# How can we increase the **climate resiliency** of the **electricity system?**

Renewables Grid Initiative

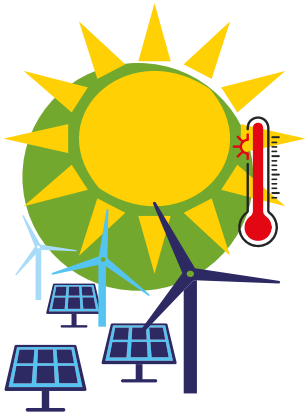
## The electricity system is becoming increasingly dependent on weather and climate conditions as we electrify and integrate renewables.

\+ Climate change increases the weather variability, as well as the likelihood and severity of **extreme weather events and cascading disasters** such as windstorms, heavy precipitation, droughts, or wildfires.

\+ Changing weather patterns and extreme events **impact the whole electricity system**, which creates severe implications for the planning and operation of the system infrastructure.

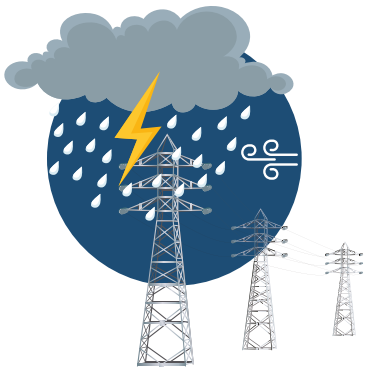
\+ Planning climate resilient electricity infrastructure means **anticipating, limiting, and recovering quickly** from adverse climate impacts.

## The electricity system is sensitive to climate change and extreme weather events, for example:



**POWER PLANTS**

Efficiency and potential of generation assets can be affected.



**POWER LINES**

Transmission and distribution electricity grids can be disrupted.

**CONSUMERS**

Heating and cooling demands are directly affected by extreme temperatures.

## Including climate projections in energy modelling is necessary to ensure an affordable, secure, and sustainable energy system.

Relying on a single past climate year in electricity system planning used to be a common practice. With advancing climate change, planning tools should consider a wider range of climate scenarios.

## Connecting climate science and energy planning expertise is a complex task.

**TOOLS**

Lack of standardized tools for combining expertise from the two disciplines.

**DATA**

Unavailability or incorrect use of granular data and energy models.

**COMPLEXITY**

Potentially challenging for non-meteorologists to understand climate models without losing crucial information.

## The Pan-European Climate Database is a good example of the adjustment process of energy models to climate change.

This database contains a large set of variables that can be used for modelling and planning the European electricity system. This tool is currently being adapted to better address climate change impacts by using several climate scenarios and models.

# Solutions for **successful climate adaptation** require:

## TAILORED MEASURES

Investing in resilience enhancement measures, such as:

- **grid hardening** (physically stronger infrastructure),
- **smart operation** (better monitoring and control), and
- **network recovery plans** (shorter service disruption).

## RESEARCH

Considering extreme climate scenarios in energy system models and planning tools.

## GOVERNANCE

Reinforcing policies and regulations to include climate impacts in electricity infrastructure planning.

## PARTNERSHIPS

Building and strengthening transdisciplinary collaborations, such as the Copernicus Climate Change Service or the European Climate + Energy Modelling Platform.

Renewables Grid Initiative

renewables-grid.eu

Hitachi Energy

Co-funded by the European Union

Based on the discussion at the Modellers' Exchange Workshop - "Climate change impacts on electric system infrastructure: towards adaptation and resilience planning" organized by RGI in collaboration with Hitachi Energy, that took place on September, 21, 2022 in Brussels.