

Workshop on Power Grid Interconnection in Northeast Asia

May 14-16, 2001

CROSS BORDER TRADE IN SCANDINAVIA
Ivar Wangensteen

Power generation capacity and demand Nordic countries 1997

Country	Hydro (TW h)	Nuclear (TW h)	Thermal (TW h)	Sum generation (TW h)	Demand (TW h)
Norway	113	0	0	113	114
Sweden	63	70	37	170	138
Finland	13	18	39	70	70
Denmark	0	0	52	52	35
Sum (TW h)	189	88	128	405	357

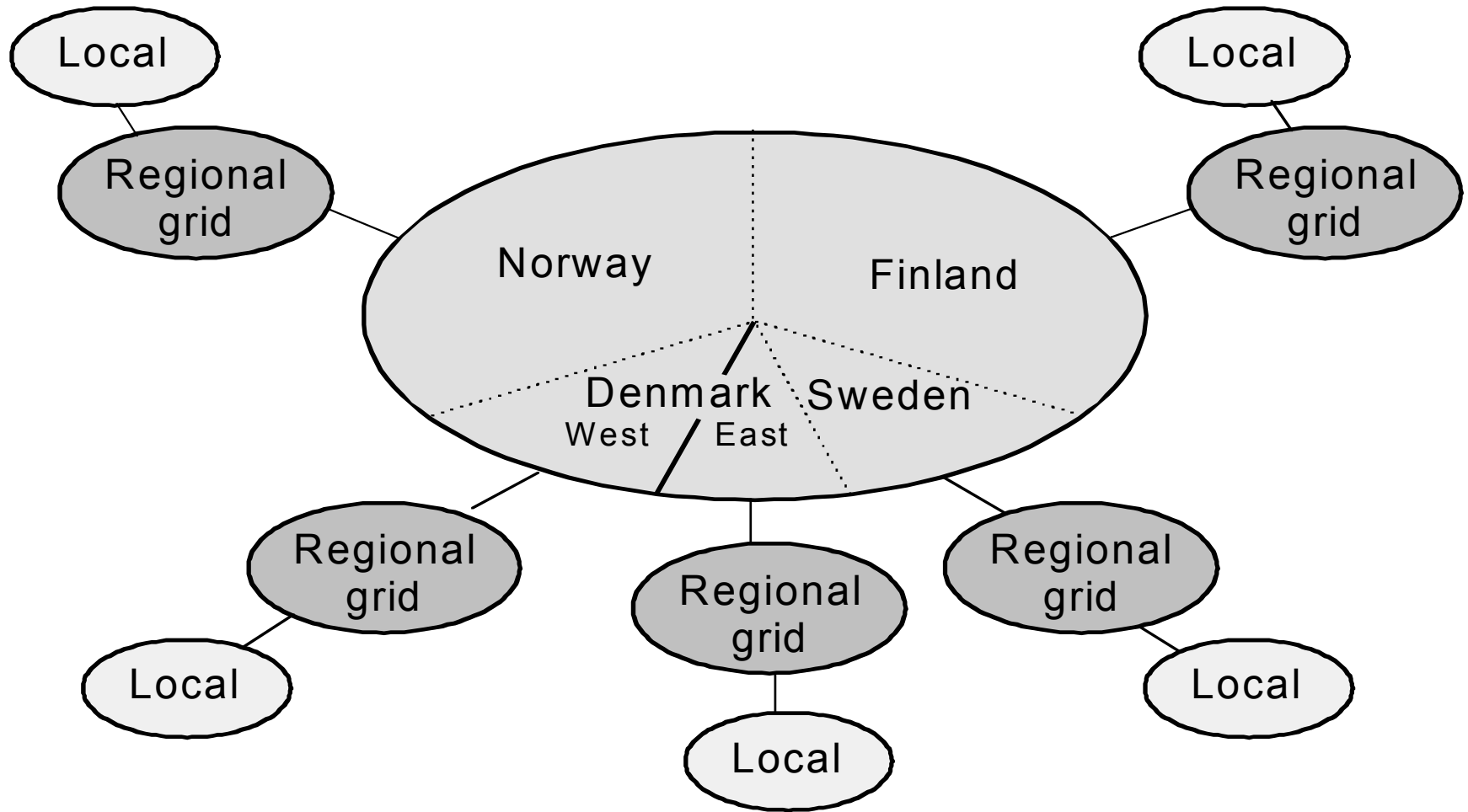
NORDEL before 1990

- **Established in 1963.**
- **Main objective was to optimise operation (minimise operational cost).**
- **Mutual assistance during disturbances.**
- **Co-ordination related to system planning.**
- **Cooperation on ancillary services.**

