# Climate Action

## Handbook

# Contents

# Overview

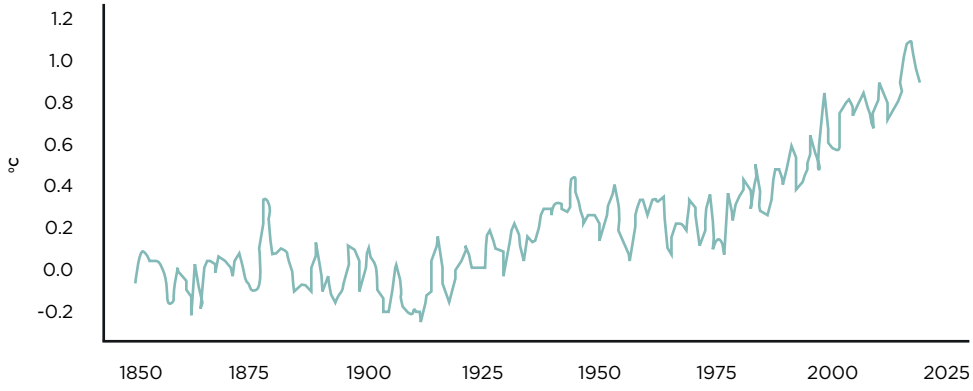
## About this handbook

This handbook is designed to be a high level guide to climate change for anyone working in or with the mobile industry. It explains the need for timely and decisive action, how emissions are categorised and the related terminology, before focusing on how the mobile industry is responding and potential next steps. The overall aim is to provide an informative and objective overview of this existential challenge facing the planet and what it means for mobile operators, their customers, partners and suppliers.

## How climate is changing

In May 2019, sensors at the Mauna Loa observatory in Hawaii detected a $CO_2$ concentration of 415.26 parts per million in the Earth's atmosphere.[1] The last time this threshold was breached was more than three million years ago, when sea levels were several metres higher and trees grew at the South Pole.[2] In the 2015-18 period - the four hottest years in recorded history - extreme weather events devastated ecosystems and communities, as floods, droughts and high temperatures impacted millions of people, and destroyed natural habitats, such as coral reefs. July 2019 was the hottest month ever recorded, according to the United Nations.[3] In 2018, the World Meteorological Organization (WMO) warned the physical signs and socio-economic impacts of climate change are accelerating. Sea levels are now rising by more than three millimetres per year[4], threatening coastal cities. Parts of Jakarta, for example, are sinking by 25 centimetres per year[5] as the sea rises and the land subsides as aquifers are drained for fresh water.

**FIGURE 1: Global mean temperature difference from 1850-1900 (degrees Celsius)**




**Source: IPCC (Intergovernmental Panel on Climate Change)**

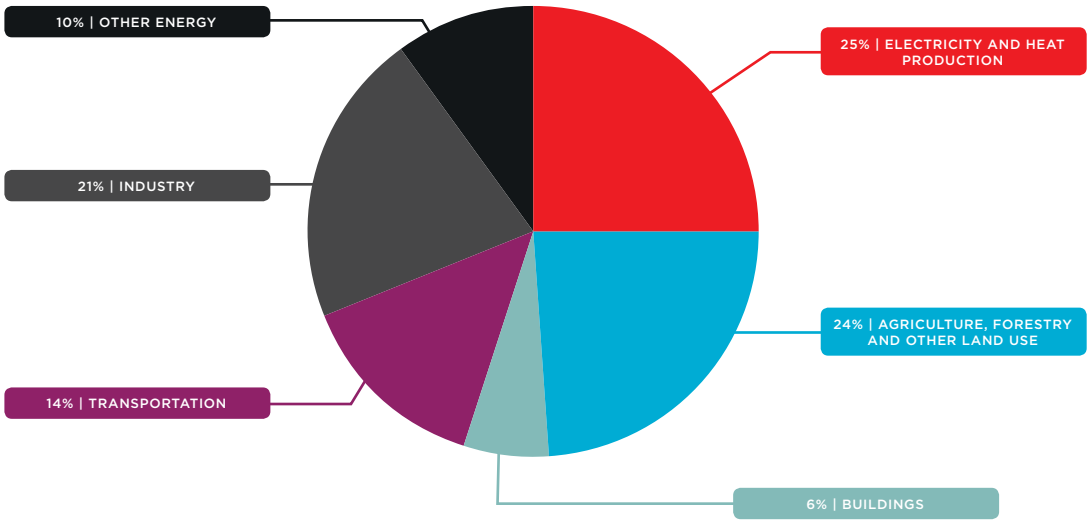
1. https://www.research.noaa.gov/News/Scientist-Profile/ArtMID/536/ArticleID/2461/Carbon-dioxide-levels-hit-record-peak-in-May
2. https://www.sciencealert.com/there-were-trees-at-the-south-pole-the-last-time-there-was-this-much-co2-in-the-air
3. https://www.washingtonpost.com/climate-environment/2019/08/05/heres-how-hottest-month-recorded-history-unfolded-around-globe/
4. https://ocean.si.edu/through-time/ancient-seas/sea-level-rise
5. https://www.bbc.co.uk/news/world-asia-44636934

# What are the primary sources of greenhouse gases?

The scientific consensus is that human activity (rather than natural phenomena, such as volcanoes) is the primary cause of climate change.[6] Carbon dioxide emitted by fossil fuels and industrial processes makes up the largest portion (65%) of greenhouse gases emitted each year, but methane (16%) and carbon dioxide from forestry and land use (11%) also account for significant portions of greenhouse gases, according to the Intergovernmental Panel on Climate Change (IPCC). Emissions from fossil fuels have been climbing fairly steadily since the 1950s, driven by global economic growth.[7]

Just about every segment of the economy contributes to greenhouse gas emissions. Together, industry and transportation accounts for 35% of greenhouse gas emissions, while electricity and heat production generate 25% and agriculture and forestry 24%. Agricultural activities, waste management, energy use, and biomass burning all contribute to methane emissions, while agriculture is also the primary source of another greenhouse gas: nitrous oxide. Just as deforestation, land clearing for agriculture, and degradation of soils adds carbon dioxide to the atmosphere, reforestation, improvement of soils, and other activities can have the reverse effect. Ericsson estimates greenhouse gas emissions from the ICT sector are 1.6% of global total, with mobile accounting for under 1%.

