S2S Real Time Pilot Workshop

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Presentation Title: Climate services for clean energy: the S2S4E project

Presenter & co-author names: Albert Soret, Ilaria Vigo

Presenter & co-author affiliations: Barcelona Supercomputing Center

Session Title: Theme 2: Use and evaluation of S2S forecast applications

Abstract:

Energy is responsible for over 70% of GHG emissions globally. Therefore, the energy transition is pivotal to achieve the Paris Agreement's goals. The *European Green Deal* is fostering massive development of renewable energy, especially solar and wind. At the same time, climate change, increasing climate variability and extreme events, is posing a challenge to integration of renewables into the power mix. Although ongoing research has focused on assessing the impacts of climate variability at different timescales, research gaps still need to be addressed. One noticeable gap is providing robust and homogenised information that would break down the artificial barriers coming from different observational and modelling systems and temporal and spatial scales.

The S2S4E project developed an innovative service to improve renewable energy variability management by developing new research methods exploring the frontiers of weather conditions for future weeks and months. The main output of S2S4E was a user co-designed Decision Support Tool (DST; https://s2s4e-dst.bsc.es/) that for the first time integrated sub-seasonal to seasonal (S2S) climate predictions with renewable energy production and electricity demand indicators.

The pilot of the DST has been developed in two steps. The first step was drawn on historical case studies pointed as relevant by energy companies - e.g. periods with an unusual climate behaviour affecting the energy market. An ex-post analysis of the forecasts and their impacts on users' risk management was conducted. The impact analysis covered energy trading, production planning and maintenance. The second step was an improvement of probabilistic S2S real-time forecasts built up into the DST. The DST was providing S2S forecast near-real time for 18 months. The performance and the usability of the system was assessed in real life decision-making processes with three different energy companies covering different regions and strategies. The evaluation served to identify the potential value of the service as well as the gaps providing inputs for improvements.