



WEMC
World Energy &
Meteorology Council

Copenhagen, 20 Sep 2018

What can European climate services offer to the energy sector?

Prof. Alberto Troccoli

World Energy & Meteorology Council and University of East Anglia, Norwich, UK

EEA – Workshop on Adaptation for European Energy Systems



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Energy and meteorology go hand in hand



Passing clouds



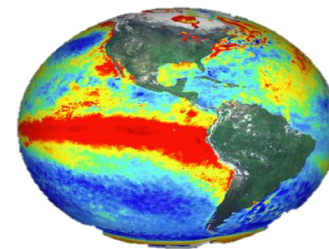
Drop in
solar power



Hurricanes



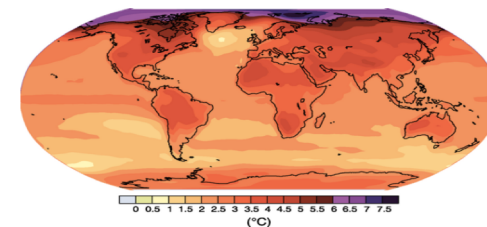
Disruptions to oil
rig operations



El-Niño



Changes in Demand
Patterns



Long term changes



Renewable Resource
Assessment

Seconds

Minutes

Days

Months

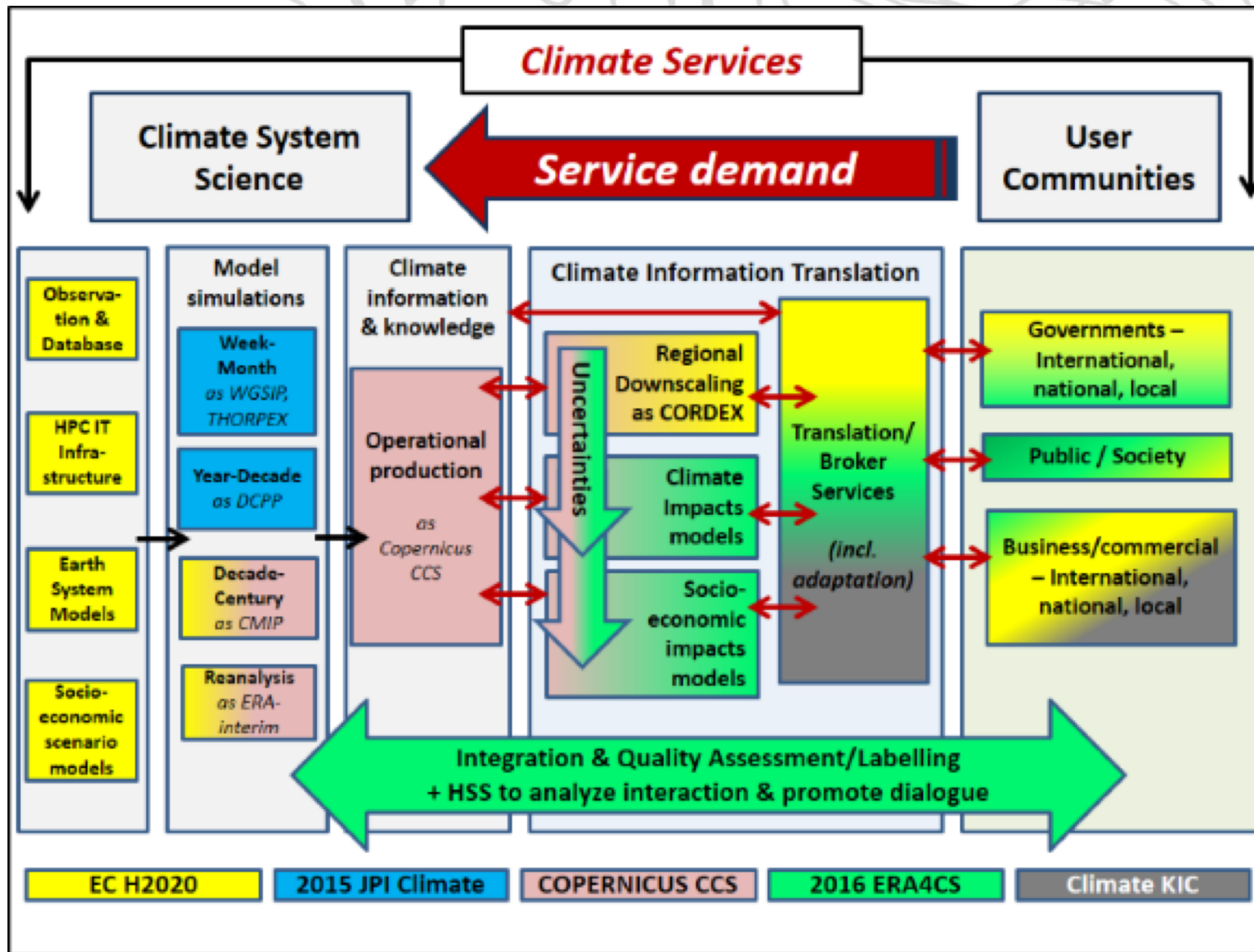
Seasons

Years

Decades

Climate Services Landscape in Europe

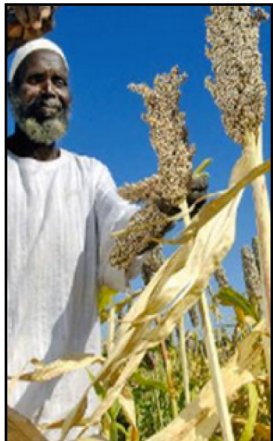
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Global Framework for Climate Services