**FIGURE 2: Global Greenhouse Gas Emissions by Economic Sector**




**Source: IPCC (2014) EXIT based on global emissions from 2010.**

6. https://climate.nasa.gov/causes/
7. Source: Boden, T.A., Marland, G., and Andres, R.J. (2017) - https://cdiac.ess-dive.lbl.gov/trends/emis/overview_2010.html

# COP21 – The Paris Agreement

At COP21 ('Conference of the Parties' No. 21) in December 2015, participating countries adopted the first ever universal, legally binding climate deal. Known as the Paris Agreement, the Accord sets a collective goal to limit the temperature rise from pre-industrial levels to substantially below 2 degrees Celsius, if possible 1.5 degrees. It establishes a process for countries to further reduce emissions over time, strengthens transparency of climate finance flows and obliges all countries from 2020 onwards to report regularly on their greenhouse gas emissions and progress against their climate targets. Beginning in 2023, there will also be a global stocktake every five years to assess collective progress and to guide further individual actions by signatories. Since entering into force in November 2016, 185 countries have ratified the Paris Agreement.

## Why a limit of 1.5°C?

In 2015, global mean warming reached 1 degree Celsius above pre-industrial levels. Limiting the temperature rise to 1.5 degrees Celsius, as opposed to 2 degrees, would mean 10 million fewer people lose their homes to rising seas, 50% less people worldwide will experience water scarcity, and 50% fewer species will lose half their geographic range, according to the Intergovernmental Panel on Climate Change (IPCC).[8] However, it will be very hard for the world to keep the temperature rise down to 1.5 degrees: In October 2018, the IPCC published a special report, which considered it likely that global warming would hit this limit between 2030 and 2052.[9] Efforts to limit climate change (mitigation) will need be accompanied by adaptation – measures that limit the negative impacts of climate change.

8. Source: https://public.wmo.int/en/resources/bulletin/ipcc-issues-special-report-global-warming-of-15-%C2%B0c
9. https://www.ipcc.ch/sr15/

# Why is the mobile industry acting now?

Addressing climate change and its effects is one of most urgent concerns that the world faces today, and is an issue for which global bodies, national governments and the private sector must take responsibility and show leadership. Annual emissions have to fall by 29-32 gigatonnes of equivalent carbon dioxide ($CO_2e$) by 2030 to maintain a fighting chance to stay below 1.5°C, according to the UN.[10] This is a five-fold increase on the current ambition.


Coordinated by the GSMA, the mobile industry was the first sector to commit to achieving the UN's Sustainable Development Goals (SDGs), which were established in September 2015. Central to the UN's 2030 Agenda for Sustainable Development, the 17 goals include SDG 13, which calls for serious action to regulate carbon emissions and promote developments in renewable energy. Mobile connectivity can play a major role in enabling organisations and individuals to become more efficient and reduce their greenhouse gas emissions. Moreover, addressing climate change and its impacts cuts across a range of other goals, including the provision of clean energy (goal 7), the development of sustainable cities (11) and protecting terrestrial ecosystems (15).

There is also a solid business case for action to mitigate climate change. Two thirds of consumers around the world are willing to pay more for sustainable goods, according to a 2015 survey of 30,000 consumers in 60 countries by Nielsen.[11] That figure rose to 73 per cent among Millennials (people born from 1977 to 1995).

At the same time, the cost of cleaner energy is decreasing. For example, solar PV module prices have fallen by around 80% since the end of 2009, while wind turbine prices have fallen by 30–40%, according to the International Renewable Energy Agency.[12]

The economics of energy usage will become increasingly important, as usage of mobile services rises dramatically with the rollout of 5G networks. Ericsson has forecast[13] that total mobile traffic will increase by a factor of five over the next six years, reaching 136 exabytes per month by the end of 2024. In a similar vein, Cisco estimates[14] monthly global mobile data traffic will be 77 exabytes by 2022, up from 11.5 exabytes a month at the end of 2017.

10. https://www.unenvironment.org/pt-br/node/25028
11. https://www.inc.com/melanie-curtin/73-percent-of-millennials-are-willing-to-spend-more-money-on-this-1-type-of-product.html
12. https://www.irena.org/costs/
13. https://www.ericsson.com/en/mobility-report/reports/november-2018/mobile-data-traffic-growth-outlook
14. https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.html

# Getting To Grips With Greenhouse Gas Emissions

## Breaking down greenhouse gas emissions

The World Resources Institute's Greenhouse Gas Emission Protocol Corporate Standard categories emissions into three scopes:

- **Scope 1 emissions** are direct emissions from owned or controlled sources. In the context of the mobile industry, scope 1 emissions stem directly from infrastructure and operations controlled by operators, which includes the fuel (e.g. natural gas or diesel) for the self-generation of electricity on-site in base stations, offices and elsewhere, as well as fuel consumption in company-owned vehicles.

- **Scope 2 emissions** are indirect emissions from the generation of purchased energy. Scope 2 come from the consumption of electricity in operators' own networks, offices and stores. The source of the electricity consumed can be renewable or non-renewable; in the case of the former, this can be purchased or self-generated.

- **Scope 3 emissions** are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. For mobile operators, this includes emissions from business travel, fleets from suppliers, materials purchased and employee commuting. It also includes emissions resulting from the production and disposal of handsets and other connected devices. Moreover, scope 3 emissions include emissions generated in the use of mobile products and services by the mobile industry's customers.

