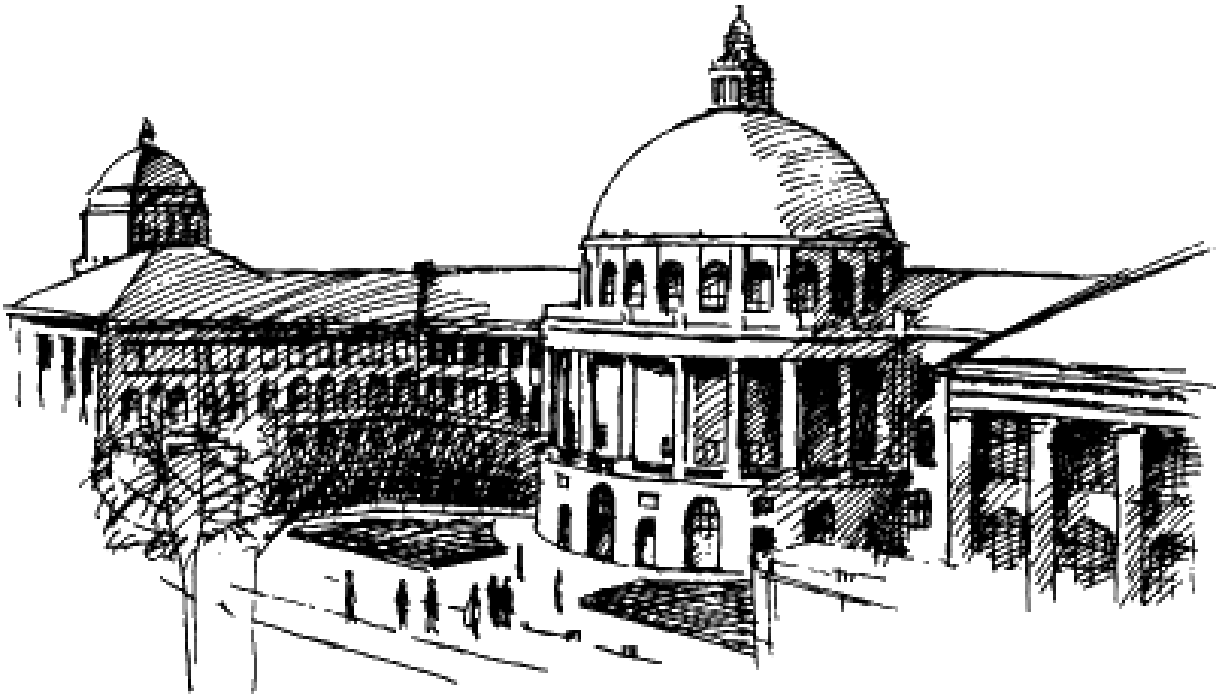
ETH zürich



ESC workshop

Frontiers in Energy Systems Modelling

Experiences in energy markets, integration of renewables and combining modelling approaches.

Organized by the Energy Science Center (ESC)
Zürich, 19th of November 2015.

10:10 am to 4:50 pm
LEE E 101, LEE Building, ETH Zürich
Leonhardstrasse 21, 8092 Zürich

Energy Science Center

ETH Zurich
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Sonnegstrasse 28
8092 Zürich
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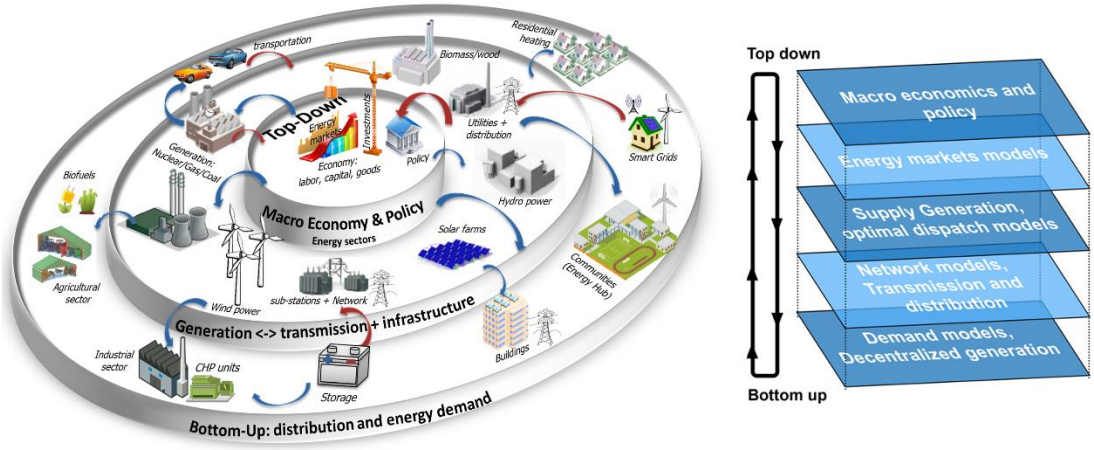
Workshop on Energy Systems Modelling

Grid expansion planning and policy mechanism analyses have relied on assessment tools that represent certain aspects of the energy-economic system. However, the ongoing transformation of the energy system with an emphasis on renewable energy sources, system security, new market-regulatory frameworks and decentralized generation sources brings about new modelling challenges. Understanding this ongoing structural rearrangement of the energy system requires interdisciplinary collaboration so as to combine models and to discuss advantages of different research modelling perspectives.

