



# DR – Market Design Aspects

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Elforsk Marketdesign research program

# Marketedesign /IEA project

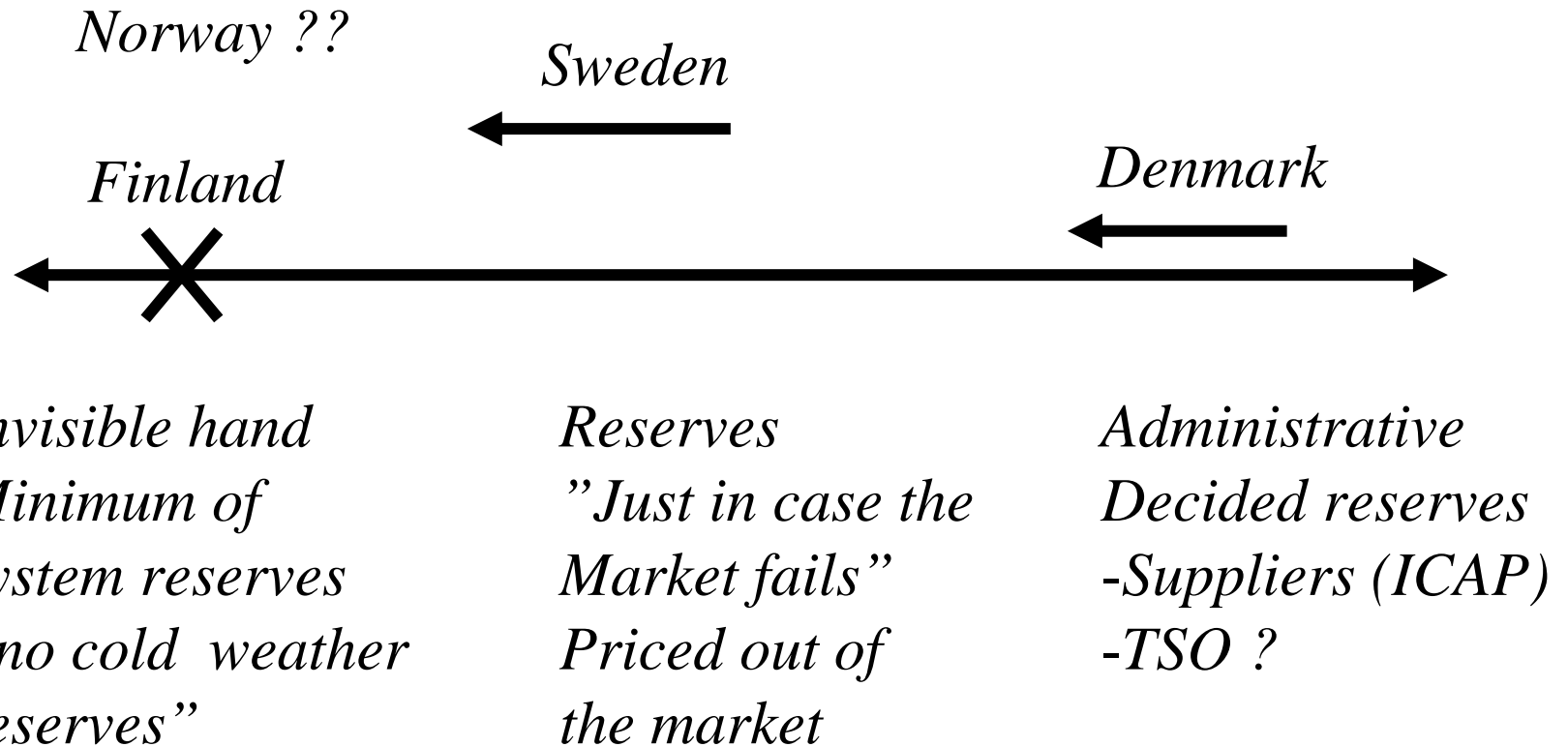
## Background

Temporary solution until 2008, SvK purchase 2000 MW of reserves. After that the market shall create enough capacity.

