

From national to Nordic transmission system operations

Differences and Harmonisation Opportunities in Nordic Transmission System Operations,
Fortum Energy Review, November 2019

Fingrid Advisory Board, 4.12.2019

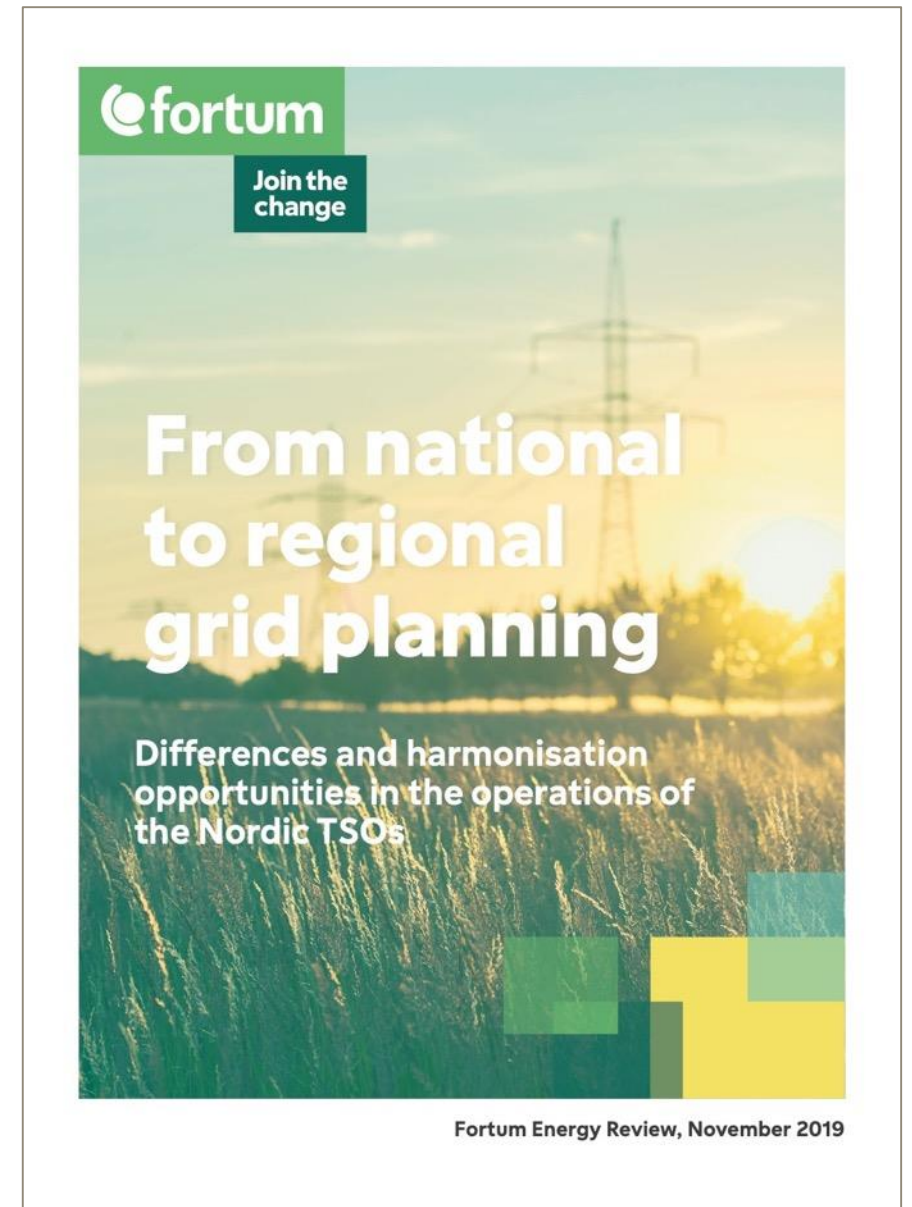
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From national to Nordic transmission system operations