The Energy Science Center of ETH Zurich has recently started two research projects focused on combining modelling approaches to link technology-rich engineering perspective with economic analysis of energy markets and the macro economy. These projects along with other being developed in Switzerland will be covered in this workshop to discuss modelling experiences in energy markets, the grid infrastructure, and the integration of renewables. It is a workshop to stimulate cross-disciplinary discussions and potential collaborations on energy system modelling, to share current research initiatives on addressing energy challenges, and to bring energy system modellers together to share and discuss latest research results.



The energy-economic system: energy sectors and the typical modelling layers

Scope

The workshop's morning talks are focused on modelling energy markets while the afternoon session is devoted to modelling the grid infraestructure. The workshop ends with a panel discussion on research-to-practice challenges and opportunities. Overall, topics to be discussed include, but are not limited to:

- Modelling energy markets: challenges, experiences and approaches.
- Renewable energy sources impact on energy networks and risk aspects.
- Interlinking renewables, economics and security of supply.
- Interdisciplinary discussion between macro-economic-policy and energy-technology disciplines (Top down vs. bottom-up modelling paradigms).
- Energy policy: regulatory framework and economic incentives.
- Exchange views on modelling challenges and the value of developing interfaces between models.

Audience and setting

The workshop is limited to participants within ETH Zurich and selected external partners and collaborators (by invitation only). It is a one-day conference including a panel discussion.

Program
Frontiers in Energy Systems Modelling

10:10 am **Registration and coffee**

10:15 am **Welcome,** Dr. Christian Schaffner, *Energy Science Center, ETH Zürich.*

10:25 am **SwissMod: A model of the Swiss Electricity Market**
- Prof. Dr. Hannes Weigt and Ingmar Schlecht
  University of Basel

Examples of Applications in Hybrid Economy-Energy-Electricity Modelling
- Prof. Dr. Sebastian Rausch and Dr. Jan Abrell
  Center for Energy Policy and Economics, ETH Zürich

How to model decision making in Electricity Markets? Bi-level games and stochastic programming
- Dr. Martin Densing[1] and Prof. Dr. Karl Schmedders[2]
  [1]Energy Economics Group, Paul Scherrer Institute. [2]University of Zurich

The role of short-term trading in electricity markets
- Aymen Salah-Abou-El-Enien and Davide Orifici
  EPEX Spot

12:30 pm **Lunch**

1:15 pm **Enerpol: An integrated, high resolution, system-wide, electricity & gas networks model**
- Prof. Dr. Reza Abhari and Dr. Ndaona Chokani
  Laboratory of Energy Conversion, ETH Zürich

Swiss TIMES Energy systems Model (STEM): Application for long term energy transition scenarios
- Ramachandran Kannan
  Energy Economics Group, Paul Scherrer Institute

Green-X: RES policy and investment model
- Dr. Gustav Resch and Dr. Claus Huber
  TU Wien and Axpo Holding AG

Engineering the Resilience of Interdependent Energy Infrastructures
- Prof. Dr. Giovanni Sansavini
  Laboratory of Reliability & Risk Engineering, ETH Zürich

3:35 pm **Coffee break**

3:55 pm **Ideas for a future market design - modelling needs,** Dr. Christian Zeyer, Swisscleantech

Combining modelling approaches, *Energy Science Center projects, ETH Zürich.*
- Dr. Christian Schaffner and Dr. Pedro Crespo Del Granado

4:20 pm **Panel: Frontiers in Energy Systems Modelling**
- Dr. Arthur Janssen, Prof. Dr. Göran Andersson, Dr. Martin Everts.

4:50 pm **Closing reception**

Participants

- Marija Zima, ABB
- Stefan Linder, Alpiq
- Christopher Andrey, Artelys
- Martin Everts, Axpo
- Claus Huber, Axpo
- Thomas Faber, Axpo
- Olivier Baillifard, BFE
- Anne-Kathrin Faust, BFE
- Urs Meister, BKW
- Domenico Mignone, BKW
- Aymen Salah-Abou-El-Enien, EPEX Spot
- Davide Orifici, EPEX Spot
- Sabine Perch-Nielsen, Ernst Basler & Partner
- Peter de Hahn, Ernst Basler & Partner
- Jan Abrell, ETH Zürich
- Göran Andersson, ETH Zürich
- Ndaona Chokani, ETH Zürich
- Pedro Crespo Del Granado, ETH Zürich
- Turhan Demiray, ETH Zürich
- Patrick Eser, ETH Zürich
- Massimo Filippini, ETH Zürich
- Jared Garrison, ETH Zürich
- Gil Georges, ETH Zürich
- Sebastian Rausch, ETH Zürich
- Giovanni Sansavini, ETH Zürich
- Christian Schaffner, ETH Zürich
- Giacomo Schwarz, ETH Zürich
- Clemens Streitberger, ETH Zürich
- Renger van Nieuwkoop, ETH Zürich
- Hidemichi Yonezawa, ETH Zürich
- Fabio Veronesi, ETH Zürich
- Martin Densing, PSI
- Ramachandran Kannan, PSI
- Gustav Resch, TU Wien
- Christoph Zehetner, TU Wien
- Arthur Janssen, Swissgrid
- Joshu Jullier, Swissgrid
- Christian Winzer, Swissgrid
- Christian Zeyer, Swisscleantech
- Jonas Savelsberg, University of Basel
- Ingmar Schlecht, University of Basel
- Hannes Weigt, University of Basel

Organiser

Energy Science Center (ESC), ETH Zürich

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Venue

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