The Nordic Market: Signs of Stress?

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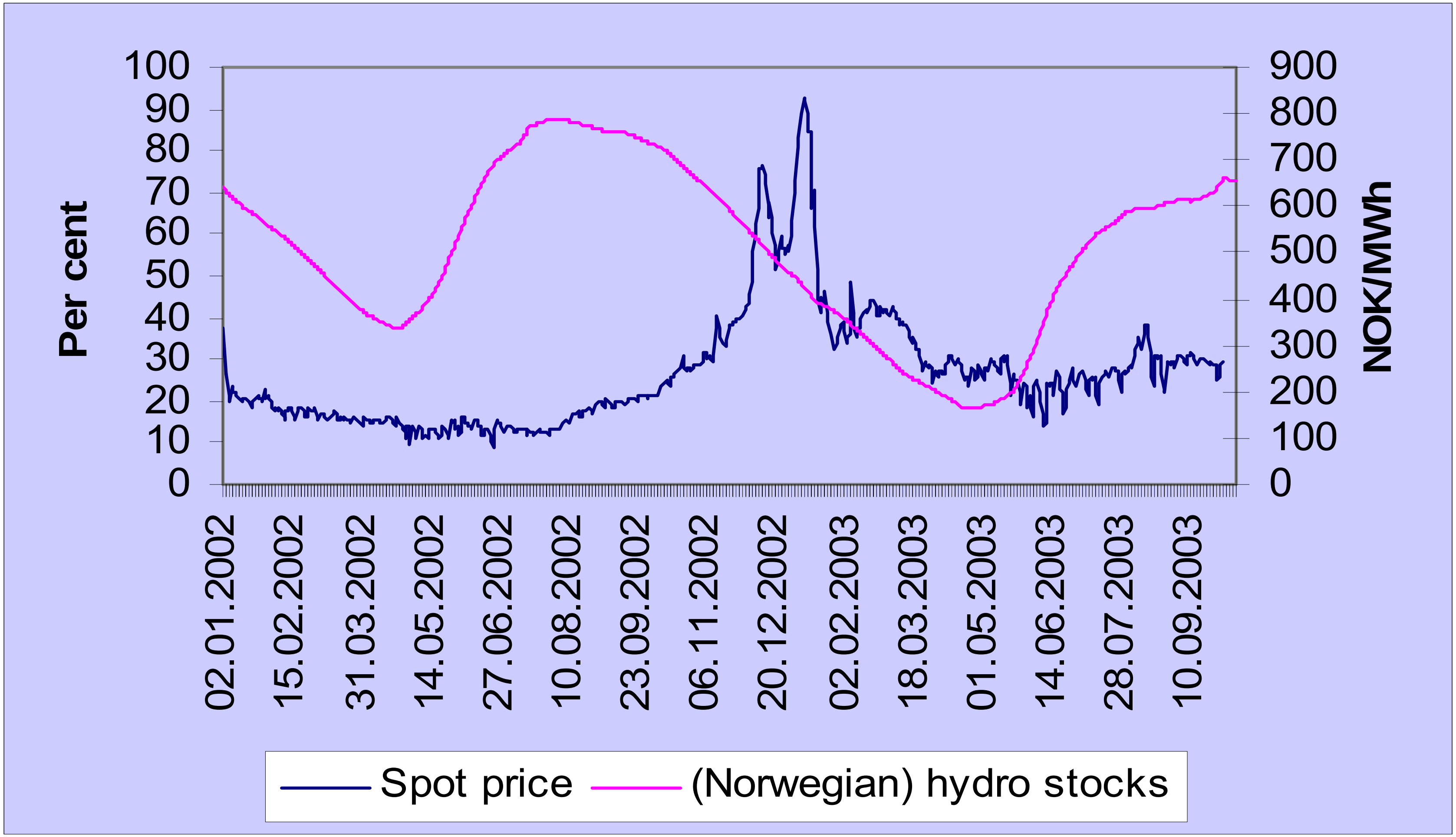
Overview

