Adequacy of supply standards for the electricity market
From obligations to informal market signals

Outline of the presentation

• The adequacy of supply problem
• Lessons to be learned from abroad and the past
  – Use of a planning standard (former Dutch approach)
  – Create more transparency without the use of a standard (UK approach)
  – Indicative programme (Belgian approach)
• The signalising standard in practice
  – Scenarios of the future need of generating capacity
  – Expected market developments; market indicators
• Conclusion
The adequacy of supply problem

- Uncertain whether liberalised electricity markets invest sufficiently in generating capacity in time
- Long term problem
- How can a certain desirable level of adequacy of supply be translated into a transparent standard?
  - How to measure adequacy of supply?
  - What is the socially desirable level of adequacy of supply?
- Struggle / tensions between guaranteeing adequacy of supply and the free working of the liberalised electricity market

Planning standard (Dutch approach) I

- Large-scale electricity generation was planned and controlled centrally
- Required generating capacity was based on the *Loss of load probability* (LOLP), which was used as a planning standard
- Uncertainties in availability of installed capacity and maximum peak load taken into account by means of probability densities
Planning standard (Dutch approach) II

- Probability density $f_2(l)$ for max. load $l$
- Probability density $f_1(c)$ for generating capacity $c$

AoS problem – Netherlands – UK – Belgium – Standard – Conclusion
Planning standard (Dutch approach) II

- Probability density $f_1(l)$ for max. load $l$
- Probability density $f_2(c)$ for generating capacity $c$
- Load and capacity (MW)
- Capacity margin
- Historical data presented alongside forecasts in order to see market changes in their full context.

Transparency (UK approach) I

- Joint Energy Security of Supply Working Group (JESS): cooperation between DTI and Ofgem
- Twice yearly reports in which adequacy of supply is monitored by means of indicators
- No use of a standard! Fear of strategic behaviour
- Indicators looking ahead (~7 years) provide an indication of possible future trends, which may inform market participants’ decisions
- Historic data are presented alongside the forecasts in order to see market changes in their full context.
Transparency (UK approach) II

• Supply and demand forecasts
  – Electricity generation by fuel type
  – Generator margin

• Market signals
  – Forward electricity prices
  – Spark spread

• Market response
  – Electricity capital expenditure

• Policy measures based on monitoring results (or on a standard), could provoke strategic behaviour of market participants

Indicative programme (Belgian approach)

• Indicative 10-year programme on the development of generating capacity; every 3 years

• The indicative programme informs market participants about the (future) need for additional generating capacity in different future scenarios, and gives an investment calendar

• It offers an independent evaluation of the working of the Belgian electricity system

• It is not binding!
Indicative programme (Belgian approach)

- Use of scenarios
  - Fuel prices
  - Electricity demand developments
  - CHP and RES investments (targets)
  - Prices of CO₂ emission permits
  - Import
- Use of a standard: Loss of load probability (LOLP) of 16 hours/year
- Need of additional generating capacity to comply with the LOLP standard

Shortcomings

- Planning standard - former Dutch approach
  - No central planning anymore in a liberalised market
  - Less information available
  - Interconnection with foreign electricity systems make that: LOLP ≠ chance of service interruption!
- Increase transparency - UK approach
  - It remains unclear how actual developments compare with the socially desired situation
- Indicative programme - Belgian approach
  - The desired amount of generating capacity is barely compared with actual and expected developments in the electricity market
A signalising standard I

- Combining the Dutch, British, and Belgian approach
  → signalising standard
- Present scenarios to the market
  - Electricity (peak) demand
  - Capacity of transmission connections with foreign countries
  - Development of sustainable electricity generation
- Inputs
  - Assumptions about (non-)availability of generating capacity
  - Assumptions about maximum peak load
  - Assumptions about reliability of foreign electricity systems
    (imports and mutual assistance)

A signalising standard II

- Determine a socially acceptable LOLP (e.g. by means of a cost-benefit analysis)
- Information problem
  - Legal framework, e.g. generators are obliged to give certain information that is only made public in aggregated form
  - An independent working group, like the JESS
- Additional monitoring by means of market indicators, aimed at supply side (generating capacity)
  - To compare desired developments with actual and expected developments
Conclusion - Why a signalising standard?

- It is focussed on generating capacity, but also aims at providing information to / influencing the behaviour of other market participants:
  - Generators
  - Government
  - System operator
  - Suppliers
  - Customers

- It is more than the provision of information to increase transparency: it makes clear to what extent the market leads to a desired outcome