



Nordic TSO cooperation and security of supply

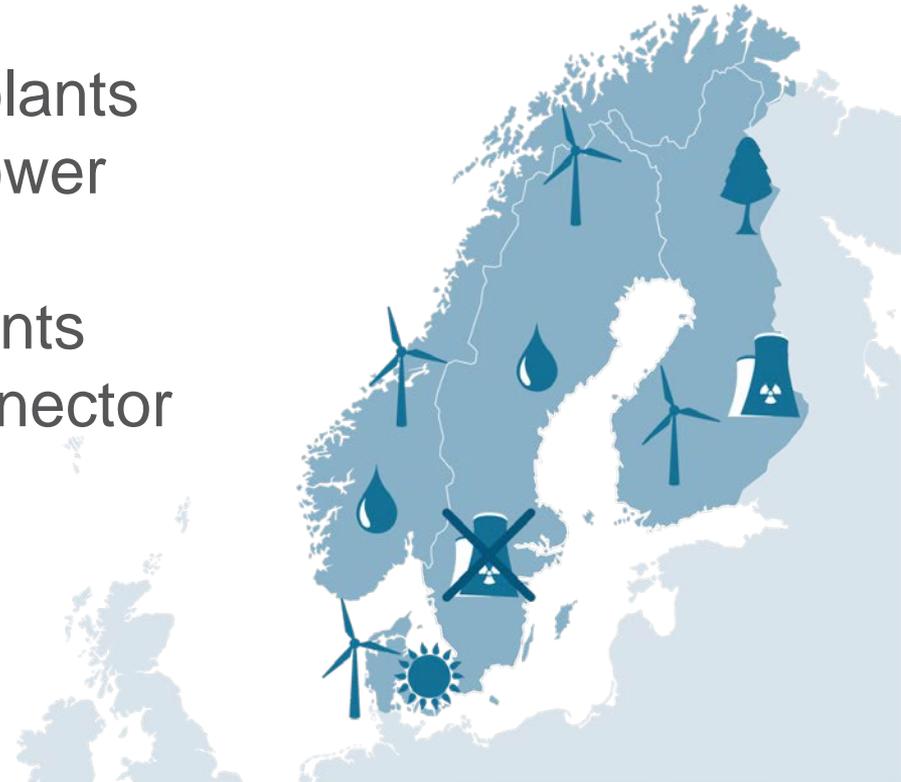
Auke Lont, EERA JP Smartgrid Conference

21 September 2016

Statnett

Fundamental changes in the Nordic synchronous power system

- Closure of thermal power plants
- Increased share of wind power
- Early decommissioning of Swedish nuclear power plants
- > 50% increase of interconnector capacity



Nordic cooperation is getting more important

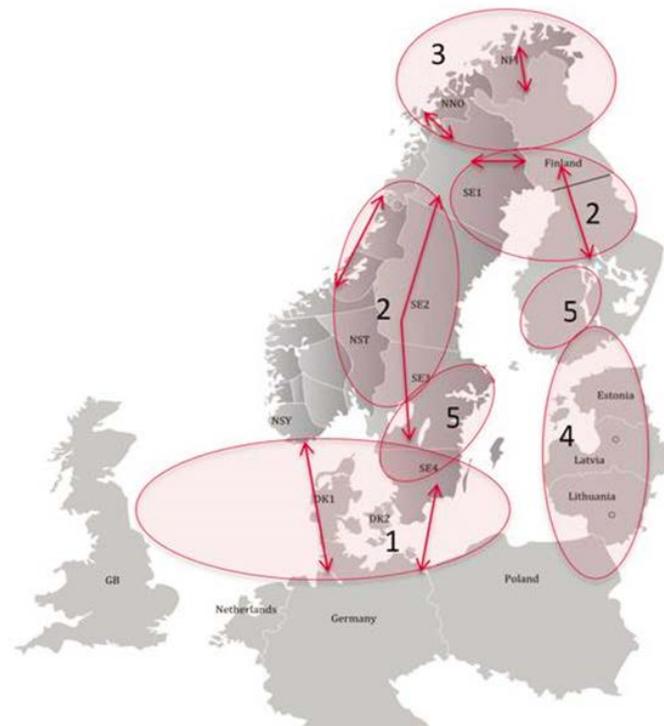
- Flexibility
- Capacity
- Security of supply
- Stability