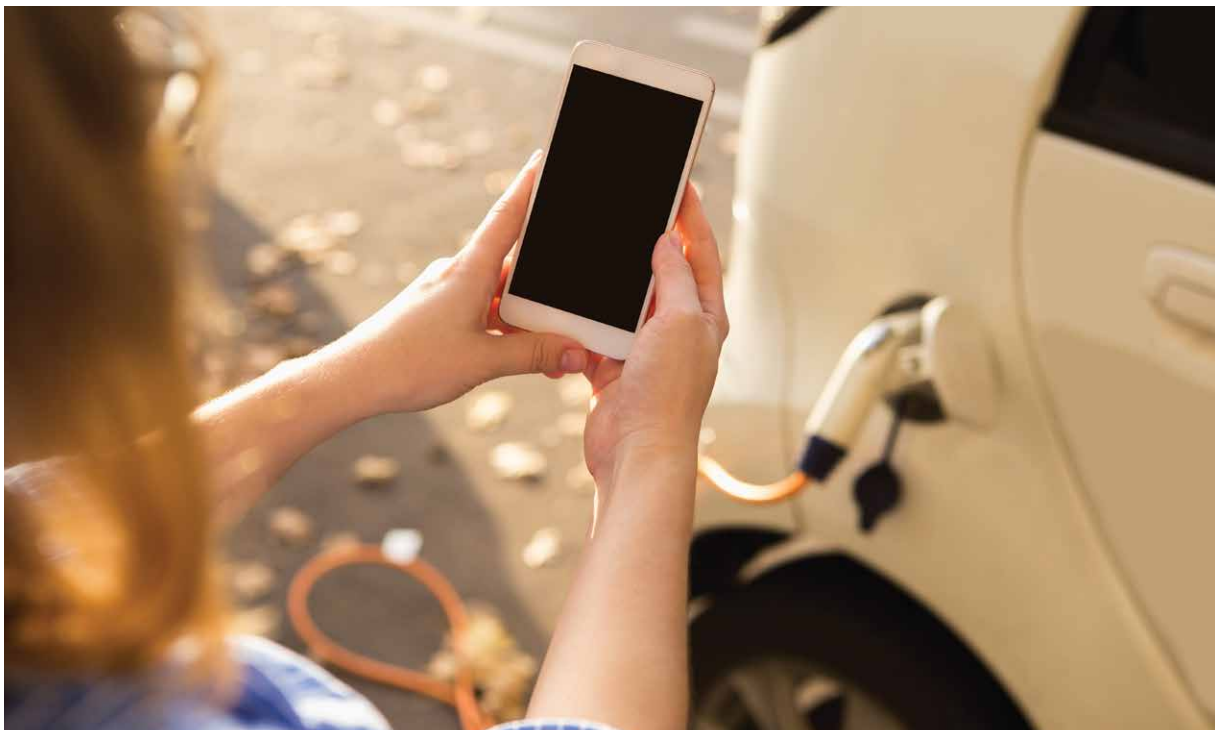
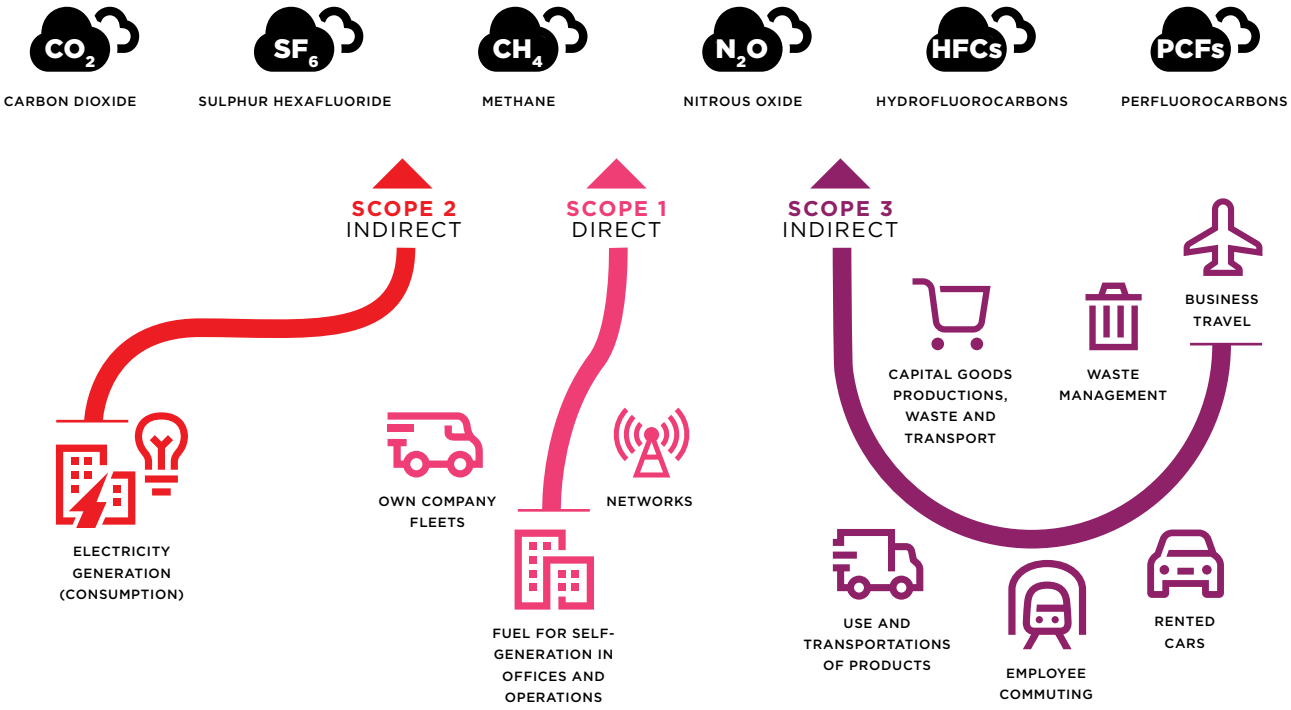


**FIGURE 3: GHG emissions at a glance**




**SCOPE 2**
Emissions generated in the productions of electricity consumed by the institution.

**SCOPE 1**
Emissions are those directly occuring "from sources that are owned or controlled by the institution".

**SCOPE 3**
Other indirect emissions from supply chain and not controlled by the institution.

Data collected from GSMA members shows that scope 1 emissions count for approximately 3% of mobile operators' emissions, while scope 2 emissions account for 25% and scope 3 72%.

## Net zero carbon

A number of countries, such as Canada, Mexico, Japan and the UK, are making commitments to net zero emissions targets. 'Net zero' or 'carbon neutral' means that any emissions are balanced by absorbing an equivalent amount from the atmosphere. Net zero can be achieved through a major shift away from a carbon-based economy, combined with steps to remove greenhouse gases from the atmosphere through carbon capture technologies, reforestation and other sequestration measures. The push for net zero carbon is in response to climate science showing that in order to halt climate change, carbon emissions have to stop – reducing them is not sufficient. The IPCC recommends[15] that countries reduce carbon pollution by 45% by 2030 and to zero by 2050, which is likely to involve major reforestation and behavioural changes for citizens in terms of diet and energy use.

