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Climate services for clean energy: the S2S4E project

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Despite cost competitive in many settings, renewable energy diffusion remains limited largely due to its generation variability. To foster renewable energy deployment while maintaining energy security, the S2S4E project will provide sub-seasonal to seasonal (S2S) climate forecasts. The main objective of S2S4E is to make the European energy sector more resilient to climate variability and high impact events, such as heat waves, by exploring the potential of S2S predictions tailored to users' needs. This information will enable the energy industry to assess the renewable energy sources capacity to meet demand over extended time horizons (weeks to months), focusing on the impact of climate variables on energy outputs. Based on a user-centric approach of climate services development, S2S4E will provide access to tailored real-time climate prediction products to optimise decision making across all levels of the energy sector community. A Decision Support Tool (DST) will be co-designed and co-developed with relevant industrial partners of the consortium which represent different needs and interests in terms of regions, renewable energy sources (wind, solar and hydro) and electricity demand. The DST will be developed taking into account eight historical case studies pointed as the most relevant by industrial partners, i.e. periods with an unusual climate behaviour affecting the energy market. To illustrate S2S potential, one of these case studies will be presented. In winter 2016 a significant decrease of wind speed was observed through all central and southern Europe leading to a reduction of wind energy generation. At the same time the cold wave observed in December had a significant impact on the power system. It created a combination of large increase in electricity demand and lower than usual renewable energy generation.