

ELECTRICITY: HOW LONG COULD WE SURVIVE WITHOUT IT?

As cities expand, so does demand for electricity. Electricity is required for everything from providing citizens with water to other community functions such as powering hospitals, traffic control systems and communications. Power outages pose serious threats to communities in terms of safety, heating, cooling, nutrition and healthcare.

According to the Intergovernmental Panel on Climate Change (IPCC), the world will likely experience more extreme weather as a result of climate change¹. Extreme weather poses an increasing threat to power supply and increases the risk of frequent damage to electrical power systems, affecting hundreds of millions of people.

Power outages often occur because of storms, heavy snow, lightning or intense heat. According to a report by non-profit news organization Climate Central, weather-related blackouts doubled between 2003 and 2014 in the United States^{2,3}. Cities need to prepare infrastructure for the challenges ahead.

Previous blackouts in Europe have had severe consequences. For example, in early 2019, Storm Alfrida caused power outages in large parts of Sweden, leaving 100,000 households without power. In 2003, when a tree fell on an important power line in Switzerland, 56 million people in Italy and Switzerland were without power for several hours. On Christmas Day in 2011, a storm left 40,000 people in Norway without mobile coverage or landlines, more than 40,000 homes in Sweden without power, and 300,000 customers without power in Finland, with large swaths of the country without power for several days and some areas for up to three weeks.

KEY FINDINGS – WHAT NEEDS TO BE DONE?

The Urban Insight report “Electricity: How long could we survive without it?” explores how communities can be better prepared for power outages and the consequences if they are not. Much can be done to improve cities’ resilience to power outages. Recommendations on how to secure power supply and improve safety management are listed below.

- All countries should conduct risk assessment based on security of supply to identify the weakest points in their systems.
- Cities need to plan weatherproof networks to secure electrical power supply, e.g. through better energy storage and moves towards underground cables.
- Technical safety management can reduce the frequency and duration of power outages. This can help cities avoid costs running into millions of euros.
- Securing energy supply is not only to understand technical detail but also to understand the reason why power outages can happen. National preparations for power outages are needed to ensure inhabitants’ safety and healthcare.

Today’s urban development of electrical system affects future communities and the environment of inhabitants. We need to make it easier to choose clean energy sources. Also, systems need to adapt to new energy production. But to secure power supply, both centralised and decentralised production are necessary when considering communities’ energy production and distribution.

1) www.ipcc.ch/

2) www.phys.org/news/2016-04-blackouts-europe.html

3) www.assets.climatecentral.org/pdfs/PowerOutages.pdf

Digitalisation has transformed cities: today, there are more automated devices and machines than ever before. Not only do designers and urban planners need to consider how automated systems work, but also what happens if they malfunction, for example due to planned or unexpected power outages.

URBAN ENERGY SYSTEMS NEED TO ADAPT TO NEW ENERGY PRODUCTION

Energy production in Europe is undergoing major changes. Holistic risk assessment evaluates critical functions and processes, and proposes solutions to optimise safety. With holistic technical safety management, cities and communities can reduce the frequency and duration of power outages. This can prevent costs of millions of euros of damage caused by power breaks.

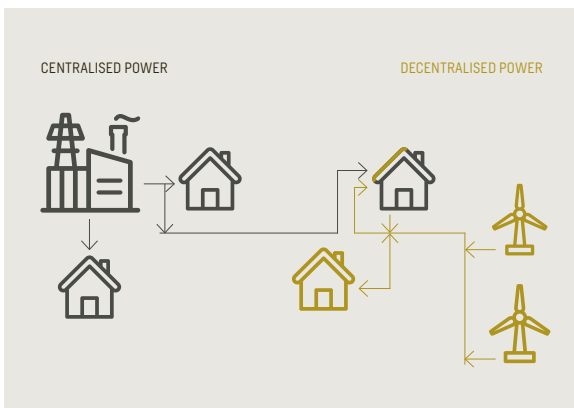
WHAT CAN YOU DO?

Technical safety is often overlooked. Our sense of safety tends only to be triggered when technical safety fails. By securing a good risk assessment, cities can prepare for power outages and reduce longer blackouts.

Find out if you know how to handle power outages by answering these questions:

1. What can be done to prevent emergency situations caused by power breaks?
2. What can we do to minimise disruption to society, and people around you, when power breaks happen?
3. Which kind of communication is needed under power outages?

Read more about how we can build resilient electrical systems in the Urban Insight Report [Electricity: How could we survive without it?](#)



Ill. 1 (above left): Differences between centralised and decentralised energy networks. Local producers are connected to networks, an aspect that should be considered in network design.

Ill. 2 (above right): Smart housing refers to a variety of automated services in the home. Power outages might shut down such devices and services.

Ill. 3 (below right): In the absence of intelligent control systems, large numbers of electric vehicles connected to the grid simultaneously may cause local power outages.