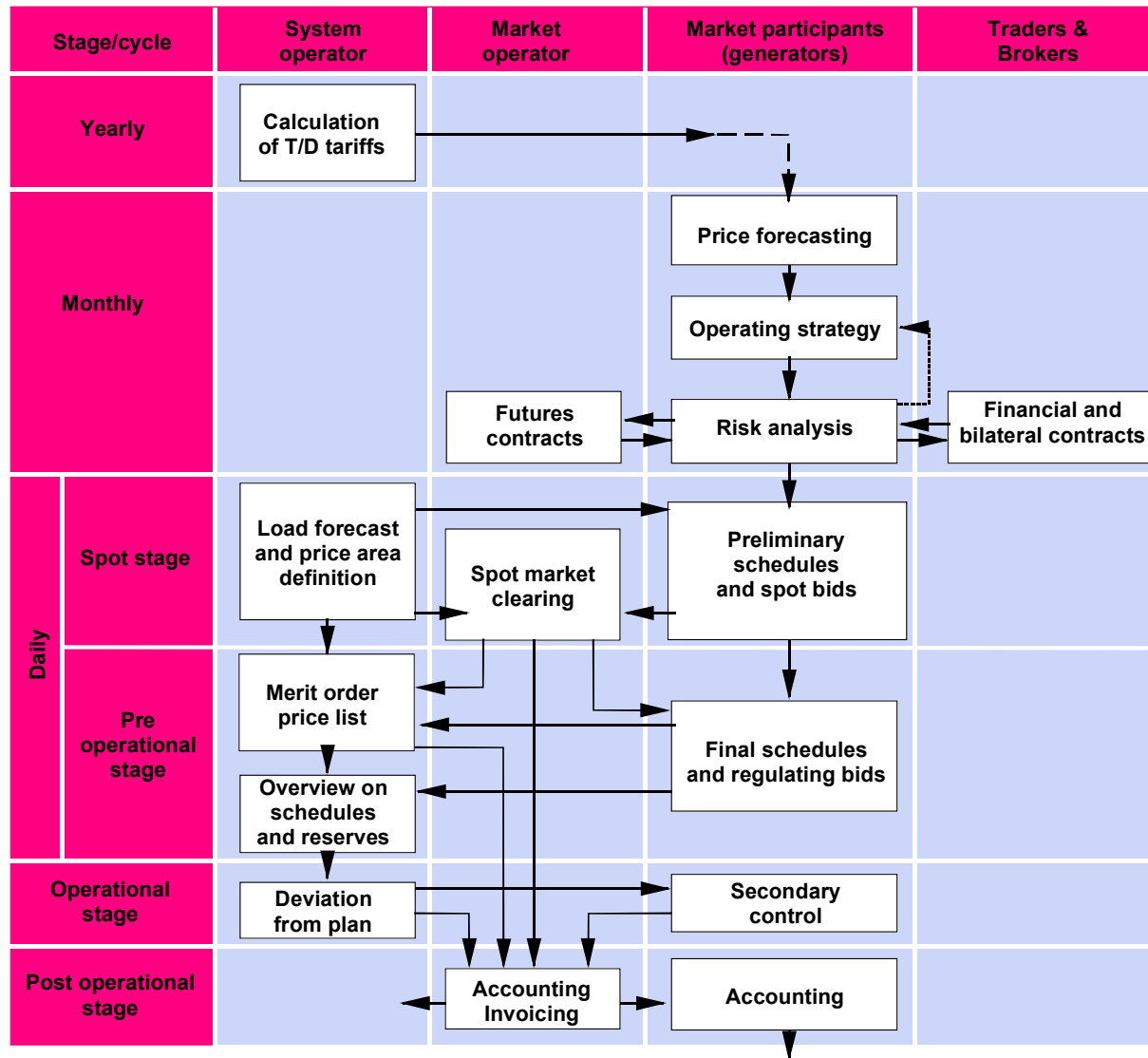
History of deregulation

Norwegian Energy Act effective from	Jan 1990
Institutional rearrangement ready	May 1992
Sweden joins Nord Pool	Jan 1996
Finland joins Nord Pool	June 1998
Denmark joins Nord Pool	2000

