



**ENERGINET**

# THE DANISH ELECTRICITY RETAIL MARKET

Introduction to DataHub and the Danish supplier-centric model

# THE DANISH ELECTRICITY RETAIL MARKET

Denmark's electricity retail market has been going through a remarkable transformation the last decade. The overall purpose of the transformation is to stimulate competition, encourage innovation and to motivate the demand-side of the market to play an active role in Denmark's green transition.

## Historical background

In 2003, the Danish electricity market was liberalised, making it possible for all Danish consumers to freely choose their electricity supplier. A range of other vital adjustments to the market were introduced in the following years – all aimed at stimulating competition in the electricity market even further.

In 2013, the first version of the Danish DataHub was implemented. The objective was to simplify and manage communication and standardise the market processes between market participants.

In 2016, a new market design – the supplier-centric model - was introduced, together with a deregulation of the consumer electricity prices. The aim was to increase competition and support the development of new consumer products and services. Also, Energinet upgraded its DataHub. The ongoing development of DataHub and the Danish retail electricity market continues to ensure an efficient retail market in support of Denmark's green transition.

## Content

This paper describes and illustrates the Danish electricity retail market today. In addition, it explains how DataHub supports current and future changes to the market and market processes in the Danish electricity retail market.

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– roles & responsibilities

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# 1. THE DANISH ELECTRICITY RETAIL MARKET - ROLES & RESPONSIBILITIES



**Energinet** is Denmark's TSO.<sup>1</sup> Energinet supports a well-functioning electricity market that ensures the best possible conditions for competition. Energinet owns and operates DataHub.



**The Balance responsible party** buys and sells electricity on the electricity exchange Nord Pool.<sup>2</sup> Every day, a balance responsible party must submit scheduling plans to Energinet for the energy it expects to generate and consume during the next 24 hours.



**The DSO**<sup>3</sup> owns the network between the transmission grid and the consumer. The DSO also has the exclusive right to transport electricity in its geographically demarcated grid. One of the DSO's responsibilities is to measure electricity consumption and generation within its grid area. This task can be delegated to a metering point administrator.



**The electricity supplier** is the Danish consumer's primary contact to the electricity market. The electricity supplier trades electricity – either through a balance responsible party at Nord Pool or directly from plant owners – and sells it to the end consumers.



**The consumer** buys electricity from the electricity supplier and pays a single bill for energy, network, and taxes & levies directly to the electricity supplier.



**Third party participants** offer energy-related services to consumers based on consumption and production data from the particular consumer. A third-party participant can be anyone active in the energy market, e.g. electricity suppliers, brokers or IT service providers.

<sup>1</sup> Transmission System Operator, <sup>2</sup> Nordic electricity market exchange, <sup>3</sup> Distribution System Operator

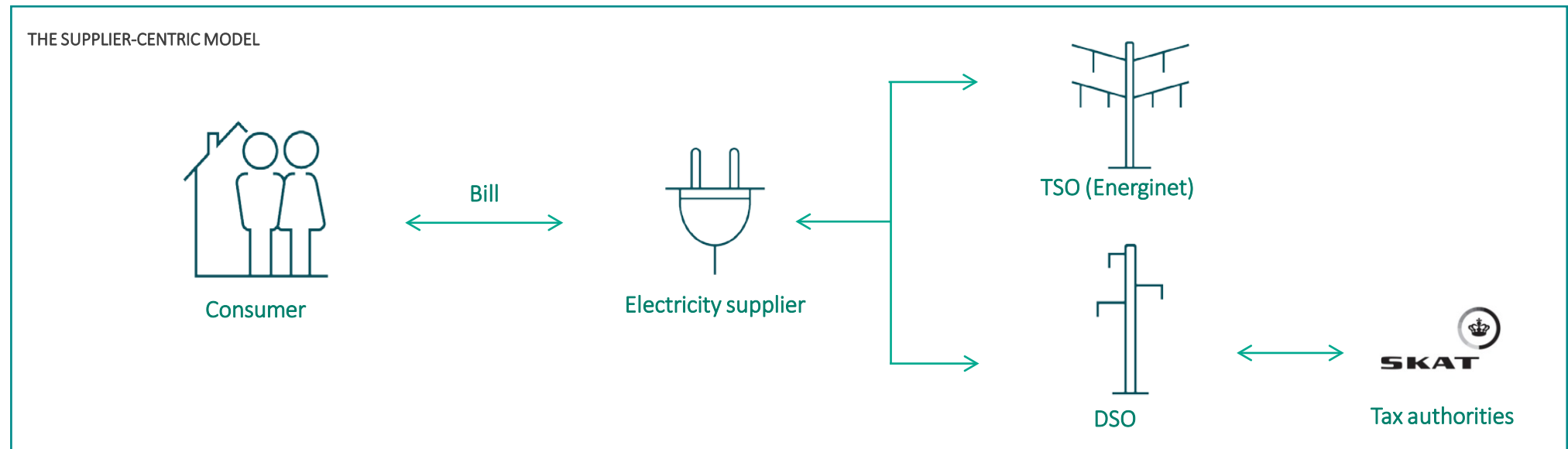
## 2. SUPPLIER-CENTRIC MODEL

A supplier-centric model was introduced in the Danish electricity retail market in April, 2016. The objective of the new market design was to increase competition and stimulate the development of new product and services to the consumers.