The traditional way in the Nordic cooperation: Grid development

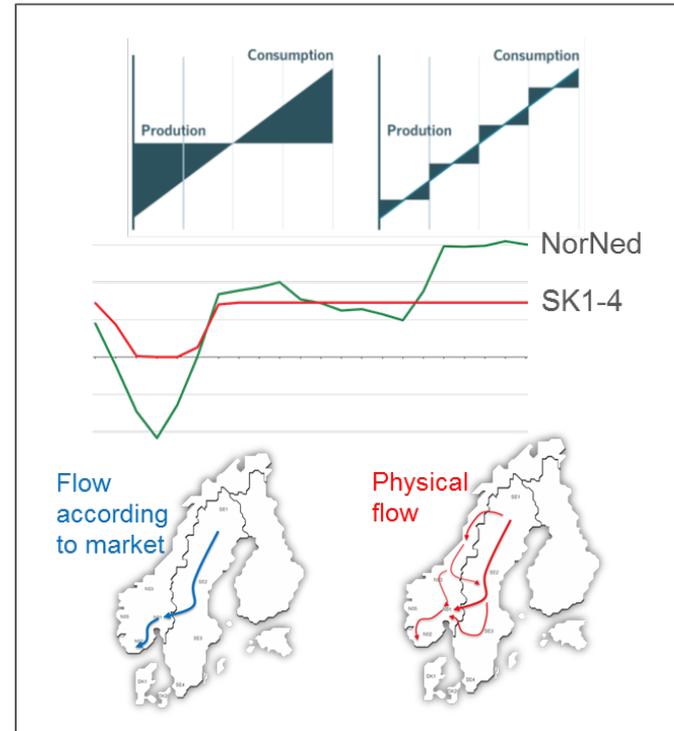
Drivers for grid development:

1. Further integration between Nordic countries and the Continent
2. North south flows
3. Arctic consumption
4. Baltic integration
5. Nuclear and thermal decommissioning



The smart way: Using markets

- Finer time resolution
 - From hour to quarter
- Continuous ramping
- Flow based market coupling
 - More efficient utilisation of both production resources and transmission capacity



The smart way: Using technology

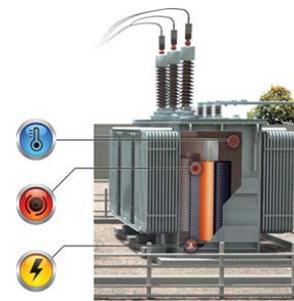
Inertia provider

- HVDC in AC net



Enabler for better frequency quality

- Digital Substation: Pilot installation at live 300 kV substation
- SAMBA: Smarter Asset Management with Big data
- SPANDAX: PMU-phasor measurement unit project



Flexibility provider

- Demand Side Response (DSR): From pre-study pilot to a larger project



The smart way: Extended cooperation

NOIS

- Elspot & Intraday Capacities
- Planning Table
- Nordic Merit of order Bid List
- Pricing Nordic Regulating Power Market
- Daily Exchange Report
- Reserves
- Maps
- Nordic Outage Coordination

