



Potential use of climate information for mitigation and adaptation of the energy sector

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In order to reach ambitious climate mitigation targets, low-carbon energies must grow very fast in the coming decades. Scenarios leading to a limited warming of 2°C have a share of low-carbon energies exceeding 50% by 2050 for total energy supply and 80% for electricity supply [IPCC, 2014]. Supply of electricity from renewable energies, with a varying resource uncorrelated to the demand, is expected to grow in the coming decades. Thus the energy system at the scale of a connected grid will become more vulnerable to weather and climate variability. For an improved management, as well as for optimized investments, climate information is crucial. Seasonal forecasts and climate projections of essential climate variables help energy producers, traders and grid operators to better cope with such climate variability. However these climate model outputs need to be properly tailored.

Climate trends and associated changes in the risks also impact the energy industry. Changes in energy demand due to higher temperature are expected. Precipitation regimes are also expected to change, inducing evolution in hydropower resource, in low flow risk and river temperatures with impacts on thermal production. Wind and solar power resources may also change. Risks of extreme events such as extreme cold spells, heat waves, heavy snowfalls and freezing rain, storms, floods combined with increasing sea level may also evolve, potentially requiring adaptation in the supply and transmission systems.

The presentation will review the impacts of climate change on the energy sector at the scale of Europe. The potential of a pan-european climate service for the energy sector will be discussed through a few typical examples where climate science appears mature enough to provide valuable information for the sector.