Common trading area for Norway, Sweden and Finland

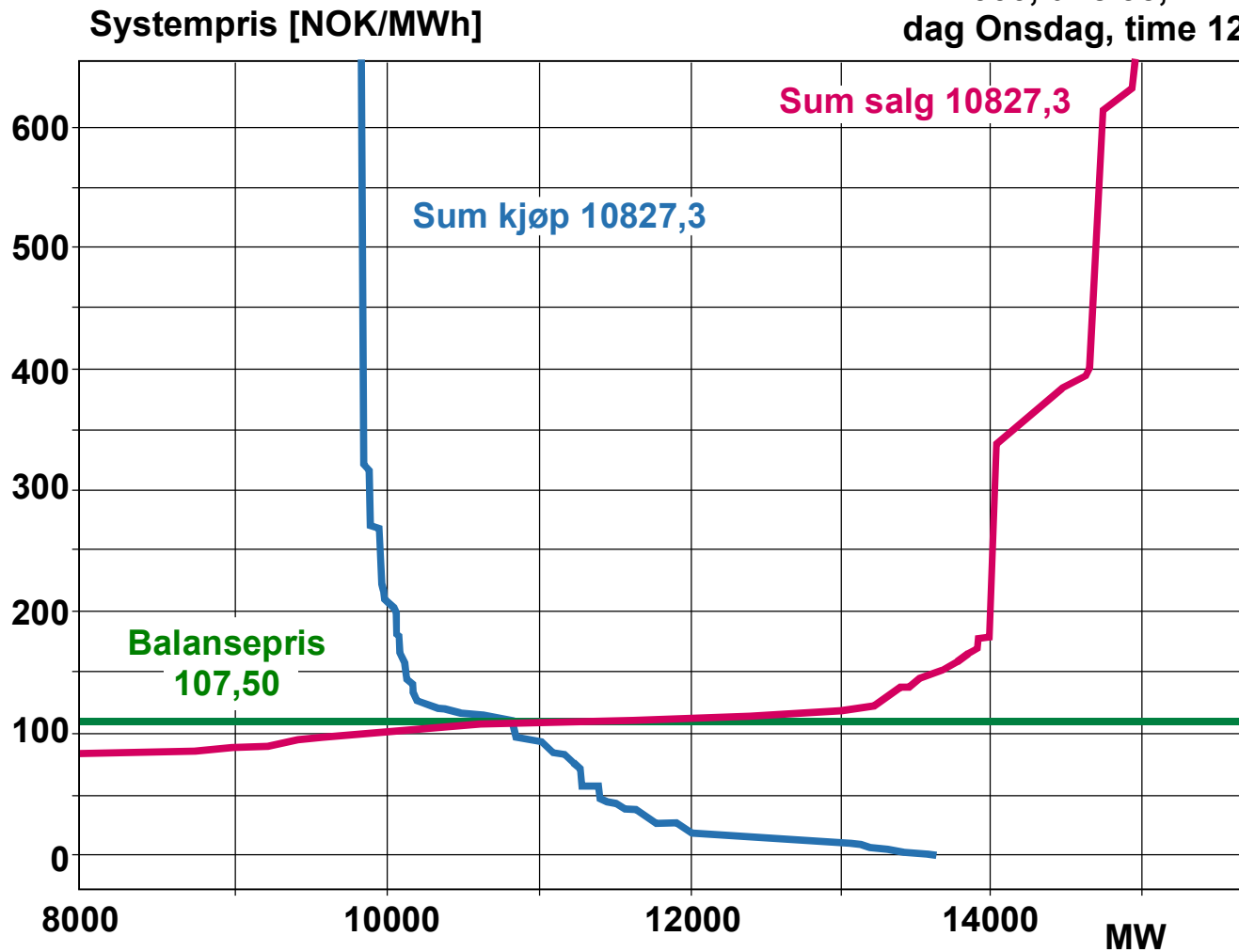