- The 2002-2003 supply shock
- Market integration and retail competition
- Supply security and adequacy
- Environmental regulation
- Conclusion

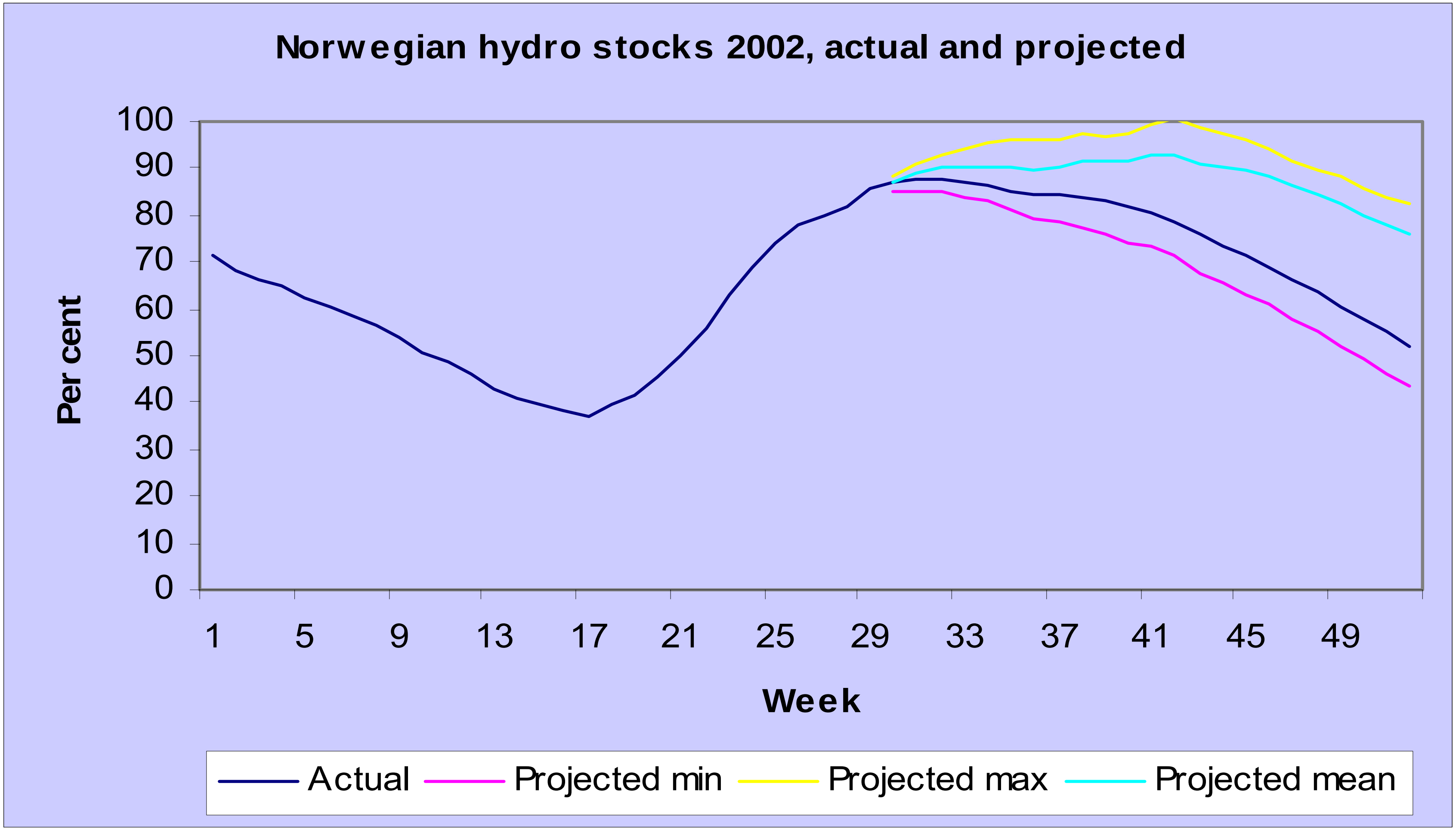
The 2002-2003 Supply Shock

- Hydrological conditions
  - above normal until early autumn
  - extremely dry late autumn and early winter
- Market performance
  - late, but strong reaction
  - spot prices peaked at around 850 NOK/MWh (≈ 100 EUR/MWh) in January 2003
  - In Norway, domestic consumption dropped by 6-7% (price elasticity around 0.2); elsewhere, little or reaction
- Political economy
  - electricity market developments front-page news
  - governments worried, but strongly committed to the market

