ELTRAMOD – Electricity Transhipment Model

Model purpose

- Fundamental system analysis
- Integration of renewable energy sources (RES) in the European electricity market
- Flow calculation based on Net Transfer Capacity (NTC)
- Trade-off between grid and storage expansions
- Optimal dispatch of power plant capacity

Main characteristics

- Bottom-up electricity market model
- Temporal resolution of 8760 hours
- Calculation of the cost-minimal generation dispatch and investments in additional transmission lines and storage facilities
- Country specific time series of wind and PV feed-in
- Net Transfer Capacity from ENTOS-E (European Network of Transmission System Operators for electricity)

Exemplary Results:

Influence of RES feed-in obligation on investments in new grid and storage capacities

RES feed-in obligation
(every unit of available RES needs to be feed-in)

RES curtailment
(the surplus of RES can be curtailed)

- Feed-in priority for RES significantly influences investments in NTC and storage capacities
- Regardless of the presence of feed-in obligation, investments in additional NTC are needed
- In the midterm grid expansion, rather than storage expansion, is necessary to integrate the increasing RES generation
- The requirement for additional storage capacity becomes important beyond 2040 when the penetration of RES will reach approx. 80%

Exemplary References

