Power Capacity in the Nordics

Jukka Ruusunen
President and CEO, Fingrid Oyj

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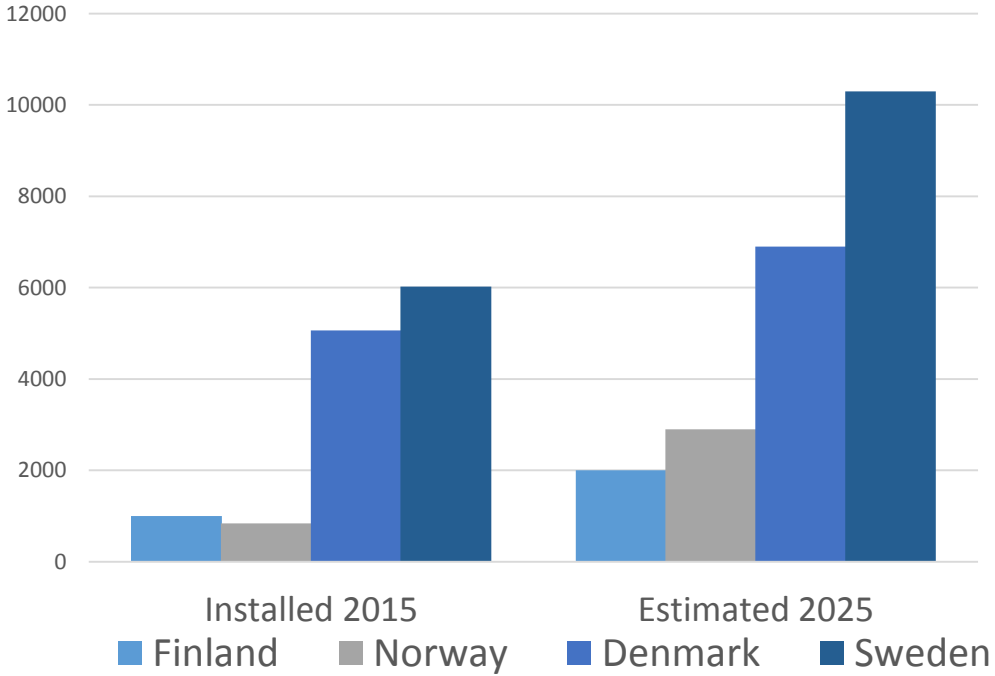
Our idea has been that market mechanism organizes the electricity system efficiently and reliably

- Electricity supply and demand have to be in balance from hour to hour – each and every second
- Price signals steer demand, operation of power plants and use of cross-border connections
  - electricity flows from low-price regions to high-price regions regardless of national frontiers
- Price drives market-based investments
- Markets and competition produce efficiency and high security of supply

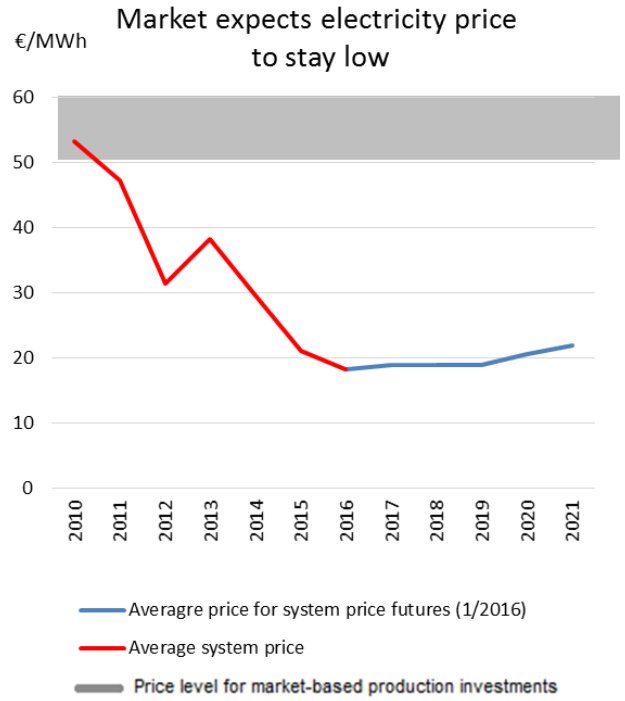
Game changer: generous subsidies for renewables

Nordic market: Over 22 GW of windpower planned by 2025!