Planning and market clearing process



Priskryss i Nord Pool

År 2000, uke 35,
dag Onsdag, time 12



The Nordic electrical system as modelled in the EMPS model

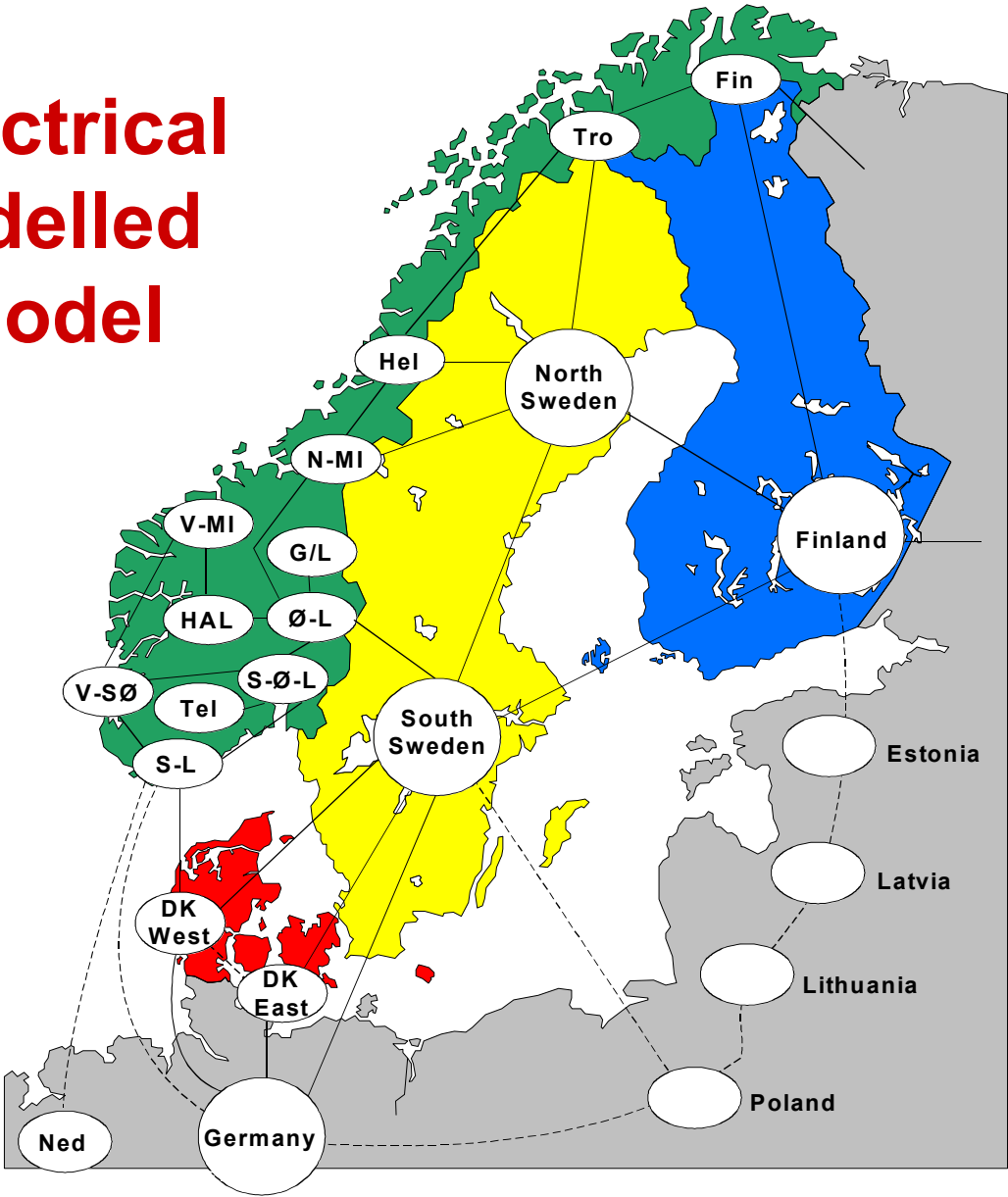
