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Implementation of data hubs in the Nordic countries

Status Report, June 2019

Index

Preface

NordREG, a cooperation between Nordic energy regulators, has for several years been devoted to the work of developing the Nordic electricity market. In recent years, NordREG has focused on establishing joint recommendations to achieve a harmonized Nordic electricity retail market. The Nordic countries have, and still are, making substantial changes to their national electricity markets to make them coherent. Such measures include supplier centric market processes and the development of data hubs.

NordREG provides an important platform for information exchange and sharing of best practices. This report describes the status of the implementation of data hubs in the Nordic countries. The information comes from both the Nordic transmission system operators (TSOs) and the Nordic regulators.

Carsten Smidt
Chair of NordREG

Copenhagen, June 2019

Executive summary

Since 2005, NordREG has worked towards a harmonized Nordic electricity retail market. Many important steps have been taken, and in three years' time all Nordic countries will have a data hub that will facilitate wholesale and retail market processes. The successful implementation of the data hubs and the ability to centralize the handling of market processes is a key factor for the Nordic retail market to work effectively. In all the Nordic countries the government and regulators have given the transmission system operators (TSOs) the responsibility to operate the data hubs in each respective market.

Data hubs have been implemented successfully in Denmark and Norway. In Finland and Sweden, development of data hubs is in progress. In Finland, the scheduled start date is April 2021, and in Sweden in Autumn 2022.

In the coming years, work will be carried out to develop the existing data hubs further. In Finland and Sweden, the focus is to develop and launch data hubs with the necessary legislation and coordination with market participants.

In 2018, the main challenge in the development of data hubs in the Nordic countries has been for Sweden. Due to an uncertain time frame for when the necessary legislation will be ready for presentation by the Ministry of Infrastructure (government body responsible for the energy sector in Sweden), the data hub project has been forced to revise the time plan and the approach for system development.

In the coming two years, the main challenges for Denmark are the increase of data volumes for hourly settlement and the 15-minute imbalance settlement. For Finland, the main challenge is to get market participants ready for the go-live date. For Sweden, the delayed legislation remains a major challenge, and, therefore, not giving market participants the prerequisites to prepare their IT systems.

The TSOs in the Nordic countries have several forums where the issue of interoperability between the data hubs have been discussed. The Danish and Norwegian data hubs don't have systems for interoperability, and the Finnish and Swedish data hubs will not have this functionality in the initial stage. This is an issue that the TSOs will look into after all data hubs have been implemented. However, a pilot project in Denmark has shown that it´s possible to let foreign market participants operate in the Danish market via the Danish data hub.

In all the markets, customers can access their personal data thru the data hub. Third parties can get access to customer data with the customer's authorization.

The operational data hubs in Denmark and Norway, as well as the ones that are under construction, have some functionality for storing information on flexibility potential and the likes.

1. Introduction

In 2019, Denmark and Norway are the only NordREG members that have fully implemented data hubs in their markets. In Finland and Sweden, the development of data hubs is underway, with planned launches in April 2021 and Autumn 2022.

NordREG believes that implementation of data hubs is beneficial for the development of electricity retail markets. The development of national data hub solutions and adhering regulations will be implemented on a national level. However, NordREG promotes the exchange of ideas and lessons learned from current data hub projects. Increased cooperation between data hub operators may potentially lead to lower costs and improved IT services for the industry.

In recent years, NordREG's Retail Market Working Group (RMWG) has followed the work to implement national data hubs and reported the findings to the NordREG Board on an annual basis. Initially, the report was based on information from the national regulators in NordREG. Now, with the legislation in place (or suggested to the government[1]) and the TSOs gradually taking responsibility for the implementation, the RMWG has included the TSOs in the biannual status report.

In chapter 2, the TSOs have provided an update on the status of the implementation of data hubs, which from 2019 also includes a status on interoperability between the Nordic data hubs. In chapter 3, the national regulators have described the legal framework and functionalities of the data hubs in their country.