The supplier-centric model provides a market where:

- electricity suppliers have 100% of the consumer contact
- the consumer receives one single bill for electricity and has one single point of contact to the electricity market through the electricity supplier
- the electricity supplier bills the consumer directly for energy, network, and taxes & levies. Subsequently, the electricity supplier then settles with the DSO and TSO (Energinet).

All data necessary to enable the electricity supplier to operate in the market is exchanged through **DataHub** – the technical prerequisite for the supplier centric model.



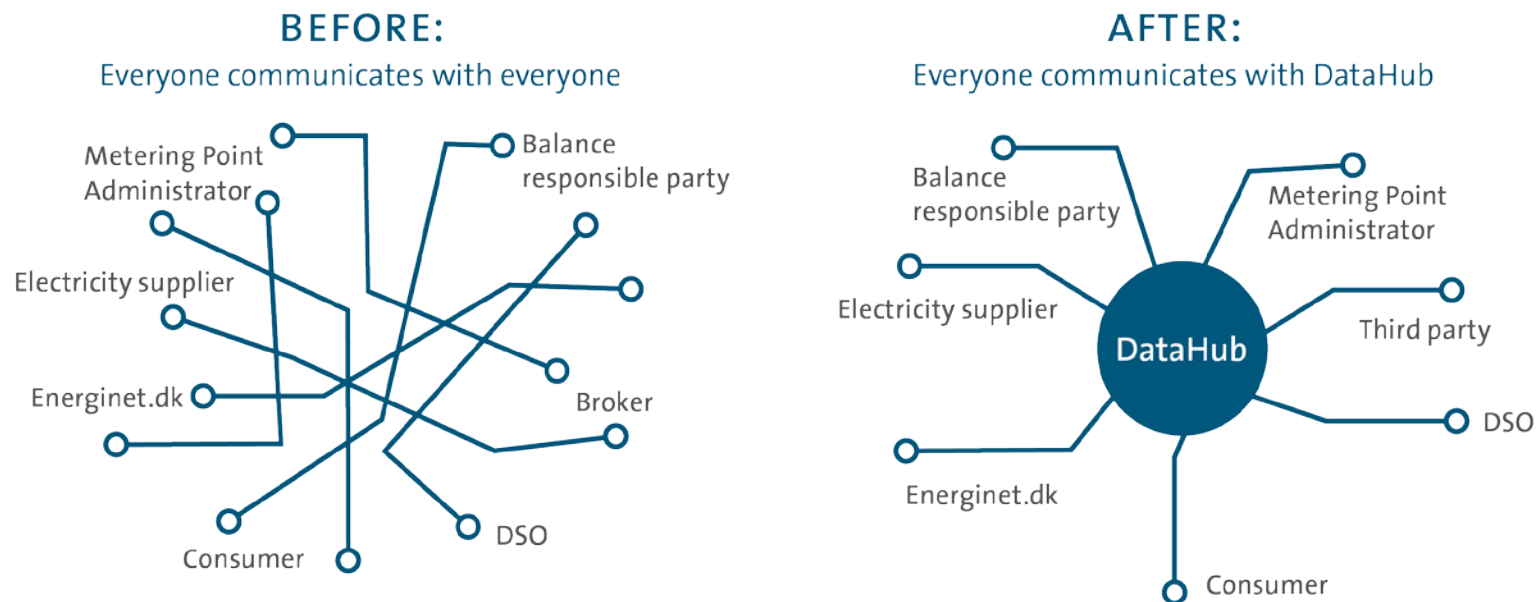
### 3. DATAHUB - BEFORE AND AFTER

In March 2013, DataHub was introduced to the Danish electricity retail market. The Danish DataHub is an IT platform that is independently owned and operated by Energinet.

