Regulation D1: Settlement metering

March 2016

Version 4.11

Effective as of 1 April 2016

'The regulations are available in Danish and English. In the event of discrepancies between the Danish and English version, the Danish version of the regulation is legally binding.'

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Revision view

Chapter no.	Text	Version	Date
	Revised as draft pseudo-regulation in connection with the introduction of flex-settlement and the wholesale model.	4.0	May 2013
	Revised as pseudo-regulation.	4.1	July 2013
	Revised as pseudo-regulation in connection with the BRS work.	4.2	September 2013
	Revised as pseudo-regulation in connection with the preparation for consultation. Definitions have been revised and chapter 5.1.4 concerning corrections of metered data for profile-settled metering points has been added.	4.3	November 2013
10	Settlement of corrections after refixation.	4.4	December 2013
	Revised in accordance with consultation memo of 25 February 2014. The changes are shown in the regulation with track changes.	4.5	February 2014
	Revised improvement of the procedure for meter management.	4.6	May 2014
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	Lists of sanctions added.	4.8	September 2014
	Revised as a result of flex-settlement. Appendix 2 concerning mergers updated.	4.9	May 2015
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	Corrected according to consultation version: 1.32. Periodisation by means of the distribution curve. 3.4. Distribution curve is only sent to the balance supplier. 8.2.4. The grid company must send metered data if they are remote-read	4.11	

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Reading instructions

This regulation contains general and specific requirements for handling metered data in the electricity market.

The regulation is structured in such a way that **chapter 1** contains terminology and definitions used in the subsequent chapters.

Chapter 2 contains the regulatory provisions of the regulation.

Chapters 3 to 9 contain requirements for handling metered data, including requirements as to where settlement metering should be carried out and the time limits for sending metered data.

Chapter 10 contains the procedure for corrections of metered data after refixation and reconciliation.

Chapter 11 contains overviews of the relevant obligations and sanctions for the market participants.

The regulation is published by Energinet.dk and is available from:

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The regulation can be downloaded from **www.energinet.dk** in the main menu 'Electricity' under 'Regulations', 'Market regulations'.

1. Terminology and definitions

1.1 Market participant

General term for parties, with the exception of customers and third parties, operating in the electricity market, ie grid companies, balance suppliers, balance responsible parties (BRPs), transmission companies and transmission system operators (TSOs).

1.2 Register of market participant master data

Register of market participants meeting the requirements set out in Energinet.dk's 'Standard agreement for DataHub access'. The register is available on the DataHub market portal with various information about each market participant.

1.3 Load shares

The most recently read or estimated electricity consumption measured in kWh per year for a profile-settled customer or group of customers in a grid area. Load shares are added together for all profile-settled customers in the relevant grid area.

1.4 Working days

Working days as defined in Regulation D1: 'Settlement metering', appendix 3: 'Definition of working days'.

1.5 Child metering point

A metering point linked to a parent metering point.

1.6 DataHub

An IT platform owned and operated by Energinet.dk. The DataHub handles metered data, master data, required transactions and communication with all market participants in the Danish electricity market.

1.7 Electricity tax

Electricity tax is a fixed national tax charged as a price per kWh.

1.8 Electronic data interchange (EDI)

Structured electronic transfer of data between companies.

1.9 Electricity supply grid

General term for public grids and direct electricity supply grids as defined in the Danish Electricity Supply Act (Elforsyningsloven).

1.10 Balance supplier

A company which:
1) Energinet.dk has included as balance supplier in the DataHub
2) and

- *sells electricity to customers and holds balance responsibility for the metering point, or*
- *buys electricity from producers and holds balance responsibility for the metering point.*

1.11 Fixation

At the fixation time, the fixation determines a preliminary settlement basis for balance and wholesale settlement based on time series sent to the DataHub. Moreover, the residual consumption and thus the distribution curve are determined.

1.12 Flex-settlement

Flex-settlement is used for metering points with an annual consumption of less than 100,000 kWh, where the grid operator continuously remote-reads and distributes hourly values, and where these values are used for balance settlement.

1.13 Move-in/move-out

Change of customer for a metering point, which takes place either in the form of a move-in or a move-out.

1.14 Consumption

Synonymous with 'ordinary consumption' (actual metered consumption) and calculated as the consumption in the electricity market. This does not include own consumption for electricity and CHP production as well as own production at small RE facilities exempt from metering.

1.15 Distribution curve

The distribution curve is calculated on an hourly basis per grid area as the fixed residual consumption divided by the sum of load shares for the month for the relevant grid area. The distribution curve is used for periodisation in connection with customer account settlement of profile-settled consumers.

1.16 Distributed consumption

*Distributed consumption is calculated as residual consumption*load shares/sum of load shares (provisionally calculated consumption) per market participant for profile-settled metering points. Used in connection with refixation of balance and wholesale settlement.*

1.17 GLN no.

Global Location Number. Unique 13-digit identification number for a grid operator, balance supplier or balance responsible party (BRP).

1.18 GSRN no.

Global Service Relation Number. Unique 18-digit identification number for a metering point. Also known as a metering point ID.

1.19 Calendar days

Time limits indicated in calendar days include all weekdays, weekends and public holidays.

1.20 Customer

The person(s) or entity(ies) that use a metering point and therefore are entitled to conclude legally binding agreements for this metering point, ie entitled to change supplier, report a move-out for the metering point etc. A customer can either be a legal or natural person.

1.21 Customer portal

The customer portal is an application developed by Energinet.dk, which is to be made available to the customer via the balance suppliers' websites. Customers can use the customer portal for showing consumption and for enquiries etc. concerning their metering points. Customers also have the option of contacting their balance supplier (for each metering point) in connection with change of supplier etc.

1.22 Customer-controlled data access

Where the customer, by way of electronic consent via NemID, grants a market participant or a third party access to retrieving master data and metered data about the customer in the DataHub.

1.23 Change of supplier

Change of balance supplier for a metering point.

1.24 Market portal

A web-based access point to the DataHub for market participants. From the portal, it is possible to perform and monitor business processes in the Danish electricity market.