To enable **better management of the risks** of climate variability and change and **adaptation to climate change**, through the development and incorporation of science-based climate information and prediction into planning, policy and practice on the global, regional and national scale.

Priority Areas



**Agriculture and
food security**



**Disaster risk
reduction**



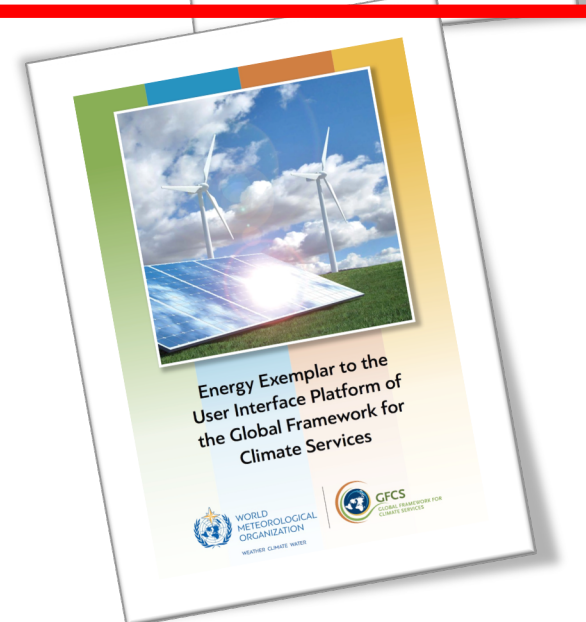
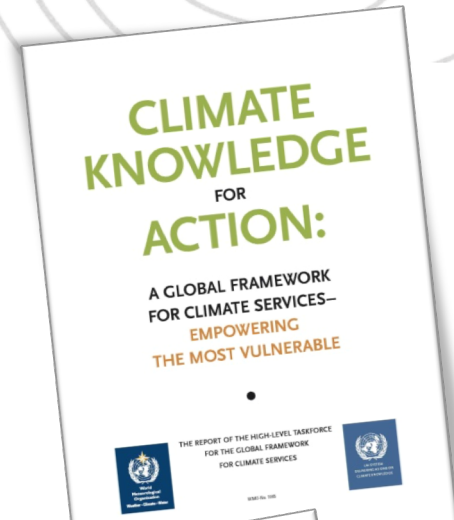
Water

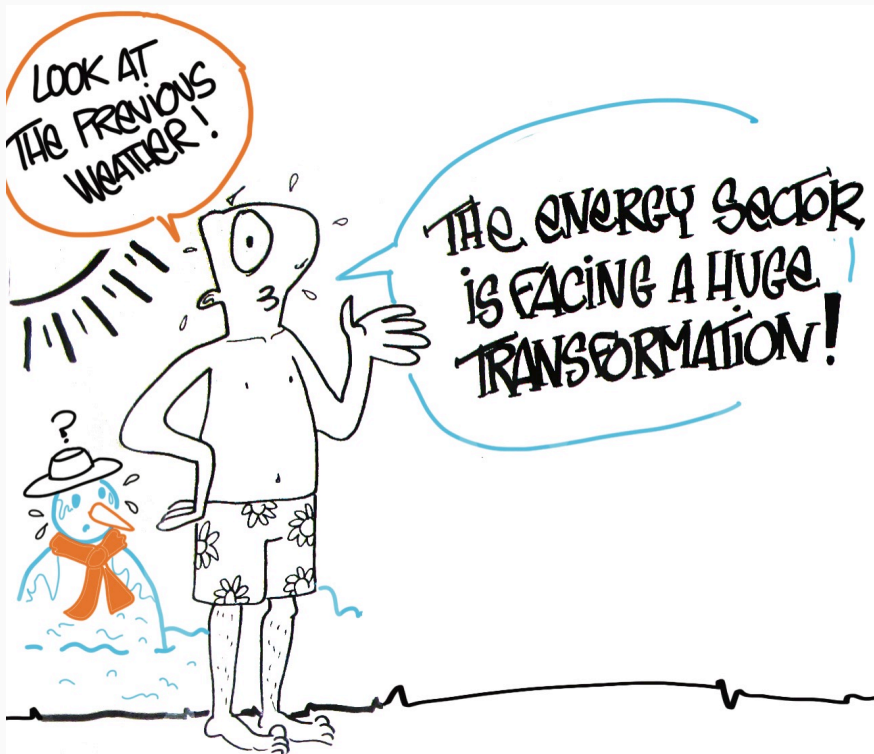


Health



Energy





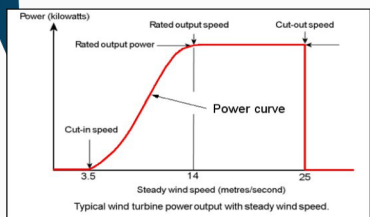
The Copernicus Climate Change Services (C3S) European Climatic Energy Mixes (ECEM) developed a **demonstrator** to which provides data and information to assess how well **different energy supply mixes** in Europe will meet demand, over different time horizons, focusing on the role climate has on the mixes.