[1] Ei (Energimarknadsinspektionen) has suggested new legislation to the Swedish government. New law has not yet been approved by Swedish parliament.

2. Status of the Nordic TSOs' implementation

The TSOs are responsible for developing and operating the data hubs for each of the electricity retail markets in the Nordic countries. This chapter gives an update from each of the Nordic TSOs regarding the status of the implementation of data hubs in their country. Table 1 (below) presents a summary of the answers from the national TSOs. This is followed by a full presentation of the answers. The answers are presented as they were received by each of the national regulators from the national TSO.

Table 1. Summary - Status of the TSOs data hub implementation.

Question	Denmark	Finland	Norway	Sweden
What is the status of the national data hub implementation in March 2019?	The Danish data hub has been live since March 2013	Under development	The Norwegian data hub successfully launched 18th February 2019	Under development
What overall activities are planned in 2019 and onwards?	**2020:** Implement eSett integration. **End of 2020:** All metering points will be settled hourly. **2020+:** Implement 15-min imbalance settlement. **2021:** Fully CEP compliant.	**Q3 2019:** Pilot group testing starts **Q4 2019:** Electricity market decrees are ready **Q2 2020:** Industry testing starts **Q4 2020:** Market party certification	Continuously monitoring and supporting DSOs and suppliers in improving data quality and reporting systems. **2020+:** Acquisition and development of 15 min interval capabilities for imbalance settlement.	The plan for the next 12 months is: **1.** to move from developing a prototype to developing the actual hub **2.** to initiate a renewed procurement of a migration solution in Autumn 2019 **3.** start internal establishment of an organization for the future operation.
When do you estimate that the implementation of the data hub is completed?	N/A	March 2021	N/A	It can at the earliest be operational by Autumn 2022

2.1 What is the status of the data hub implementation, and when is it planned to be in use for market participants?

Denmark (Energinet.dk)
The Danish data hub has been live since March 2013 for all market participant. The second version of the data hub that includes financial billing information has been live since April 2016.

Finland (Fingrid Oyj)
The Finnish data hub is scheduled to go live in April 2021. The Electricity Market Law came into effect at the beginning of February 2019. Fingrid's data hub vendor has been selected (CGI) and the project is ongoing. Mandatory processes for data migration and cleaning are up and running and all market parties are participating.

The mandatory market participant project and implementation plans will be delivered to Fingrid and the national regulator by end of April 2019. Market participants software vendors testing towards the data hub was started in April 2019 and the secondary legislative update is being processed by the ministry.

Norway (Statnett)
The Norwegian data hub is now in operation and was successfully launched on February 18th, 2019.

Sweden (Svenska kraftnät)
Since the last report, a contract was signed with a system developer by mid-2018, and the system developer is currently developing a prototype in close collaboration with the project. An RFI (Request for Information) regarding a migration solution for data was carried out in 2018 and a procurement was initiated in December. However, the procurement was stopped in Spring 2019 as new demands had to be taken into account.

The expected legislative package from The Ministry of Infrastructure has been delayed by one year, which affects the time frame. The legislative package is now estimated to be implemented by mid-2020. Data migration needs to be supported by legislation, which means that these activities will be delayed until the legislative package has been implemented. A voluntary data inventory has been carried out by market participants.