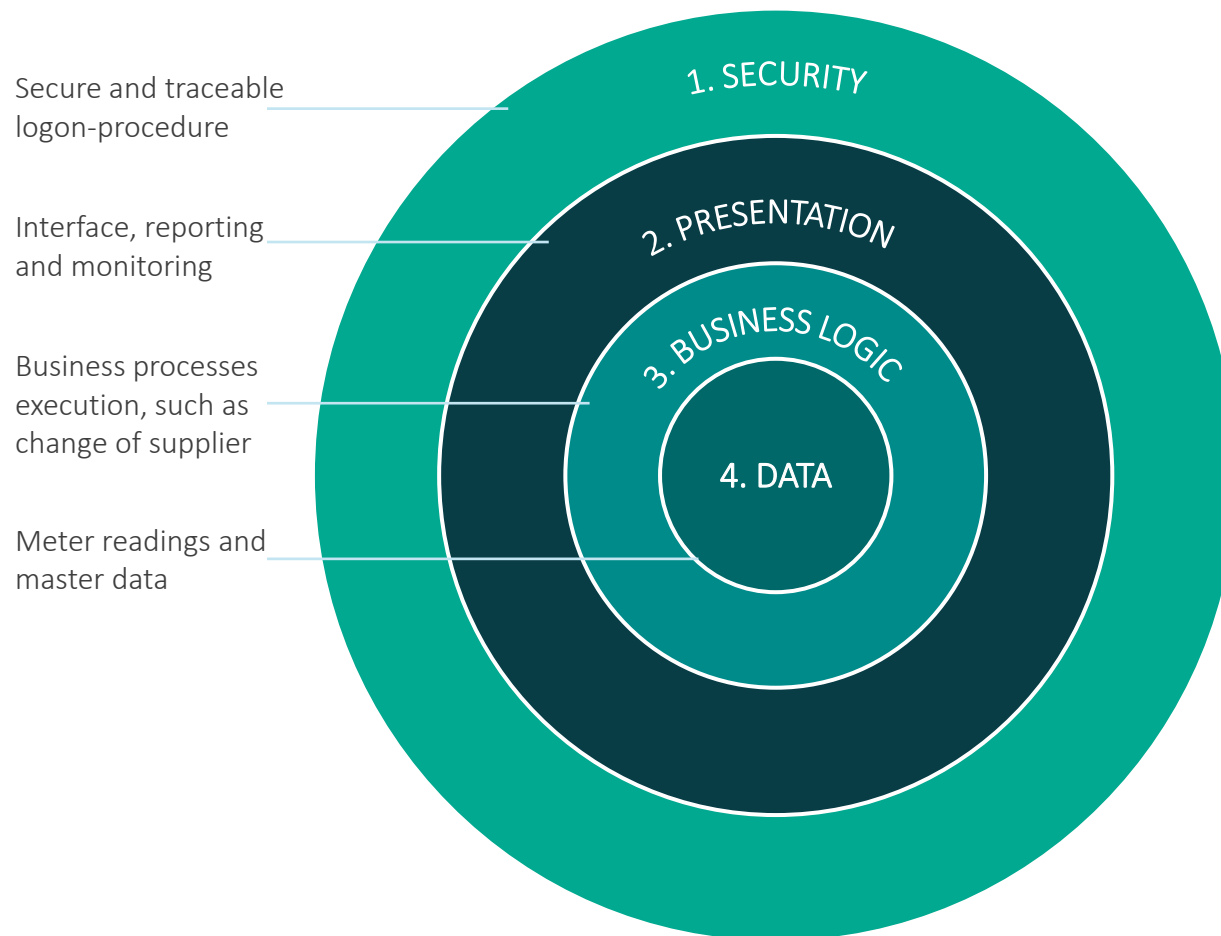
The DataHub facilitates and automates the execution of market processes and business transactions in the Danish retail market. Meter readings from approx. 3.3 million metering points (consumption and production) are registered and managed in the DataHub for settlement purposes.

DataHub ensures a level playing field for all electricity suppliers through:

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



## 3. DATAHUB - FUNCTIONAL OVERVIEW



### The four functional layers in DataHub

The functions of DataHub are organised in four layers, each with a different purpose.