1.25 Meter data responsible

Third parties in the market which perform tasks delegated to them by a grid operator, eg collecting, storing and verifying metered data for a grid area. The grid operator's responsibility under the regulations cannot be delegated. Meter data responsibles can be registered in the register of market participant master data despite the fact that meter data responsibles are not market participants.

1.26 Metering point

A physical or defined (virtual) metering point in the electricity supply grid where electrical energy is metered, calculated as a function of several meter readings or estimated. A metering point is the smallest unit in the electricity market when calculating electrical energy for customers and market participants. A metering point is identified by a metering point ID.

1.27 Grid area

A specific delimited area for which a licence has been granted to conduct grid activities under the Danish Electricity Supply Act and which is delimited against the adjacent electricity supply grids with 15/60 meters that are included in the DataHub's computations in the electricity market.

1.28 Grid loss

The amount of energy consumed in the electricity supply grid. Measured as the difference between the amount of energy supplied to the electricity supply grid and the amount of energy supplied from the electricity supply grid.

1.29 Grid operator

Company licensed to operate distribution grids.

1.30 Mandatory limit

Limit for when a grid operator performs mandatory hourly settlement of metering points as stated in the explanatory notes for Section 72 (Danish Act no. 494 of 9 June 2004) concerning adjustment of the default supply price and as described in further detail in Regulation H2: 'Profile settlement etc.'.

1.31 Parent metering point

A metering point with one or more child metering points linked. There are no limits to the number of child metering points that can be linked to a parent metering point. The parent metering point determines the linking to the customer and balance supplier.

1.32 Periodisation

Time distribution of read consumption by means of the distribution curve.

1.33 Production

Synonymous with 'electricity production' or 'net production' and defined as gross production from the generator less own consumption for electricity and CHP production.

1.34 Refixation

The recalculation and filing of the aggregated settlement basis in the form of a filed copy of the aggregations of the applicable time series sent to the DataHub at the time of refixation, which is described in further detail in this Regulation D1: 'Settlement metering', chapter 4.

1.35 Residual consumption

Total consumption in a grid area calculated on an hourly basis deducted the consumption of flex and hourly settled customers in the grid area.

1.36 Continuous reading

The grid operator's reading of profile-settled consumption metering points takes place continuously, ie at regular intervals over the year, and is divided into reading groups, each of which is read, for example, once a year.

1.37 Concurrent reading

The grid operator reads all profile-settled metering points simultaneously, eg once a year.

1.38 Profile settlement

Covers settlement of all consumption in a grid area which is not subject to flex or hourly settlement. The consumption is distributed on the basis of a profile for the grid area as described in Regulation H2: 'Profile settlement etc.' and involves, for example, metering points read annually by the customer and metering points where hourly values are remote-read without being used for balance settlement.

1.39 Effective date

Date and time for the day on which a change, eg a change of supplier, move-in/move-out or change of a price element, is to come into force. The time is always at the beginning of the day, at 00.00, on the relevant date as described in Regulation F1: 'EDI communication with the DataHub in the electricity market'.

1.40 Tariff

A price indicated as a tariff is a price in respect of the metering point which is determined per kWh.

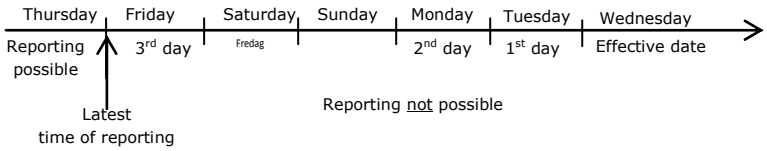
1.41 Technical metering

Metered data to be used in connection with operation monitoring and operation analyses, as described in further detail in Energinet.dk's technical regulations.

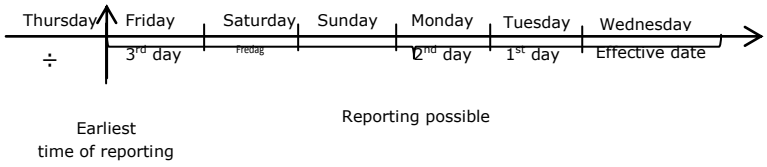
1.42 Time limits

Time limits define the latest or earliest time for receipt of, for example, messages in the DataHub as described in Regulation F1: 'EDI communication with the DataHub in the electricity market'. Time limits are always full days unless otherwise specified. The time limit is calculated from midnight on the effective date.

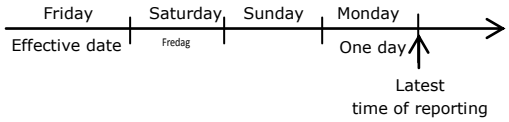
Up to/no later than three working days before the effective date:



No earlier than three working days before the effective date:



No later than one working day after the effective date:



1.43 Hourly settlement

Hourly settlement is used for metering points with an annual consumption exceeding 100,000 kWh, where the grid operator continuously remote-reads and distributes hourly values, and where these values are used for balance settlement.

1.44 Transmission company

Transmission company as defined in the Danish Electricity Supply Act.

1.45 Third party

Natural and legal persons operating in the electricity market on behalf of market participants or customers, but which are not market participants or customers themselves. Meter data responsibles, brokers and energy consultants, for example, are third parties.

1.46 Meter reading

The meter reading is displayed on the electricity meter for the metering point and indicates the accumulated or balanced consumption or production.

1.47 Point of exchange

A physical point in the electricity supply grid defining the border between two neighbouring grid companies. A point of exchange must be defined entirely by metering points with a resolution of 15/60 values.

1.48 15/60 metering

Metered data remote-read on a 15- or 60-minute basis used in connection with balance settlement. In Western Denmark, production/exchange is metered on a 15-minute basis, whereas consumption is metered on a 60-minute basis. In Eastern Denmark, metering is performed on a 60-minute basis only, except for the electricity production of new offshore wind farms (starting with Rødsand 2).

1.49 15/60 value

A metered value obtained from 15/60 metering.

