

# Policy makers need to proactively implement network resilience strategies to maintain public safety

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Telecoms networks, particularly mobile networks, are becoming increasingly affected by natural disasters (for example, storms, floods and wildfires) worldwide due to the effects of climate change, resulting in prolonged network outages, in some cases.

## The unpredictability of the impacts of climate change demands a proactive approach to mobile network resilience

Network outages have various negative societal and economic effects such as preventing people from making emergency calls. Furthermore, public-sector emergency networks (for example, police, fire brigade and rescue) are also affected, which is made worse by the fact that emergency networks are increasingly relying on public mobile networks such as FirstNet (implemented on AT&T's mobile network in the USA) and the Emergency Services Network (implemented on EE's mobile network in the UK).

Additionally, with major structural changes currently taking place in fixed networks – notably large-scale fibre roll-out and copper switch-off in many countries – there is the risk that more people need to rely on mobile communications during natural disasters.<sup>1</sup> Therefore, in order to maintain public safety and mitigate the economic impact of climate-related natural disasters, the implementation of a mobile network resilience strategy is essential.

Some countries have already implemented bespoke mobile resilience measures while other countries, which, historically, did not experience as many natural disasters, are now starting to formulate such strategies as the risk of climate-related natural disasters increases. This article provides two interesting examples of resilience strategies from around the world that we hope will assist policy makers who are considering how to best develop such a strategy.

## The Australian government has been implementing incremental measures to enhance the resilience of its mobile networks

Between June 2019 and May 2020, Australia experienced a series of bushfires across the country, which caused significant damage to its electricity grid and telecoms networks.<sup>2</sup>

In response to these events, the Australian government launched the [Mobile Network Hardening Programme \(MNHP\)](#) under its [Strengthening Telecommunications Against Natural Disasters \(STAND\)](#) umbrella programme in January 2020, which provided grant funding to network operators to implement resilience measures via a

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<sup>1</sup> Public switched telephone network (PSTN) copper network is directly powered by copper lines and therefore does not rely on power to be available at the end user's premises whereas fibre end-user devices cannot operate without power unless they are equipped with a back-up battery.

<sup>2</sup> 1390 telecoms facilities were affected by the bushfires, with around 50% of the country experiencing network outages lasting over 4 hours, 51km of damaged copper cables and 9km of damaged optical fibre cables.

competitive tender process. Resilience measures include a minimum of 12-hour back-up battery, portable and permanent generators at selected sites, redundant backhaul and physical site hardening. The government sets a yearly budget under this programme to continuously implement enhanced resilience measures as it continuously assesses which measures should be prioritised and which are within their budget to do so. Initially, grant funding covered up to 50% of the initial eligible equipment capex and the remaining 50% was covered by the operators. The latest round of resilience measures introduced by the government provides grant funding for up to 75% of eligible initial equipment capex and equipment replacement capex over a 10-year period considering commercial viability of these resilience measures.

## Norway has proactively adopted a mix of regulatory and government policy measures to improve network resilience

Norway has suffered power outages over the years in certain regions due to heavy snowfall and storms. In particular, Norway was heavily affected by [Cyclone Dagmar](#) in 2011, with mobile networks being severely damaged and many sites being out of service.<sup>3</sup> Following this event, the Norwegian telecoms regulator, Nkom, mandated a 2–4 hour back-up battery for access sites which had to be fully funded by the mobile network operators (MNOs) themselves.

Due to the increased frequency of severe weather events and power outages in some municipalities, Nkom introduced the Enhanced Electronic Communications (EEC) programme in 2014, which aims to deliver enhanced power and backhaul resilience. The EEC provide the following resilience measures:

- power back-up of at least 72 hours and physically redundant backhaul to at least one mobile radio access site per municipality
- at least one physically diverse redundant backhaul route, and at least one backhaul link must be fibre-based.

Under the EEC programme, Nkom selects appropriate EEC sites in each municipality<sup>4</sup> and estimates the costs for enhancing each site that has been selected for the EEC programme in consultation with all MNOs. The government provides annual grant funding adding up to around EUR10 million per year, which covers both capex and opex over a 10-year operations period. On average, resilience measures for each EEC site costs around EUR1 million, which means around ten sites can be enhanced with resilience each year.

## Each country requires its own tailored network resilience strategy

While countries can learn lessons from various existing mobile resilience measures from other countries, each measure needs to be fit-for-purpose for the specific country. Resilience measures should consider factors such as geographical characteristics, demographics, statistics of natural disaster events and the quality and robustness of the existing infrastructure (including backhaul connectivity and power grid networks). Moreover, a continuously proactive approach is required as consequences of climate change have become more unpredictable over time, while also taking into account the ongoing evolution of technology (for example, satellite-based communication is expected to play an increasingly important role in formulating resilience strategies, especially with the deployment of low earth orbit (LEO) satellite constellations and direct-to-device communications).

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<sup>3</sup> 35 000 households lost power for more than 24 hours.

<sup>4</sup> There are 350 municipalities in Norway.

## About Analysys Mason

Analysys Mason has significant global experience in designing mobile network resilience strategies to mitigate the network impacts caused by natural disasters and maintain public safety. If you would like to talk to one of our experts in network resilience, please get in touch with [Franck Chevalier](#), [Khoosh Oodhorah](#) or [Matt Yardley](#).