- The report investigates the operational, legislative and historical differences among the Nordic TSOs operations and planning.
- The report has been prepared by Pöyry Management Consulting for Fortum Oyj. It is an independent report by Pöyry and all the findings and views expressed in the report reflect the views of Pöyry as they were interpretable based on public information and interviews.
- The report was published in November 2019.
- Report available:
<https://www.fortum.com/sites/g/files/rkxjap146/files/documents/fortum-energy-review-grid-planning-11-2019.pdf>



Background

The purpose of the study is to understand the behaviour, and underlying obligations and incentives of the Nordic TSOs; specifically how and in what circumstances these support Nordic regional (or wider European) interests, or give precedence to national requirements



Goal

- Support an open constructive debate discussion on the differences in Nordic TSOs' operations in a way that makes it possible to help stakeholders understand the situation of the TSOs and their behaviors and also to identify areas where TSOs could align more closely to deliver Nordic (and European) benefits
- While differences are discussed, we do not assess or compare the ways in which Nordic TSOs are executing their statutory tasks. Neither do we suggest solutions for the issues where the differences may lead to unoptimised solutions



What's in it for

- Market parties: increase the understanding of the perspectives of Nordic TSOs
- TSOs: the study provides material to discuss opportunities for harmonisation that result in Nordic socio-economic benefit
- Public authorities (ministries and NRAs): understanding better their vital role in promoting cooperation and harmonisation in the Nordic electricity market



Methodology

- Based on public information and a series of interviews with TSOs / NRAs / Ministries in each Nordic market



TSOs operate in different physical context



Source: ENSTO-e



Transmission

- Reflects that electricity supply has developed through regional development of hydropower
- Five bidding zones



- Main network is old and reaching end of lifetime and requires investment
- Four bidding zones

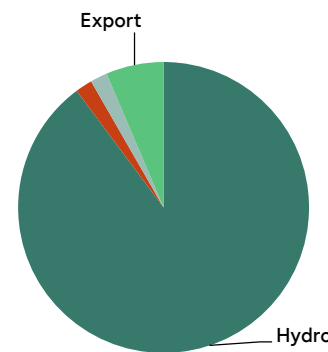


- Strong grid and north-south transmission
- Emphasis on maintaining one bidding zone

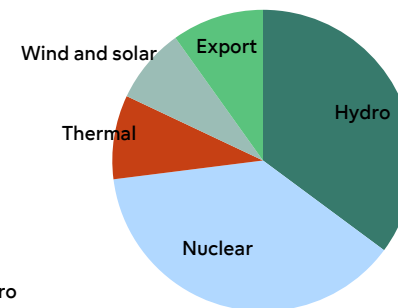


- Two synchronous transmission systems and two bidding zones

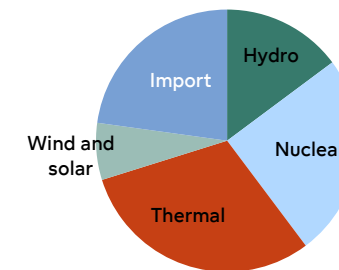
Generation



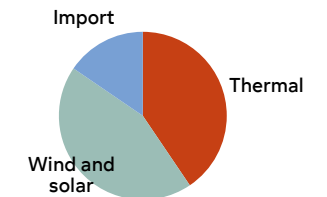
146 TWh



158 TWh



68 TWh



29 TWh

TSO obligations and tasks are similar across the Nordics, however governance structures differ

- The roles of TSO, NRA and ministry are broadly the same, but the responsibilities, decision making power and political influence may differ
 - Governance structures give room for national perspectives and decision-making processes to emerge as a means of control
- There are platforms and processes to support Nordic cooperation and harmonisation but there are different views on their effectiveness and the underlying development needs
 - Strong political will and commitment is seen as a more plausible way for pushing Nordic cooperation

Statnett

- State enterprise fully owned by the Ministry
- The Ministry has a double role; that of an owner and a regulator through NVE

SVENSKA KRAFTNÄT

- Part of the state directly, not just owned by the state
- Receives written instructions ('Regulatory Letter') from the Swedish Parliament each year