Calibrated Climate Variables

Temperature
Rainfall
Wind Speed
Cloud Cover
Solar Radiation
Others ?
River Discharge

+Ancillary

Define models & transfer functions
Select / Gather relevant datasets



Energy Variables

Hydro Power
Demand
Wind Power
Solar Power
Thermal Power

• Skill & Reliability

• Assessment of Seasonal Forecasts of Energy Variables

+ Extreme Events Case Studies



- Sub-Country Scale
- Historical Period
- Seas. Fcst
- Clim. Proj.

Countries Clusters

Time Period: Historical

Variables: Climate ?

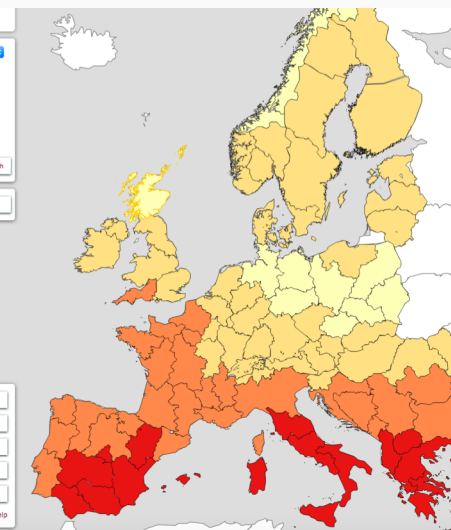
Surface Solar Radia

Temporal Resolution: 1 month

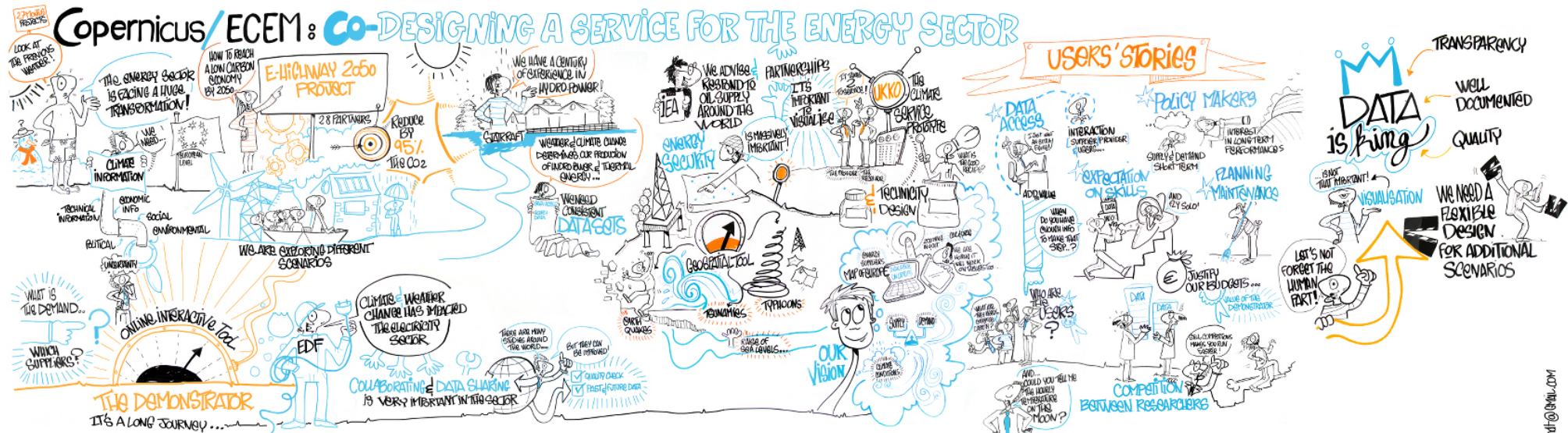
Cluster: 94 United Kingdom

New graph Refresh graph Add to graph

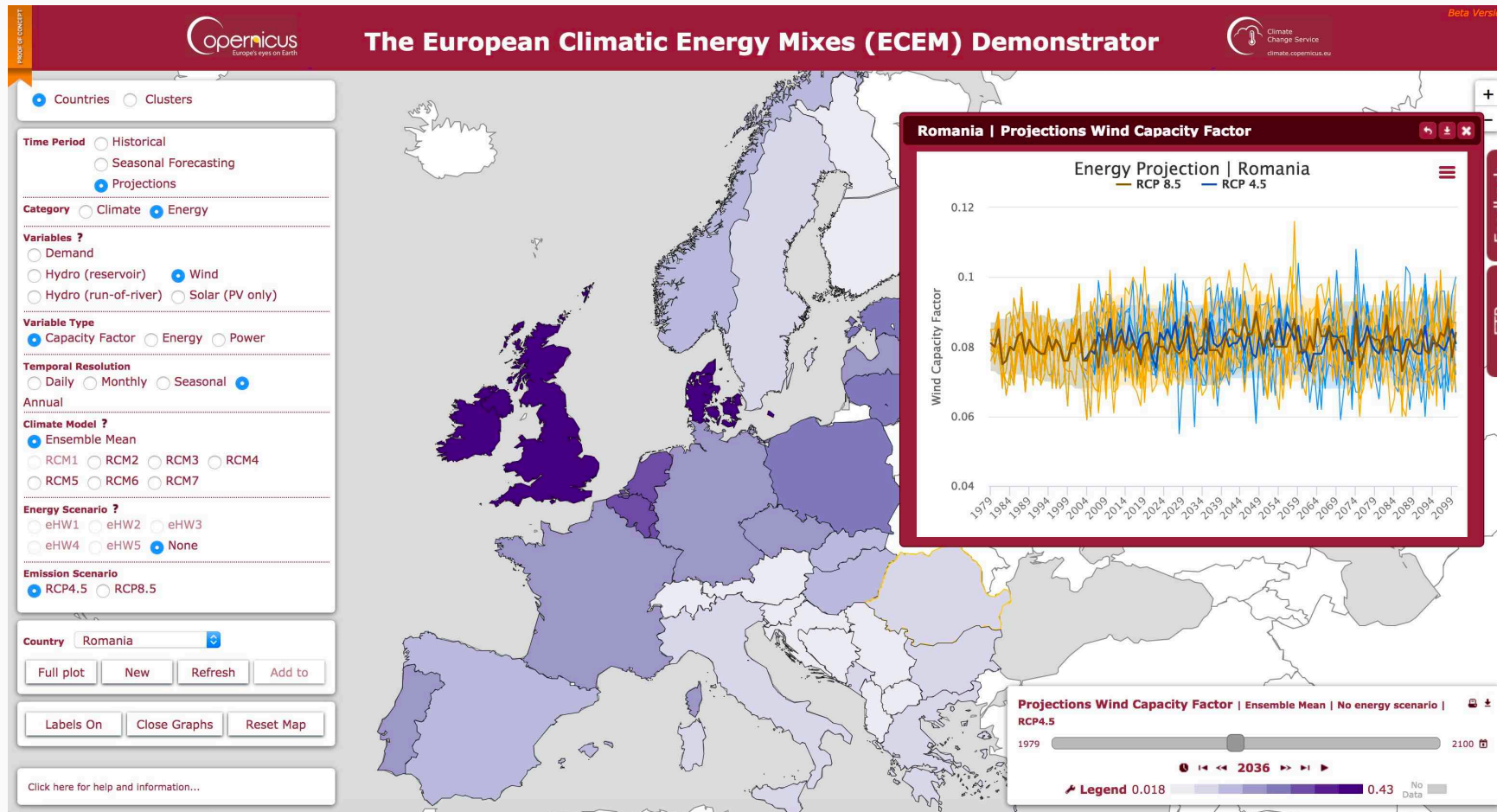
Labels On Close Graphs Reset Map



Stakeholder Engagement: Workshops



An online interactive tool to test energy mixes



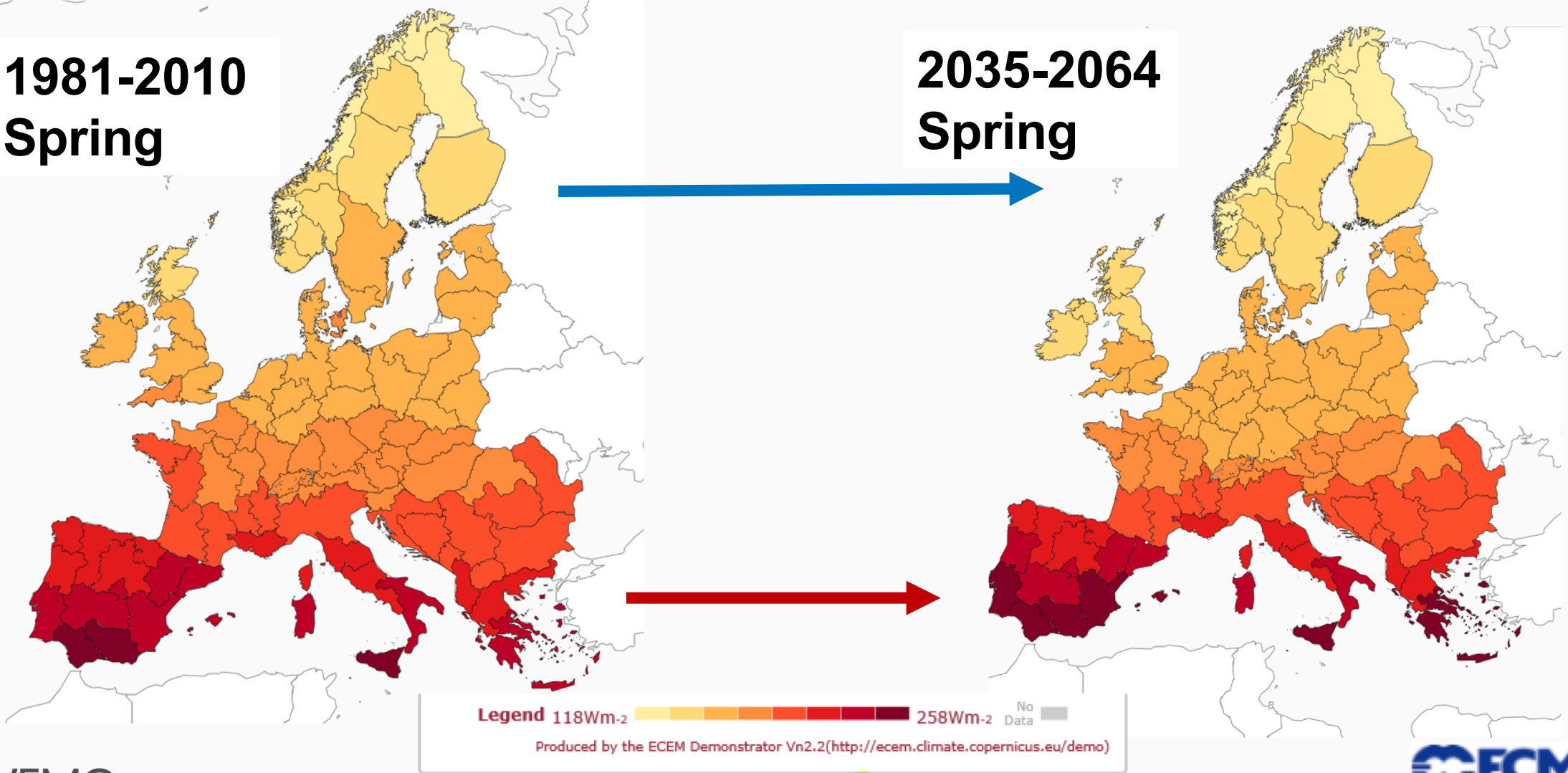
https://www.youtube.com/watch?v=U-w5_sTHqG4