2. Objective, scope and regulatory provisions

2.1 Objective and scope of the regulation

Under Section 7(1) and Section 8(1) of the Executive Order on transmission system operation and the use of the electricity transmission grid etc.[1] (Executive Order on transmission system operation *(Systemansvarsbekendtgørelsen)*), this regulation has been prepared following discussions with grid and transmission companies and balance suppliers. It has also been subject to public consultation before being registered with the Danish Energy Regulatory Authority.

This regulation lays down detailed requirements for the relevant market participants in the Danish electricity market as regards handling of metered data.

The regulation is primarily aimed at the grid companies and specifies the obligations and tasks that come with the responsibility for metering electricity and sending metered data to the DataHub. The regulation also describes the market participants' rights concerning receipt of metered data and calculated values from the DataHub.

This regulation is effective within the framework of the Danish Electricity Supply Act[2].

2.2 Statutory authority

The regulation is issued under the authority of Section 28(2), items 7, 12 and 13, and Section 31(2) of the Danish Electricity Supply Act and Section 7(1), items 3 and 4, and Section 8(1), items 1-3, of the Executive Order on transmission system operation.

2.3 Sanctions

The regulation sets out a number of obligations which the market participants comprised by the regulation must meet; see chapter 2.1 above.

If a market participant grossly or repeatedly violates its obligations, Energinet.dk may issue injunctions in accordance with Section 31(3) of the Danish Electricity Supply Act. In the event of failure to comply with an injunction, Energinet.dk may decide to fully or partially exclude the market participant from using Energinet.dk's services until the market participant complies with the injunction. If Energinet.dk becomes aware that obligations in relation to the grid operator's licensed activities have been violated, Energinet.dk will inform the Danish Minister for Energy, Utilities and Climate thereof.

If the market participant's obligations concern information about electricity metering as stated in Section 22(3) of the Danish Electricity Supply Act and these obligations are not met, this may result in an injunction being issued as stated in Section 85c(1) of the Danish Electricity Supply Act and possibly in daily or weekly default fines being imposed by the Danish Energy Regulatory Authority under Section 86(1) of the Danish Electricity Supply Act.

Chapter 11 contains a detailed description of the procedure for sanctions as well as overviews of the relevant obligations and sanctions for the market participants.

[1] Executive Order no. 891 of 17 August 2011 on transmission system operation and the use of the electricity transmission grid etc.
[2] Consolidated Act no. 1329 of 25 November 2013 on the Danish Electricity Supply Act as amended

The overviews specify only the sanctions that follow from the Danish Electricity Supply Act in the event of non-fulfilment of a market participant's obligations. If non-fulfilment of the market participant's obligations also entails violation of other legislation, this may result in other sanctions permitted under such rules.

2.4 Complaints

Under Section 7(3) and Section 8(3) of the Executive Order on transmission system operation, complaints about the regulation can be lodged with the Danish Energy Regulatory Authority, Carl Jacobsens Vej 35, 2500 Valby, Denmark.

Complaints about how Energinet.dk has enforced the provisions of the regulation can also be lodged with the Danish Energy Regulatory Authority.

If decisions made by Energinet.dk result in the deregistration of a market participant as a user of the DataHub, the market participant which the decision concerns can also demand that such decision be brought before the courts; see Section 31(5) of the Danish Electricity Supply Act.

2.5 Effective date

This regulation comes into force on 1 April 2016 and replaces Regulation D1: 'Settlement metering', March 2013.

Questions and requests for additional information can be directed to Energinet.dk's contact for this regulation as stated on Energinet.dk's website www.energinet.dk.

The regulation is registered with the Danish Energy Regulatory Authority pursuant to Section 73 a of the Danish Electricity Supply Act, Section 1 of the Executive Order on grid companies', regional transmission companies' and Energinet.dk's methods for determining tariffs etc.[3] (*Bekendtgørelse om netvirksomheders, regionale transmissionsvirksomheders og Energinet.dk's metoder for fastsættelse af tariffer m.v.*) and Section 7(2) and Section 8(2) of the Executive Order on transmission system operation.

[3] Executive Order no. 1085 of 20 September 2010 on grid companies', regional transmission companies' and Energinet.dk's methods for determining tariffs etc.

3. Roles and obligations

3.1 Introduction

The following division of work applies to the exchange of metered data:

1. The grid operator sends metered data per metering point for calculation of production, exchange and consumption to the DataHub as stated in chapter 3.2. This applies to both settlement metering and other metered data which are not necessarily included in the balance settlement, but may be included in the wholesale settlement between grid operator and balance supplier.
2. The DataHub checks the data for general errors and calculates all derived values such as sums, periodised consumption etc.
3. Energinet.dk sends data per metering point and derived values to legitimate recipients of EDI data via the DataHub.

This applies irrespective of the time resolution of the metered data. Permissible time resolutions appear from Regulation I: 'Master data'.

The various market participants' general roles and obligations in respect of metered data are described in the following.

3.2 Grid operator

3.2.1 Metered data collector

The grid operator acts as the metered data collector for all the metering points in its grid area that directly or indirectly form part of the settlement performed with the balance supplier/BRP, grid operator and/or Energinet.dk.

The grid operator is thus obliged to:

- Ensure metering and reading of metered data; alternatively estimate metered data.
- Check that the metered data are correct.
- Send metered data per metering point to the DataHub.
- Check the correctness of metered data in the DataHub.
- Guarantee confidentiality and discretion in respect of metered data.

These tasks are described in further detail in appendix 1: 'Grid operator, grid areas, metered data collector etc.'

3.2.2 Legitimate recipients of metered data

Grid companies are legitimate recipients of metered data for points of exchange shared with neighbouring grid companies and for which the neighbouring grid operator functions as metered data collector (see table 1 below).

