Case study: Understanding changes in risk of cold, high demand winters using the ECEM projections

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**MOTIVATION**

- Using a case study approach to:
  - Demonstrate the value of climate information for understanding variability and informing risk

<table>
<thead>
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<th>Understanding Variability</th>
<th>Seasonal Forecasting</th>
<th>Future Change</th>
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<td>Return times of particular classes of events and their impacts</td>
<td>How can seasonal forecasts be used for the energy sector?</td>
<td>Changes in risk of events under future climate</td>
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<td>Pattern based analysis of large-scale drivers using historical reanalysis</td>
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<td>Identifying vulnerabilities under future power systems</td>
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• Using a case study approach to:
  – Get the best out of the ECEM demonstrator tool and datasets
  – How might demonstrator tool be used to understand risks of particular events?
ECEM CASE STUDIES

• A series of case study documents available from the ECEM demonstrator
Use ECEM demonstrator and data to boost decision-making
- Fewer temperature-related winter demand peaks seen in future
- Increasing sensitivity of power system to weather as renewables generation increases
- Likelihood of low wind winters in future is similar to their occurrence in past

The ECEM datasets:
- Bring together credible climate and energy data
- Processed in a consistent way over Europe
- Covering a range of time scales and resolutions

Historical data and projections data has been used to:
- Explore the changes in occurrence and impact of winters like 2009/10
- Highlight the changing balance between temperature/demand-driven power systems and renewables generation driven systems
- Ask ‘what if’ questions
- Help to anticipate future risks
• Record power demand in 2010
• A very cold winter
• What if winter 2009/2010 happened today?
Can we anticipate cold spells and their impacts?
- Climate projections useful to anticipate changes in risk
  - Fewer cold winters likely in future, although still possible
• Anticipating future demand (UK)
• Future potential for renewables supply (wind - UK)
• Risk to supply under future energy mixes (wind - UK)
• Current cases:
  – Winter 2010
  – Climate projections of cold, still winters
  – Seasonal Forecasting (focus on the Balkans region)
  – Spanish heat wave 2015
  – Technical report on historical variability

• Other cases:
  – Get in touch if you have cases you’d like to explore!
• Use ECEM demonstrator and data to boost decision-making
  – Unusually cold winter of 2009/2010 can be seen in the ECEM data
  – Impact of a winter like 2009/2010 would have bigger impact on energy sector today
  – In future fewer temperature related winter demand peaks are expected
  – Low wind winters still possible in future and will have a larger impact due to increased wind power capacity

• Reanalysis, seasonal forecasts and climate projection data can:
  – Reveal dependencies and risks across Europe
  – Put an event into context of recent history
  – Ask ‘what if’ questions
  – Help to anticipate future risks