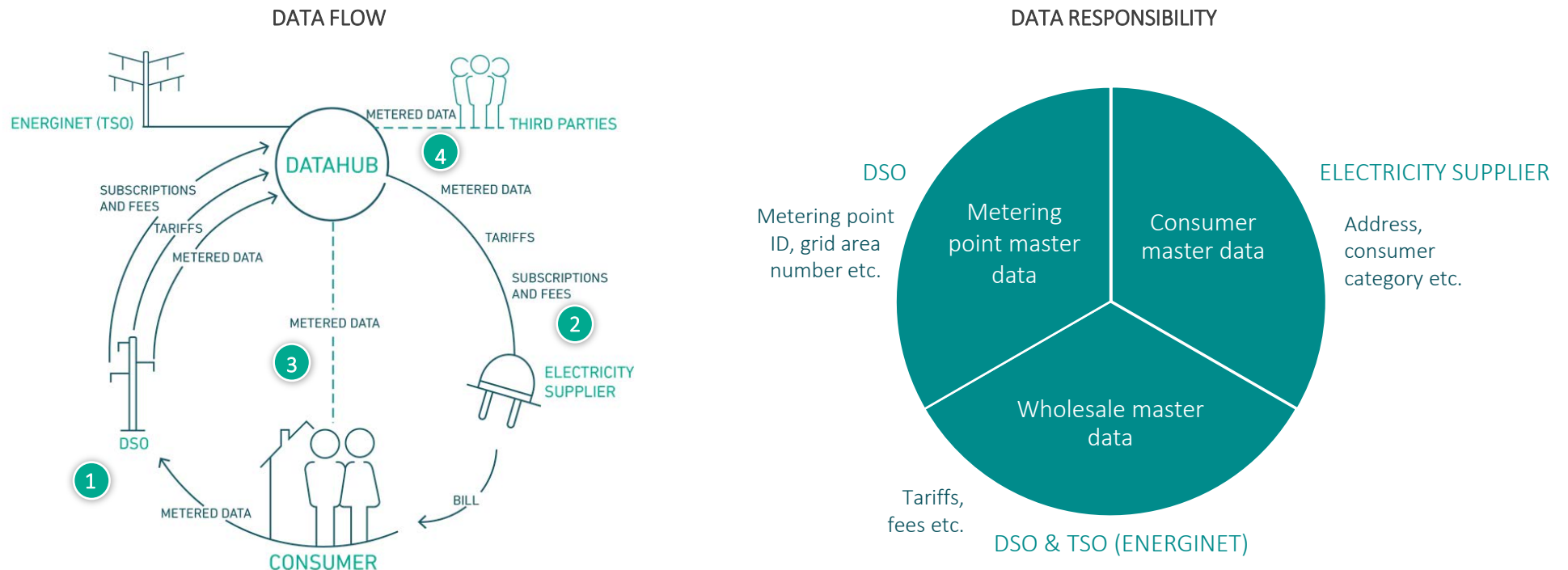
- 1. The security layer** of DataHub protects the data by providing a secure environment and a secure and traceable access process.
- 2. The presentation layer** features DataHub services such as market support, reporting, monitoring and statistics. General DataHub operations, and administration are also handled here.
- 3. The business logic layer** orchestrates the market and business processes such as a consumer change of address, change of supplier or the submission of consumer master data. Calculations, processing and logical work flow are handled here.
- 4. The data layer** manages the data such as times series, meter readings and master data. Also aggregations and reconciliations are part of the large hub of data.

### 3. DATAHUB - DATA FLOW AND DATA RESPONSIBILITY

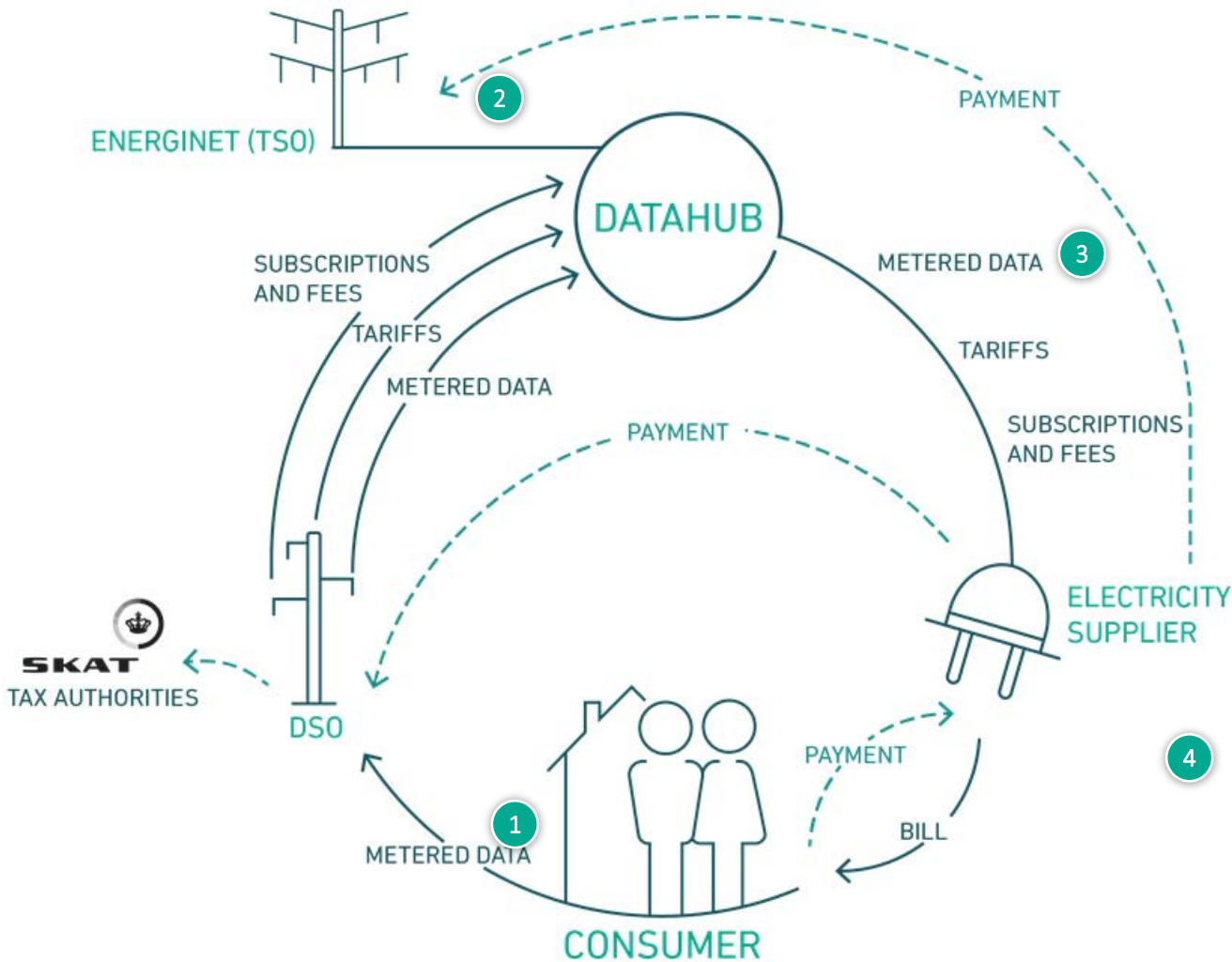
**Data flow.** Several market participants feed into and collect data from DataHub:

