

eLOAD – energy load curve adjustment model

Model purpose

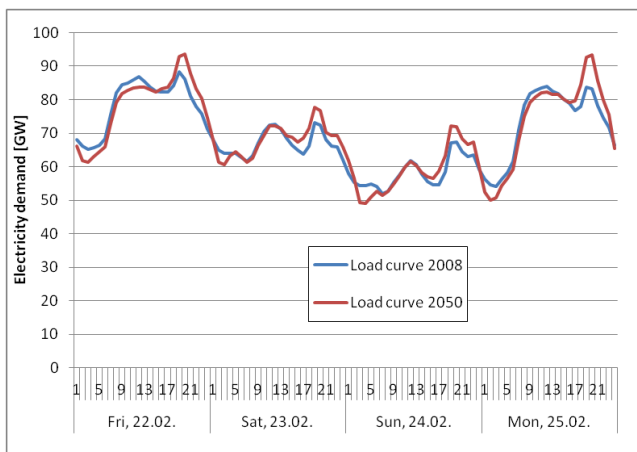
- Provision of hourly national system load curves to assess potential transformations of the shape due to structural changes in annual energy demand
- Residual load smoothing by modelling cost optimal load shift of various end use applications such as heat pumps, industry processes or electric vehicles

Main characteristics

- Partial decomposition of historic load curves
- Temporal resolution of 8760 hours
- Main input:
 - annual demand projection from the bottom-up simulation model FORECAST
 - appliance specific load profiles
- Applicable on different energy carriers
- Available for DE, FR, UK, SE, FI, NO, DK, PL, IT, ES

Exemplary Results from the report “Shaping our energy system – combining European modelling expertise”:

Four-day extract of the German electricity load curve in the year 2008 and 2050



- Maximum load will increase as a result of diffusion of electric vehicles (assuming uncontrolled charging behaviour)
- Volatility and load ramp rates further rise due to load reduction during day-time (mainly related to efficiency improvement) and load growth in evening hours (heat pumps, electric vehicles, intensified use of ICT applications)
- Load peak will shift from midday hours (that feature high shares of electricity generation from renewable energy sources, mainly PV) to early evening hours, further increasing the need for a holistic strategy to integrate large amounts of renewable generation

Exemplary References

Energy System Analysis Agency: Shaping our energy system - combining European modelling expertise, Brüssel, 2013.

Boßmann, T.; Elsland, R.; Lickert, F.; Wietschel, M.: The German load curve in 2050: structural changes through energy efficiency measures and their impacts on the electricity supply side, Summer study on energy efficiency (ECEEE 2013), Hyères, 2013.

Boßmann, T.; Pfluger, B.; Wietschel, M.: The shape matters! How structural changes in the electricity load curve affect optimal investments in generation capacity, 10th International Conference on the European Energy Market (EEM13), Stockholm, 2013.