AKE 14: System Aspekte und Modellierung

Time: Tuesday 17:30–18:00 Location: DO24 Reuter Saal

AKE 14.1 Tue 17:30 DO24 Reuter Saal

Demand Side Management and the Potential of Power to Heat for Balancing Fluctuating Production from Renewable Energy Sources — •David Kleinhans — NEXT ENERGY - EWE-Forschungszentrum für Energietechnologie an der Carl-von-Ossietzky Universität Oldenburg, Carl-von-Ossietzky-Str. 15, DE-26129 Oldenburg

Environmental issues and limitations in the availability of resources necessitate an increased degree of sustainability for future power systems. In fact the availability of Renewable Energy Sources (RES) could be shown to be sufficient for a transformation of energy system towards a production based almost entirely on RES. One of the major conceptual drawbacks, however, are spatio-temporal fluctuations in the availability of the main resources, wind and solar power.

This contribution addresses the role of demand side management in future power systems. In particular, the potential for demand side management is investigated and discussed with respect to its storage-equivalent characteristics. Based on the evaluation of simulation data it is investigated, to which extend demand side management can contribute to an integration of fluctuating RES. A particular field of applications for demand side management is the heating and cooling sector with its rather high share in energy consumption and the availability of efficient storage devices. For this reason a particular focus is on the potential for a renaissance of power to heat technologies and economical aspects of their integration and operation.

AKE 14.2 Tue 17:45 DO24 Reuter Saal

Data Assimilation System KENDA and Weather Dependent Renewables — •Stefan Declair, Annika Schomburg, and Roland Potthast — Deutscher Wetterdienst, FE12 - Datenassimilation, Frankfurter Str. 135, D-63067 Offenbach

To predict the amount of power produced by weather dependent renewable energy sources is a demanding task for the transport system operators (TSOs) in terms of net stability and power supply safety. In the BMU funded project EWeLiNE, the German Weather Service and the Fraunhofer Institute for Wind and Energy Systems develop innovative weather- and power forecasting models for the grid integration of weather dependent renewables to strongly support the TSOs.

Due to the chaotic behavior of the atmosphere, data assimilation is a crucial part in numerical weather prediction (NWP) to correct model data towards the true atmospheric state. The kilometerscale ensemble data assimilation System KENDA consists of the non-hydrostatic and convection-resolved short-range NWP system COSMO-DE, together with a Local Ensemble Transform Kalman Filter (LETKF) to take observational data into account and create a best-fit initial state for the subsequent NWP model integration.

In this presentation, the EWeLiNE project is introduced. Furthermore, the LETKF and its integration into a potentially operational system is explained. Additionally, the needs to successfully apply KENDA within the EWeLiNE project to improve the power prediction based on the weather forecast by assimilating power measurements are discussed.