<http://ecem.wemcouncil.org>

Climate Projection (RCP 8.5) Radiation

**1981-2010
Spring**

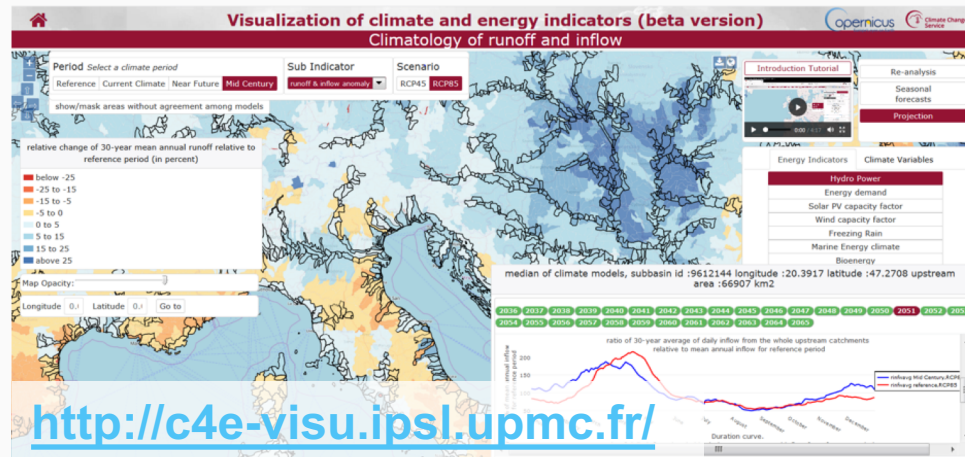
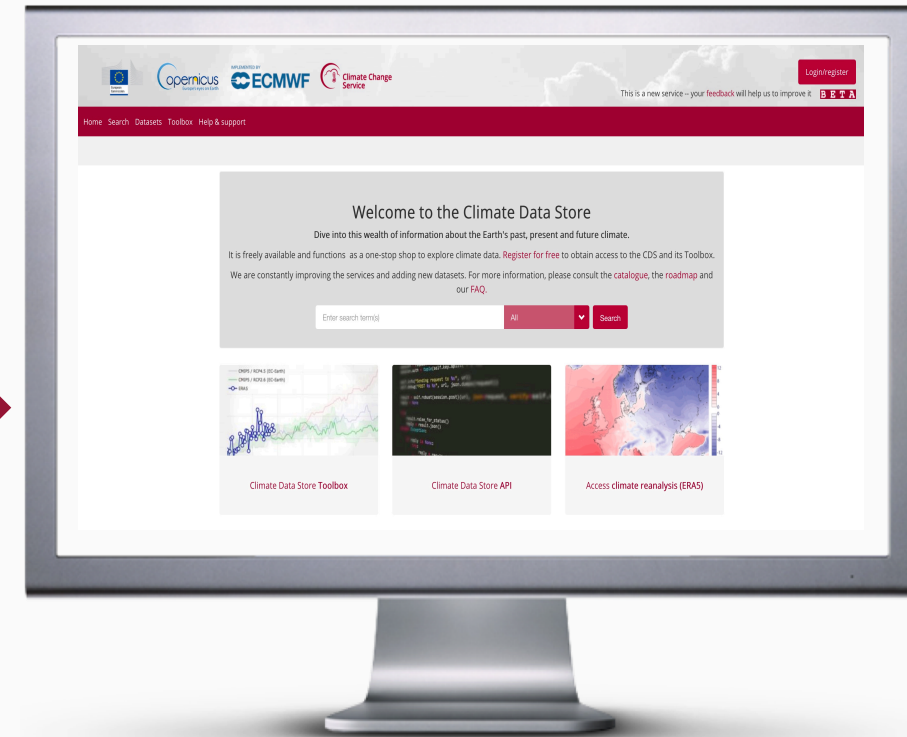
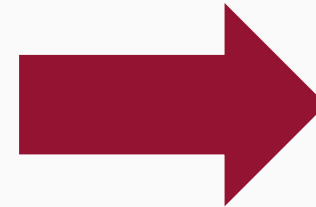
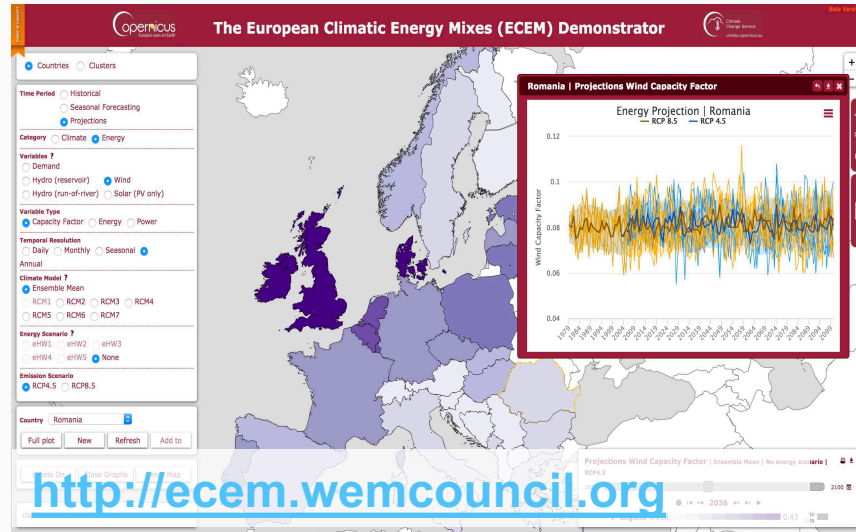
**2035-2064
Spring**



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C3S ENERGY – An operational system