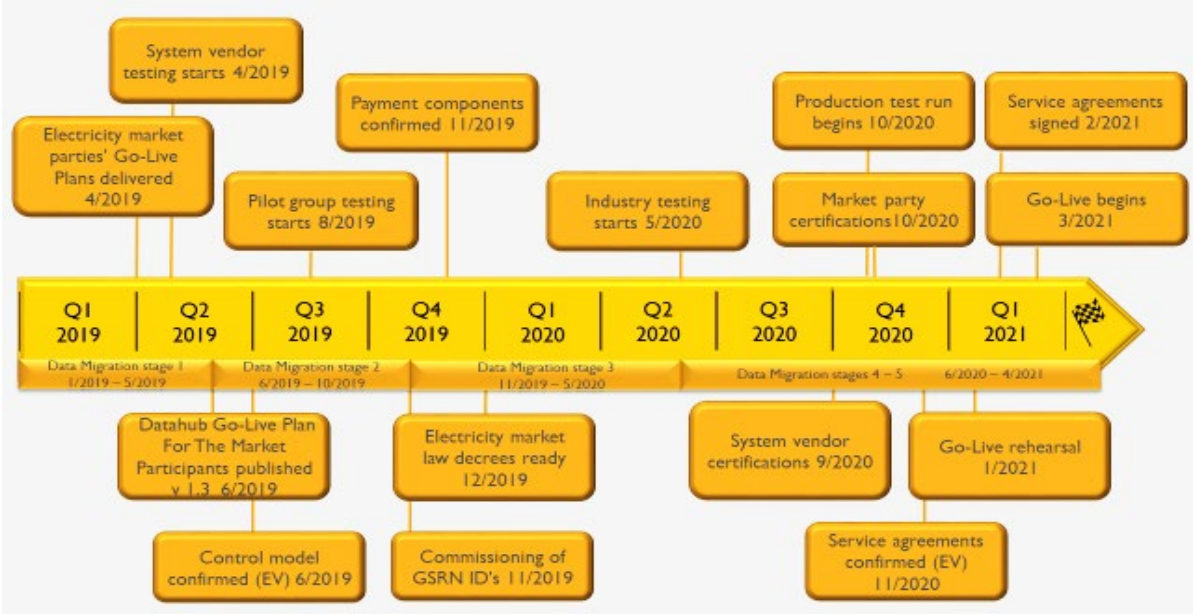
The delayed legislation also has an impact on the Swedish hub's go-live date, and currently there is no revised timetable. It is foressen that the data hub will be operational by Autumn 2022 at the latest. Svenska kraftnät has evaluated two options for operating the data hub. It has been decided that Svenska kraftnät will operate the hub, not a subsidiary to Svenska kraftnät.

2.2 What overall activities are planned in 2019 and onwards? Please present a timetable.

Denmark (Energinet.dk)
The Implementation of aggregators as a separate role. It is not important when this happens, but it is important that it is done right and that it is compliant with the definitions of the Clean Energy Package (CEP). In 2020, eSett will be fully integrated, and by the end of 2020 all metering points will be settled hourly, including grid loss. Profiled settlement and reconciliation will be obsolete.

After 2020, the planned activity is to implement 15-min imbalance settlement. The deadline for this is coordinated with the other Nordic countries. Besides the above, we are getting ready to be fully CEP compliant.

Finland (Fingrid Oyj)



Norway (Statnett)
Elhub is currently working with vendors on planning for the development of functionalities that allow for the introduction of 15-minute intervals in metering data.

Sweden (Svenska kraftnät)
The plan for the next 12 months is pending approval from the board of Svenska kraftnät and includes moving from developing a prototype to developing the actual hub. The development will be focused on core functionality, which is not, or only to some extent, affected by legislation.

The plan is also to initiate renewed procurement of a migration solution in Autumn 2019, with the aim to have a system that can be initiated as soon as the necessary legislation is in place. Svenska kraftnät will also be starting internal establishment of an organization for the future operation of the hub, thus including customer support, operations and maintenance of the data hub.

Later, when the legislation is in place, migration activities will start, and work will focus on implementing the data hub. Also, involving the almost 400 market participants will be a very high priority, as it is a key success factor that they understand the new model, make the necessary changes to their IT systems, adapt processes, etc.

2.3 What were the main challenges and focus areas regarding the national data hub in 2018?

Denmark (Energinet.dk)
No particular challenges. The main focus area has been the transformation from profiled settlement to hourly settlement.

Finland (Fingrid Oyj)
Electricity Market Law, finalizing Data hub procurement, and getting Data hub it-project ongoing (starting activities).

Norway (Statnett)
The main areas of focus in 2018 were finalizing the development of Elhub (correcting bugs, improving performance, security, etc.) and preparing market participants for go-live (improving the data quality on customer data and metering points; testing daily reporting of metering data from DSOs; testing communication with users' systems and performing business processes including supplier switching).