- ① The DSO collects metered data from the consumer and sends it to DataHub.
- ② The electricity supplier receives data from DataHub that makes it possible to create a bill for the consumer.
- ③ The consumer is able to view her/his metered data in DataHub, either through the web portal of her/his electricity supplier or the website eloverblik.dk.
- ④ Third party participants collect consumer data in DataHub through a secure access, to the extent permitted by the affected consumer.

**Data responsibility.** Electricity suppliers, DSOs and the TSO (Energinet) are each responsible for submitting current data to DataHub. DataHub contains three types of data necessary for settlement: Wholesale master data, consumer master data and metering point master data. In addition, DataHub handles metered values for all metering points as well as master data from the market participants.



### 3. DATAHUB – BILLING PROCESS



**Consumer billing** is generated from the data flow in DataHub between market participants:

- 1 The DSO sends metered data and information about tariffs and other price elements to DataHub.
- 2 The TSO (Energinet) uploads the TSO tariffs to DataHub.
- 3 DataHub continuously sends metered data and tariffs for each metering point to the electricity supplier. The electricity supplier only receives data from its own metering points.
- 4 The electricity supplier generates one single bill to the consumer.

**Wholesale billing** between the DSO, TSO (Energinet) and electricity suppliers is generated from aggregated consumption data sent from DataHub. The aggregations are based on metered data and tariffs for the metering points of each electricity supplier.

Based on the aggregations, the DSO and TSO (Energinet) each generate a bill to the electricity supplier. The DSO is responsible for passing on all consumer tax payments to the Danish tax authorities.



### 3. DATAHUB - PROSUMER SETTLEMENT

DataHub handles data from the 'prosumers' – consumers who both produce and consume electricity. After an approval process, prosumers are allowed to sell their excess electricity to the grid. The net settlement of prosumers is made possible through advanced structures of metering points in DataHub.

The prosumers have one electricity supplier for their production and one for their consumption of electricity. For renewable energy production, the electricity supplier with the production obligation is the TSO (Energinet), provided that the relevant plant has been approved for price subsidies. The electricity supplier delivering the electricity is chosen by the prosumer itself – giving the prosumer the same market terms as other consumers.

Approx. 96,000 of Danish consumers are net settled:

- Approx. 9,500 with hourly netting
- Approx. 86,500 with yearly netting <sup>4</sup>



<sup>4</sup> Only for renewable energy facilities and devices installed prior to 31-12-2013

