EMS Annual Meeting Abstracts
Vol. 14, EMS2017-822, 2017

The ECEM climate service: how reanalysis can help energy planning

Laurent Dubus (1), Matteo De Felice (2), Sandra Claudel (3), Yves-Marie Saint-Drenan (4), Alberto Troccoli (5), Clare Goodess (6), Siyue Zhang (1), Thierry Ranchin (4), and Hazel Thornton (7)

(1) EDF R&D, Applied Meteorology and Atmospheric Environment, CHATOU CEDEX, France (laurent.dubus@edf.fr), (2) ENEA, Bologna, Italy (matteo.defelice@enea.it), (3) EDF R&D, Saclay, France (sandra.claudel@edf.fr), (4) Mines Paristech, O.I.E, Sophia Antipolis, France (yves-marie.saint-drenan@mines-paristech.fr), (5) WEMC, Norwich, UK (alberto.troccoli@wemcouncil.org), (6) CRU, UEA, Norwich, UK (C.Goodess@uea.ac.uk), (7) Met Office, Exeter, UK (hazel.thornton@metoffice.gov.uk)

European Climatic Energy Mixes (ECEM) is a Copernicus Climate Change Service (C3S) activity which is developing, in close collaboration with the energy sector, a proof-of-concept model – or demonstrator. Its purpose is to enable the energy industry and policy makers to assess how well energy supply will meet demand in Europe over different time horizons, focusing on the role climate has on energy supply and demand.

This presentation sums up how energy time series were modelled and computed at country level and daily time step for the whole Europe.
Bias-adjusted Essential Climate Variables from ERA-Interim over a European domain for 1979-2016 were used to calculate electricity demand and generation from wind, solar and hydro power. Different strategies were adopted depending on the target variable, and the availability of measured data to calibrate and validate the energy models. For demand, individual models were set up for each country, using a general approach based on Generalized Additive Models. Hydro power generation could not be modelled precisely using a physical model at plant level, due to the lack of a plants database; hence a simplified statistical model approach was chosen, and gives good results. Wind and solar power generation were modelled with both statistical and physical models.
Results of these different models and approaches will be presnted, and compared to actual measurements or estimations of electricity demand and supply. Comparison will also be made with other projects.

We will then present how the produced time series are integrated into the ECEM demonstrator, and how such information can be exploited to analyze and understand the supply/demand balance problem at the European scale. We will also discuss some critical needs for the further development of such services, including the availability of energy data.

The service developed by ECEM is original in the sense that it provides a European wide, multi-parameters view of the energy system, and we will finally discuss how it can be further developed in the future, and what benefits it could provide to the energy industry and decision makers at different levels.