15. https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/

## Carbon offsets

Ideally, an organisation or individual will become carbon neutral by completely eliminating their greenhouse gas emissions. However, this may not be feasible in the near term, so they may seek to offset their remaining emissions in the interim period. Organisations that exceed permitted emissions' levels can use verified carbon offset schemes to fund projects that reduce carbon dioxide in the air, essentially balancing out their emissions equation. Carbon offset projects range from forestry sequestration projects (which remove carbon dioxide from the atmosphere when trees grow) to funding third parties' energy efficiency and renewable energy projects (which reduce future carbon dioxide emissions in the atmosphere). The already high level of carbon dioxide in the atmosphere means it may also be necessary for the world to invest heavily in carbon capture projects to restrain climate change in the long-term.

However, carbon offsetting should be regarded as an interim step. UN Environment agency says carbon offsets are useful while infrastructure and industry make the transition to electric mobility, alternative energy and the new technology necessary for low- and zero-carbon lifestyles. "UN Environment supports carbon offsets as a temporary measure leading up to 2030, and a tool for speeding up climate action," says UN Environment climate specialist Niklas Hagelberg. "However, it is not a silver bullet, and the danger is that it can lead to complacency."

## Emissions trading and carbon pricing

The EU, South Korea, California and Quebec are among the regions and countries to have introduced emissions trading schemes. The world's first major carbon market, the EU emissions trading system (EU ETS) is a cornerstone of the EU's policy to combat climate change. The EU ETS works on the 'cap and trade' principle. A cap is set on the total amount of greenhouse gases that can be emitted by installations covered by the system. The cap is reduced over time so that total emissions fall.

Within the cap, companies receive or buy emission allowances that they can trade with one another as needed. They can also buy limited amounts of international credits from emission-saving projects around the world. The limit on the total number of allowances available ensures that they have a value. The European Commission says it will impose heavy fines on a company that fails to surrender enough allowances to cover all its emissions in a given year. If a company reduces its emissions below this threshold, it can keep the spare allowances to cover its future needs or else sell them to another company that is short of allowances. The European Commission says such trading brings flexibility that ensures emissions are cut where it costs least to do so, adding that "a robust carbon price also promotes investment in clean, low-carbon technologies."

Note, effective emissions trading schemes are only in place in a small number of geographies. In any case, they should be regarded as an interim measure, as the world works towards completely decarbonising the economy.

# Climate finance

Climate finance is targeted at projects in developing countries that help reduce emissions or adapt to climate change. The United Nations Framework Convention on Climate Change calls for climate finance to support the large-scale investments required to significantly reduce emissions and adapt to the adverse effects of a changing climate. Through a number of financial mechanisms established by the Conference of the Parties (COP) process, governments are making more resources available for climate finance. Under the Paris Agreement on climate change, they committed to raising US$100 billion per year by 2020[16] – from public and private sources.

Climate finance can be delivered either via increasing the revenues available to public and private development projects, using tariff support or carbon finance programmes, or by improving project capital structure, for example, by reducing the costs of debt and equity.

Some mobile operators, such as Millicom, Telefónica and Verizon, have issued green bonds designed to fund projects that have clear positive environmental and/or climate benefits, but backed by the issuer's entire balance sheet. Telefónica said[17] the proceeds of its €1 billion green bond will finance measures to improve the company's energy efficiency, among other projects, while Verizon said proceeds of its $1 billion offering will fund renewable energy, energy efficiency, green buildings, sustainable water management, and biodiversity and conservation projects.

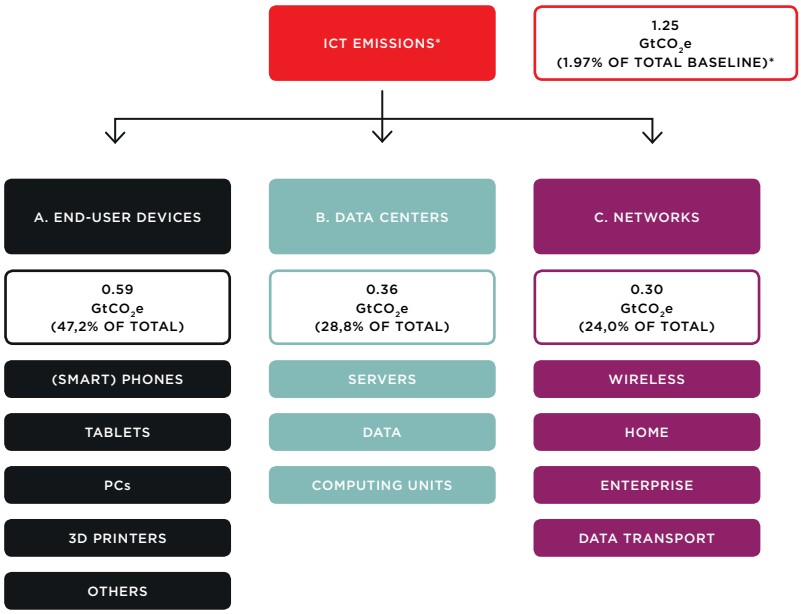
16. https://unfccc.int/topics/climate-finance/the-big-picture/climate-finance-in-the-negotiations
17. https://www.telefonica.com/en/web/press-office/-/telefonica-issues-the-first-green-bond-of-the-telco-sector-amounting-to-1-billion-euros

# Spotlight on the Mobile Industry

## How big an emitter is the mobile industry?

The mobile industry is a relatively small, but growing, contributor to greenhouse gas emissions. According to a 2015 report by the Global e-Sustainability Initiative (GeSI), fixed and mobile networks each accounted for the equivalent of 0.1 gigatonnes of carbon dioxide in 2011. It envisions the emissions from the mobile sector will grow faster to reach the equivalent of 0.16 gigatonnes of carbon dioxide in 2020 (equivalent to the annual emissions of Algeria), whereas the emissions from the fixed sector will reach 0.14 gigatonnes of carbon dioxide. In the 2020s, emissions from networks are forecast to be largely flat, remaining at the equivalent of 0.3 gigatonnes of carbon dioxide in 2030.

