

Challenges and Opportunities

The emerging EU market for electricity

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History of European electricity market reform

- The process started in England & Wales and Norway in the early 1990's. Sweden was an early follower.
- EU Electricity Market Directives requested a restructuring of the power industry, entailing:
 1. Vertical separation of generation, transmission, distribution and retailing
 2. TPA to transmission and distribution networks
 3. Competition in generation and retailing
- The EU "Target Electricity Model" was designed as an "energy-only" model

Expectations of the reforms

- That power industry investments would be driven by regular market forces (instead of technical standards)
 - Thus overcapacity should be avoided and productivity increased
- That competition would stimulate efficiency, innovation and structural change in the power industry
- That cross-border trade would increase and eventually lead to an integrated market for electricity in Europe

Key features of current EU electricity markets

- Slow growth of demand
- Significant subsidy-driven investments in wind- and solar power, adding a lot of potential energy (MWh:s) but not so much reliable capacity (MW:s)
- Downward pressure on electricity prices, reducing the profitability of conventional power and creating financial problems in power companies

Towards a different electricity market

- The emerging new situation can be illustrated by results from model simulations by Mr Folke Sjöbohm, Svensk Energi
- It is a comparison between the actual situation one week in January 2008 and the corresponding week in 2030
- In 2008 the installed capacity in nuclear and wind power was 8 900 MW and 1 000 MW, respectively
- In 2030 the corresponding numbers are assumed to be 0 and 18 800, respectively

Behov av reglering exkl. vindkraftsproduktion i Sverige, utfall år 2008, januari

MWh/h

25000

20000

15000

10000

5000

0

01-Jan

08-Jan

15-Jan

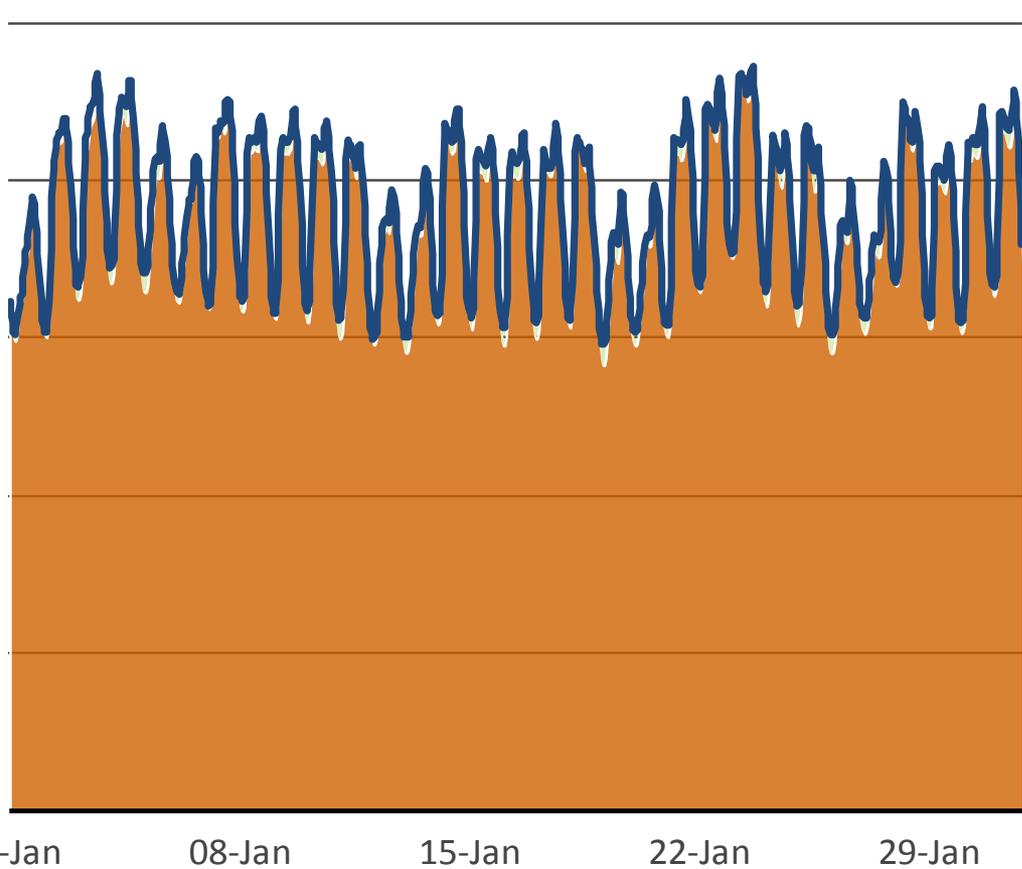
22-Jan

29-Jan

SE, Vind + sol

SE, Reglering

SE, Elanvändning



Behov av reglering exkl. vind- och solkraftsproduktion i Sverige, scenario 47 TWh vind + 11 TWh sol, januari