## 6 Subtasks

- Expectations of future price spikes
- Insights from other studies and pilot projects
- Participant analysis – what incentives do participants have with the set of rules employed today?
- Business models
- Analysis of rules
- Nordic / international co-operation

# Market Models, peak load capacity



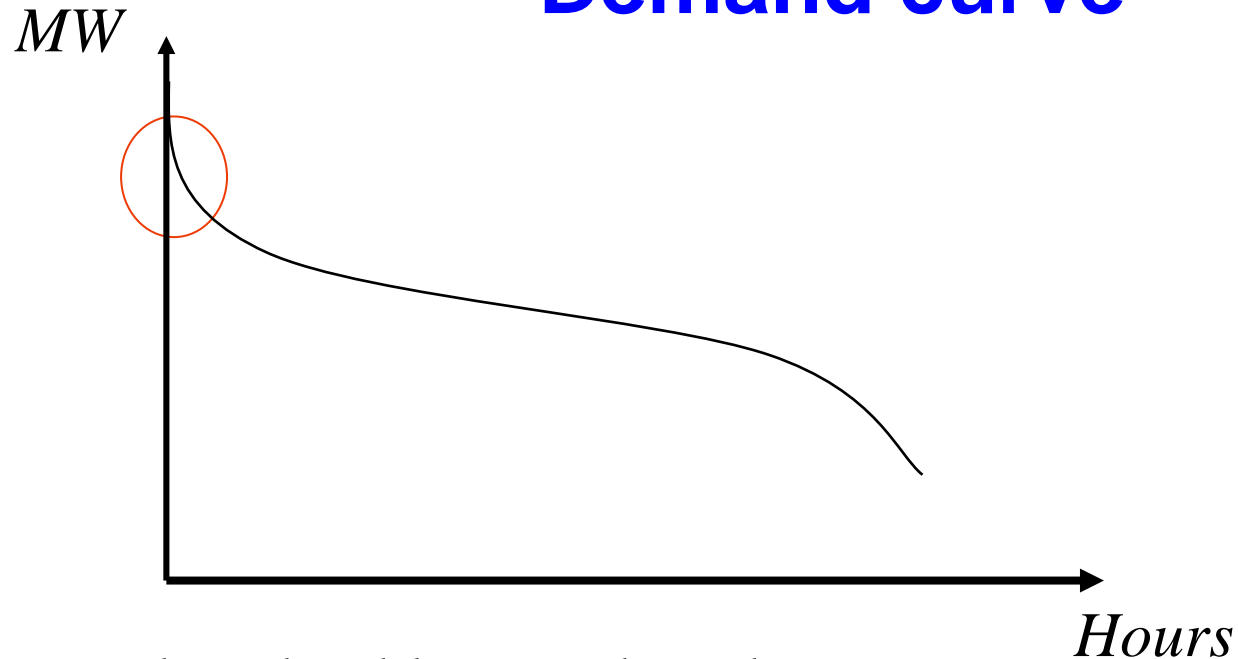
# Sweden

peak load 28 000 MW

- Operating reserves 1 000 MW
- Temporary peak load capacity (until 2008)
  - Contracted for a 1-3 year period
  - Maximum 2 000 MW
    - generation
    - Interruptible load

Prices on the "Balancing market" when utilized  
5000 SEK / MWh + variable cost (1000 \$ / MWh)

