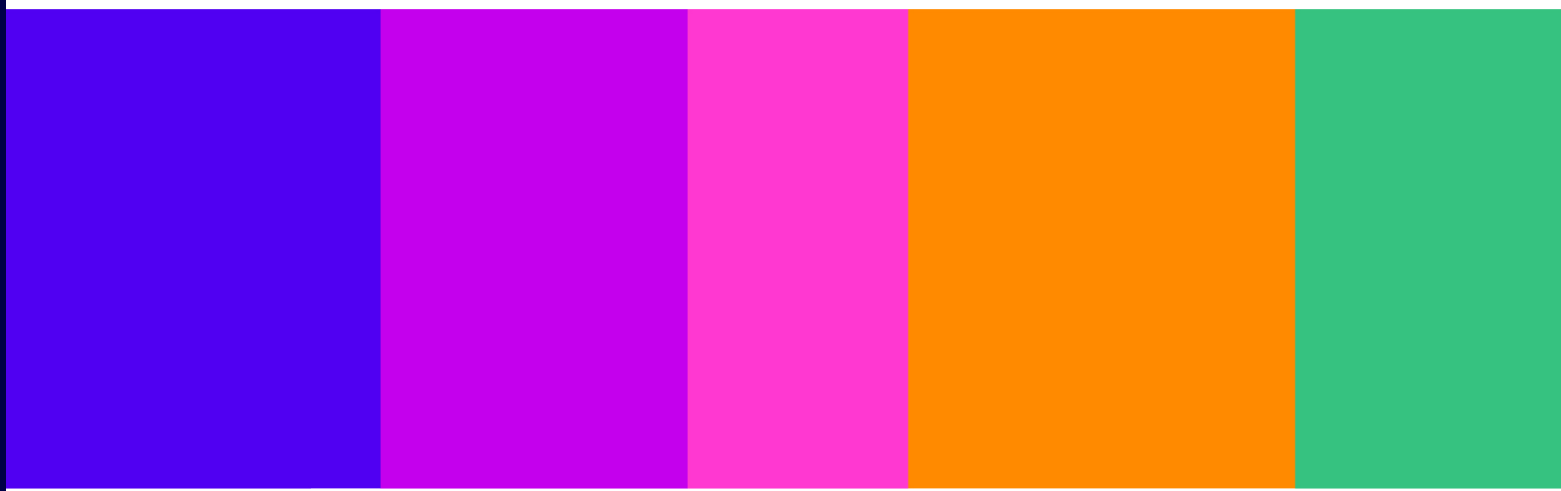# Resilience to climate change in the telecoms sector

Ofcom report to Defra

Report

Submitted 19 December 2024

Contents

1. Executive Summary

1.1   Climate change is expected to have profound social, political, environmental and economic impacts. Ofcom does not have duties to pursue environmental or climate change policy goals. Nonetheless, due to our general duties to secure the availability of communications services across the UK, we have an interest in ensuring resilience to climate change. The Department for Environment, Food and Rural Affairs (Defra) has asked Ofcom to submit a report on how climate risks are affecting the electronic communications sector and how it is adapting. This will inform the UK's 4th Climate Change Risk Assessment. Our report focuses on the telecommunications sector, considering adaptation defined by Defra as "actions that protect us against the impacts of climate change…reacting to the changes we have seen already, as well as preparing for what will happen in the future."

1.2   In section 2, we set out Ofcom's approach to matters related to climate change. This includes engaging with other regulators, government and industry, as well as providing guidance to ensure resilient networks and services.

1.3   In section 3, we summarise our understanding of industry views on adaptation to climate change (without providing an Ofcom assessment of these). This is based on our engagement on a voluntary basis with 11 major telecoms and infrastructure firms, and we welcome their constructive support.

Key issues shared with Ofcom by industry

- **Overall, firms do not consider that there is a significant present material threat to delivery of services** due to climate change, but recognise that risks will increase over time.
- **Firms particularly consider physical risks** (to telecoms infrastructure, workforces, and supply chains). Some also consider transitional risks (energy market volatility, reputation, regulatory, R&D) and opportunities (enabling adaptation for the wider economy).
- **Flooding, changing temperatures, wind and fire are most widely considered as individual climate change risks.** Storms - incorporating wind, flooding and lightning - are most commonly cited as the example of risks that are likely to occur concurrently.
- **Key barriers to adaptation cited by firms include: co-ordination challenges** (both across the public sector and amongst industry); **interpreting climate change data; interdependency with the energy sector** (such as data on energy supply resilience); and **tension between adaptation and reducing emissions.**
- **To support further adaptation, firms consider that more could be done to support collaboration including across government departments and the telecoms sector, and with the energy sector.** Some firms support a greater role for the Digital Connectivity Forum, stressing the importance of recognition and sponsorship from government departments.