Table 1. Legitimate recipients of metered data

Data	**Recipient**
Data per exchange metering point: Metered grid flow	Neighbouring grid operator
Sum per grid area: Residual consumption, distribution curve, load shares per tariff and sum of load shares	Grid operator

Sum of production per grid area:	Grid operator
Sum of exchange per grid area:	Grid operator
Sum of consumption per grid area:	Grid operator
Sum per balance supplier per tariff per grid area: Flex and hourly settled consumption, distributed consumption, periodised consumption	Grid operator

3.3 Energinet.dk

Energinet.dk is responsible for:

1. Receiving metered data per metering point from the grid companies. This applies to both settlement metering and other metered data which are not necessarily included in the balance settlement, but may be included in the wholesale settlement between grid operator and balance supplier.
2. Calculating all aggregated and other derived metered data as well as load shares.
3. Sending metered data via EDI to the balance suppliers, BRPs and grid companies that are legitimate recipients; see chapters 3.2, 3.4 and 3.5. The same applies to any other parties that may be entitled by law to receive such data.
4. Making all metered data available on the DataHub market portal for all legitimate recipients.
5. Guaranteeing confidentiality and discretion in respect of metered data, including complying with Regulation G: 'Discretionary policy and data protection procedures'.

Energinet.dk uses the DataHub for performing the above-mentioned tasks.

Energinet.dk uses aggregated values to perform its own settlement, ie:

- Settlement of grid, system and PSO tariffs with balance suppliers.
- Balance settlement with BRPs.
- Reconciliation of balance suppliers.
- Settlement of subsidies etc. with electricity generators.

3.4 Balance suppliers and BRPs

Balance suppliers and BRPs are legitimate recipients of metered data for consumption and production as shown in tables 2 and 3 below. In this context, 'legitimate recipients' are those which have a legitimate right to see the data in the DataHub. Whether they receive them automatically via EDI is a different matter. The latter will appear from chapters 4 and 5.

Table 2. Legitimate recipients of metered data for consumption

Data	**Recipient**
Data per metering point: Metered consumption, periodised consumption, load shares, estimated annual consumption, meter reading	Balance supplier
Sum per balance supplier per grid area: Metered hourly and flex-settled consumption, load shares, distributed	Balance supplier and BRP

consumption	
Sum per balance supplier per grid area: Periodised consumption	Balance supplier
Sum per BRP per grid area: Metered hourly and flex-settled consumption, load shares, distributed consumption	BRP
Sum per grid area: Residual consumption, distribution curve* and load shares	Balance supplier and BRP
Sum per grid area per tariff: Load shares, flex and time consumption, distributed consumption, periodised consumption	Balance supplier

*Distribution curve is only sent to the balance supplier

Metered data for consumption can be estimated, calculated or metered.

For production the following applies:

Table 3. Legitimate recipients of metered data for production

Data	**Recipient**
Data per metering point: Metered production	Balance supplier
Sum per balance supplier per grid area: Metered production	Balance supplier and BRP
Sum per BRP per grid area: Metered production	BRP
Sum per grid area per tariff: Metered production	Balance supplier

Metered data for production can be estimated or metered. In relation to net-settled metering points, metered data can also be estimated or calculated by the grid operator or by the DataHub.

Other requirements:

- These market participants must also guarantee confidentiality/discretion in respect of metered data.
- A market participant may appoint another market participant to act as a legitimate recipient on behalf of the market participant. For example, a balance supplier may agree with Energinet.dk that all time series must instead be sent to the BRP.

The latter situation will in such case be handled via the market participant master data for which the market participant is responsible for updating in the register of market recipient master data.

3.5 Customers and other interested parties

Customers are legitimate recipients of metered data for their own metering points. The metered data will not be sent via EDI, but the customers can see them via the customer portal on the balance supplier's website where they can activate download to a spreadsheet.

In accordance with Regulation H1: 'Change of balance supplier, move-in/move-out etc.', the customer can also, via customer-controlled data access, grant third parties access to retrieving master data and metered data about the customer via relevant data extracts from the DataHub. Moreover, in a quotation phase, the customer can also, via customer-controlled access, give the balance supplier access to one year's historical hourly data.

Upon request, public authorities and others can have metered data sent to them to the extent required by legislation.

4. Daily data exchange of 15/60 values

This chapter describes the daily exchange of the flex and hourly settled metered data which are used in the balance settlement and/or in the wholesale settlement. These metered data are always 15/60 values and are therefore simply referred to as 'metered data' in this chapter.

According to the settlement of wholesale services, see Regulation H3: 'Settlement of wholesale services and taxes', the grid operator may link other metering points to consumption andproduction metering points in a parent/child structure. Child metering points (also called other metering points) will not be included in the balance settlement, but will be included in the wholesale settlement between the grid operator and the balance supplier for the consumption/production metering point.

A child metering point is established to handle the situation where the wholesale settlement between the grid operator and the balance supplier cannot be based directly on the energy amounts registered for the consumption orproduction metering point. Furthermore, child metering points are used to register metered data for installations using net settlement (M1, M2 and M3).

Data exchange for profile-settled metering points is described separately in chapter 5.

4.1 Procedures until 21.00 on the fifth working day after the day of operation

4.1.1 General information on hourly settled metering points

The period until 21.00 on the fifth working day after the day of operation can be divided into two sub-periods:

1. 'Collection period', at 10.00 on the first-third working day: In this period, the grid operator remote-reads 15/60 values for all hourly settled metering points making registrations using a resolution of 15/60 values. Collected hourly values must be sent all days of the week without undue delay, and all values must be available at the end of the period, if necessary in the form of estimates. For the same reason, missing values are only acceptable until the end of the period.

2. 'Control period', third working day at 10.00 to the fifth working day at 21.00: In this period, the affected market participants check the data sent/received. If this check gives rise to corrections, the same procedures as were used for the original data will in principle be repeated.

The grid operator must send metered data for all child metering points (physical and virtual) linked to the individual hourly settled metering point as soon as possible; however, no later than within the time limits specified in items 1 and 2 above.

4.1.2 General information on flex-settled metering points

Metered data from flex-settled metering points must be sent to the DataHub according to the following procedure:

- First-fifth working day at 21.00: In this period, the grid operator remote-reads hourly values for all flex-settled metering points. Collected hourly values must be sent all days of the week without undue delay, and all values must be available at the end of the period, if necessary in the form of estimates. A maximum of 5% of metered data may be estimated values.