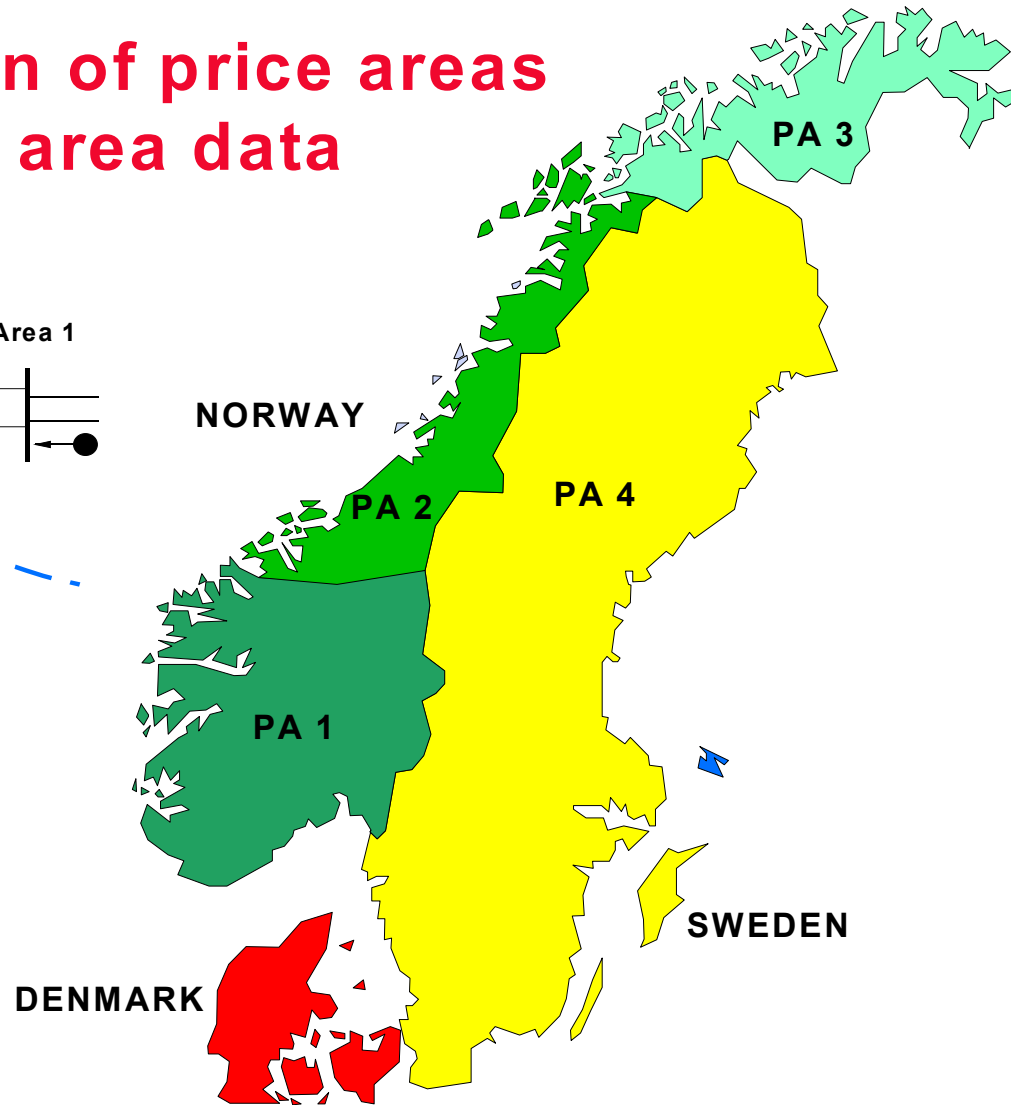
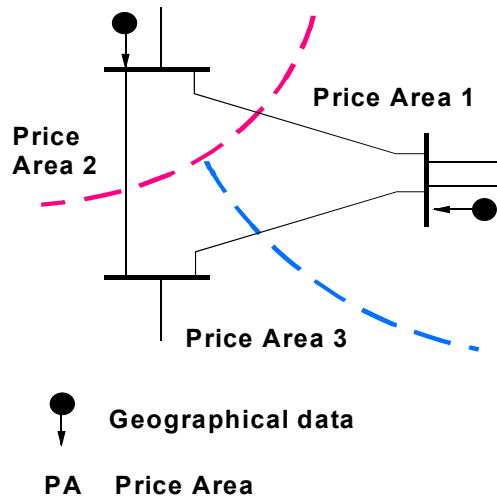
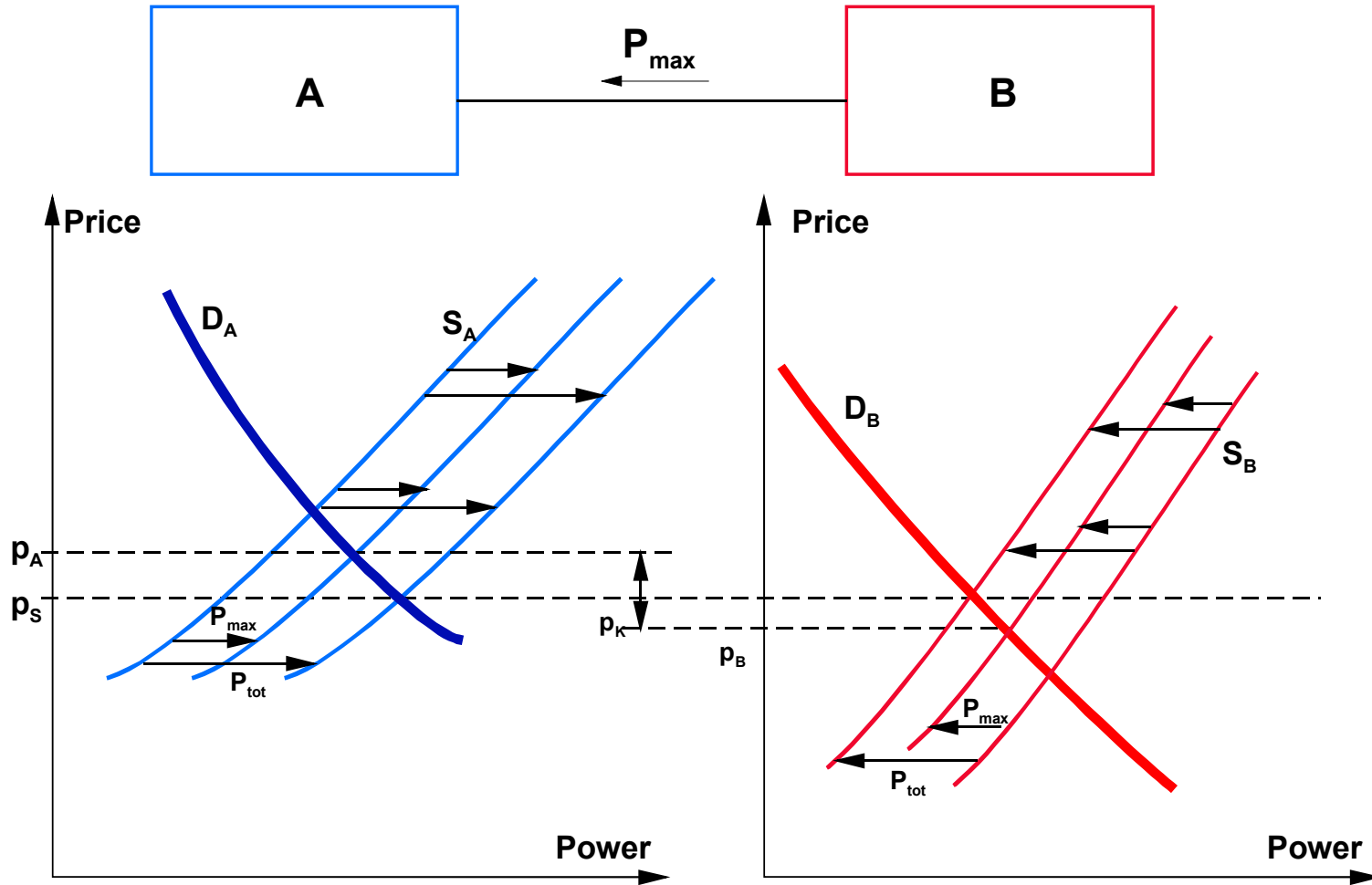