2. Ofcom's climate change work

2.1 This report focuses on the telecommunications sector.[1] Ofcom does not have any duties to pursue environmental or climate change policy goals in carrying out our regulatory functions in the sectors that we regulate. That said, our general duties under section 3 of the Communications Act 2003 require that we secure the availability throughout the UK of a wide range of electronic communications (telecommunications) services, and the optimal use for wireless telegraphy of the radio spectrum.

2.2 Ofcom therefore has an interest in understanding how sustainability issues affect our sectors and stakeholders. Our work related to climate change covers three areas as illustrated in Figure 1. We particularly focus on collaborating with industry, convening discussions and gathering information. The constructive relationships we have developed with industry have allowed us to gather information for this report.

Figure 1: Different elements of climate change responses considered by Ofcom
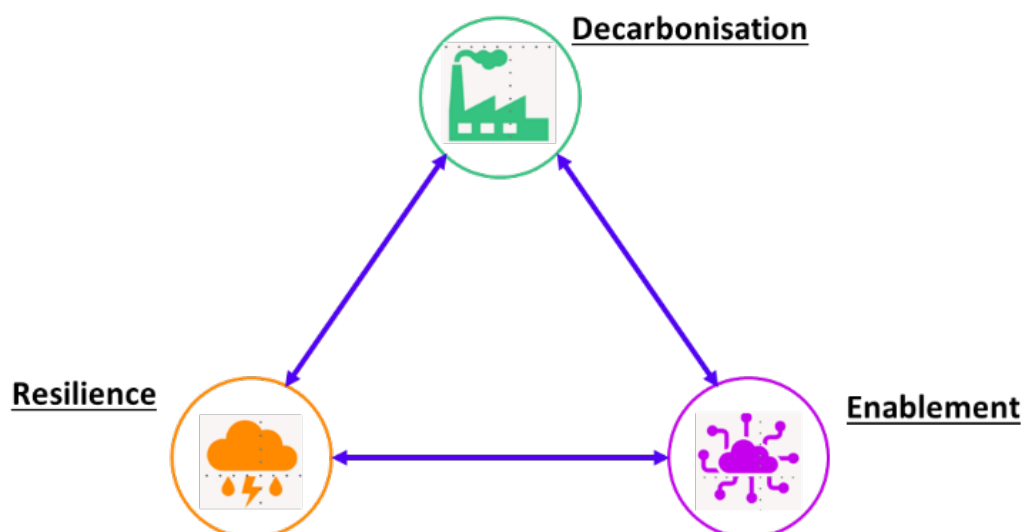
2.3 Our work related to climate change covers:

a) **Enablement:** Telecoms networks and services can have a partnership role in helping enable other industries and government to deliver against climate change commitments. Examples include the use of fixed or wireless communication in place of travel, or connectivity to power smart devices. Last year we highlighted that telecommunications can particularly enable reductions in emissions in the energy, manufacturing, logistics and agricultural sectors.[2]

b) **Decarbonisation:** Ofcom is supporting industry work to reduce emissions, such as by helping to convene industry through the UK Telecoms Sustainability Roundtable with the Digital Connectivity Forum. Ofcom has maintained an interest in industry's environmental metrics and last year we published a summary of leading providers'

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[1] Ofcom is the converged regulator of communications matters in the UK. Our broader remit includes the regulation of the telecommunications sector, the postal sector and the broadcasting sector, as well as specific matters affecting the communications sector generally such as online safety and the airwaves over which wireless devices function.

[2] Ofcom, Connected Nations 2023: UK report, p.80-81.

targets for decarbonisation.[3] We wish to understand the comparability of targets and are engaging with other regulators to discuss their work in this area.

c) **Resilience:** We have an ongoing interest in developments in firms' plans to adapt and be resilient to climate change, as we need to ensure the ongoing availability to telecoms services. Our work on resilience is described in more detail below.

Ofcom collaborates to promote resilience to climate change

2.4   This is the first formal output we have produced on telecoms climate adaptation since we last reported to Defra in 2011. Nonetheless, in line with our approach to climate change more widely, we have been engaging with stakeholders to promote climate resilience.

2.5   We engage with other regulators and with government:

i)   We are members of the UK Regulators Network (UKRN) climate change network. This forum provides a platform for member regulators to share and exchange net zero best practice, promoting a whole-system approach, when appropriate.

ii)   We engage through the UKRN's net zero Regulators-Government Forum. This allows us to share information, identify needs and look for areas of cooperation between government departments and regulators.