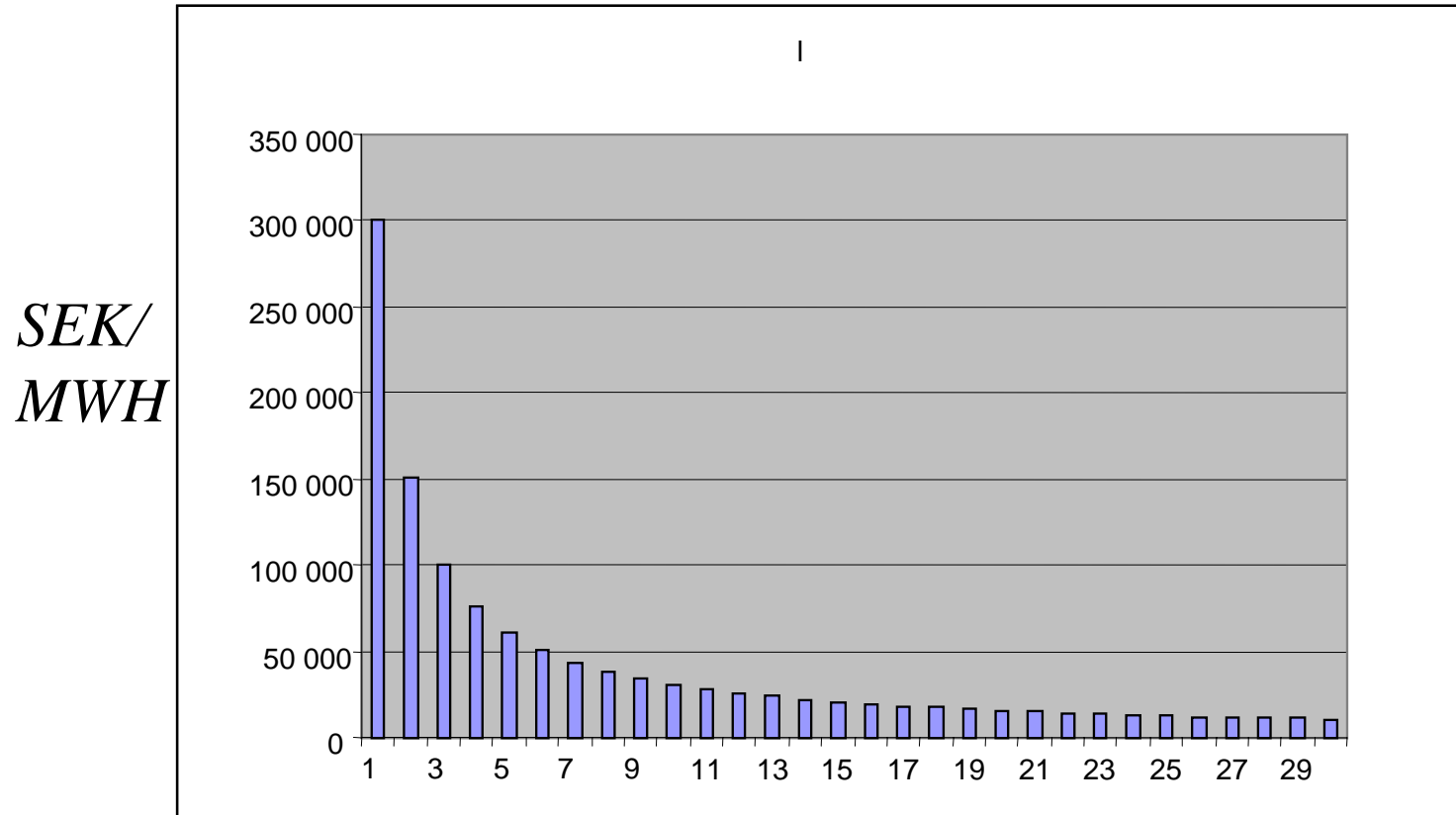
# Demand curve



*What should cover these hours?*

- *Gas Turbines*
- *Hydro*
- *Old oil fired units*
- *Demand response*

# Gas turbines > fixed costs 300 000 SEK/MW



**Prices over 10 000 SEK/MWh for 30 hours/year ?**

## Unrealistic !

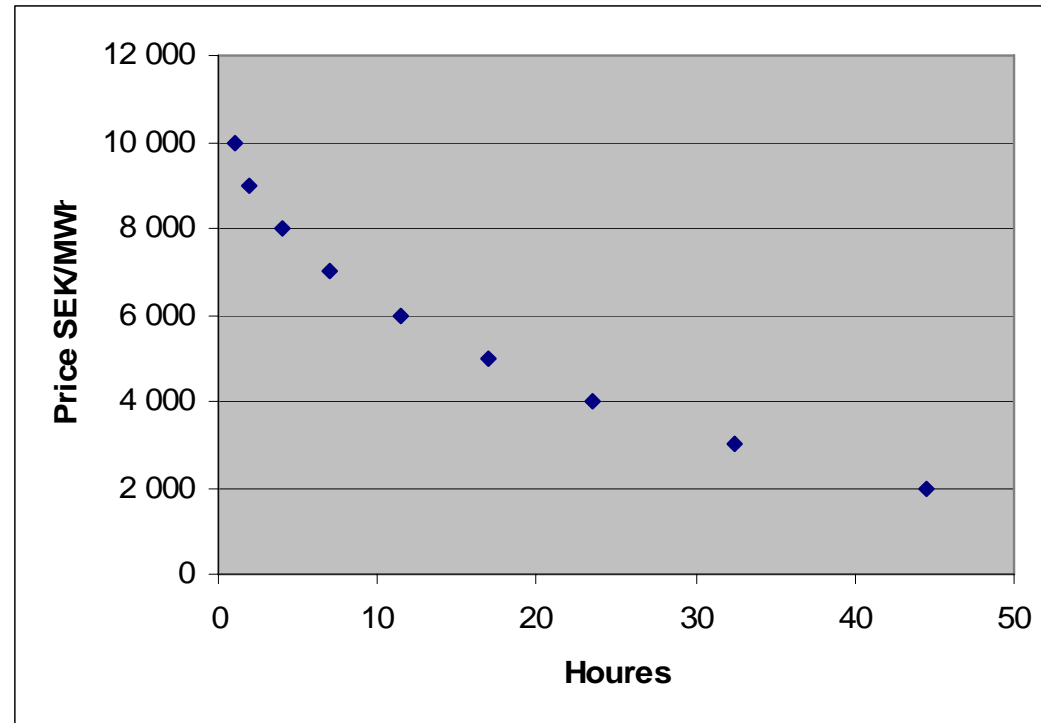
- Income 27 billion during these hours = 100 % of average costs for the annual generation in Sweden
- Consumers will not buy at those price levels.

