

PARALLEL SESSION C: IMPACTS AND APPLICATIONS
C2: REGIONAL ATMOSPHERIC AND OCEAN CIRCULATION SYSTEMS

**Towards the assessment of climate change impacts on critical energy infrastructure
applied for offshore wind farms**

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Critical infrastructures are facilities of special importance for countries and broader economic regions. Implications can result in severe consequences for associated sectors and society as a whole. Regarding critical energy infrastructure, planning and operational horizons usually span several years to decades. Hence, climate and climate change information of potential direct or indirect impacts for such infrastructure is of interest for planning purposes serving risk management and to assure secure and sustainable energy supply.

Here we present a first step towards a methodological framework to assess the climate related impacts on critical energy infrastructure, which is exemplarily applied for offshore wind energy. As part of the project management financing is an important key aspect. Large wind farm projects of the size of power plants are most commonly based on financing, which in turn is covered by sold energy produced during operational phase. As the variable renewable resource wind might be affected by climate change energy production from wind could be affected directly. Furthermore, extreme events might be affected potentially causing enhanced machine malfunction. This could impact on project financing as well as in a broader sense on energy security.

In a first attempt, high-resolution climate simulations addressing wind farm characteristics will be carried out with the regional climate model REMO. First results of a systematic process-based analysis will be presented with a focus on wind climate in terms of variability and boundary layer characteristics. This information can serve as valuable climate information for climate service applications as well as subsequent economic assessment.

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