**FIGURE 4: Environment – ICT emissions footprint (2030)[13]**

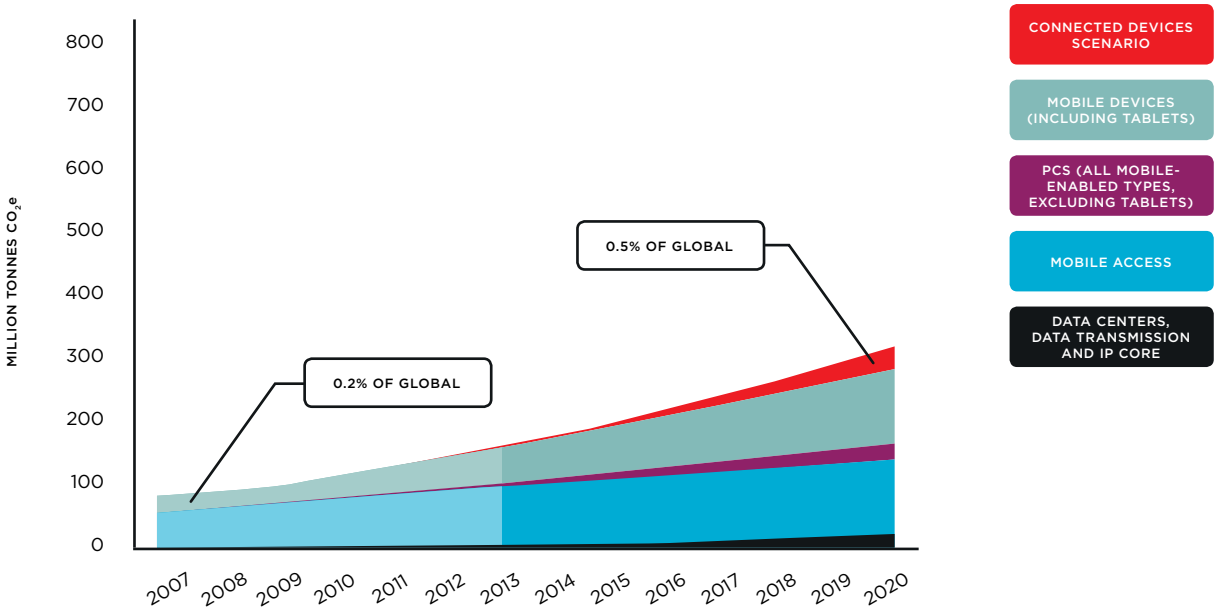



**Source: GeSI**

18. * Includes, where feasible, scope 1 (direct), scope 2 (indirect from consumption of energy) and scope 3 emissions (all others related).

Ericsson estimates that greenhouse gas emissions per gigabyte of mobile data transmitted have drastically fallen since 2007. However, it says the greenhouse gas emissions per mobile subscriber are rising steadily as people become increasingly reliant on cellular connectivity and digital technologies in general. Ericsson reported that the greenhouse gas emissions per capita for ICT are set to increase from 100kg in 2007 to about 130kg in 2020. The latter figure is the equivalent of driving 318 miles in an average car, according to the U.S. Environmental Protection Agency.

**FIGURE 5: Total greenhouse gas emissions from mobile ICT networks[14]**




**Source: Ericsson**

19. Energy and Carbon Report, Ericsson, 2014

## What impact will 5G have?

Although 5G networks are likely to drive a dramatic increase in mobile traffic, they are also designed to be more energy efficient than their predecessors. Indeed, 3GPP's 5G specification calls for a 90% reduction in the energy used to transfer each unit of data. Crucially, 5G and related technologies give mobile operators precise control over their networks' performance and, by extension, energy consumption.

Mobile operators will increasingly be able to use network function virtualisation, software-defined networks and network slicing to tailor the connectivity to the needs of the application. That will mean less energy is wasted. Moreover, 5G networks can support the low power wide area connectivity required by environmental sensors, smart meters, asset trackers and other battery-powered devices that only need to transmit small amounts of data. Although 5G is likely to drive a massive expansion in the number of things connected, many of these connections will consume very little energy. For example, some NB-IoT connected devices will be able to function for a decade using a single battery.[20]

At the same time, 5G networks will be much denser than their predecessors, employing more base stations and other infrastructure. Moreover, many mobile operators will run 2G, 3G, 4G and 5G networks in tandem for much of the next decade, placing upward pressure on their energy usage, before they are able to realise savings by decommissioning legacy networks.

## What has the mobile industry done to date?

The mobile industry itself is taking steps to decarbonise, including the accounting and granular reporting of greenhouse gas emissions, implementing energy efficiency programmes and incorporating a greater proportion of renewables into the energy mix. As well as buying energy from renewable sources, some mobile operators are curbing their emissions by equipping base stations with solar panels, relying less on power-hungry air conditioning and installing more energy-efficient equipment in their radio access networks, their core networks and their data centres. AT&T, for example, is curbing its scope 1 emissions by reducing the size of its fleet and employing hybrid vehicles, while Telefónica is lowering its scope 2 emissions through a wide range of energy efficiency measures. Meanwhile, BT is building sustainability into its contracting process with suppliers, helping it address scope 3 emissions.

In the wider economy, mobile connectivity will play a key role in reducing energy consumption, achieving SDG 13 and to delivering a zero carbon future. Mobile technologies are enabling carbon emissions abatement approximately five times greater than the carbon emissions from mobile networks, according to a 2015 report by GeSI.[21] For example, mobile connected navigation systems enable drivers to avoid congestion and thereby reduce fuel consumption. Mobile solutions can also help people adapt to climate change. For example, smart drones and IoT systems monitoring weather patterns can help farmers to become more resilient. Mobile networks also play an essential role in enabling the humanitarian assistance required to respond to climate-related disasters, enabling citizens to adapt to environmental change.

20. https://www.u-blox.com/en/beyond/blog/iot/powering-ten-years-nb-iot-connectivity-single-battery
21. https://www.carbontrust.com/resources/reports/advice/mobile-carbon-impact/

# Counting and reporting emissions

Many mobile operators are preparing a corporate-level greenhouse gas emissions inventory, and are generally seeking to improve their ability to accurately measure and track both energy consumption and greenhouse gas emissions across their entire operations. In general, they are using established standards, such as ICT sector guidance from GeSI and the Carbon Trust.[22]

Further, voluntary schemes, such as the Science Based Targets initiative (SBTi) and the Global Reporting Initiative (GRI), are supporting the disclosure of scope 3 emissions, which can expose operators' current and future risks, as well as identifying potential savings in the supply chain. Other reporting initiatives include the ESG, the UN Global Compact, EcoVadis, GRI, FTSE4Good, DJSI, SASB, CDP, CDSB, UN PRI, TCFD and ISO50001.

**CDP (Carbon Disclosure Project)** is an international non-profit that drives companies and governments to reduce their greenhouse gas emissions, safeguard water resources and protect forests. Working with investors with assets of US$96 trillion, CDP seeks to leverage investor and buyer power to motivate companies to disclose and manage their environmental impacts. Over 7,000 companies, representing 50% of global market capitalisation, disclosed environmental data through CDP in 2018. Some 750 cities, states and regions also use the CDP platform to disclose their environmental impact. 30 mobile operators are disclosing their emissions via CDP.