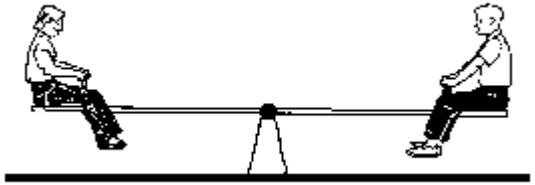
Subsidized zero marginal cost renewable energy has created new challenges for the electricity markets and the investment climate

- Markets should drive profitable investments for adequate generation capacity
- Rapid increase of promoted zero marginal cost intermittent production has eroded wholesale electricity prices
- Power plants are being decommissioned
- Low incentives for market-based production investments
- Security of electricity supply is challenged



Trends that challenge the Nordic power system

There is **surplus** of energy



BUT

there will be **scarcity** of

- ✓ peak power
- ✓ flexibility
- ✓ rotating mass to support system stability

Possible implications

Peak power

✓ Power shortages for citizens during peak hours

Flexibility

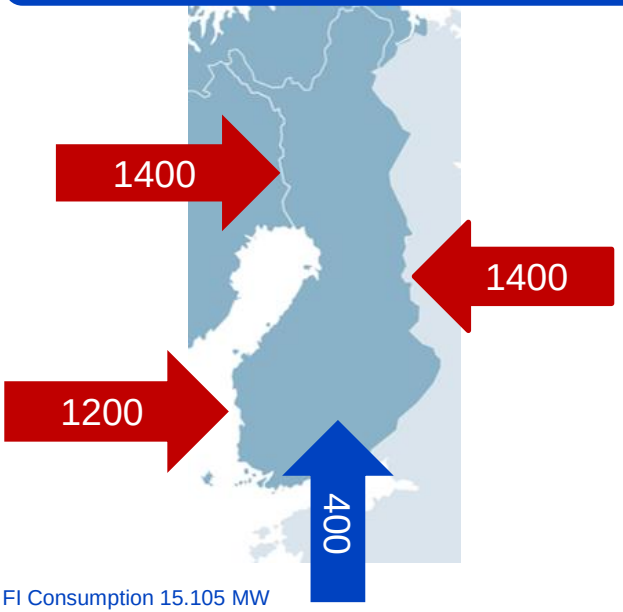
✓ Centralized control actions to balance supply and demand

Rotating mass

✓ Restrictions for the operation of big nuclear units and interconnectors

Market mechanism proved it's benefits during the peak load season

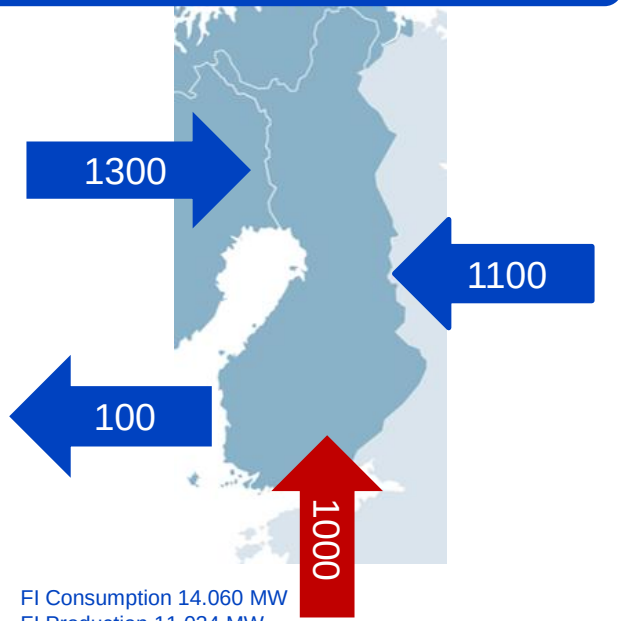
All-time peak load record in Finland 7.1.2016



FI Consumption 15.105 MW
FI Production 10.874 MW
FI Day-ahead price: 99 €/MWh

Well functioning electricity markets ensures efficient utilization of cross-border connections

Winter season's peak load in the Nordics 22.1.2016



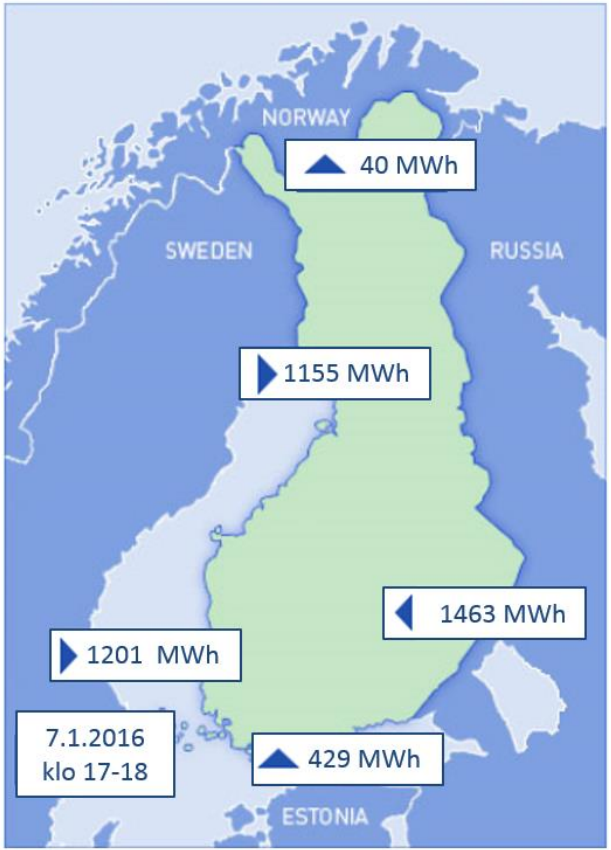
FI Consumption 14.060 MW
FI Production 11.034 MW
FI Day-ahead price: 214 €/MWh