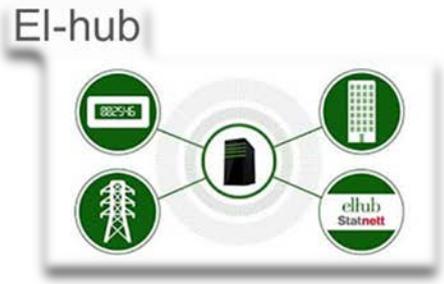


RSC

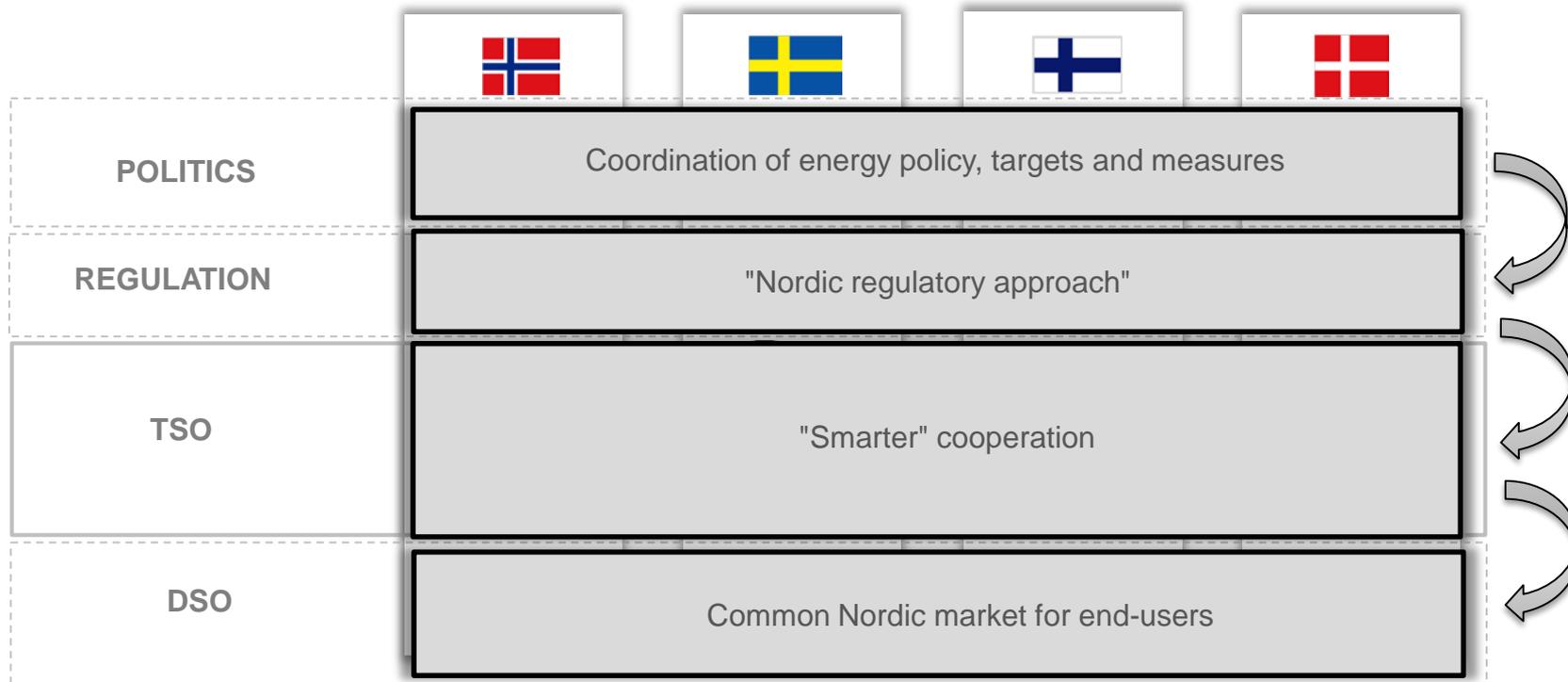
ETWORK SECURITY INITIATIVES

- Greece
- TSO
- TSO + Greece
- TSO + NRC
- Nordic
- Nordic + TSO
- WEBS

All-TSOs contract to define pan-European coverage in 2015



The smart way: Nordic coordination at all levels



Changing mindset: "From grid to system"

- First report:
*Challenges and Opportunities
for the Nordic Power System*
- Second report:
Solutions (Q2 2017)



What does it take?

- From concept to concrete ideas