Sweden (Svenska kraftnät)
The main challenge has been the uncertainty of the time frame for the legislation and later also the confirmation that the legislative work will take longer than originally expected. The delayed legislation has forced the project to revise project plans as well as the approach for system development. Concerns about information and cyber security related issues have also been raised by a few stakeholders and these matters are of course of the highest importance to solve, but also challenging.

The main focus has been to procure a suitable system developer and establish good collaboration between the project and the system developer.

2.4 What are the main challenges that TSOs see in the coming two years regarding implementation and operation of the data hub?

Denmark (Energinet.dk)
Settlement data volumes will increase tremendously due to the transition from profiled settlement to hourly settlement. On top of that, further data growth is anticipated due to the 15-minute imbalance settlement period.

Finland (Fingrid Oyj)
Market participants' readiness to start go-live activities Q2/2020.

Norway (Statnett)
Nothing reported.

Sweden (Svenska kraftnät)
To get legislation and regulations in place, as well as to secure that correct and suitable information regarding the data hub and related processes is made available to all relevant market parties. Thus, giving businesses the prerequisites to prepare their IT systems, processes and organizations for the new market model.

2.5 What is being done to facilitate interoperability with the other data hubs in the Nordic countries?

Denmark (Energinet.dk)
In 2016, a report was published based on specifications provided across the national data hub projects. A lot of similarities were identified, but the varying maturity of the different TSOs with regard to the data hubs identified that it was not possible to discuss interoperability yet. However, the Nordic TSOs have a collaboration group called MSG (Market Steering Group) and a sub group called RMG (Retail market group). In RMG the data hubs have been discussed and experience shared. Besides that, a technical group exists that also shares experiences.

Finland (Fingrid Oyj)
Focus is now to implement the data hub in Finland.

Norway (Statnett)
In the current situation, with some data hubs still under development, it is difficult to consider ways of promoting interoperability. It is always preferable if current development of data hubs takes into account how the other data hubs have been designed and how business processes are specified, but Statnett respects that the development of national data hubs also has other goals that may lead to results that hinder interoperability. The most effective way of promoting interoperability is to adopt similar market rules, implemented in all Nordic markets.

Sweden (Svenska kraftnät)
Knowledge sharing is carried out between the TSOs. A complete interoperability between the hubs is, however, difficult to achieve when detailed rules and regulations differ between countries.

2.6 Will the planned (or already implemented) data hub in your country be interoperable with the other data hubs in the Nordic countries?

Denmark (Energinet)
No. However, a pilot project has shown that there is no problem in letting foreign market participants operate in the Danish market via the Danish data hub.

Finland (Fingrid Oyj)
It has not been agreed what is covered by interoperations, but we do not foresee problems if and when this may be required.

Norway (Statnett)
No.

Sweden (Svenska kraftnät)
No, not from the start.

2.7 How can a customer access her/his personal data in the data hub, and how can a third-party access data?

Denmark (Energinet)
Customers get access to their own data on www.eloverblik.dk and third parties get access to data by an application programming interface (API) with granted access. Access to third parties are always granted by the data owner themselves and can be revoked any time by the data owner.

Finland (Fingrid Oyj)
Customers will have the opportunity to check personal information stored in the data hub by using the customer portal. Customer logon to the service will be implemented through the national Suomi.fi service maintained by the Population Register Centre (Väestörekisterikeskus).

The data hub facilitates business operations for various service providers. It will be possible for a third party to obtain accounting point-specific and customer-specific data, including metering data, from one and the same place. A third party always requires customer authorization.

Norway (Statnett)
Suppliers are required to provide customers with access to their metering data on the web. Customers may also directly access Elhub to see data that is stored there and see who has access to the data. Third parties may access Elhub with permission from the customers.

Sweden (Svenska kraftnät)
End-customers can access their data through a customer portal. Third parties can access data through the hub if a consent is registered by the end-customer.