**The Global Reporting Initiative (GRI):** Of the world's largest 250 corporations, 92% report on their sustainability performance and 74% of these companies use the GRI's Standards to do so. Some 35 countries also use GRI in their sustainability policies. Based in Amsterdam, the GRI is a non-profit foundation. The creation of the Global Sustainability Standards Board in 2014, and related governance structure changes, was designed to strengthen the independence of the standards. The GSMA Sustainability Assessment Framework captures operators who have adopted GRI.

**The Task Force on Climate-related Financial Disclosures (TCFD)** is developing voluntary, consistent climate-related financial risk disclosures that companies can use to provide information to investors, lenders, insurers, and other stakeholders. The Task Force considers the physical, liability and transition risks associated with climate change and what constitutes effective financial disclosures across industries. The goal is to help companies understand what information financial markets want in order to measure and respond to climate change risks. Mobile operators engaging with TCFD say it helps them build the business case for investment in climate mitigation by enabling them to accurately assign costs and model how climate related disasters could impact their revenues.

**The United Nations Global Compact:** A special initiative of the UN Secretary-General founded in 2000, the United Nations Global Compact has been signed by more than 9,500 companies around the world. Signatories commit to align their operations and strategies with ten universal principles in the areas of human rights, labour, environment and anti-corruption. In June 2019, the UN Global Compact launched a campaign calling on businesses to set science-based targets that are aligned with limiting the global temperature rise to 1.5 degrees Celsius.

22. ICT Sector Guidance built on the GHG Protocol Product Life Cycle Accounting and Reporting Standard, GeSI/Carbon Trust, 2017

# The Science-Based Targets Initiative

Ambitious emissions reductions targets make a clear statement of intent and should be aligned with existing sustainability strategies, including the UN's Sustainable Development Goals.

For those operators without explicit goals in place, a UN-endorsed mechanism already exists to ensure this is done in a transparent and effective way: science-based targets, managed through the Science Based Targets initiative (SBTi). This project develops guidance and methodology for industries to set greenhouse gas emissions reductions goals aligned with the greater ambitions of the Paris Agreement. The SBTi approach recognises not only those emissions directly generated by companies and their power supply (i.e. scope 1 and 2), but also those in the value chain (scope 3) – on both supplier and customer sides.

Under the SBTi approach, in 2017, telecoms group BT pledged to reduce emissions by 87% by 2030 against a 2016/17 baseline, subsequently increasing its ambition to commit to becoming a net zero carbon business by 2045. More mobile operators have followed since. As of October 2019, a total of 23 operators have either committed to setting an SBT or have already set one. These 23 operators represent 30% of all mobile connections globally.

**RE100:** Some 189 companies across Europe, North America, India, and China have made a commitment to use 100% renewable energy by a specified date through RE100, an initiative led by non-profit The Climate Group in partnership with CDP. Members of RE100 disclose their electricity data annually, and the initiative reports on their progress. BT, KPN, Proximus, Swisscom, Telefónica and Vodafone are among the members of RE100.

However, there isn't yet common methodology for the mobile sector as a whole, presenting operators with a challenge in agreeing SBTi-based targets. The GSMA is engaged in the process of working with stakeholders to develop a mobile industry pathway specifically to facilitate target setting which should be available by 2020. Such a pathway would be agreed with SBTi and provide a trajectory for the industry globally in line with achieving net zero emissions by 2050.

# How will the mobile industry be impacted by climate change?

**Changes in customers' behaviour:** As consumers and companies are becoming increasingly concerned about climate change, there will be greater demand for mobile devices that are more durable and are energy efficient. As enterprises look to reduce their carbon footprint, business people may also seek to make greater use of telepresence/virtual presence services, rather than travelling to in-person meetings.

**Demand for green innovation:** Both private companies and public entities are increasingly looking to mobile operators to help them reduce their emissions by making broader and smarter use of connectivity to optimise their operations. GeSI and the Carbon Trust estimate that mobile technologies enable a reduction of the equivalent of 180 million tonnes of carbon dioxide per year in the US and Europe.[23] This amount is greater than the annual carbon emissions from the Netherlands. Specifically, the organisations estimate that 70% of these carbon emission reductions come from the use of machine-to-machine (M2M) technologies in the buildings, transport and energy sectors, while 20% of abatements come from the use of smartphones to enable behavioural changes in lifestyle and working patterns. The report also identifies significant future opportunities to reduce emissions through the use of smart applications in cities, healthcare and agriculture. A further GeSI report estimates that ICT solutions across the economy could drive a total global emissions cut of the equivalent of 12 gigatonnes of carbon dioxide by 2030.

**Extreme weather events:** If climate change results in more rising sea levels, more hurricanes, tornados and other extreme weather events, mobile operators' networks could be damaged with greater frequency, resulting in greater financial risks. At the same time, operators are likely to come under increasing pressure from governments and aid agencies to make their networks as robust as possible so that they can withstand extreme weather and/or be restored quickly. Mobile operators are also leveraging their Big Data & AI capabilities to develop insights to governments and aid agencies to prepare for disasters and analyse their impact on a country. A number of them are partnering through the GSMA's Big Data For Social Good initiative.

**Changes in regulation:** Governments are likely to make reporting of emissions mandatory, while introducing carbon taxes and emissions trading programmes. They could also impose limits on the use of diesel and other energy sources that result in high levels of greenhouse gas emissions.

**Investment:** Increasingly investors want evidence that their assets will be protected, and the effects of climate change are being mitigated. Companies are being expected not only to demonstrate resilience to the impact of climate change but also offer solutions to rising temperatures.

**Reputational risk:** As climate change is getting traction across all levels of society, the cost of inaction for companies who are not seen to be part of the solution could lead to reputational damage. Employees themselves are increasingly expecting employers to do the right thing.[24]

23. GeSI Mobile Carbon Impact: How mobile communications technology is enabling carbon emissions reduction, GeSI/Carbon Trust, 2015
24. 2019 Edelman Trust Barometer

# Counter Measures and Next Steps

## The roadmap for the mobile industry

The mobile sector has now embarked on an ambitious journey to decarbonise. The GSMA has brought the industry together to develop a long-term climate action roadmap. The roadmap will comprise mobile operators' carbon emissions disclosures, a global emissions reduction pathway for the mobile sector according to the most ambitious target of the Paris Agreement, and individual company target setting in line with a Net Zero ambition. To date, 57 global mobile operators, representing two-thirds of the world's mobile connections, are actively engaged in the initiative, with further discussions under way. It will begin with robust disclosure of relevant data, before agreeing a route to decarbonisation in conjunction with a SBTi-endorsed target (from early 2020).