  On the fifth working day, the DataHub will check the percentage of estimated metered values; see appendix 7, 'Key performance indicators (KPI)'.

  For flex-settled metering points, missing values are acceptable until 21.00 on the fifth working day after the month of operation.

The grid operator must send metered data for all child metering points (physical and virtual) linked to the individual flex-settled metering point as soon as possible; see the time limit specified above.

4.1.3 Procedures used by the grid operator and the balance supplier

Before data are sent to the DataHub

The grid operator must on a daily basis remote-read metered data per metering point for all production, flex and hourly settled consumption and exchange. In addition, any other metered flow to and from the transmission grid, including reactive metering, must also be sent individually. The specific rules on the different metering types are outlined in chapters 6-9.

Before sending data to the DataHub, the grid operator must check the data and if necessary replace any missing and incorrect/unreliable data with the best possible estimates. As such, the grid operator must check data for:

1. Missing values (NULL).
2. Sign errors; see chapter 6.
3. Zero sequences where, based on the grid operator's knowledge of the metering point, the value should not constantly be zero.
4. Min./max. check, ie as to whether the metered value lies within a defined, plausible interval.

Estimates may be used for a maximum of three months for a single metering point before metered hourly values must be sent.

The estimates must be prepared using one of the following methods:

1. Using data from a check meter (is mandatory if check meters are available).
2. Using metered data for the same metering point for a previous day of operation resembling the current one, for example the previous day or the same day a week earlier.
3. Rescaling metered data from another metering point of the same type.

4. Distributing the total daily meter reading on 15/60 values on the basis of empirical values if daily meter readings are available
5. Using estimates based on specific knowledge about the metering point concerned, for example outage.

In all cases, the estimated value must be probable in light of the grid operator's specific knowledge. The value can only be set to 0, for example, if it is a probable value in light of the grid operator's specific knowledge.

When sending metered data per metering point to the DataHub, the grid operator must state in its status code whether the value has been read, estimated or is missing (NULL). The last option (missing) must be used only until 10.00 on the third working day for hourly settled metering points, and until 21.00 on the fifth working day for flex-settled metering points.

If metered data are corrected after the expiry of the time limits, the new data must be checked using one of the methods outlined above.

After data are sent to the DataHub
For flex and hourly settled metering points, the balance supplier and the grid operator must both, before fixation, carry out checks of the 15/60 values per metering point already sent and of aggregated sums. For that reason, it may be necessary to correct the data already sent.

The checking of metered data already sent entails the following:

1. The balance supplier is responsible for checking the metered data per metering point and the consistency between the metered data per metering point and the sum per balance supplier.

2. The BRP is responsible for checking the consistency between the sum per balance supplier and the sum per BRP.

3. The grid operator is responsible for reviewing the values per metering point sent to the DataHub and checking whether values are still missing by mistake, as well as checking the consistency between the metered data per metering point and the sums per grid area.

4. Energinet.dk reviews the time series sent and received for the purpose of validation and checking; see chapter 4.1.5. Energinet.dk also checks, for example, if the status codes have been entered correctly, if metered data comply with the sign convention and if the summarised and calculated values, such as residual consumption, are consistent and comply with the sign convention etc.

4.1.4 Procedures for errors and unexpected deviations
Balance supplier

If the balance supplier discovers errors in metered data per metering point and/or values deviating from the expected values of metered data per metering point, the balance supplier must contact the grid operator. This can be done either directly using the contact information specified in the register of market participant master data or – if the balance supplier does not want to reveal its identity to the grid operator – by sending a query to the DataHub using a web form which the DataHub passes on to the grid operator.

In the event of any inconsistencies between the metered data per metering point and the sum per balance supplier, the balance supplier must contact Energinet.dk.

BRP

If the BRP discovers any inconsistencies between the sums per balance supplier and per BRP, the BRP must contact Energinet.dk.

Grid operator

If the grid operator discovers errors in the sent metered data per metering point, the grid operator sends the corrected data to the DataHub. In the event of any inconsistencies between the metered data per metering point and the sum per grid area, the grid operator must contact Energinet.dk.

When sending metered data to the DataHub, sending corrected time series together with non-corrected time series is not allowed. Exceptionally, from 10.00 on the third working day after the day of operation until fixation takes place (at 21.00 on the fifth working day), it is possible for a grid operator to send all time series if a grid operator's initial sending of time series was incomplete. This typically occurs in connection with an IT system breakdown.

4.1.5 Procedures used by Energinet.dk (DataHub)

Check

Having received the data, the DataHub checks the data received for:

1. Missing values (NULL), which, as mentioned above, are only permitted for hourly settled metering points until 10.00 on the third working day after the day of operation and for flex-settled metering points until 21.00 on the fifth working day after the day of operation.
2. Sign errors: Metered data per metering point cannot be negative; see chapter 6.
3. Min./max. check: Data must lie within a plausible interval.

The threshold values shown in table 4 below is used for the min./max. check.

Table 4. Threshold values to be used for min./max. check

	Min.	**Max.**
Flex-settled consumption	0	1 MWh/h
Hourly settled consumption	0	100 MWh/h
Production	0	1,000 MWh/h
Exchange	0	1,000 MWh/h

If errors and defects are found during this check, the following procedure is used:

1. The DataHub sends a negative acknowledgement to the grid operator indicating the error.
2. The grid operator then sends the missing or corrected data as quickly as possible, unless item 3 applies.
3. If the DataHub informs the grid operator that errors have been found in the DataHub and that the data already received must therefore be re-entered, item 2 does not apply.

If values are missing after the applicable time limits, the DataHub sends a reminder to the grid operator as described in appendix 4.

The DataHub prepares statistics for these situations.

Corrected value

The DataHub checks whether the values received per metering point represent a correction of a previously received value. In that case, the following must be done:

1. The value received is saved in the DataHub together with a status code indicating whether the value is metered, estimated or missing. It is also registered in the DataHub that the value has been corrected.
2. The corrected value per metering point and the status code for a corrected value are sent to the balance supplier within one hour. The grid operator's status code is not sent (is overwritten).
3. If necessary, the balance supplier can see the original, overwritten status code by looking in the DataHub.