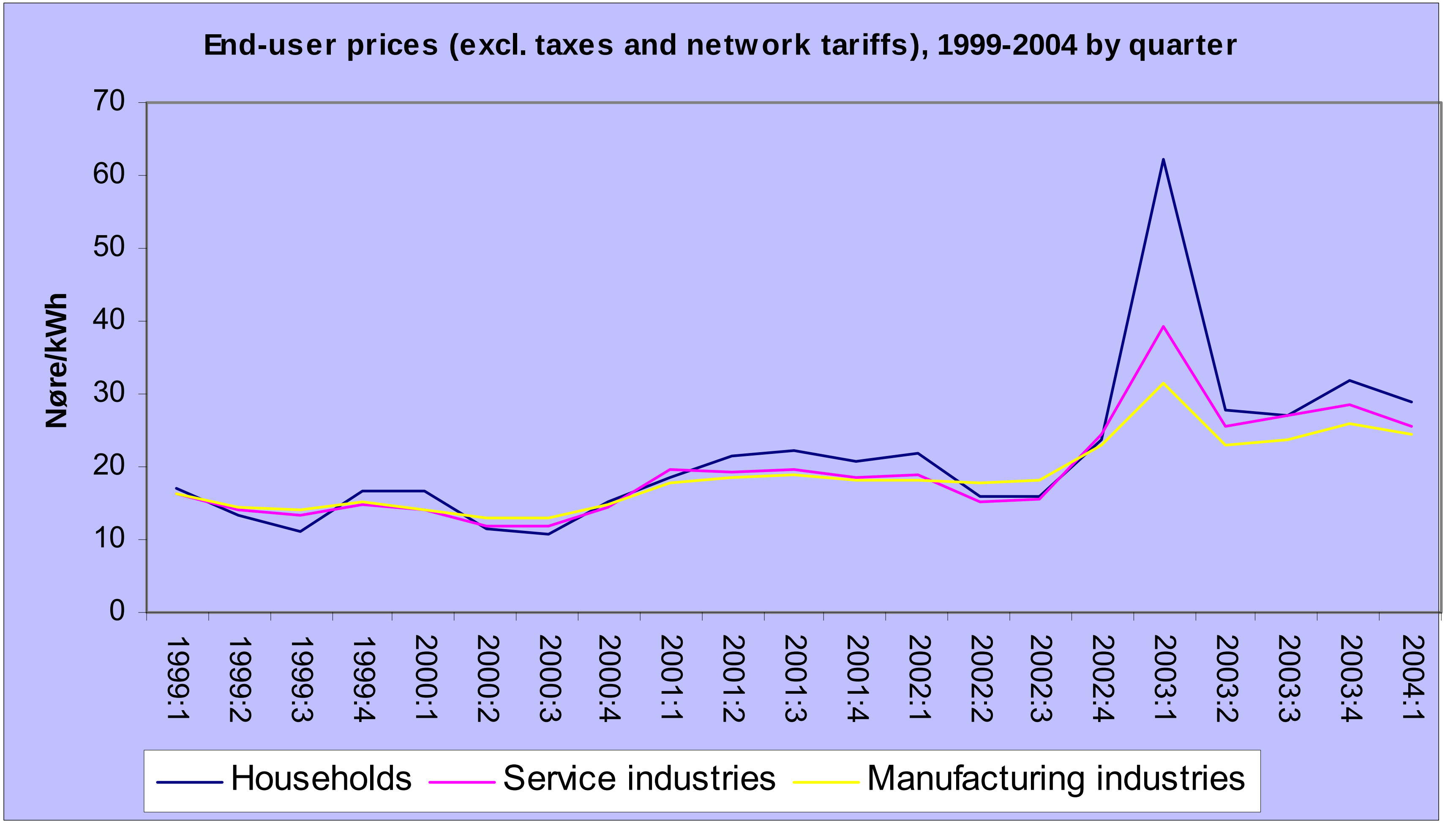
Supply-driven price spike



