

“Energy planning and the transition to renewable energy systems”

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Room 211 | Fondazione Bruno Kessler | Via Sommarive, 18 Povo (TN)

Abstract:



Future energy systems need to be based on renewable energy sources, they need to be integrated and thus **exploiting synergies across traditionally distinct energy sub-sectors** and they need to be flexible to accommodate variations in demand and availability of various fluctuating renewable energy sources. Analyses have demonstrated how such smart energy systems can cover the electricity needs as well as energy needs for transportation and thermal services (cooling/heating) of Denmark. Balancing the energy system with a high temporal resolution remains a challenge particularly when energy systems are designed under strong biomass availability constraints. **Demand flexibility in the**

electricity sector is of limited avail for balancing the system, however integration with thermal needs and transportation enable the utilisation of low-cost storage and demand flexibility in these sectors.

In his presentation, **Poul Østergaard will introduce the results of Danish energy planning** and how the transition that Denmark has undergone is a result of interaction between academia, interest organisation and official planning. This is followed by a look at how energy system simulation and analysis have been instrumental in establishing viable developments paths and to overcome institutional inertia. Finally some of the main possibilities and issues in the transition to renewable energy systems are presented.

Biography:



Poul Alberg Østergaard is professor in energy planning at the Department of Planning at Aalborg University, Denmark. He has worked within the field of energy planning since 1995 with a focus on simulation of energy systems based on high penetrations of renewable energy sources as well as on the design of renewable energy system scenarios.

Poul is currently work package leader on the 4DH project which focuses on 4th generation district heating and is involved in two large projects starting up in 2017; deputy head in REInvest on renewable energy investment strategies for Denmark in an interconnected European context and work package leader in the EU funded SMILE project on smart renewable energy islands.

In addition, **he is the programme director of the M.Sc. programme in Sustainable Energy Planning and Management at Aalborg University and editor-in-chief of the International Journal of Sustainable Energy Planning and Management.**

EnergyPLAN:



EnergyPLAN is a software that simulates the operation of national and regional energy systems on an hourly basis, including the electricity, heating, cooling, industry, and transport sectors. It is developed and maintained by the Sustainable Energy Planning Research Group at Aalborg University, Denmark. The model is used by many researchers, consultancies, and policymakers worldwide. This is

possible due to the key focus on sharing the model during its development. For example, the model has a user-friendly interface, it is disseminated as a freeware, there is a variety of training available, and existing models are already available for many countries. The EnergyPLAN model has been used in hundreds of scientific publications and reports.