For aggregated and other calculated values, the same procedure must be used where the status code is concerned, but not until fixation has taken place; see chapter 4.4.3.

Aggregation

Every day until the fifth working day after the day of operation, the DataHub calculates the following sums:

1. Total production, flex-settled consumption and hourly settled consumption per balance supplier per grid area.
2. Residual consumption per grid area.
3. Total production, flex-settled consumption and hourly settled consumption per BRP per grid area.
4. Total flex-settled consumption and hourly settled consumption per grid area.
5. Total production per grid area.
6. Total exchange per grid area.
7. Total consumption per grid area.

The sums are calculated using the metered data per metering point that have been received by the DataHub no later than at 21.00 on the day in question and have subsequently passed the DataHub's check.

The DataHub indicates a status code for these sums and other calculated values. A calculated value, which in the underlying metered data per metering point contains just one estimated value, will thus be classified as 'estimated'. The same applies to missing values.

If Energinet.dk discovers an error in the aggregated sums, Energinet.dk contacts the market participants with a view to correcting the error.

Sending of data to balance supplier etc.

The DataHub sends metered data for hourly settled metering points to the balance supplier no later than one hour after they have been received by the DataHub unless such data do not comply with the DataHub's checking procedures. The balance supplier will also receive metered data for child metering points, if any, linked to the consumption/production metering point. Metered data for flex-settled metering points are sent as soon as possible after they have been received by the DataHub; however, such that metered data received by the DataHub before 21.00 are sent to the balance supplier no later than at 8.00 on the following calendar day.

The balance supplier must, however, keep in mind that metered data for child metering points are not necessarily sent to the balance supplier at the same time depending on the grid operator's sending of data to the DataHub.

Every day until the fifth working day after the day of operation, the DataHub must send the above-mentioned sums (see the list in the *Aggregation* chapter) to the following recipients no later than at 8.00 on the following calendar day:

- Balance suppliers: Items 1-2
- BRPs: Items 1-3
- Grid companies: Items 2, 4, 5, 6 and 7.

4.2 Fixation

In order to determine the residual consumption and thus the distribution curve, the DataHub fixes its data basis for one day of operation at a time at 21.00 on the fifth working day after the day of operation. The fixation may form the basis for a preliminary determination of the balance and wholesale settlement.

For the fixation, the DataHub calculates a series of values to be included in the fixed data basis:

- The sums mentioned in chapter 4.1.4, '*Aggregation for hourly settled metering points and flex-settled metering points, respectively*'.

- The distribution curve is calculated in accordance with Regulation H2.

- An estimate of the distributed consumption, ie the residual consumption distributed on balance suppliers and BRPs as described in further detail in Regulation H2: 'Profile settlement etc.'.

- An estimate of the wholesale settlement basis between grid operator and balance supplier: The sums for the total flex and hourly settled consumption and production per tariff per balance supplier per grid operator as described in Regulation H3: 'Settlement of wholesale services and taxes'.

- An estimate of the profile-settled consumption per tariff per balance supplier per grid area by calculating the distributed consumption on the basis of fixed residual consumption and load shares for the tariff.

The DataHub sends the fixed basis to the various balance suppliers, BRPs and grid companies no later than at 8.00 on the calendar day after the fifth working day.

Energinet.dk may decide to postpone the fixation. The conditions for this are described in appendix 6, which also describes the information to be provided by Energinet.dk if the sending of the fixed settlement basis may be delayed.

4.3 Procedures to be performed in the period between fixation and refixation

4.3.1 Checking of metered data

The checking of metered data already sent entails the following:

1. The grid operator is responsible for reviewing the values per metering point sent to the DataHub and checking whether there are any incorrect estimated metered data for flex-settled metering points. Any incorrect values must be replaced with metered or correctly estimated values no later than at the end of the second month after the month of operation.

2. The DataHub reviews the metered data received and sent for the purpose of validation and checking. It is also checked, for example, if the status codes have been entered correctly, if metered data comply with the sign convention, and if the sums for the flex-settled consumption are consistent and comply with the sign convention etc.

4.3.2 Various procedures

Sending of aggregated values etc.

Between fixation and refixation, the DataHub does not automatically send calculated values to all relevant market participants. Market participants can have data sent to them by either:

1. Sending an EDI message to the DataHub, which then automatically sends the data specified in the EDI message.
2. Accessing the DataHub market portal and activating the sending of data.

Corrections

If the DataHub receives corrected metered data between fixation and refixation, such data will form part of the balance and wholesale settlement. The following procedure must be used:

1. In the event of corrections, the grid operator must send the corrected data to the DataHub (only time series containing corrections may be sent).
2. Before resending the data, the DataHub indicates in the status code that the values concerned are corrected values, both where metered data per metering point and calculated values are concerned.
3. The market participant has the opportunity to receive correction reports for changed metered data as stated in appendix 4.

4.4 Refixation

Prior to balance and wholesale settlement, the data basis is refixed, meaning that the procedures in chapter 4.3 are repeated. Refixation is performed each month for the preceding three months. Refixation must be carried out as follows:

- the month of operation is refixed at 21.00 on the fifth working day after the month of operation (first refixation)
- the month preceding the month of operation is refixed at 21.00 on the fourth working day after the month of operation (second refixation)
- the month preceding the month of operation by two months is refixed at 21.00 on the third working day after the month of operation (final refixation).

The data basis for January will thus be refixed at the following times:

- the first refixation takes place on the fifth working day in February
- the second refixation takes place on the fourth working day in March
- the final refixation takes place on the third working day in April.

The refixed data basis is sent to the relevant parties according to the same rules as apply to the sending of the fixed data basis; see chapter 4.3.

The refixed data basis is sent no later than at 8.00 on the calendar day following the completed refixation.

4.5 After refixation

Sending of aggregated values etc.

The procedure to be used is the same as the one outlined in chapter 4.4.2.