2.6   We engage with industry:

i)   Ofcom encouraged the creation of the Digital Connectivity Forum's Climate and Sustainability Working Group (DCF-CSWG). This group's main focus is emissions reduction, but the DCF is also interested in climate resilience, as demonstrated in its State of the Industry Report, which sets out industry measures to improve climate resilience.

ii)   Since 2023, we have helped convene an annual telecoms industry sustainability roundtable, creating a catalyst for further discussions, including on adaptation.

2.7   To support Ofcom's aim of ensuring an appropriate level of resilience for networks and services across the UK, we have published resilience guidance describing a range of practices in the architecture, design, and operational models that underpin robust and resilient telecoms networks and services.[4] Telecoms providers are expected to have regard to this guidance when considering their resilience-related security duties.

2.8   The guidance makes clear that there is a wide range of risks that communications providers need to assess in relation to network resilience and service reliability.[5] Most of these risk categories are not related directly to climate, although some do overlap with climate change issues.[6] The guidance also recognises that climate change is leading to more uncertain weather conditions and that during severe weather events the resilience of UK networks to maintain services, particularly emergency services, is made more important.

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[3] Ofcom, Connected Nations 2023 - UK Report, p.76-78.

[4] Ofcom, Network and Service Resilience Guidance for Communications Providers, September 2024. The guidance covers network design (which includes physical and logical planes), processes, tools and training.

[5] These include, for example, external physical threats, human risks, technology, physical and cyber security vulnerabilities, loss of key dependencies, architecture vulnerabilities and software failures.

[6] For example, within the category of external physical threats, our guidance describes the risk posed by natural phenomena, which can include factors such as extreme weather, flooding, lightning, falling trees.

3. Industry reporting on climate risks and opportunities

3.1 This section summarises our understanding of industry's approach to climate change, before focussing on industry's views on preparedness, barriers to further work and potential solutions. It does not provide an assessment by Ofcom of the merits of these points, but highlights issues which could be explored further.

Climate change risks are incorporated into wider business risk management processes

3.2 Most respondents use frameworks that weight the potential impact of risks against likelihood, and many include assessments of likely timeframes. They typically integrate assessment of climate risks as part of wider, business-as-usual risk processes.

3.3 Some respondents have specific committees, or risk registers, for climate change issues, which typically feed into broader risk management processes. Larger telecoms providers also report routinely on climate change as part of their annual plan and accounts processes, typically spanning emissions, as well as risks and opportunities.

3.4 Ownership of climate risks is assigned to different areas, including sustainability teams, affected parts of the businesses, or governance committees.

Providers identify and organise climate risks

Firms generally use a mix of internal and external expertise to identify risks

3.5 Almost all firms make use of internal and external subject matter experts to identify climate risks. Approaches described include:

a) **Internal expertise:** some firms rely primarily on internal expertise to identify and manage risks. Some emphasise that they encourage risk identification as a bottom-up process, as well as from the top down.

b) **External support:** in some cases, a list of risks has been produced internally before being shared with external consultants for further advice, such as to support benchmarking. In others, firms have collaborated with external advisers early on, or throughout.

c) **No processes:** a minority treat climate as a normal risk with no additional analysis.

3.6 Some firms have carried out an initial long-listing of climate risks as a one-off activity, whereas others do this on an ongoing basis.

Firms use a range of similar scenarios to categorise risks

3.7 Defra's guidance includes timeframes for reporting on near-term (present day), medium-term (mid-century) and long-term (end of century) climate risks. Most respondents we spoke to use short, medium and long-term ranges to model scenarios and risks but with

different definitions. Typically, short term is considered by industry to be around 1-3 years, medium term 2-10 years, and long term 10-50 years. In some cases, these ranges are pegged to other internal processes such as risk management or investment. Two respondents said that they do not use timeframes to model impacts.

3.8   In terms of temperature change scenarios used, most firms use two to three scenarios, typically including changes of around 1.5, 2 and 4 degrees, often with reference to Intergovernmental Panel on Climate Change standards. Although the ranges used are broadly similar, no two firms report using exactly the same set of temperature scenarios.

3.9   A few firms conceptualise these three scenarios as being the result of i) a steady implementation of policies to reduce emissions (orderly transition), ii) less action in the short term, ramped up later on (disorderly transition) and iii) business continues as usual with minimal transition efforts. One firm has different scenarios for transitional and physical risks, while another uses net zero against a 3 degree scenarios.