2.8 Are there functionalities to store information regarding flexibility potential, prosumer data, etc. in the data hub?

Denmark (Energinet)
The data hub can receive meter data down to 15 min window, which is enough to identify and prove delivery of flexibility. Price signals are currently on an hourly level and actively used for consumer flexibility. For example, time-of-use tariffs during peak hours in certain grid areas.

Finland (Fingrid Oyj)
There are functionalities to store information regarding flex potential. This kind of information includes a data hub data standard, where the data is provided by DSO/supplier.

Norway (Statnett)
Elhub will integrate all prosumers into the retail market. With access to installed capacity and historical consumption and production, it will be possible to develop demand response markets in the future.

Sweden (Svenska kraftnät)
There are functionalities to store information regarding flexibility potential, prosumer data, etc. but a complete list has not yet been specified.

3. The legal framework described by the Nordic regulators

This section describes the legal framework for the Nordic data hubs and the functionalities that will be available. Information has been provided by the Nordic regulatory agencies from each respective country.

3.1 Governance of data hub development and operation of data hubs

Denmark
The Danish TSO, Energinet, owns and operates the Danish data hub. Energinet has close cooperation with stakeholders and authorities, including DERA who approves methods within Energinet's market regulations. A key area of cooperation between companies, authorities and stakeholders is the assurance of the quality of data. The data hub ensures a level playing field for all electricity suppliers through:

- Standardized processes for registration and distribution of market data
- Low entry barriers for new market participants
- Single point of entry for change of supplier
- Clear definition of DSO and electricity supplier, and separation of roles

The data hub protects data by providing a secure environment and a secure and traceable access process to data. Data stored in the data hub is e.g. meter readings and master data. Further, the data hub features services such as market support, reporting, monitoring and statistics. The data hub registers e.g. change of supplier and a consumer's change of address.

Finland
Fingrid Oyj (TSO) is responsible for developing Finish data hub and is in charge of the project. The data hub will be operated by a fully-owned subsidiary of Fingrid Oyj, named Fingrid Datahub Oy. The necessary legislation is now in place.

Fingrid Oyj has established four different working groups for industry cooperation. An implementation working group has been working with issues related to implementation of the data hub. The council has monitored the progress of the project, contributed to the achievement of the project objectives, increased stakeholders' knowledge and given views in matters relating to industry and stakeholders. There are also sub-working groups that have concentrated on DSO processes, supplier processes and technical issues.

The industry is now making the required preparations. Fingrid has in co-operation with the industry prepared a deployment plan for the introduction of the data hub.

Norway
NVE (Regulator) is in charge of the Norwegian Elhub project at a superior level, while Statnett (TSO) is responsible for the operational implementation. NVE makes all binding decisions regarding Elhub for Statnett, DSOs, suppliers and third-party service providers. Statnett provides non-binding guidelines. As required by NVE, Statnett has established a stakeholder council for the project. The council consists of representatives from DSOs and suppliers, while NVE participates as observer. The council has provided the industry with updates on the progress of the project from Statnett and NVE and invited to discussions of issues raised by any of the parties. NVE has also required that Statnett applies an external quality assurance. Since the beginning of 2014 three QA revisions of the project have been undertaken, resulting in recommendations for improvement of the project regarding project management, risk management, cost control, security, migration, architecture, contract features, change request handling, stakeholder interaction, resources/competence, progress, goals/mandate of the project and realization of benefits.

Sweden
The national TSO, Svenska kraftnät (Svk), is responsible for developing, building, implementing and running

Sweden's data hub. It is also responsible for working out features in the user contract, compiling a handbook and other detailed requirements. Ei is responsible for producing the overall regulatory framework that is required for giving the data hub a place in the electricity market.

In June 2017, Ei handed over a report to the Government containing proposals for legislative changes necessary to allow the introduction of the data hub as well as a supplier-centric market model. The report was on public consultation during the Fall of 2017. During the process that led up to the finished report, Ei and Svenska kraftnät worked closely with stakeholders in different reference and working groups to ensure stakeholder involvement.

