

Joint project: Assessing Future Electricity Markets (AFEM)

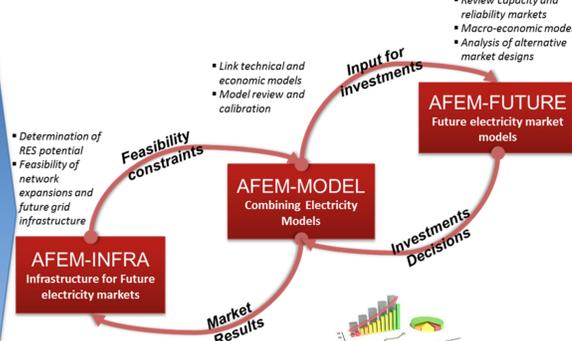
Overview

Why AFEM?

To provide an assessment of the feasibility of integrating renewable energy sources into the grid, since current market model, in the long run of the Energy Strategy 2050, will no longer deliver the right investment incentives for the electricity market.

Today's goals

- Phase out of nuclear energy
- Increase of renewables
- Reduction of carbon emissions
- New market regulatory framework or business as usual scenario?



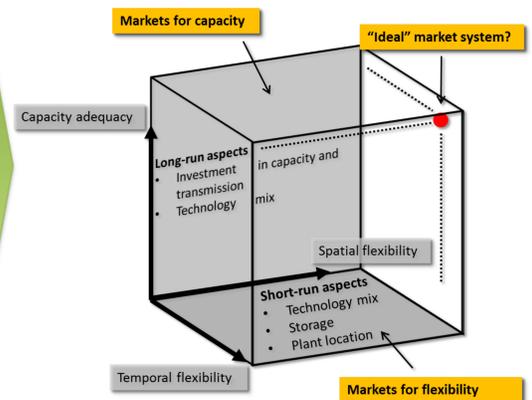
AFEM is an integrated modelling and analysis framework to design the transition of electricity markets towards 2050

Energy strategy 2050

- AFEM analyses the "right" investment incentive for various 2050 scenarios
- New energy market structures are tested taken into account EU regulations
- Feasibility assessment of capacity markets



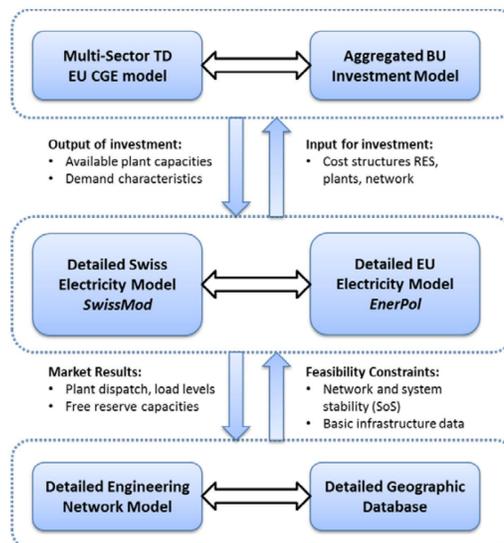
Problem dimension underlying the AFEM project



AFEM research questions

1. How will the Swiss and European electricity market evolve if the existing market mechanism (energy only market, reserve market) were perpetuated as is?
2. How will the market evolve if additional market components such as capacity markets are introduced?
3. How do future market models need to be designed in order to give the "right" investment incentive (e.g. flexibility markets) for an efficient and carbon-free electricity supply system?

AFEM Model framework



Objective

The AFEM goal is to analyse the current design of the electricity market in Switzerland-Europe today and then identify shortcomings both of the existing setup and the additions of capacity markets or capacity payments. AFEM will develop new models to analyse the specific behaviour of future electricity supply systems in which renewable energy sources (RES) are likely to be deployed on a large scale. The expected results is to provide inputs for the evaluation of grid development strategy scenarios and market design.

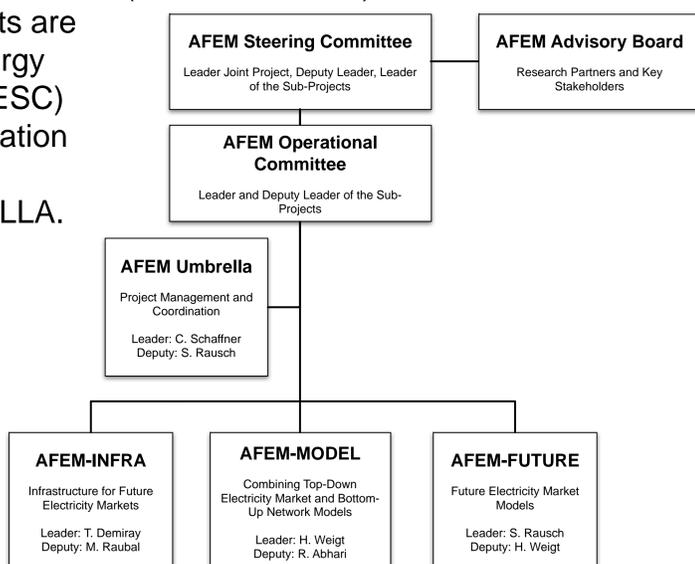
Main (industrial) partners: ewz swissgrid ALPIQ

Collaborations: NFP-70: IMES, SCCER-SoE, SCCER-FURIES, SCCER-CREST, SCCER-Mobility, INMES.

Subprojects

The joint project (AFEM) is set up with three subprojects "Infrastructure for Future Electricity Markets" (AFEM-INFRA), "Combining Electricity Models" (AFEM-MODEL), and "Future Electricity Market Models" (AFEM-FUTURE).

These sub-projects are hosted at the Energy Science Center (ESC) under the coordination and management of AFEM-UMBRELLA.



Energy Turnaround

AFEM increases the knowledge about electricity market mechanisms, in particular with respect to coordinating short-term flexibility and long-term investment goals for policy making activities. The results provide insights into the question of what future market models will be required for the second phase of the "Energy Strategy 2050" after 2020.

AFEM contribution to Energy Strategy 2050

- provide a holistic tool to assess electricity market designs;
- present possible scenarios to reach the goals of ES2050 support decision makers in questions regarding market designs, support schemes for RES, maintaining security of supply and grid expansion;
- take uncertainties into account.
- Identify which topological modifications of the Swiss transmission network would be required over the course of the next decades.

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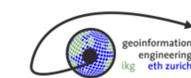
Laboratory for Energy Conversion



Research Center for Energy Networks
Forschungsstelle Energienetze



Centre for Energy Policy and Economics
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