Illustration of price areas and price area data



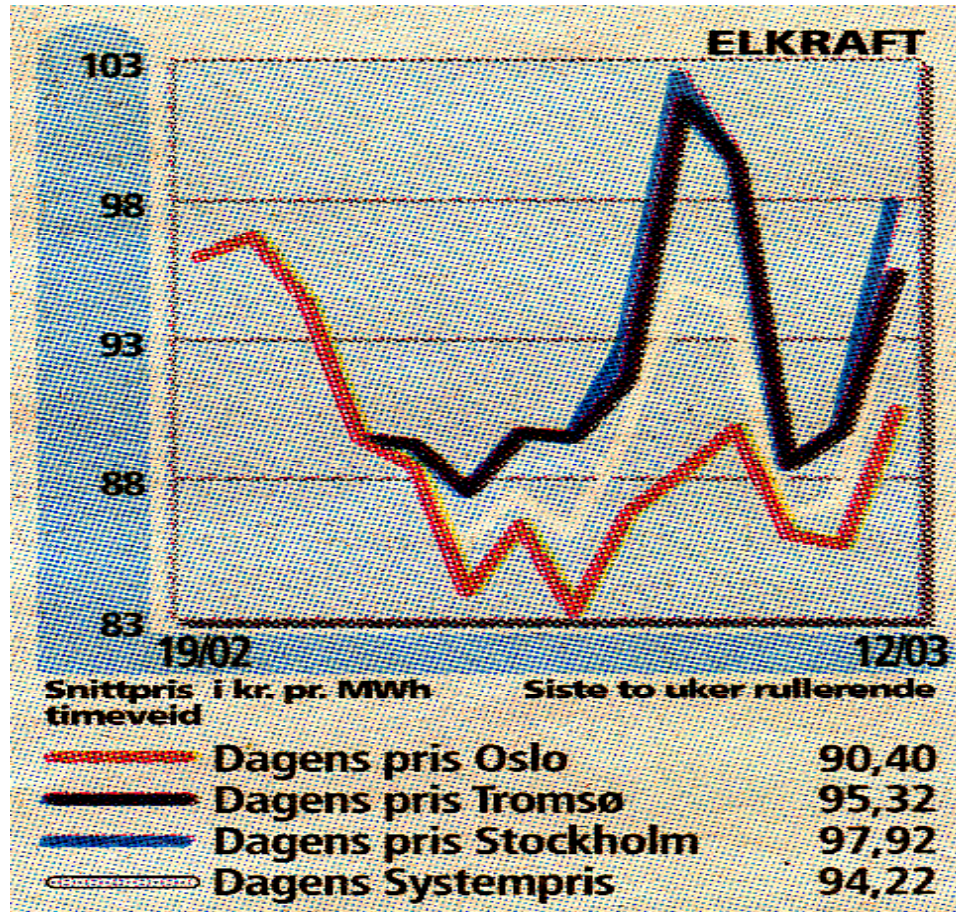
Congestion management

Area price settlement. Principle

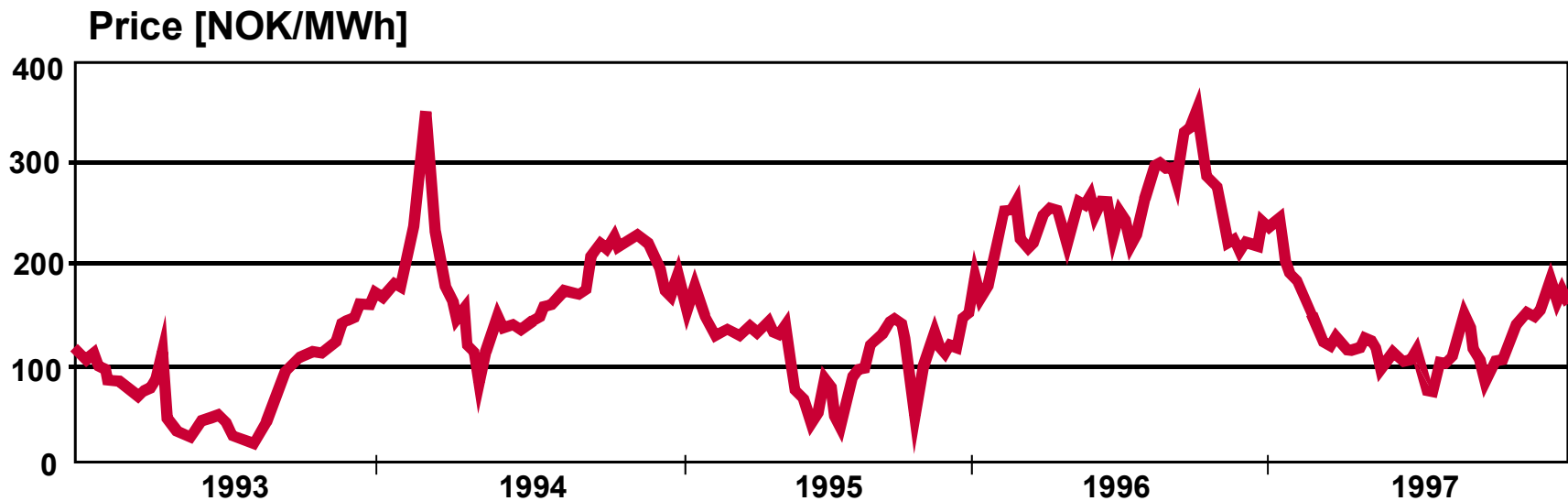


Spot prices in the Nord Pool area

(From “Dagens Næringsliv”, Norwegian business newspaper)



Price volatility in the Norwegian electricity market, 1993 - 1997



Interconnected grids in Europe