FINGRID

- Limited liability company in which the Finnish state has a controlling stake

ENERGINET

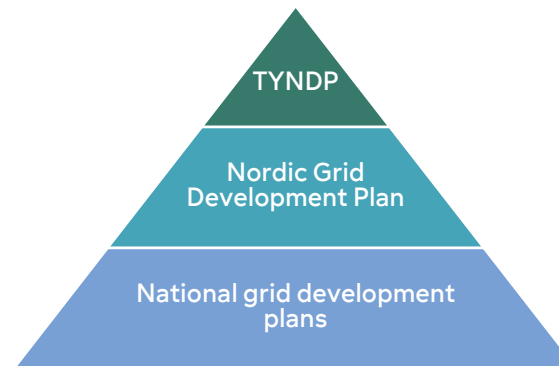
- Public company belonging under the ministry, and is fully owned by the Government of Denmark
- Operates also as a gas TSO

Grid planning and investment is probably the least Coordinated activity between the Nordic TSOs

Asymmetric costs and benefits between countries complicate cross-border investments and is a new normal

- Simple win-win investment cases have been completed and new projects are more complicated with uneven and uncertain benefits and costs
- Complicating the cost and revenue sharing agreements is the threat from regulators to take retrospective actions on revenue sharing schemes

Grid investments are subject to national interests and prioritisation



- Position of a TSO on investments can change as the process develops
- Investment decisions are ultimately always national and subject to political interests → TSO or NRA or Ministry can stop analysis for non-priority IC
- Prioritisation of Nordic grid investment is a vague subject
- One or several bidding zones – national or TSO objective?

Standard Nordic CBA methodology exists but the scenarios, uncertainties and other inputs cause controversy

- There is a question whose welfare is optimised and how wider Nordic benefits are included in national approval processes
- Different views on economic uncertainties and risks can be used as a means of justifying different prioritisation of grid investments

System operation has the most effective Nordic cooperation excluding times of disturbances

Congestion management

There is no common approach to dealing with congestion in the main grid

- The philosophy of planning for and dealing with congestion is not consistent
- A common merit order for managing re-dispatch on a Nordic basis is missing
- There is limited transparency towards the market around how congestion is dealt with

Contingency management

The protocols regarding capacity calculations for contingency management appear unclear

- Unclear under which circumstances cross-border capacity will be reduced and by how much
- RSC rules suggest that capacity calculations should be done but there are specific complexities in the Norwegian grid that make this task necessary to perform in Norway according to NVE and Statnett

Balancing model & tools

Although a new balancing model is being developed, balancing tools are not fully harmonised

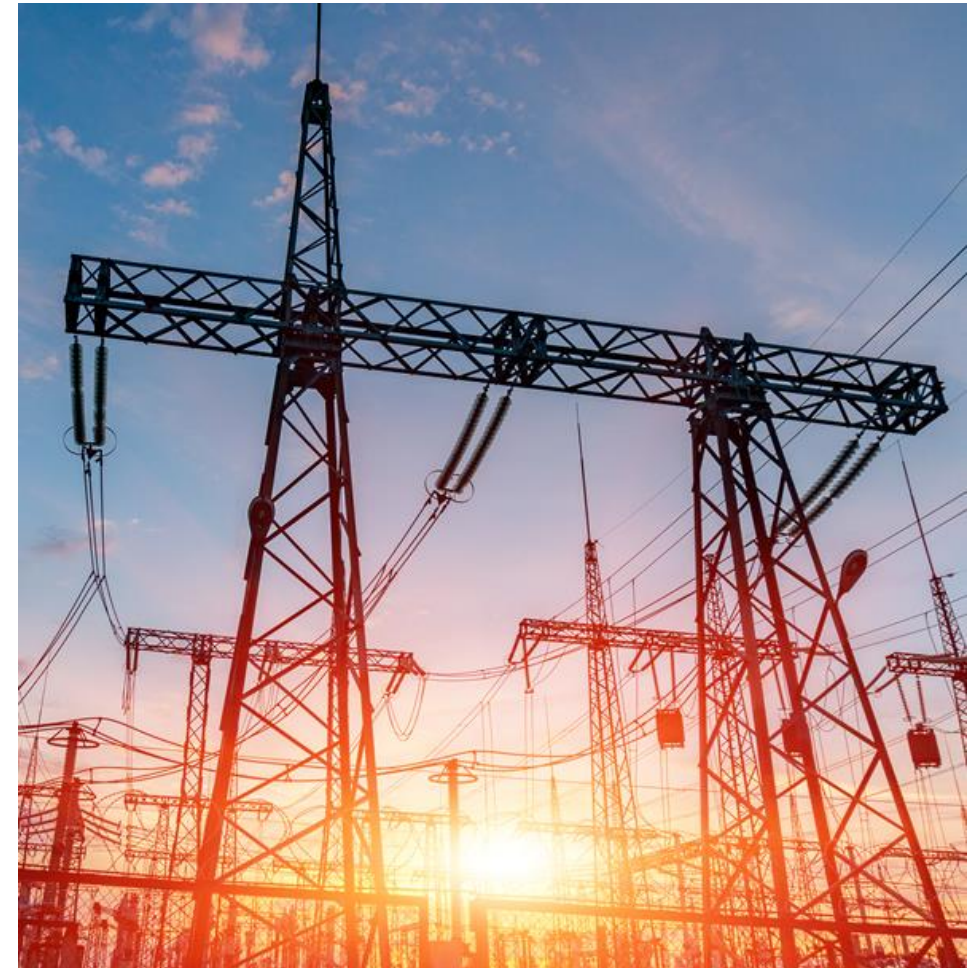
- Example: Reserve costs included in the calculation of the unit transmission tariffs:

	Statnett	Energi-net	SvK	Fingrid
Primary	C (est)	C (est)	C	N
Secondary	C (est)	C (est)	N	N
Tertiary	C (est)	C (est)	N	C
Cost* MEUR	26.3	107.9	150.5	56.7

*2018

Information about the state of the market is not revealed in a systematic way across the TSOs

- Transparency of the electricity market information is a key element in improving the functioning of the electricity market
- Common Nordic conditions about transparency in critical situations of supply and demand are lacking
- Capacity calculation at borders is unclear, especially in times of scarcity



Summary

- Nordic collaborative activities have visibly slowed, and European electricity market design has been led by other countries with different drivers
- To meet the challenges of the energy transition towards a zero-carbon economy, even deeper partnership will be needed
- The key findings of the study can be summarised in the following points:

Politics & governance

- TSOs obligations and tasks are similar across the Nordics, however governance structures differ
- There are platforms and processes to support Nordic cooperation and harmonisation but there are different views on their effectiveness and the underlying development needs

Grid investment

- Grid investments are subject to national interests and prioritisation
- For future shared investments, the asymmetric distribution of costs and benefits between countries is a new normal

Congestion and contingency management

- There are national differences in approach to the existence and management of congestion in the main transmission grid

Transparency

- Information about the state of the market is not revealed in a systematic way across the TSOs



Thank you

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Fortum's key messages related to Nordic TSO operations

are primarily targeted to the Nordic policy makers, regulators, TSOs and other stakeholders, but they are equally applicable at the EU level

- **Energy transition and electrification** - will require significant strengthening of the regional grid transmission system
- **Farsighted and transparent grid planning decreases the uncertainty of investment decisions for market participants and the overall cost of the energy transition and electrification.**
- **Enhancing and harmonising the TSO operations and regulations at the regional level requires strong political backing**
- **A co-ordinated regional approach in grid planning should be based on top-down optimisation of grid development. The regional plan should be more than a compilation of national plans**
- **The socio-economic benefits of grid investment should be assessed from the regional perspective rather than from the national perspective**

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- Congestion revenues should be invested in grid development to reduce existing bottlenecks.
- A separate regional financing hub should be established where congestion revenues would be collected. These pooled resources should be used to remove bottlenecks from the most congested areas.
- There should be a clear target to decrease the number price areas in the Nordic power market.
- Nordic balancing markets should be harmonised and the number of balancing market places reduced. Market access to balancing market places should be equal and technology neutral
- Market information should be disclosed in a systematic and transparent way across the Nordic TSOs.
- The Nordic Regional Security Co-ordination (RSC) should be strengthened to be the real co-ordination centre for Nordic system operations and planning