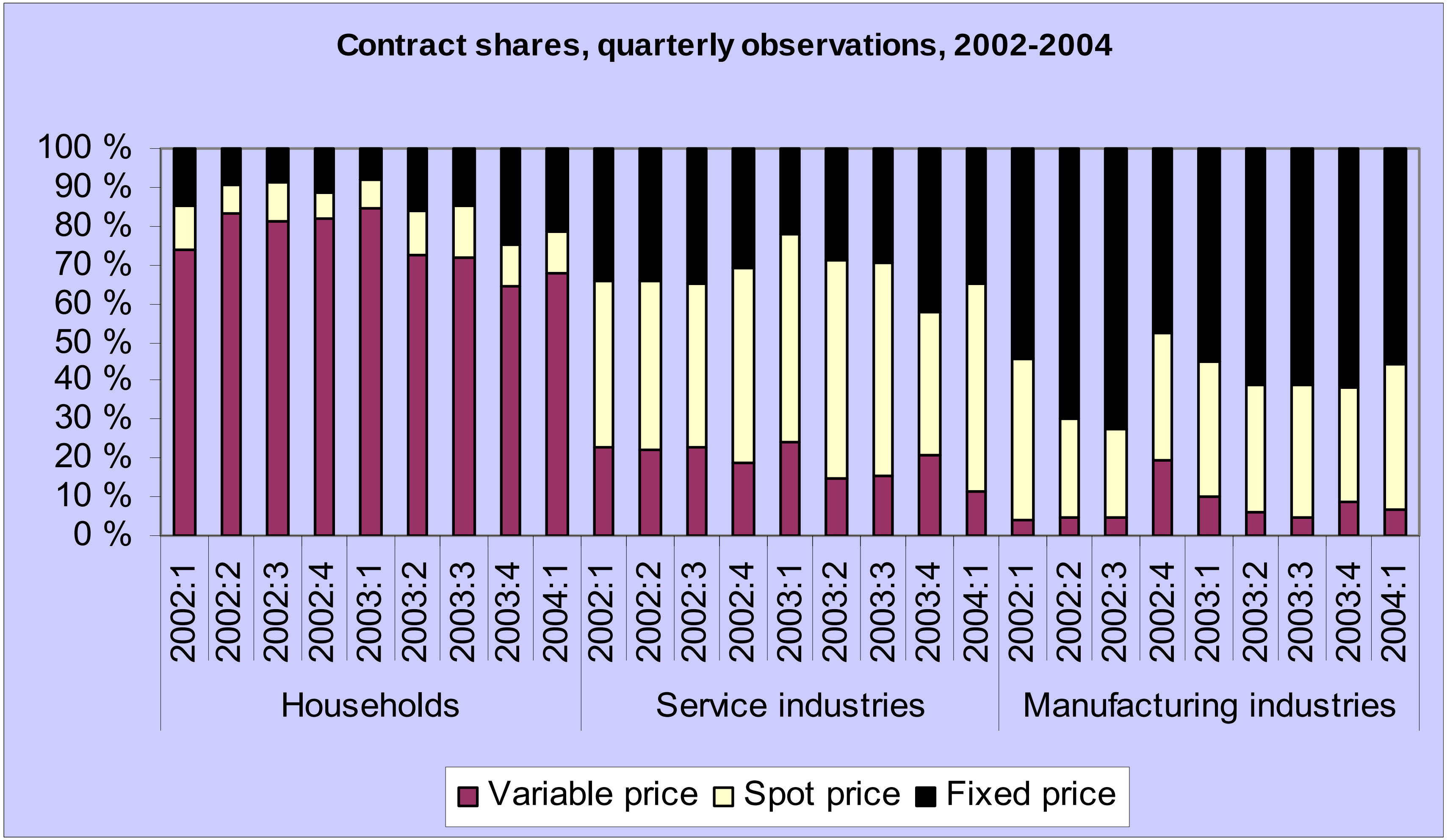
Market Power?