The government has been working on Ei:s proposals and the estimate is that the bill with the legislative changes will be approved by the Government and Parliament next year. Svenska kraftnät has already started development of the data hub, having produced a prototype so far. Ei has started a project in preparation for issuing secondary regulation, after the legislation has been passed.

3.3 Functionalities in Nordic hubs

	Norway	Denmark	Finland	Sweden
Meter point management	Yes. DSO provides data.	Yes	Yes. DSO provides data (creates, updates and removes metering points). Supplier may request changes, which the DSO carries out.	Yes. DSO provides data.
Customer data management	Yes. The supplier is responsible for updating customer information.	Yes	Yes. Supplier provides customer data in connection with a new contract. The supplier is also responsible for updating customer information. The DSO may request changes. The data hub forwards the request to the supplier with the latest customer contract.	Yes. The supplier will be responsible for updating customer information.
Customer moving and switching	Yes	Yes	Yes. When providing data on a new supply contract, it is not necessary to specify whether it is due for moving or switching -> the data hub validates it automatically.	Yes, these processes will be part of the hub.
Contract management	Includes contract data for start and end of supply, but no data on supply prices. Elhub does not notify suppliers of fees for cancellation of fixed price contracts.	The data hub has no legal authorization for storing data concerning the contract between the supplier and the costumer.	Supplier provides information on new supply contracts as well as updates them. The data hub automatically terminates the previous rolling contract once a new contract is registered in the data hub and communicates it to the previous contract party. The data hub includes the end date for fixed contracts, but not possible contractual penalties for breach of contract. In valid fixed time contracts, the data hub prevents making a new supply contract in	Suppliers register information on customers' supply contract (end date and any fee for ending the contract early). The data hub will not contain any physical contracts. These will be handled outwith.

	Norway	Denmark	Finland	Sweden
			cases where the same customers are in question. The DSO confirms new network contracts and updates them.	
Forwarding service requests from supplier to DSO	Yes	Yes	Yes, and vice versa.	Yes
Meter value management	Yes. DSOs are responsible for data quality.	Yes	Yes. The DSO or a service provider is responsible for providing meter values. The DSO is responsible for meter equipment and data quality. Meter values will be stored for six years.	Yes
Third party access to metering data	Yes	Yes	Yes	Yes
Provides settlement data to NBS	Yes	No	Yes. Provides balance settlement data to eSett according to NBS rules.	Yes
Market monitoring	Yes	Yes, to a limited extent.	Yes	Yes
Correction settlement	Yes	Yes	Yes	Yes
Compiling statistics	Yes	Yes	Yes, that is planned (no details yet).	Compiling information for Statistics Sweden, etc.
Billing	Mandatory combined billing has not yet been implemented by law in Norway, and this functionality has not been included in the first version of Elhub. It will be possible to include the functionality at a later stage (probably closer to 2019).	In accordance with the supplier-centric model, the bill from the DSO and the bill from the supplier have merged into one bill. The supplier sends the bill to the consumer.	Mandatory combined billing has not been implemented in Finland. The data hub includes information on separate/combined billing as well as on billing channels (paper bill, E-billing, email, etc.). DSOs and suppliers can submit more detailed billing data to the data hub (e.g. billing frequency, start and end date, product, price, amount).	Ei has suggested to the Government that mandatory combined billing should be introduced.
Other functionalities	1. Reversal of business processes (e.g. in case of faulty switches) 2. Security management system 3. Privacy management for customers incl. giving data access to other persons or companies and view own data stored in Elhub 4. Security management system	The data hub sets up possibilities for third party access to the. A consumer controls third party access to the data hub. The data hub handles data from prosumers.	1. Disconnection and reconnection processes 2. Handling of customers' power of attorney 3. Cancellation (due to distance selling regulation) and contract	1. Central registration and/or handling of customers' power of attorney 2. Supplier of last resort functionality for customers that are without power supply.