It is not possible to depend on generation for peak demand in an “energy only market” !

# What prices do we need for DR and will we get it ?

- Emergency power  
prices 2 000 SEK/MWh (potential 300 MW)
- Electric heating domestic customers  
profit 1000 SEK / year (potential >1 000 MW)
- Large electricity intensive industries  
prices up to 10 000 SEK/MWh ( potential > 500 MW)

# Estimated average annual Peak load prices



5 billion/year from these 45 h > 15-20 % of average costs for the annual generation in Sweden

# Conclusion

The Nordic market is designed to be an  
"energy only market"

Such market doesn't even work in theory  
without substantial demand response  
(price elasticity)

Enough Demand Response is possible  
but we need price spikes.



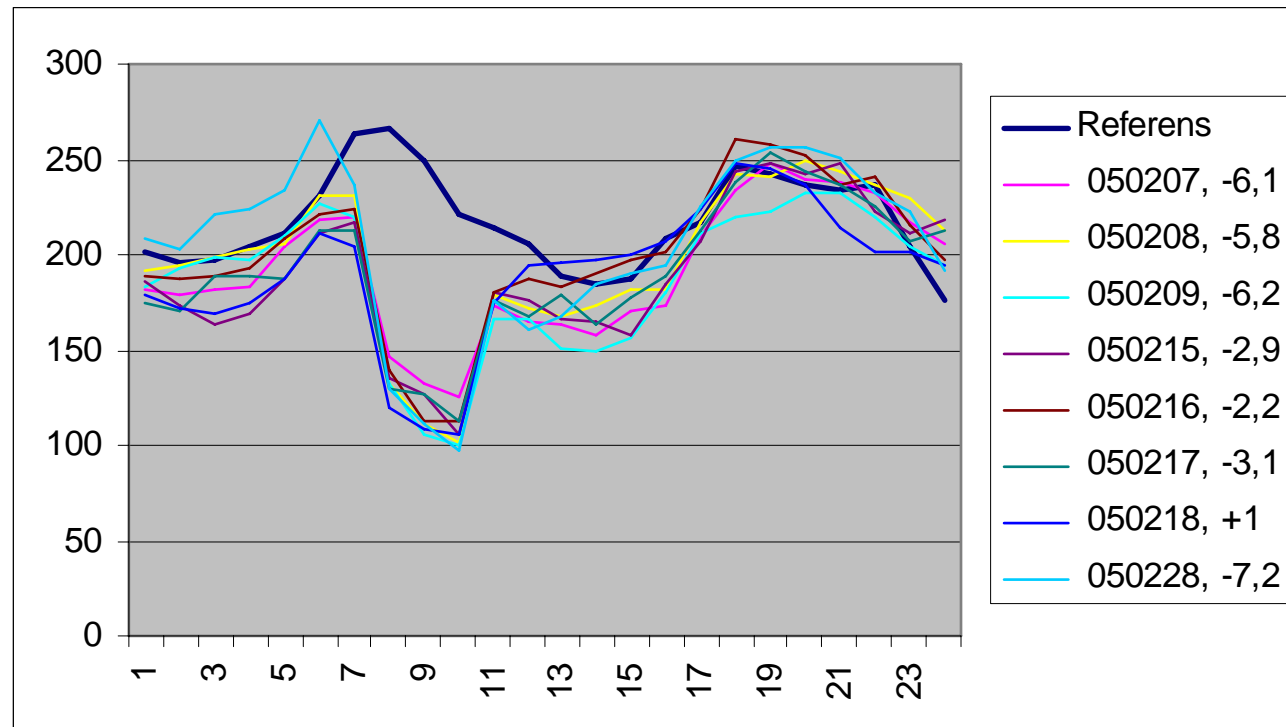