Pass-through to retail prices



Contract coverage



Issues

- Retail market competition
  - pass-through of wholesale prices
  - contract availability and choices
  - differences across countries
  - vertical integration, concentration and market power
- Supply security and adequacy
  - gradual tightening of markets
  - investment in generation and transmission
- Environmental regulation
  - emissions trading
  - technology choice
  - trade

Retail prices

Yearly averages by contract type, NOK/MWh

Norway

	1997	1998	1999	2000	2001	2002	2003
Variable	n.a.	160	151	141	210	205	454
Spot	n.a.	n.a.	131	123	193	193	323
1 year fixed	n.a.	n.a.	152	144	189	195	287
Average	210	162	152	141	206	203	414

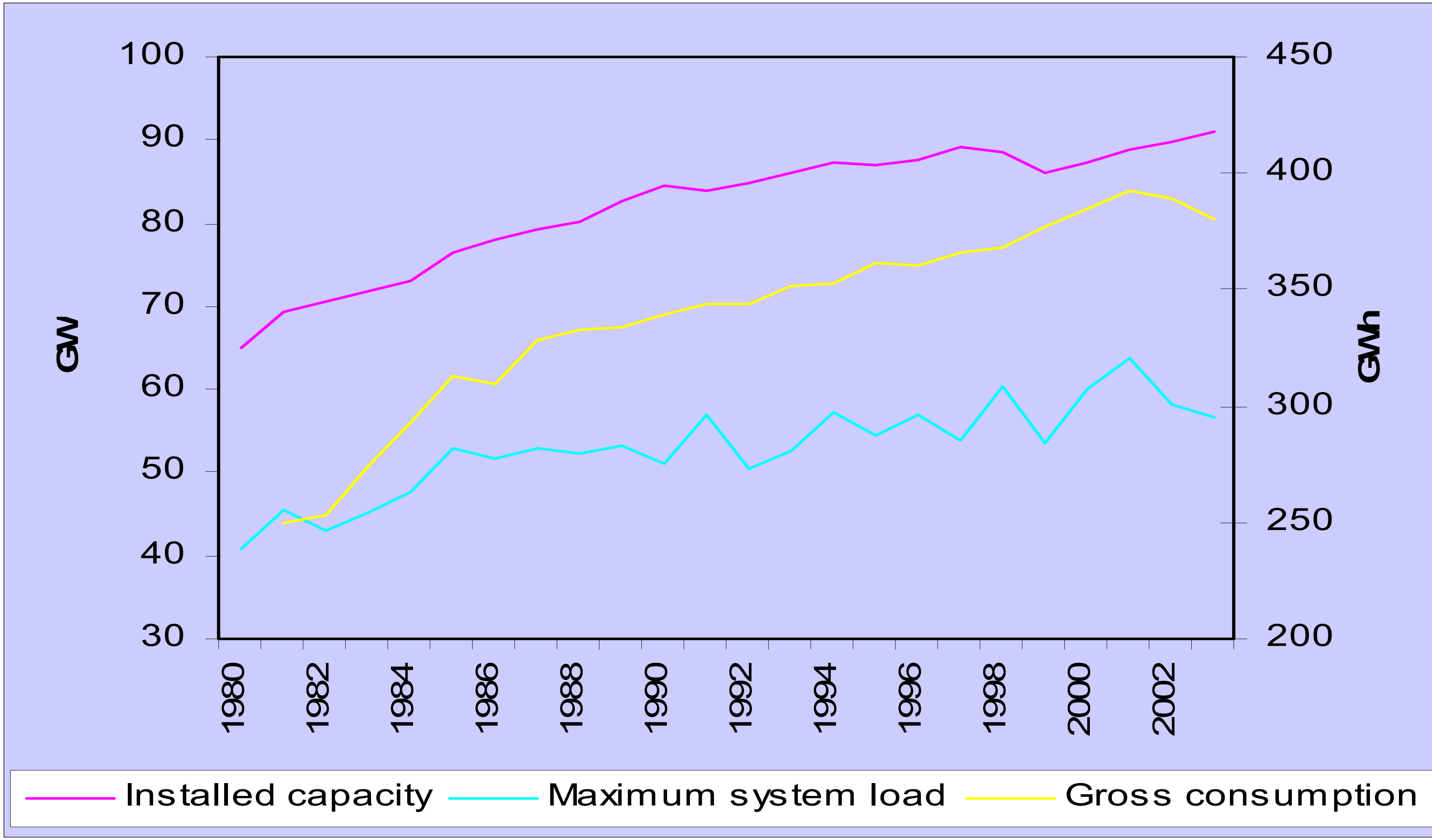
Sweden

	1997	1998	1999	2000	2001	2002	2003
Variable	259	251	244	218	225	296	447
1 year fixed				178	181	256	397
2 year fixed				177	184	253	351
3 year fixed				182	186	252	324

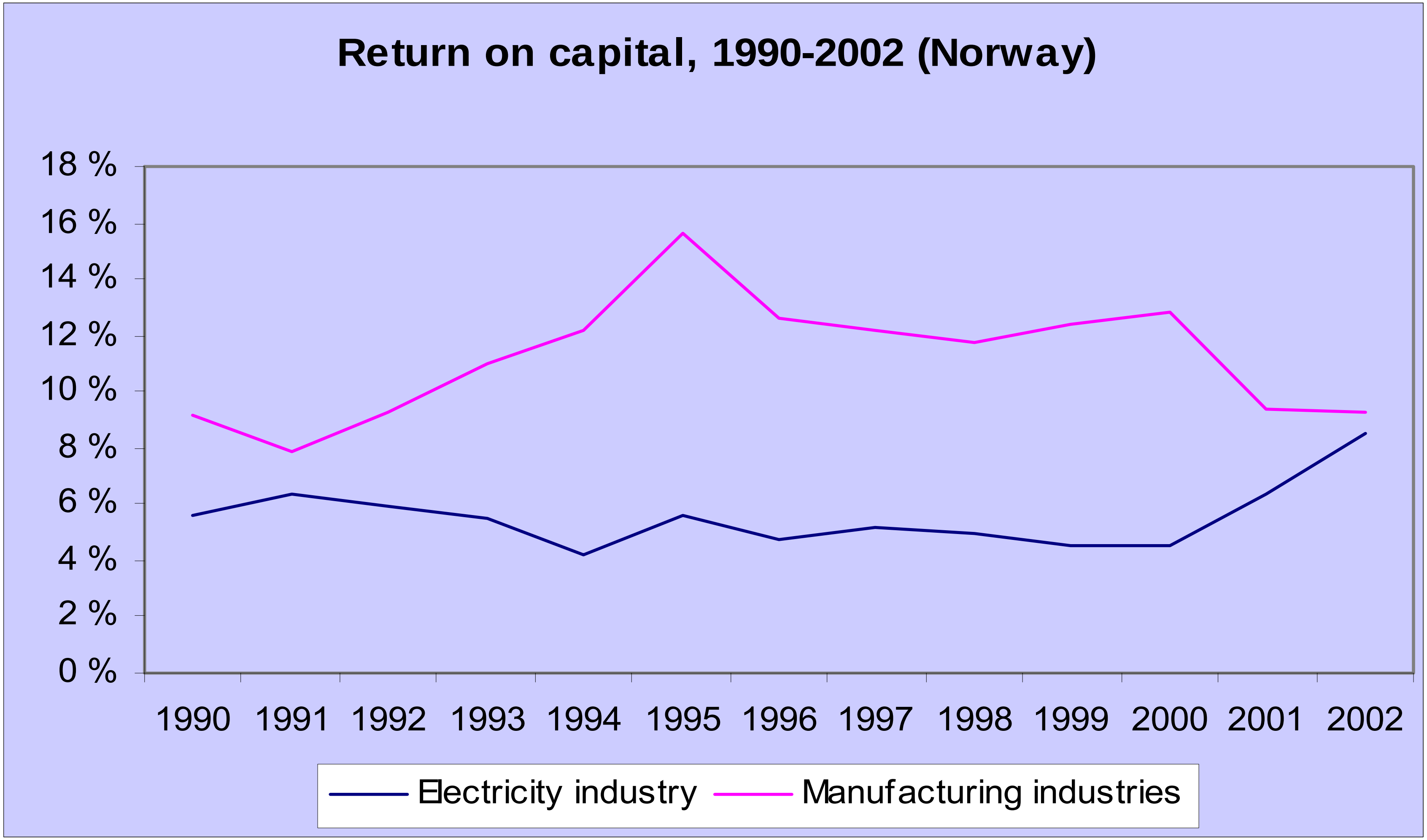
Market Integration and Retail Competition