MWh/h

25000

20000

15000

10000

5000

0

01-Jan

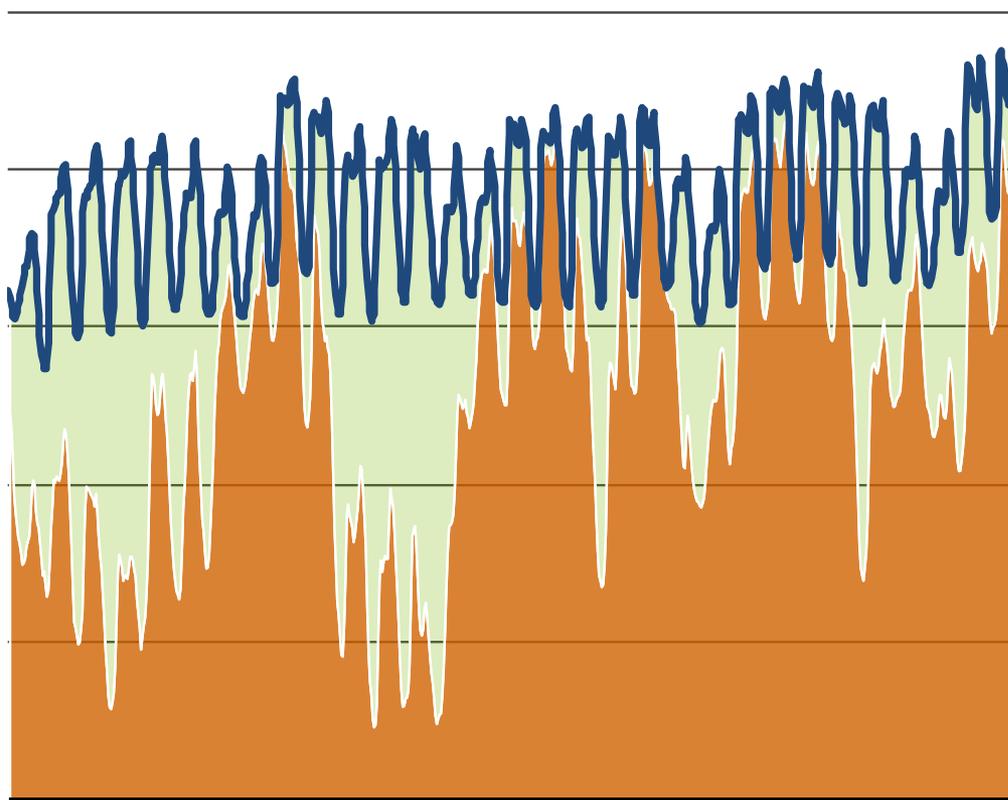
08-Jan

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- SE, vind och sol
- SE, Reglering
- SE, elanvändning



Two major market design challenges

1. Increased and more unpredictable price volatility, possibly shifting trade towards balancing and real time markets
 2. Reduced security of supply as the profitability of conventional (dispatchable) power is depressed by lower prices and fewer hours of operation
- But most of the political and public attention seems to be focused on the security of supply issue
 - And the commonly proposed remedy is to add a "capacity mechanism" to the "energy-only" market

Different capacity mechanisms (CM:s)

Capacity mechanisms can be designed in many different ways, such as the "volume-based":

- Capacity auctions (implemented in the UK)
- Capacity obligations
- Reliability options
- Strategic reserve (currently implemented in Sweden)

and the "price-based":

- Capacity payments

Common features and issues

- Whatever the choice of CM design some external part, for instance the TSO, has to prescribe the level of available capacity during peak load periods
 - Issue 1: On which basis should the reliability standard be determined? Cost-Benefit analysis?
 - Issue 2: To what extent and how should interconnectors to neighbouring countries be included in the measure of available capacity?
- Whatever the choice of CM design the extent of and conditions for demand side participation has to be determined

To have or not to have a CM?

Choosing between risks

- Risk #1: Too little security of supply on an "energy-only" market
 - More frequent black-outs and brown-outs
 - More frequent price spikes
- Risk #2: Too much security of supply on an electricity market with capacity mechanism
 - Costly overcapacity
 - Less frequent price spikes and reduced incentives for demand side flexibility and development of energy storage technology

CM:s and the Single European Market

- With CM:s *ceteris paribus* cross-border trade will be reduced
 - Producers have a choice between being paid for keeping capacity idle or using the capacity to generate electricity for export
- With different CM:s and reliability standards in different countries cross-border trade may be distorted

Energy-only market reform instead of CM?

- Increase demand flexibility
 - Technology: Smart grids
 - Contracts: Hedges limited to fixed quantities so that retail customers face spot or real time prices on the margin
- Develop ancillary service and financial markets
 - A market for the inertia provided by conventional power plants
 - A market for long-term futures and call-options

Thank you!