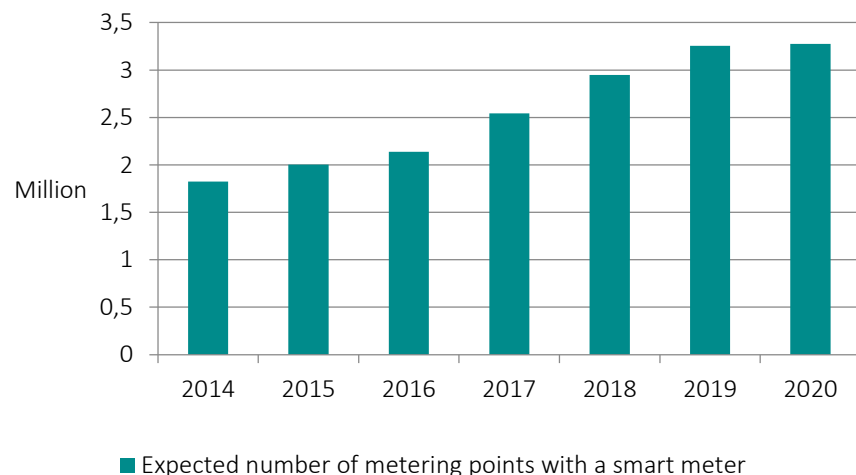
## 4. HOURLY SETTLEMENT – THE NEXT STEP

From 2020 smaller consumers will be hourly settled. Currently, hourly settlement is only mandatory for large consumers with a consumption above 100 MWh per year. The large consumers cover more than 50 % of the electricity consumed.

Hourly meter readings from smart meters are a prerequisite for hourly settlement. As of July 2016, approx. 1.8 million or 2/3 of Danish consumers have a smart meter installed. DSOs are obliged to install smart meters to all consumers by the end of 2020. Also the it-systems of the electricity supplier as well as DataHub must be enabled to handle hourly settlement by 2020.

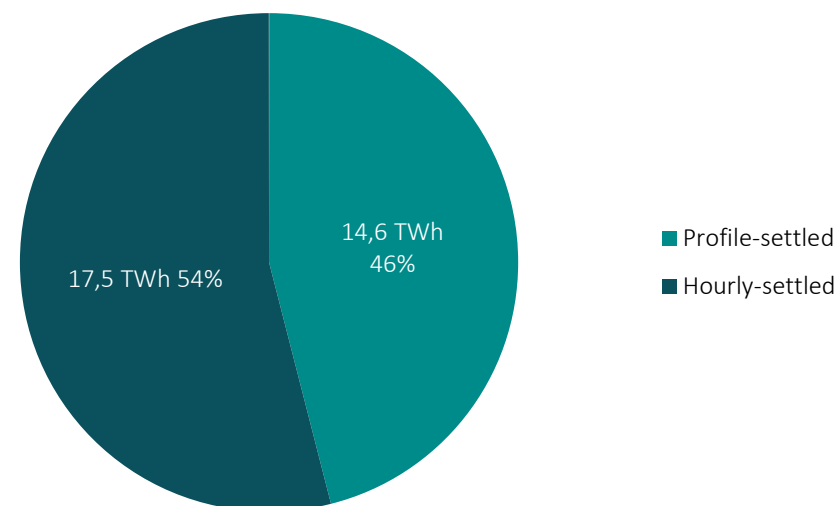
The hourly data from smart meters is available for consumers and market needs. Hourly settlement together with price signals from the wholesale market that reflect the real cost of energy, is expected to increase consumer incentive to adjust consumption accordingly. This however, requires that new and existing market participants offer services or products for the consumers that make this consumer experience possible.

ROLLOUT OF SMART METERS



Source: Survey among DSOs, Jan. 2015

SETTLEMENT OF ANNUAL ELECTRICITY CONSUMPTION 2017



Source: DataHub Market Report, no. 3

## 5. ACCESS TO ENERGY DATA - DIFFERENT SOLUTIONS FOR DIFFERENT PURPOSES

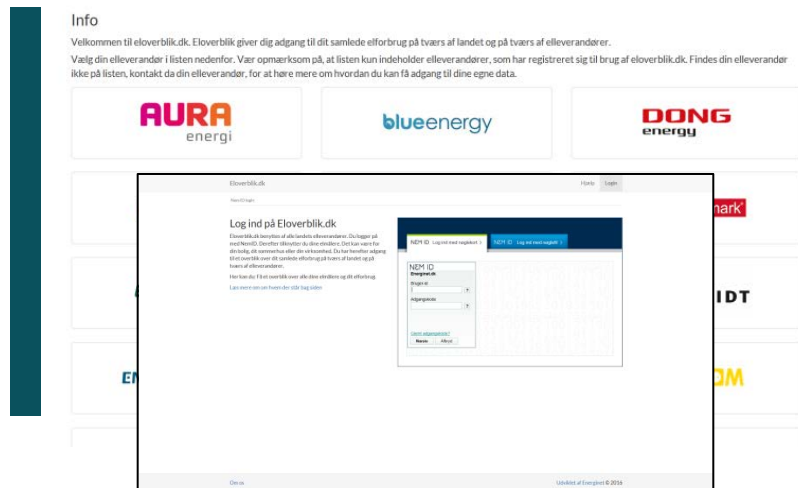
DataHub provides different solutions for access to data with varying degrees of anonymity. Data management and how data is made available for a variety of purposes are a vital part of the transformation of the Danish electricity retail market and the implementation of DataHub.

