurred over the past few years and climate change is predicted to exacerbate the problem.

### Resilience

Mobile technology also has an important role in helping with resilience, as mobile operators are leveraging big data analytics and artificial intelligence (AI) capabilities to develop insights for governments and aid agencies to prepare

for disasters, monitor pollution levels and analyse country-level impacts<sup>29</sup>.

AI for Impact is a GSMA-led initiative, guided by a taskforce of 21 operators and an advisory panel of 12 UN agencies and partners, that defines the technical, commercial and ecosystem requirements to deliver viable data-driven products and services that adhere to principles of privacy and ethics.

AI for Impact's climate-related work includes helping to build communities that are resilient to climate extremes<sup>30</sup>. Due to extreme climate variability in certain parts of the world, forced migration is occurring within and across countries. By leveraging mobile operator big data to understand the internal displacement of citizens, governments can make evidence-based policy decisions to facilitate long-term support for vulnerable communities.

By using their assets, mobile operators can also play a key role in improving a variety of services for rural communities. These range from weather and crop insurance to protect farmers against agricultural losses, to accurate weather forecasts and agro-climatic advisory to help farmers adapt to changing weather patterns and extreme weather events<sup>31</sup>. These services can help the most vulnerable adapt to climate change - for example, smallholder farmers dependant on rain-fed agriculture.

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Without adaptation, climate change will continue to degrade infrastructure performance over the rest of the century, with the potential for cascading impacts that threaten our economy, national security, essential services and health and well-being.

The Fourth National Climate Assessment, the U.S. Global Change Research Program's mandated report to United States Congress and President

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27 <https://www.gsma.com/mobilefordevelopment/resources/the-role-of-digital-and-mobile-enabled-solutions-in-addressing-climate-change>

28 [https://about.att.com/story/2019/climate\\_resiliency\\_project.html](https://about.att.com/story/2019/climate_resiliency_project.html)

29 <https://www.gsma.com/betterfuture/aiforimpact>

30 <https://www.gsma.com/betterfuture/resources/building-communities-resilient-to-climate-extremes>

31 <https://www.gsma.com/mobilefordevelopment/resources/ooredoo-myanmars-agricultural-smartphone-app-site-pyo-supports-smallholders-suffering-the-effects-of-climate-change>

## 11.1 Case study: Zain on providing vital connectivity in a crisis

# 700,000

people in South Sudan were in crisis due to flooding in 2020



# 71

power hybrid solutions were deployed by Zain to provide connectivity to people located in remote and off-grid areas



# 5

months

=



# 60%

+



# 200

metric tons

+



# \$400,000

reduction in fuel consumption

CO<sub>2</sub> emission reduction

reduction in fuel consumption

The disruption of mobility caused by the Covid-19 crisis has amplified the need for virtual connectivity. This is especially the case in South Sudan, where the country witnessed unprecedented flooding caused by torrential rains coupled with security issues. According to the UN World Food Programme (2020), around 700,000 people across South Sudan were in crisis due to flooding in 2020.

Zain did not spare any effort in trying to provide connectivity to people located in 71 remote and off-grid areas in South Sudan. It tried to balance the need for people to connect to their families and the rest of the world (Sustainable Development Goal (SDG 10), with one of its sustainability objectives to ensure that it mitigates the impact of its operations on the environment (SDG 7 and 13).

To provide connectivity to people in those remote areas, Zain deployed 71 power hybrid solutions. The base stations deployed in those areas run one-third of the time on diesel generators and use batteries as power source during the remaining time.

This represents around 60 per cent reduction in fuel consumption, which results in the same percentage of CO<sub>2</sub> emissions also being reduced on the related base stations. For some of the power solutions, the transport from Juba to those areas required an average of two to three months. A few were airlifted because of the floods and the security concerns in those areas.

Zain is proud to see that, despite these difficult operating conditions, it has managed to allow communities in those remote areas to stay connected and keep in contact with the rest of the world.

This was done in a sustainable way because the solutions that were deployed brought in some opportunities in terms of OPEX savings while reducing the company's impact on the environment. Over five months of operations, the power hybrid solutions helped achieve an OPEX saving of \$400,000 and a reduction of 200 tonnes of CO<sub>2</sub> emissions.



**GSMA Head Office**

Floor 2  
The Walbrook Building  
25 Walbrook  
London EC4N 8AF  
United Kingdom

**Tel: +44 (0)20 7356 0600**

**Fax: +44 (0)20 7356 0601**

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