Corrections

If metered data are corrected after final refixation, they do not form part of the balance settlement but of the subsequent correction performed between balance suppliers as described in further detail in chapter 10.

The procedure to be used with regard to the sending of corrected data is the same as the one outlined in chapter 4.4.2. However, with the exception that only the balance suppliers involved will receive the corrected data.

The DataHub will also, as a minimum, carry out a correction settlement three years after the month of operation.

5. Exchange of metered data for profile-settled metering points

5.1 Metered data for profile-settled customers (consumption)

5.1.1 Procedures used by the grid operator

Before data are sent to the DataHub

Before data are sent to the DataHub, the grid operator must first perform a quality check comprising the following elements (see chapter 4.1.3):

1. Missing reading
2. Sign errors
3. Min./max. check.

It must be checked that all metering points have been read/estimated as indicated in the master data per metering point. This also applies to metering points that have been disconnected throughout the reading period and where the consumption must therefore typically be set at 0.

Where min./max. check of annually read customers is concerned, the intervals for plausible consumption listed in table 5 are generally used. The grid operator may choose to use other intervals.

Table 5. Plausible positive min./max. consumption for annually read customers

Latest consumption = x (kWh/year)	**Plausible positive minimum consumption (kWh/year) as a function of the latest consumption (x)**	**Plausible positive maximum consumption (kWh/year) as a function of the latest consumption (x)**
0 - 2,000	x - 1,000	1.25x + 1,000
2,000 - 4,000	0.7x - 400	1.4x + 700
4,000 - 10,000	0.75x - 600	1.3x + 1,100
> 10,000	0.8x - 1,100	1.25x + 1,600

If the meter reading exceeds the mandatory limit for hourly metering applying to the grid area, it must always be checked if this is the result of an error or due to the most recently read consumption being higher than normal or if it is a virtual metering point for grid loss with a consumption above the current mandatory limit etc. In the master data for the metering point, the grid operator must specify whether it is acceptable for the metering point to exceed the current mandatory limit.

The grid operator must respond to incorrect/unreliable readings by carrying out a control reading. If the grid operator is unable to obtain a control reading, it must make an estimate based on the most recent validated reading; see chapter 8. Estimates may be used for a maximum of one year before a reading is carried out.

Sending of data to the DataHub

The time limit for sending metered data per metering point for profile-settled metering points is 35 calendar days from the nominal reading date. This applies to both ordinary readings and readings carried out as a result of a move-in/move-out, change of supplier etc.; see chapter 8.

The grid operator must send a consumption statement and meter reading per consumption metering point as well as meter readings for any other physical metering points (child metering points) in connection with both ordinary readings and readings carried out as a result of move-in/move-out,

change of supplier etc. The time limit for sending data is no later than 35 calendar days from the nominal reading date for the consumption metering point.

If the metering point is remote-read, a consumption statement and a meter reading must as a minimum be sent four times a year and when reading the meter in connection with a move-in/move-out, change of supplier etc.[4] Meter readings must be sent for physical metering points only.

Irrespective of the reading method, statements of consumption may only be sent for profile-settled metering points using yearly-based net settlement once a year in connection with ordinary annual statements and in connection with move-ins/move-outs and changes of supplier.

The grid operator must send metered data (hourly data) for all child metering points (physical and virtual) linked to the individual profile-settled metering point according to the time limits for flex-settled metering points; see chapter 4.1.2.

Within the time limit of 35 calendar days, the customer must, if necessary, be reminded to perform the reading so the time limit can be met. The grid operator must always estimate the consumption and the meter reading if this is necessary to comply with the time limit.

When sending metered data for profile-settled metering points, the grid operator must – as it does for flex and hourly settled metering points – always state in its status code whether the value has been read or estimated, as 'missing' does not apply.

5.1.2 DataHub procedures

Reminder

If the DataHub has not received data after 21 calendar days, a reminder will be sent to the grid operator as stipulated in appendix 4.

Check

Upon receipt of metered data, the DataHub checks whether the rules on sign convention, time stamping etc., as stipulated in chapters 6-9, have been observed.

If any errors and deficiencies are discovered, the same procedure as for 15/60 values is used; see chapter 4.1.4:

1. The DataHub sends a negative acknowledgement to the grid operator indicating the error.
2. The grid operator then sends the missing or corrected data as quickly as possible, unless item 3 applies.
3. If the DataHub informs the grid operator that errors have been found in the DataHub and that the data already received must therefore be re-entered, item 2 does not apply.

The DataHub prepares statistics for these situations.

Immediately before the reconciliation, an additional check must be carried out as described in Regulation H2: 'Profile settlement etc.'.

[4] See Section 72 a(3), second sentence, of the Danish Electricity Supply Act.

Sending of data to balance supplier

The DataHub sends metered data for profile-settled metering points to the balance supplier no later than one hour after they have been received by the DataHub unless such data are rejected in the DataHub's checking procedures. The balance supplier will also receive metered data for other metering points linked to the consumption metering point.

The status code which the grid operator used for the transmission must be used for sending the data.

When corrected values are sent from the DataHub, the message is marked as a correction notice.

5.1.3 Procedures used by the balance supplier

If the balance supplier discovers errors and/or values deviating from expectations, the procedure is the same as the one outlined in chapter 4.2.3. This means that the balance supplier must contact the grid operator directly or anonymously via the DataHub using a web form which the DataHub passes on to the grid operator. The same principle applies if metered data have been delayed and the balance supplier wants to send a reminder to the grid operator, even if this is done by the DataHub.

5.1.4 Correction of metered data

When sending corrections for metered data, the following procedure is used:

1. For corrections of *consumption* for periods where the start and end dates for the period are not changed, the grid operator must send corrected values to the DataHub as a correction notice. The balance supplier will then receive the corrected consumption from the DataHub.

2. For corrections of *meter reading times,* the grid operator cancels all previously sent readings up to and including the period in which the new reading is to apply. The cancellation is carried out successively, starting with the cancellation of the most recent reading period. When the cancellation is completed, the grid operator sends the correct readings in the correct order as usual.