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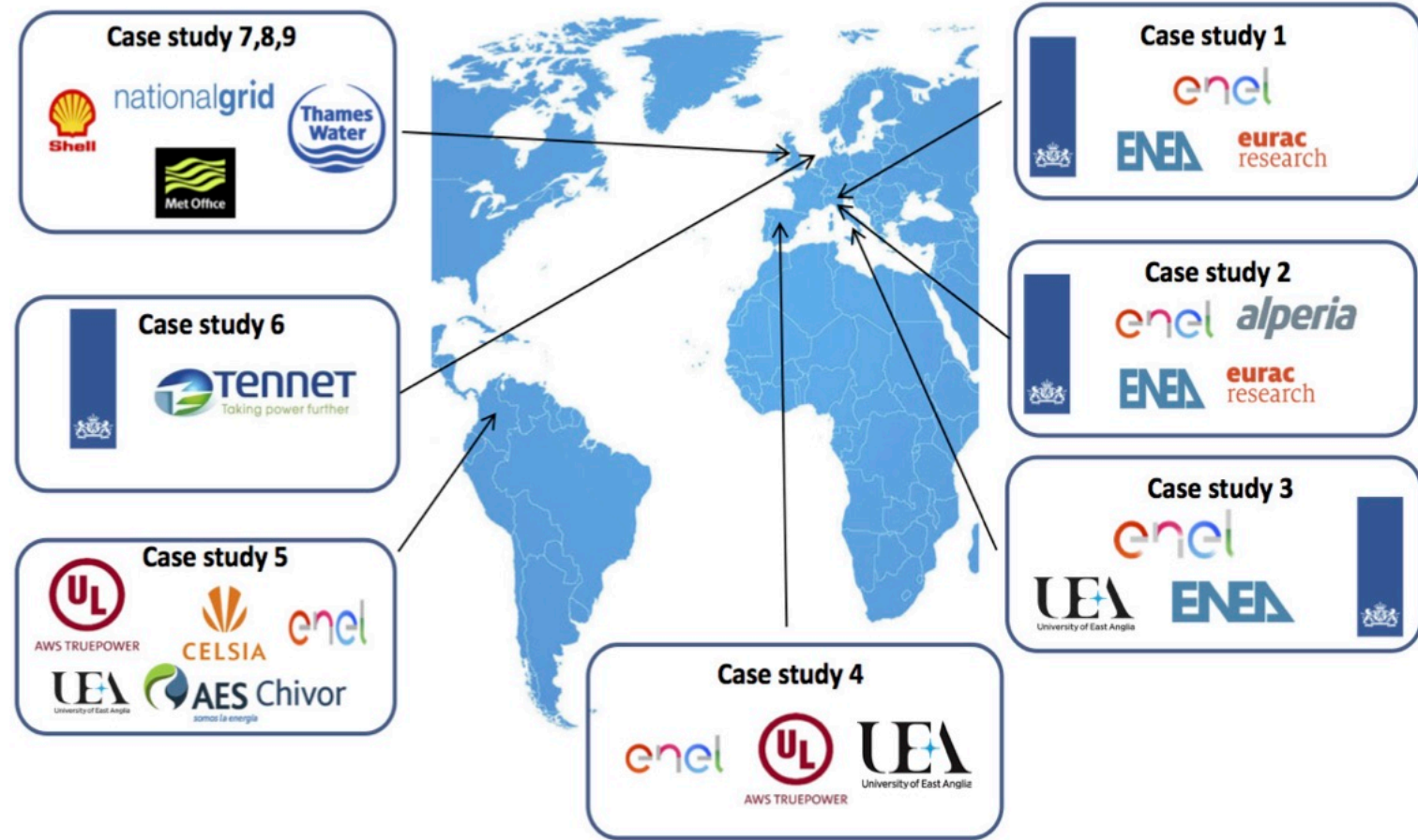




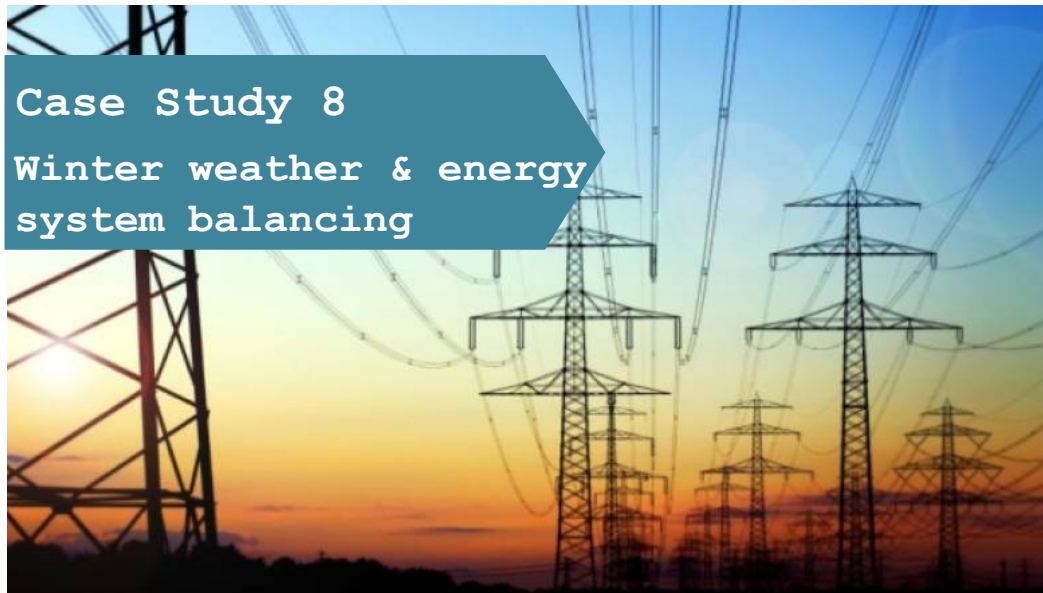
How can seasonal climate forecasts help your business?

Nine cases for Europe and S. America will be investigated.

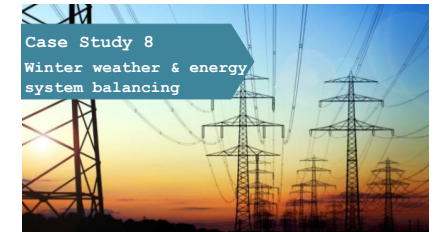
These represent recent seasons with anomalous climate conditions leading to problematic and quantifiable impacts for the energy and/or water industry. They will be co-designed by industrial and research partners



Use of seasonal forecasts by the UK National Grid Operator



The objective is to illustrate the benefits of using seasonal forecast information to better predict the UK winter mean electricity demand and wind power



Focus: Use of seasonal forecasts by the UK National Grid Operator

Boosting Decision Making

The objective is to illustrate the benefits of using seasonal forecast information to better predict the UK winter mean electricity demand and wind power.

