

How can Seasonal to Decadal forecasts be useful to the power sector ?

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The power sector is increasingly dependent on weather and climate, in the whole range of its activities (demand, production, transport and distribution). The impacts concern all time and space scales. Forecasting parameters describing the state and the evolution of the atmosphere, the ocean and the hydrosphere are essential for both the physical and technical management of energy systems and their financial optimization in national or regional competitive markets.

If state-of-the-art numerical weather predictions are routinely used for plant management optimization on short to medium term, longer lead times decision making processes need climate information as well. Long range forecasts (seasonal to annual and even decadal) have indeed become ever more important to the – physical and financial – optimization of the systems, especially for temperature and precipitation, which drive demand and hydropower production. The progress in monthly and seasonal forecasting systems in the last decade have begun to provide solutions and helped increase the reliability in energy production and demand forecasts, but much work is still needed to capitalize on recent scientific developments.

Long term investment strategy and planning are essential for the energy sector as well, with the scope between 10 and 50-60 years ahead. Currently running facilities are challenged by unprecedented extreme events like summer heat waves and droughts for instance. Design of new facilities and infrastructure, as well as adaptation of the current ones, hence require information on the possible climate of the coming decades, in terms of mean, variability and extremes.

Some key processes of the power sector on s2d timescales will be presented, as well as examples of current practices and fields of research. Identified gaps and suggested pathways will be discussed.