The mobile industry will need to collaborate with others – notably its energy suppliers – to meet the 'net zero by 2050' target, as well as partnering with, and working under the auspices of, the wider climate community. The GSMA is mobilising the industry and is inviting stakeholders and influencers to join the climate debate at key convening forums. Climate action forms part of the mobile industry's common purpose to intelligently connect everyone and everything to a better future, and reflects its ongoing commitment to the UN Sustainable Development Goals.

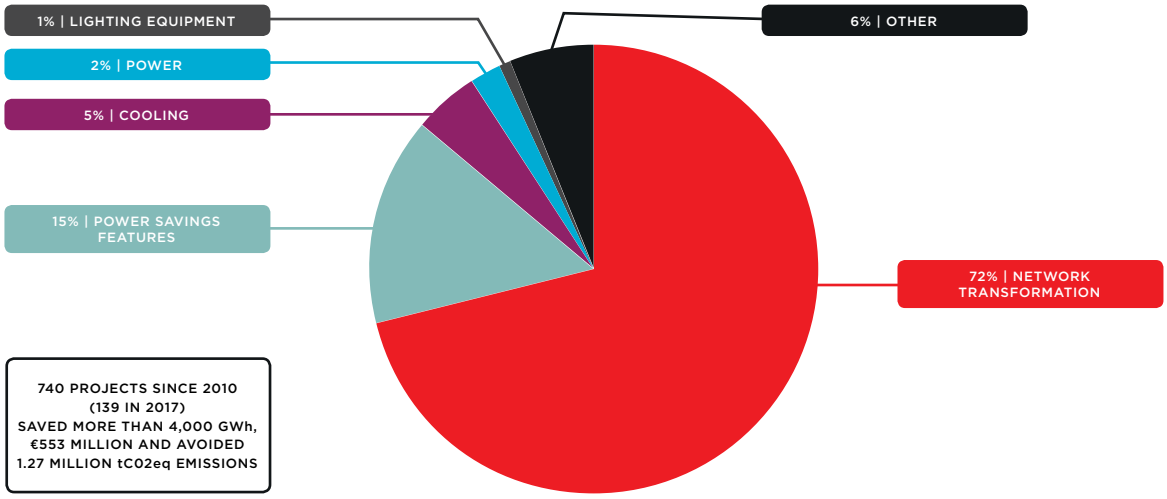
## Greater energy efficiency

Operators globally spend approximately US$17 billion on energy each year. As mobile usage continues to grow quickly, so does the demand for energy, particularly from the network infrastructure. In its latest Sustainability Report, Vodafone, which spends €700 million a year on energy, says that base station sites account for 66% of its global energy consumption, while its technology (data and switching) centres account for a further 29%.

For both financial and environmental reasons, energy efficiency is high on the corporate agenda of most mobile operators. Focused on networks and data centres, operator-led measures include temperature optimisation, free cooling at cell sites, power saving software features, selective switch-off and reducing diesel consumption (e.g. using generator-battery hybrids). These actions could save millions of dollars in annual operating costs, while also reducing the risks of possible future increasing energy costs and consumption. In addition, cloud computing could significantly reduce energy usage by virtualising operations, thereby reducing the need for physical data centre real estate.

Telefónica, for example, has set targets to reduce greenhouse gas emissions by 30% in absolute terms by 2020 and 50% by 2030, underpinned by a four-pronged work programme around energy efficiency. Having introduced its plan in 2010, Telefónica has now implemented 740 individual projects, saving more than 4,000 GWh and €553 million, and avoided emissions of close to 1.3 million tonnes of the equivalent of carbon dioxide.

**FIGURE 6: Energy savings attribution**




Operators can also make their vehicle fleets more energy efficient. For example, AT&T is cutting its scope 1 emissions by buying hybrid vehicles for its fleet, while reducing the number of vehicles it has on the roads. It plans to decommission more than 12,500 of its older technology, higher emissions vehicles by year-end 2020.

Operators are also looking to address scope 3 emissions by limiting corporate travel, introducing video conferencing facilities and collaborative working software, and scaling back requirements on commuting for employees. They can also reduce customers' emissions by working with suppliers to roll out modular handsets and other devices that enable components to be re-used and recycled more easily than in the past.