The large hub of consumer energy data is made available for eligible market participants and consumers. The purpose of sharing the data is to ensure an efficient and competitive electricity retail market and to support innovation of new products and services. The data is protected through aggregation, anonymised microdata and secure log-in procedures.

### ENERGY DATA ACCESSES



# 5. CONSUMER CONTROLLED ACCESS – CONSUMERS



All consumers have access to their data:

[www.eloverblik.dk](http://www.eloverblik.dk)

All consumers in Denmark have the option to access their own data in DataHub through Eloverblik.dk, a public website developed by Energinet.

Eloverblik.dk is a simple web interface, where consumers can access all data registered from all of their metering points in DataHub – both master data and meter data, change of supplier etc.

Additionally, Eloverblik.dk gives consumers access to cancel a future change of supplier, if the consumer believes it is an error. Consumers can also extract meter data in a specified format and export it to a spreadsheet for further analysis.


Electricity suppliers choose how to visualise consumption data to their consumers



Eloverblik.dk only provides consumers with the basic type of information that should always be accessible. It is expected that electricity suppliers will develop their own applications and provide consumers with improved visualisation and additional features.

Consumers log in at Eloverblik.dk by using the public Danish digital signature key called 'Nem-ID', which ensures complete data protection.

## 5. CONSUMER CONTROLLED ACCESS – THIRD PARTY PARTICIPANTS



**Tredjepart fuldmagter Energinet.dk**

Fuldmagter Historiske fuldmagter

Der er registreret følgende fuldmagter til din virksomhed. Du kan se nedenunder tabellen og klikke "Hent data"

<input type="checkbox"/>	Kundenavn	CVR Kunde
<input type="checkbox"/>	Anders Andersen	
<input type="checkbox"/>	Energinet.dk	28980671
<input type="checkbox"/>	Energinet.dk	28980671
<input type="checkbox"/>	Energinet.dk	28980671
<input type="checkbox"/>	Energinet.dk	28980671
<input type="checkbox"/>	Energinet.dk	28980671

Vælg periode    For excelvenligt dataudtræk, sæt flueben i boksen.

**Terms of access to and use of the DataHub – Third party**

These terms apply to third parties who want to obtain master data and metered data via the customer-controlled access to data in the DataHub.

**1. Background and purpose**

1.1 Under section 28(2), item 7, of the Danish Consolidated Electricity Supply Act<sup>5</sup> (hereinafter the Danish Electricity Supply Act (Elforsyningsloven)), Energinet.dk is responsible for the establishment and operation of a DataHub for handling metered data etc.

1.2 As the entity responsible for operating the DataHub, Energinet.dk must lay down non-discriminatory and objective terms for its use. The provisions of these terms are thus laid down pursuant to section 28(2), item 13, section 31(2) and section 72a of the Danish Electricity Supply Act.

1.3 The terms apply to the inclusion and ongoing obtaining of data from the DataHub by third parties.

1.4 The provisions of these terms have been laid down with a view to:

- creating the best possible conditions for competition in markets for generation and trade in electricity,
- ensuring the communication of data of relevance to third parties in the market and thereby supporting a flexible electricity market.

**2. General terms**

2.1 It is a condition for admission as a third party at Energinet.dk that the company meets the following requirements:

- The company is registered for VAT in Denmark.

Danish consumers maintain ownership of their own data, but the data should be accessible for third party participants who wish to develop new smart solutions and apps that benefit consumers.

Through Energinet's third party access-solution, consumers grant secure access to their data to third party participants by using the public Danish digital signature key called 'NemID'. This allows each consumer to control who is given access their data.

Only electricity agents, energy consultants or other market participants authorised by Energinet to collect data are permitted to submit access requests to consumers through Energinet's third party access-solution.<sup>5</sup>

The consumer may at any time withdraw his or her permission. All requests for data access are logged and additional market surveillance processes are setup to ensure protection against unfair practices. This makes it possible for third party participants to access the data of a specific consumer in a controlled and secure way.

<sup>5</sup> The third party participant must be registered for VAT purposes in Denmark and have a valid NemID.

## 5. RESEARCH ACCESS – STATISTICS DENMARK

**STATISTICS DENMARK**

SEARCH

### DATA FOR RESEARCH

**SUBJECTS**

Population and elections

National accounts and

Money and credit

External economy

**CONTACT INFORMATION**

[The Division of Research Services](#)

You can contact the Division of Research Services weekdays between 9 am and 3 pm

Gain access to Statistics Denmark's registers – a unique possibility

Statistics Denmark's extensive collection of register data, with data collected from the 70s to the present, contains a very substantial research potential with almost infinite possibilities. To explore this potential in agreement with the data regulations, requests should be addressed to the Division of Research Services.