3.10   Firms use a mix of qualitative and quantitative approaches to measure risks. Some conduct qualitative analysis, before employing more in-depth quantitative analysis of shortlisted risks. Other firms use qualitative and quantitative measures differently across their analysis, depending on factors such as by the timeframe or the area of functional delivery.

Firms don't identify a material present risk, based on assessment of physical and transitional risks

3.11   Telecoms providers are considering two broad categories[7] of climate risk:

- **Physical risks:** resulting from the permanent effects of climate change.

- **Transitional risks:** resulting specifically from the *transition* to net zero, but may not persist once this has been achieved.

3.12   Some firms are considering both types, while others are only considering physical risks.

All firms consider physical risks

3.13   Amongst physical climate change risks, providers highlight impacts on telecoms infrastructure, workforce, and suppliers.

3.14   Physical infrastructure risks – such as data centres located in areas at high risk of flooding, or high winds causing a threat to cell towers – are seen as particularly relevant. Potential impacts of these risks include increased costs, loss of service, and delays, all of which could in turn affect profitability and customer satisfaction.

3.15   Workforce risks include safety and productivity, delays and staff shortages. These risks are likely to affect different types of roles in varying ways. For example, one provider said climate change is likely to affect field staff more than office staff (who still face a risk, but to a lesser extent), while others said that, amongst field staff, those working on maintenance could be affected more than those building new services.

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[7] Some risks can cut across both categories, such as energy costs which might increase due to the transition to net zero, as well as permanently as a result of the effects of climate change.

3.16   Firms underline two key issues related to suppliers, some of which are also identified as transitional risks:

   a) Disruption, such as to third-party operated services including call centres, product delivery, outsourced manufacturing sites and IT facilities.
   b) Costs, with climate change causing both increased prices and greater volatility in the price of energy, transport and manufacturing.

Some firms consider transitional risks and opportunities

3.17   Only a few providers discussed transitional costs of moving towards net zero and/or outlined plans to mitigate them.

3.18   Of those that do consider transitional risks, firms expect the price of electricity to both rise and to be more volatile during the transition to net zero.[8] Some say that they could also face increased R&D costs as they seek to become more energy efficient, while also noting that resulting improvements could help to offset costs in the longer term.

3.19   Some firms anticipate that potential future legislative changes could increase the requirements on firms to reduce their emissions, which could in turn increase exposure to financial or legal risks.

3.20   Firms also recognise potential reputational risks. They generally anticipate that consumers, employees and the financial sector will have a preference for more environmentally conscious providers. Some consider that failure to adhere to these expectations could lead to loss of customer loyalty, challenges for staff recruitment and retention, and a lack of access to sustainability-related finance.

3.21   Firms also identify transitional opportunities. In particular, firms emphasise the potential benefits of telecoms enabling ICT solutions to reduce emissions in other sectors, which could increase consumer and business demand for telecoms services. Some also consider that being proactive on climate change can improve their reputation amongst customers and support access to sustainability-related financing.

Firms do not see significant material risks currently, but most expect climate change risks to increase over time

3.22   Firms do not consider that climate change presents a significant material threat to the sector in the present, and most explicitly express confidence in the resilience of their business strategy towards climate threats. At the same time, the majority of firms expect climate risks to become increasingly material over time.

3.23   Where firms consider transitional risks, they generally view these as being of greater significance in the short term, with physical risks having a greater impact in the long term, particularly in high-emission scenarios.

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[8] This could have a direct impact on firms' electricity costs and an indirect effect through increasing electricity costs for their suppliers.

Firms are taking action on specific climate risks

3.24   Firms take a variety of approaches to convert their assessment of climate risks into tangible adaptation action. In particular, extreme weather events have been integrated into planning for recovering network services in the aftermath of extreme weather events. Table 1 summarises specific risks and how firms are managing them.