## More recycling and reuse

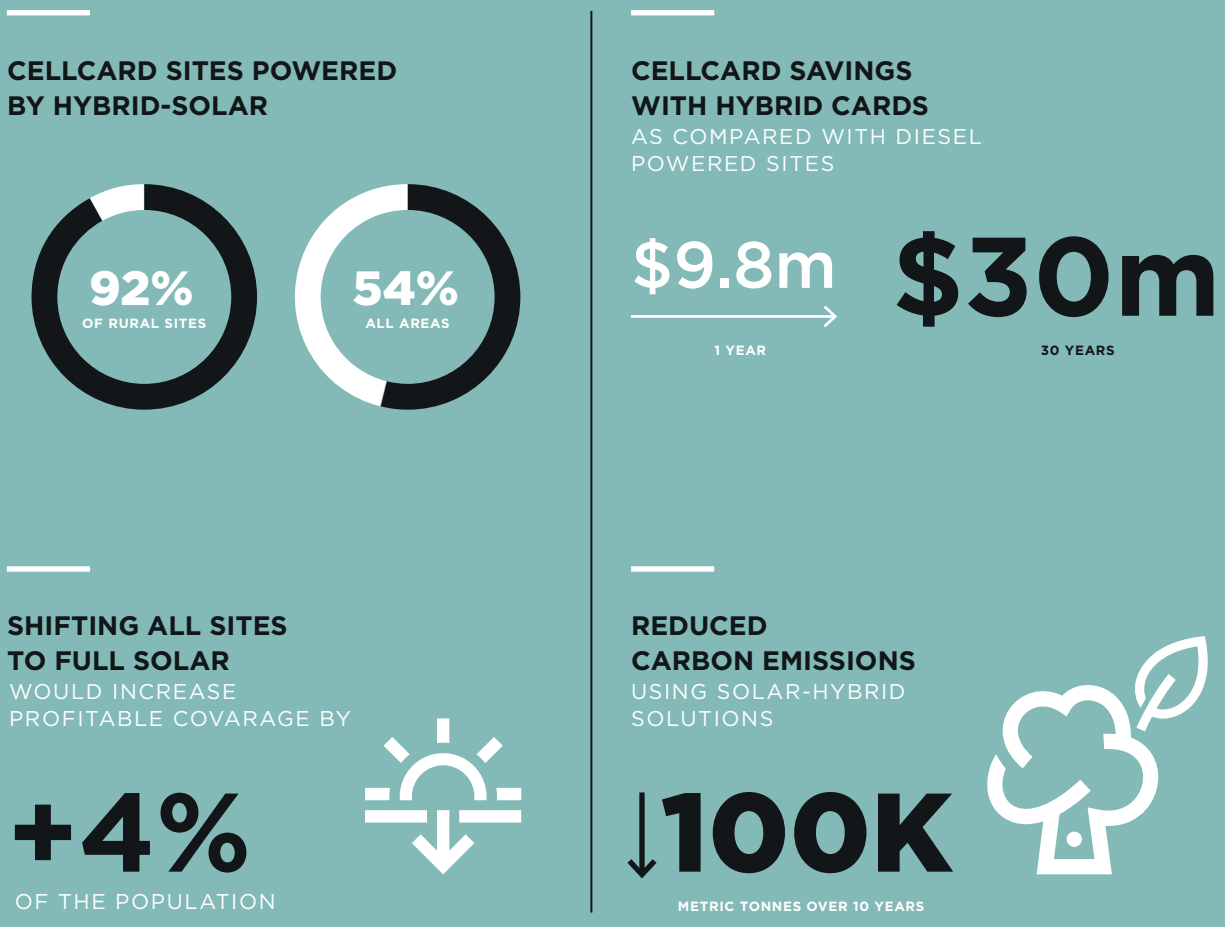
Recycling requires less energy than disposing of material in landfills and sourcing new material. In Mexico, the GSMA's Programa Verde is coordinating the joint participation of operators, vendors and device manufacturers in initiatives to increase e-waste recycling. Of the material collected, 80% is recycled domestically and 20% is exported. In parallel, the increasing use of USB-based chargers is having a positive impact on e-waste, allowing devices to power through a common charger and reducing the number ending up in landfill. There is now also a vibrant market for used mobile phones. Deloitte Global predicts that 10% of premium smartphones purchased new in 2016 will end up having three or more owners before being retired, and that 7% of smartphone sales will be used devices.[25]

25. Used smartphones: the $17 billion market you may never have heard of, Deloitte, 2016

## Sourcing cleaner power

Some operators are deploying their own renewable energy systems to generate clean power. For example, NTT DOCOMO has developed "green base stations", equipped with photovoltaic (PV) panels, cycle-type Li-ion storage batteries, DC power controllers and supply generated power to radio equipment with smart power control. They can make use of renewable energy by local PV power generation, thereby reducing carbon dioxide emissions. Cellcard is already reaping significant commercial and environmental benefits from its use of solar power in Cambodia, saving US$7,600 and 38.4 metric tonnes of carbon dioxide per site over a five-year period.[26] Also, by shifting to fully solar-powered sites, Cellcard could save US$51,200 per site over a 10-year period, with carbon dioxide emissions reduced by an additional 82.2 metric tonnes over five years.

**Figure 7: Effects of using solar power in mobile networks**




Source: GSMA

26. Rural Connectivity Innovation Case Study: Cellcard Cambodia and Solar Power, GSMA, 2018

Some operators are also pursuing direct power purchase agreements (PPAs), which are long-term renewable energy supply contracts. For instance, as part of a group-level renewables commitment, Telefónica México has signed a PPA with BAS Corporation that will see 40% of its energy for base stations and commercial stores come from solar power.[27] The GSMA is looking to convene mobile operators, renewable energy generators, and climate finance investors to explore how to accelerate the deployment of renewable electricity supply.

Mobile operators are using energy attribute certificates, such as renewable energy certificates (REC) in the US and Guarantees of Origin (GoO) in Europe, to demonstrate that purchased or acquired electricity comes from a renewable source. Telia estimates that its greenhouse gas emissions abatement, which is supported by its purchasing of GoO, is the equivalent of taking 30,000 cars off the road annually.[28] Another approach is to source clean power directly from wind farms, solar farms or other producers of clean energy.

## Engaging the value chain

Mobile operators can reduce their Scope 3 emissions by working with their suppliers to help them source renewable energy and increase energy efficiency. Operators should also consider embedding sustainability into the contracting process, while benchmarking suppliers using scorecards. The GSMA could support these steps by developing an industry-wide methodology that would mean suppliers could report their emissions on an industry basis, allowing individual mobile operators to gauge their allocation on the basis of volume procured. A common approach would reduce the burden on both operators and their suppliers.

## Supporting adaptation, building resilience

As some negative impacts from climate change are now inevitable, the world needs to take steps to mitigate these effects and increase the resilience of communities inhabiting the most vulnerable areas. In this respect, the mobile industry is playing a key role in disseminating local weather forecasts, complementing broadcast media, helping farmers, for example, to anticipate periods of drought or heavy rainfall. In Nepal, Ncell, for example, has partnered with the Department of Hydrology and Meteorology (DHM) to send early warning alerts to its customers living in high-risk areas of floods and landslides, encouraging them to move to government-designated safe locations when water levels become too high.

The mobile industry can also support adaptation in many other ways. For example, low-cost connected weather stations are increasingly being deployed at base stations for access to power, while mobile networks' microwave links data is being utilised for accurate rainfall measurements.[29] Moreover, new mobile financial services, including digital weather index insurance, are emerging to strengthen the climate resilience of rural populations. With aid increasingly becoming digitised and mobile networks becoming ubiquitous, mobile technology can also support the distribution of aid in the wake of natural and climate-related disasters.[30]

27. https://www.gsma.com/futurenetworks/wiki/case-study-telefonicamexico/
28. https://www.teliacompany.com/en/sustainability/responsible-business/environmental-responsibility/
29. https://www.gsma.com/mobilefordevelopment/resources/mobile-technology-for-rural-climate-resilience-the-role-of-mobile-operators-in-bridging-the-data-gap/
30. Partnership Guidelines: Building effective partnerships between MNOs and NGOs in complex environments and crises, GSMA, 2016

**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