## Demonstration project

### Critical Peak Pricing, electric heating

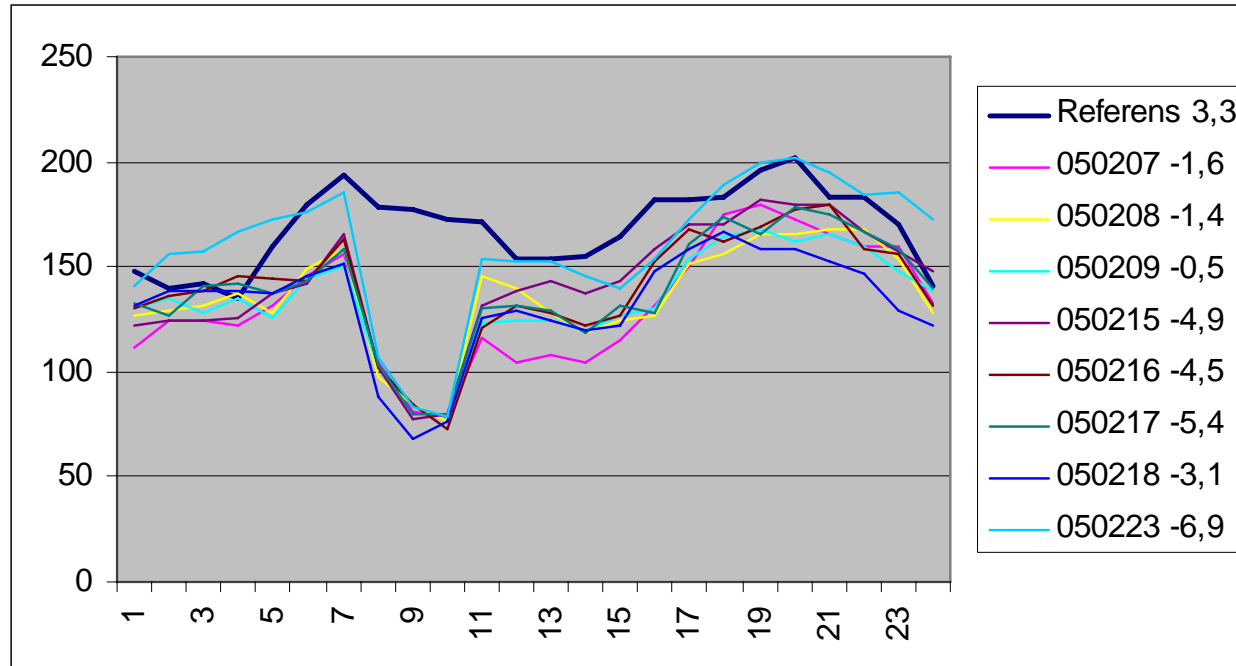
- Prices 3 000 – 5 000 SEK /MWh, maximum 40 hours a year.
- Estimated profit 1000 – 1400 SEK/year
- High price notification through sms the day before
- 100 customers in two different parts of Sweden (hourly metering already installed)
- No technology added

# Skånsk energi

## 53 electric heated houses incentive 1 400 SEK/year



# Vallentuna elverk, 40 electric heated houses Incentive 1 000 SEK /year



Conference on  
Security of Supply in  
Competitive Electricity Markets  
Market Design 2005



7 – 8 June, 2005  
Grand Hotel Saltsjöbaden  
Saltsjöbaden – Stockholm, Sweden

**Programme**

[www.marketdesign.se](http://www.marketdesign.se)

Bild 14 DRR –Electricity market impacts 25 april -05

**EME Analys**  
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