Table 1: Summary of how firms manage specific climate risks

	Monitoring Activity	Views/assessment of scale of risk and interdependencies	Current or planned future mitigations	Barriers and enablers to adaptation
Flooding	Some monitor flood risk reports (e.g. from the Met Office). Some have flood alarms and alerts in place for infrastructure.	Considered a principal risk by some firms. Assessments made using climate scenario data to understand flood risks. Power outages a key interdependency during flooding – full-fibre network can still operate when flooded with power.	Some firms instituted multiple mitigations, generally: avoiding building in high risk areas when possible; moving equipment above flood level; and installing flood defences at high risk sites. Some note that, for fibre networks, flooding does not affect service unless power is affected.	Barriers: flood risk reports from different agencies can be contradictory; lack of consistent communication from DNOs on power restoration during outages. Opportunity: shift to full fibre might enable more resilience to flooding against copper as it requires fewer cabinets.
Extreme temperatures and higher average	Some use temperature monitoring of equipment and buildings to assess extreme heat.	Not identified by any as a principal risk. Interdependency with 3rd party data service suppliers (cooling during heatwaves).	Some mitigate through ensuring appropriate cooling systems were in place, while some also seek to ensure these do not lead to a risk of significantly higher energy bills.	Potential barrier: cooling systems raise emissions through electricity and use of synthetic greenhouse gases. Potential tensions with wider sustainability strategies.
High winds	Some firms outlined monitoring service risk reports from the Met Office, amongst other similar organisations.	Some consider impact of higher wind across fixed and mobile infrastructure, data centres. Cell towers seen as at highest risk of high winds. Higher risk of power loss.	Most have a regular programme of inspection and design infrastructure to be able to cope with high. Installation of batteries and generators to provide power in the case of a power cut.	Barrier: interdependency with utility firms.
Lightning	Some monitor service risk reports from the Met Office, amongst other similar organisations.	In most cases lightning is considered alongside other risks as part of planning for storms.	Lightning is treated as part of business continuity processes, in common with other storm related risks such as high winds. Some integrate protection in infrastructure design.	None outlined.
Wildfires	Most firms do not consider wildfires or carry out any monitoring activity related to this.	Currently not considered by most, and given lower priority than other risks.	No common actions outlined. For mobile estate, creating a perimeter in forested areas was highlighted by one CP.	None outlined.

Firms consider interrelated risks and interdependencies with other sectors

3.25   Firms highlighted that some of the individual risks described above can occur concurrently, particularly those associated with storm conditions. As a result, some consider factors such as high winds, flooding and lightning holistically. Some retailers also highlight their dependence on Openreach to ensure its infrastructure is adapted concurrent risks.

3.26   Firms also describe how some actions address a range of risks, particularly in relation to physical infrastructure, as well as business continuity planning and operational resilience. Some say that FTTP roll-out may aid resilience by reducing the amount of infrastructure required, and hence the risk of damage.

3.27   The vast majority of firms outline their dependence on the energy sector, particularly in respect of power outages, to secure resilience to concurrent climate risks during storm events, such as floods, high winds and storms. Most also highlight the role that their work to extend the provision of power backup through both generators and batteries is playing to mitigate this.

3.28   Firms have engaged with the energy sector and other utilities, such as through the Electronic Communications Resilience and Response Group (EC-RRG) and the Energy Networks Association (ENA). For example, they have been trialling information sharing during major storms to support better resilience. Some firms explicitly told us that they do not carry out any cross-sector work to tackle interdependencies.

Looking ahead: firms identify challenges and potential solutions to further resilience adaptation

3.29   Firms highlighted a series of potential barriers to further measures to promote resilience to climate change, including:

- **Co-ordination challenges:**

  > **Government:** some firms note that responsibility for climate adaptation is shared between at least four UK Government departments, as well as devolved administrations and local authorities. Two firms, for example, cite specific issues with planning approval and decisions on where new homes are built presenting challenges for future resilience.

- **Industry:** Some firms note that competitive market dynamics can in general deter collaboration. One respondent highlights, for example, that more could be done to standardise measurement of risks and infrastructure resilience.

- **Interpreting available climate change data:** firms highlight challenges related both to potential gaps in climate data to inform resilience planning, and difficulty in interpreting available data without the expertise of trained climate scientists. One firm also describes a risk that expertise for outsourced services can be concentrated amongst a small group of providers.

- **Interdependency with the energy sector:** firms raise challenges related to resilience of supply in extreme weather and of price volatility more generally. One firm, for example, says it receives only limited information from Distribution Network Operators about

which locations are priority for power restoration and restoration times. Another highlights that a lack of granularity of information (currently provided at postcode level) for electricity outages makes it harder to identify and address power outages.

- **Tension between adaptation and reducing emissions:** a few firms emphasised how actions taken to adapt to climate can come into tension with reducing emissions, such as when installing backup power units and or using energy to power cooling systems.

3.30 To address these challenges, firms consider that more could be done to support collaboration, including further co-ordination across government departments, the telecoms sector and with the energy sector. Some firms support a greater role for the Digital Connectivity Forum, stressing the importance of recognition and sponsorship from government departments. Examples of areas that could be explored through further collaboration include: developing industry guidance or securing agreements on standardisation on monitoring risks; improving granularity of data and processes with the energy sector; and support for interpreting relevant climate change data.