

CEN Public Briefing: Intermittency

**Intermittency**

- Intermittency is often cited as an issue with renewable energy. Sometimes the wind doesn't blow or the sun doesn't shine, meaning renewable sources can fail to produce enough energy to meet demand.
- While it's true that sometimes individual renewable plants don't work at full capacity it is worth noting that even traditional coal, gas or nuclear power plants can experience downtime due to maintenance or unexpected failures. The key difference is that renewable energy sources are more distributed, with multiple smaller generators spread over a larger area, making it less likely that all of them will experience downtime or low capacity at the same time.
- But when the wind isn't blowing and the sun isn't shining, well-designed electricity systems with high levels of renewables can still produce ample electricity, thanks to several key innovations.

**What happens when the wind doesn't blow and the sun doesn't shine?**

- **Interconnectors between different regions mean that excess renewable energy produced in one area can be transferred to another area where it's needed** For example, Europe has been developing a network of interconnectors that allows surplus wind energy from windy regions like Denmark to be exported to other parts of the continent. This can help balance out the variations in renewable energy production and ensure a more stable electricity supply.
- **Resilient electricity systems use different renewable energy sources**, as well as other low-carbon energy sources like nuclear power. Nuclear power plants can provide a consistent and reliable source of baseload energy, which can complement the variability of renewable sources. In addition, nuclear power plants do not emit greenhouse gases, so they can play a role in reducing our carbon footprint. Other renewables like hydroelectric power can also be used at short notice. Less carbon-intensive fossil fuels like gas can be used in much the same way with carbon capture and storage as a transition fuel but they are not necessary for a resilient energy system in the long run.
- **Energy storage can also help to ensure a consistent supply of renewable energy.** Renewable energy sources often produce excess energy at certain times. This can then be stored for later use. Energy can be stored in a variety of ways, including pumped hydro storage, compressed air storage and thermal storage. New technologies like batteries and hydrogen are also being developed to work at scale. When renewable energy production exceeds demand, the excess energy can be stored for later use. Then, when energy production is low, the stored energy can be used to meet the demand. Eventually, the idea of baseload will become an outdated concept as storage and renewables will obviate the need to have a backup power source.