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Lecture by Henrik Lund

Smart Energy Systems and the modelling of sector integrated national energy strategies

ABSTRACT

In recent years, the terms “Smart Energy” and “Smart Energy Systems” have been used to express an approach that reaches broader than the term “Smart grid”. Where Smart Grids focus primarily on the electricity sector, Smart Energy Systems take an integrated holistic focus on the inclusion of more sectors (electricity, heating, cooling, industry, buildings and transportation) and allows for the identification of more achievable and affordable solutions to the transformation into future renewable and sustainable energy solutions.

It is often highlighted how the transition to renewable energy supply calls for significant electricity storage. However, one has to move beyond the electricity-only focus and take a holistic energy system view to identify optimal solutions for integrating renewable energy. In this presentation, an integrated cross-sector approach is used to argue the most efficient and least-cost storage options for the entire renewable energy system concluding that the best storage solutions cannot be found through analyses focusing on the individual sub-sectors. Moreover, such approach leads to a solutions primarily based on existing energy infrastructures rather than leading to significant extra investments.



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Henrik Lund (born 2 July 1960) is a Danish engineer (M.Sc.Eng.1985) and Professor in Energy Planning at Aalborg University in Denmark. He holds a Ph.D. in Implementaion of Sustainable Energy Systems (1990), and a Dr.Techn. in Choice Awareness and Renewable Energy Systems (2009).

Henrik Lund is a highly ranked world-leading researcher. He is listed among [ISI Highly Cited](#) researchers ranking him among the top 1% researchers in the world within engineering.

Henrik Lund has many years of management experience as head of department for approx. 200 staff persons (1996-2002), head of section for approx. 50 persons (2014 – 2016) and head of research group of 20-30 persons (2002 – present). During his time the Sustainable Energy Planning research group at Aalborg University has now grown to approx. 30 staff members including 5 professors.

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