- Consistent differences across countries
  - price levels
  - pass-through of wholesale prices
- Swedish vs. Norwegian market structure
  - more concentrated
  - higher degree of vertical integration
- Price discrimination
  - consumers that have never switched
  - consumers that have switched (supplier or contract)

Tightening of the Market



Investment Incentives



Supply Security and Adequacy

- Supply security
  - tight energy balance, but slack power balance
  - TSOs well prepared
    - balancing markets
    - long-term strategic reserves (interruptible demand)
- Supply adequacy
  - tight market conditions $\Rightarrow$ higher prices
  - generation: emerging interest in investing
  - transmission: co-ordination across countries
  - political vs. commercial will

Technologies and Emissions

	Denmark	Finland	Norway	Sweden	Total
Hydropower	0.0	9.3	106.0	53.0	168.3
Nuclear power		21.8		65.5	87.3
Coal	23.9	18.2		2.5	44.6
Natural gas	9.9	11.0	0.3	1.3	22.5
Oil	1.5	1.9		4.0	7.4
Wind power	5.6	0.1	0.2	0.6	6.5
Biofuel	2.4	10.1		5.0	17.5
Peat and other	0.3	7.5	0.7	0.7	9.2
Total generation	43.6	79.9	107.0	132.6	364.1
Total consumption	35.0	84.8	115.1	145.5	380.4

CO_2-emissions, electricity and heat-supply, Mton

Denmark	Finland	Norway	Sweden
27.8	18.2	0.2	7.9

Environmental Regulation

- EU Emissions Trading Scheme (ETS)
  - members Denmark, Finland and Sweden will join
  - non-member Norway may opt to join also
  - tends to equalise marginal abatement costs
- Nordic market for Green Certificates (GC)
  - Sweden 2001, Norway 2006, Denmark ?, Finland ?
  - consumers must hold share of GCs
  - tends to increase remuneration to green generators
- Overall impact
  - shift in trade: exports from Norway and Sweden
  - two systems not necessarily compatible: stricter ETS constraint may reduce GC prices and hence green generation

Conclusion

- The market passed the 2002-2003 test
  - flexible prices + demand and supply response
  - but, consumer exposure to high bills (Norway)
- Tighter market conditions
  - new investment seems to be forthcoming
  - but, regulatory/political uncertainty
- Retail markets
  - seem to work reasonably well
  - but, vertical integration and concentration