Only Danish research environments are granted authorisation. Foreign researchers can, however, get access to micro data through an affiliation to a Danish authorised environment. Access is given to anonymised micro data, i.e. data at an individual personal or corporate level. Access takes place through researcher's own pc over the Internet.

Data from other sources can also be linked to data from Statistics Denmark, e.g. researcher's own data collections or data from other administrative registers. Data from external sources requires approval from The Danish Data Protection Agency.

Read more about the rules and the organisational framework for researcher's access to micro data.

[Access to micro data at Statistics Denmark, 2014](#)

Learn how to get access to microdata in our step by step procedure description.

[Step by step procedures for researchers access to microdata](#)

To complement register data with additional information, Statistics Denmark can also offer customized surveys. Subsequently, the interview data can be linked to existing records. Read more about surveys here [www.dst.dk/surveys](http://www.dst.dk/surveys)

**PRICE**

When the design of a particular survey is settled, we will send you a final price quote.

Energinet makes a set of anonymised micro data available for researchers through Statistics Denmark, which is Denmark's national institute of statistics.

Through an encrypted and secure setup, researchers are given access to analyse and combine consumer data from DataHub with other available registers, without compromising the security of DataHub data.

Only Danish research environments are granted authorisation. Foreign researchers can, however, get access to micro data through an affiliation to a Danish authorised environment.



## 5. OPEN ACCESS – WWW.ENERGINET.DK

### MARKET DATA

Extract and compile your own data set across time, currency and format or many other variables. The data set is updated twice a week with the recent approved data. Energinet cannot be held liable for any data errors.

See [Introduction to download of market data](#) for further guidance or visit the web page.

SEE MARKET DATA >

Energinet's website allows users to choose selected market data from a variety of parameters.

### Download of market data from Energinet

Energinet provides aggregated market data (e.g. prices, volumes and capacities) from the Danish and Nordic electricity market on [Energinet's website](#).

The information is available to the general public and is provided in a format that allows users to select a set of data and combine with a specific time period, currency etc.

### DataHub Market Report

Energinet publishes the DataHub Market Report<sup>6</sup>, which is based on data from DataHub.

The purpose of the report is to support transparency in the Danish retail market. The report features data which includes metering points, electricity consumption and consumer change of supplier.

The report and its background data is published twice a year and is available to the public on [Energinet's website](#).

Energinet publishes key figures and statistics for the Danish electricity retail market in the DataHub Market Report.



<sup>6</sup> Currently only available in Danish

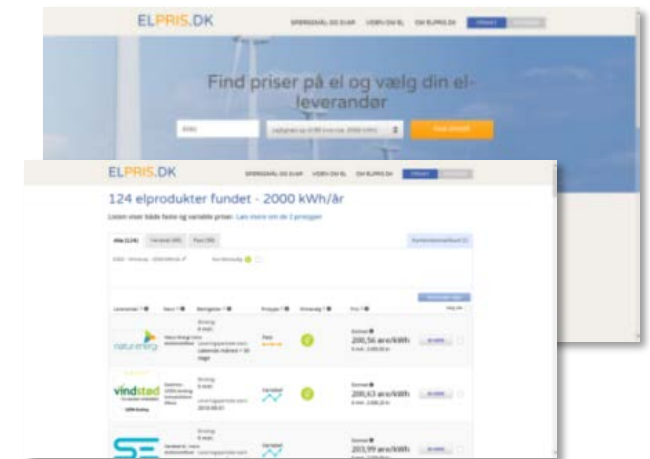
## 6. OTHER MARKET INITIATIVES

### Price comparison tool at Elpris.dk

Since 2010, Danish consumers have been able to compare prices on electricity products from different suppliers through a price comparison tool.

Elpris.dk publishes both fixed and variable prices of traditional electricity products as well as the price of climate-friendly produced electricity. Additionally, the website guides users through the rules of the electricity market – such as how to change supplier, change of address and the consumer's contractual rights and obligations.

In April 2016, in conjunction with the introduction of the supplier-centric model, the Danish Energy Regulatory Authority re-launched the website with a redesigned user interface.



### DataHub in Nordic Countries

The electricity retail markets in other Nordic countries follow a model for change that is similar to the one implemented by Denmark.

While Denmark is the only country in the Nordic countries with a DataHub - Norway, Finland and Sweden will implement similar data solutions by 2017-2020.

Energinet continuously coordinates changes to DataHub with other Nordic TSOs and cooperates with Denmark's sister nations to move the electricity retail market towards international harmonisation.





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