Closer look on the all-time peak load record

- Strong correlation between consumption and temperature
- Power system passed it's stress test – No faults on significant power plants or cross-border connections
- Moderate price level

7.1.2016 17:00-18:00	
Consumption	15.105 MWh/h
Production	10.874 MWh/h
Import	4.231 MWh/h
FI Day-ahead price	99,94 €/MWh
Temperature*	-25 °C

* Temperature is weighted with consumption

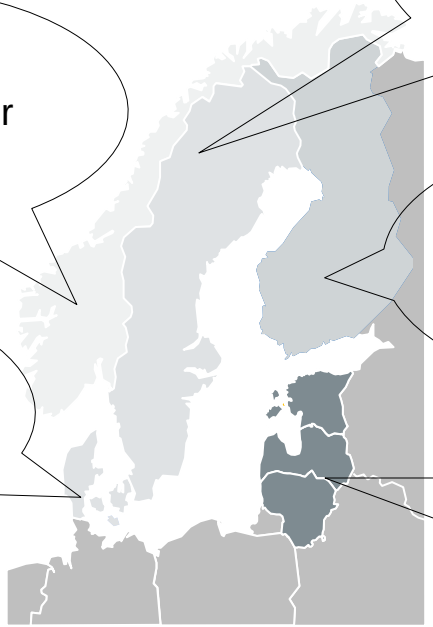


Snapshot of measured cross-border flows

Scarcity of peak power is a regional problem!

Demand for **Norwegian** balancing power increases in Europe

Sweden: Early decommissioning of nuclear power due to low profitability – replaced by wind



Finland: Closure of condensing power due to low profitability – new nuclear!

Denmark: Condensing power not competitive - peak load reserves proposed

Baltic countries: Lower price level via integration - condensing power not competitive

Price peaks become more frequent and stronger!

Probability for **power shortages and load shedding** is rising!

Different political stories...

... leading into very different solutions!

*"Finland must have an excellent security of supply. When we generate electricity by ourselves, **security of supply is in Finnish hands.** We must reach **self-sufficiency** in electricity generation, because that has an impact on security of supply and electricity pricing. Then **we rule electricity price**."*

Finnish MEP candidate

EUROPEAN COMMISSION

Brussels, 25.2.2015
COM(2015) 80 final

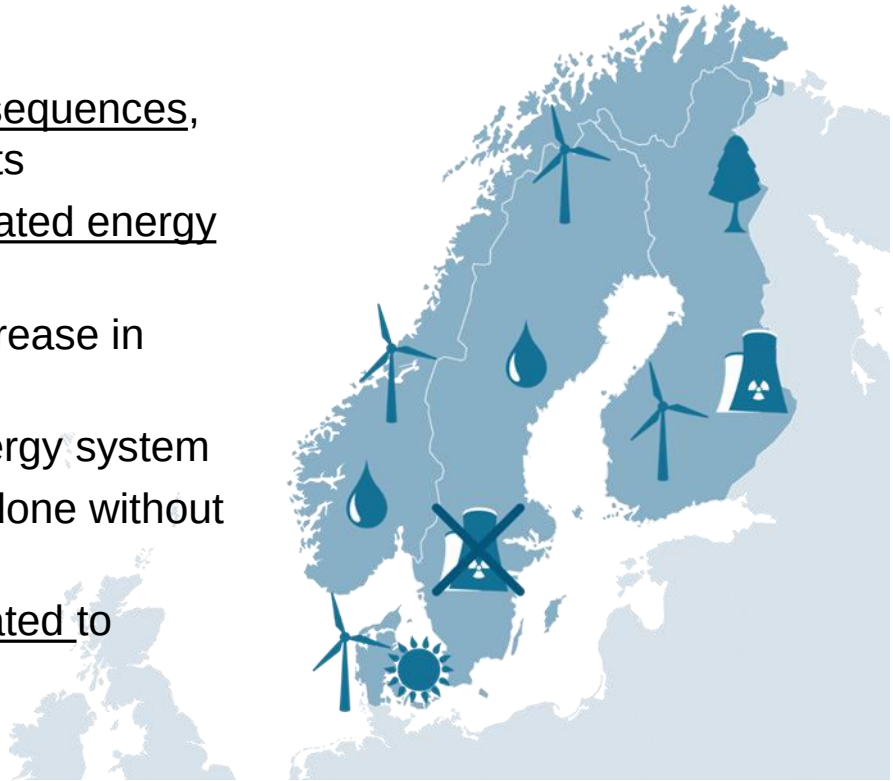
ENERGY UNION PACKAGE

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMITTEE OF THE REGIONS AND THE EUROPEAN INVESTMENT BANK

A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy

No country can solve market challenges alone – coordination is needed

- National energy policies have regional consequences, which impact international electricity markets
- Regional electricity markets call for coordinated energy policies
- Investment climate impacted from rapid increase in promoted renewable energy resources
- CO2 price should be a driver to a clean energy system
- Promotion of renewable energy should be done without hampering markets
- National energy policies should be coordinated to address common challenges



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