The seasonal forecasting context

The case study focuses on demonstrating the impact of using seasonal temperature, wind and atmospheric circulation forecast information for the United Kingdom (UK) National Grid operator. The climate forecasts will be translated into energy information, to give a forecast of winter UK energy demand and wind power.

Sectoral challenges and opportunities

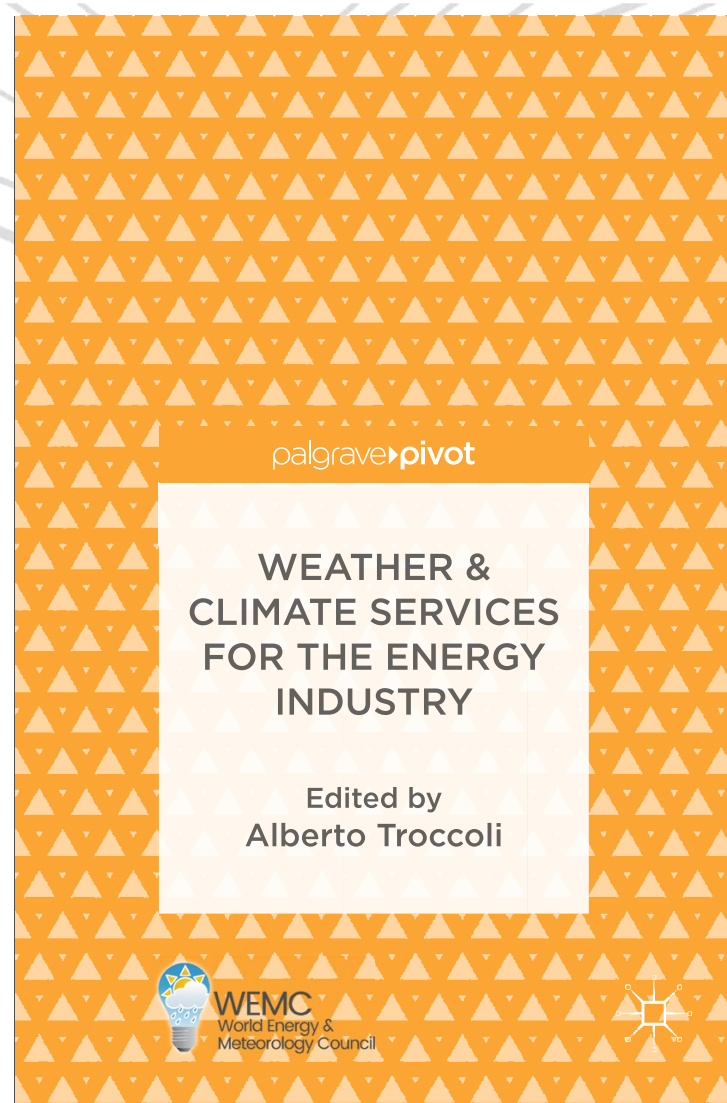
The grid network has a central role to play in the future energy mix. In a fast-changing energy landscape, National Grid is working to meet ambitious low carbon energy targets, connect new sources of energy to the people who use them, and find innovative ways to enable the decarbonisation of heat and transport. Ahead of each winter, the UK grid operator must estimate the demand over the coming winter, with a particular focus on peak electricity demand. This is to ensure there is sufficient electricity supply available to meet this demand. By identifying potential risks to the system ahead of the winter, we will explore whether it is possible to reduce balancing costs over the winter period.



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To download it (it's free!), please visit:

<https://link.springer.com/book/10.1007%2F978-3-319-68418-5> or
<http://www.wemcouncil.org/wp/resources/>

Upcoming Events

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SECLI
FIRM



6th International Conference Energy & Meteorology

24-27 June 2019
Copenhagen, Denmark

<http://www.wemcouncil.org/wp/icem2019/>




2nd Stakeholder Workshop
17 January 2019, Milan

<http://www.secli-firm.eu/events>

Would like to learn more?

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 **C3S ECEM:** <http://ecem.wemcouncil.org>

 **C3S ENERGY (operational service):**
<https://climate.copernicus.eu/operational-service-energy-sector>



H2020 SECLI-FIRM:
<http://www.secli-firm.eu>





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Thank You



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WEMC primary goal is to enable improved

Sustainable energy

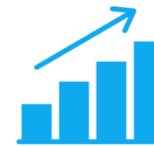
For a low carbon economy

Resilience

Of energy
infrastructures

Efficiency

Of energy systems



Under ever changing weather and climate



1. The **dissemination of information** on products, practices, and experiences in Energy & Meteorology including the promotion of our members' work
2. The **coordination of Special Interest Groups** leading to the production of reports, analyses and syntheses on key topics in Energy & Meteorology
3. The development and maintenance of **climate and energy demonstration tools** for the energy industry and the education of the general public
4. The **organisation of events** such as the International Conference Energy & Meteorology (ICEM), professional workshops, seminars and webinars