Technical University of Denmark

Inaugural Lecture

Professor Marie Münster is giving her inaugural lecture on Friday October 12, 2018 at 15.00 at DTU Lyngby, building 303A, auditorium 41.

Modeling future cost-efficient renewable energy systems providing power, heat and fuels

In the Paris agreement, it was decided to keep well below 2 degrees global warming. In order to do that, substantial reductions in greenhouse gas emissions are required in the energy and the transport sector. Analysis of future scenarios for national and regional energy systems can help to ensure robust investments by clarifying if certain pathways and technologies are efficient in many different possible futures.
Existing tools for energy system analysis mainly focus on modeling the electricity sector with some of them linking to the district heating sector, such as the Balmorel model. Energy system analyses have shown that these sectors can be fueled with renewable energy (RE) resources with minor or no cost increases compared to business as usual.
The major challenge for the future is to ensure that a similar cost-efficient transition of the transport, industry and individual heating sectors becomes possible. In order to achieve that, the synergies of the different sectors should be utilized including power-to-gas and power-to-heat, as well as utilization of excess heat. This necessitates modeling of smart integrated energy system and improved modeling of flexibility and uncertainty, as well as advanced modeling of utilization of local bioenergy resources, including waste fractions. Furthermore, energy system analysis tools must contribute to highlight environmental impacts, and deliver in terms of transparency and accessibility.
Marie Münster has applied the tool, Balmorel, using linear cost-optimization with focus on the role of biomass and waste to produce flexible power, district heating and renewable fuels and gases in combination with other RE and Power-to-X solutions. In her talk, she will present results of her research and an outlook to the research challenges of the future.

DTU Management Engineering would like to invite all interested to welcome our new Professor with special responsibilities in Energy Systems Modeling at DTU Management Engineering, Marie Münster.

There will be a reception after the lecture.

Mette Wier, Head of Department
DTU Management Engineering