Climate services in support of the energy transformation

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The energy sector is undergoing a major transformation. This transformation in the energy sector is taking place against a variable and changing climate. Given the weather-and climate-dependency of both renewable energy and demand (even in the case of large storage uptake), it is important to develop robust climate-based tools to advise energy planners and policy makers.

This talk will describe how the EU Copernicus Climate Change Service (C3S) European Climatic Energy Mixes (ECEM) project can assist in this energy transformation. ECEM is producing, in close collaboration with prospective users, a proof-of-concept climate service, or demonstrator, whose purpose is to enable the energy industry and policy makers to assess how well different energy supply mixes in Europe will meet demand, over different time horizons (from seasonal to long-term decadal planning), focusing on the role climate has on the mixes.

Energy time series were modelled and computed at country level and daily time step for the whole of Europe. Bias-adjusted Essential Climate Variables from ERA-Interim over a European domain for 1979-2016 produced by ECEM were used to calculate energy variables, namely electricity demand and generation from wind, solar and hydro power. Different approaches were adopted depending on the target variable, and the availability of measured data to calibrate and validate the energy models.

Examples from the C3S ECEM Demonstrator – an interactive and visual tool which allows users to view and explore energy supply and demand profiles for each European country (and for ca 100 clusters) and generation type, as well as climate variables, in map and/or time series format – will be used to illustrate the power of climate services in supporting the energy industry. The C3S ECEM Demonstrator is being developed according to user needs and integrates the energy and climate variables being produced in C3S ECEM on historic, seasonal forecast and climate projection timescales. Data can also be downloaded directly from the Demonstrator.

The presentation will conclude with an outlook for future developments of climate services for the energy sector, and what benefits they could provide to the energy industry and decision makers at different levels.