   Before receipt of the new meter readings, the balance supplier will first receive cancellations of the old readings from the DataHub. Please note that the procedure used may result in an otherwise correct reading first being cancelled and subsequently being resent to the balance supplier without any real change in either period or consumption.

Corrections for metered data can generally be sent to the DataHub for up to three years back in time; see chapter 10.

5.2 Metered data for monthly read production

Monthly read metering points

The grid operator reads the metering point no later than on the first working day after the end of a month and sends the meter reading as a monthly EDI time series to the DataHub no later than at 10.00 on the third working day after the end of a month.

RE production from multi-fuel units

The separate monthly time series for RE production at multi-fuel units must be sent to the DataHub no later than at 10.00 on the fifth working day after the end of a month.

Sending of net production

Net production for all production facilities connected to the grid after 31 December 2003 must always be metered if settlement is to be made at a reduced PSO tariff[5].

For production facilities using net settlement where net production (M1) is to be calculated solely in relation to the settlement of wholesale services between grid operator and balance supplier, and where there is no physical meter, the grid operator must send estimated metered data.

[5] For production facilities using net settlement which were connected to the grid before 31 December 2003, net production may be calculated on the basis of a defined formula.

6. General – metering points and settlement metering

6.1 Metering points

6.1.1 General

A metering point is a physical or defined (calculated or virtual) point in the grid where electrical energy is metered, calculated as a function of metering performed or estimated and classified as consumption, production or exchange. A metering point is the smallest unit in the electricity market when calculating electrical energy for a customer, generator, balance supplier, BRP or a grid operator. Changes of supplier and move-ins/move-outs can only be implemented for a consumption or production metering point. If child metering points are linked to a consumption orproduction metering point, these will be handled on the basis of the master data for the consumption or production metering point, and changes of supplier/move-ins/move-outs will automatically be implemented for the child metering points concurrently with changes of supplier/move-ins/move-outs being implemented for the consumption orproduction metering point (parent). Metered data sent for a child metering point will be included in the wholesale settlement with the balance supplier linked to the consumption or production metering point (parent).

For ordinary small customers with a single physical meter, the metering point is the same as the physical meter. For large customers with two or more physical meters, each of these meters is generally defined as a metering point. However, several meters may be aggregated into one (calculated or virtual) metering point.

Special cases include virtual or calculated metering points; see below.

6.1.2 Virtual metering points

Virtual metering points are metering points where the 'read value' is computed by the grid operator as a function of the value read on two or more physical meters or estimated on the basis of information about power and current delivery hours (metering points without a physical meter). It is not possible to send meter readings for virtual metering points, which therefore do not have a physical meter linked.

Large customers' metering points, as indicated in the DataHub and the grid operator's systems, are very often virtual metering points composed of ten physical meters, for example. The same applies to production facilities.

Grid losses must always be represented by a virtual metering point.

6.1.3 Calculated metering points

Calculated metering points are metering points where the amount of energy is calculated by the DataHub, and can be used as an alternative to virtual metering points. Calculated metering points are constructed by using the DataHub calculation engine based on physical and virtual metering points. These are, for example, required for autogenerators using net settlement, eg in connection with purchase (consumption metering point), sale (production metering point) and own production. It is not possible to send energy amounts or meter readings for calculated metering points, which therefore do not have a physical meter linked.

6.1.4 Especially for autogenerators

For autogenerators using net settlement, a number of virtual/calculated metering points may be defined for linking price elements and meter readings as described in the memo 'Guidelines for net settlement of autogenerators'.

6.2 Settlement metering

6.2.1 General

Settlement metering must be performed in real time. For example, it is not allowed to even out previous metering faults in 15/60 values registered at a later date.

In order to enable the internal settlement between two grid companies or the registration of the production of electricity-production facilities with displaced settlement point (see chapter 7), it is allowed to up- or downscale the 'rough' 15/60 values using a well-defined fixed proportional factor (that does not change over time) before the metered values are redistributed. The same could occur on the consumption side following agreement between the customer and the grid operator.

15/60 values are distributed in kWh with up to three decimals.

6.2.2 Sign convention

The following sign convention applies:

- Metered data per metering point are always positive, regardless of the type of metering point for which metered data are sent. Exchange per metering point is always positive as well as it indicates direction. Aggregations are normally always positive, except for the sum of exchanges for a grid area which is indicated by using a positive sign for 'import' and a negative sign for 'export'.
- The residual consumption for a grid area can be negative in connection with the sending of aggregations on the first-fourth working days.

7. Settlement metering – production

7.1 General

This chapter describes the metering of direct-connected and installation-connected production facilities, including ordinary consumption and own consumption at these facilities, ie:

- The metered data to be sent to the DataHub.
- How they are to be calculated.
- The facilities for which metering using 15/60 values is to be performed.

A distinction is made between whether the facility has any ordinary consumption in addition to its own consumption at standstill that is to be metered/calculated separately for the payment of various tariffs and/or taxes.

Installation-connected facilities can use net settlement but need not do so. The rules on facilities using net settlement are only described in general terms as the subject is described in further detail in the memo 'Guidelines for net settlement of autogenerators'.

A series of issues relating to central power stations are described in appendix 5 to this regulation.

7.1.1 Own consumption and ordinary consumption

Net production (M1) is defined as the generator production (gross electricity production)deducted the necessary own consumption of electricity for electricity and CHP production.

Own consumption is the consumption necessary to maintain production at the production facility or to keep it operational. Own consumption includes:

- Electricity consumed by environmental facilities at the plant.
- Consumption for workshops/garages, public and administrative buildings used for the necessary daily operating staff.
- Electricity consumed by coal storage sites and barges and in connection with the heating of oil supply lines.
- Electricity consumed by fuel-handling facilities.
- Electricity consumed by auxiliary steam boilers, including electric boilers, where the heat is not used for district heating.
- Transmission losses up to the grid metering point.

Own consumption does *not* include:

- Electricity consumed by district-heating circulation pumps (for the purpose of pumping heat to heat consumers).
- Electricity consumed by charge pumps and heat peak-load boilers.
- Electricity consumed at building sites.
- Electricity supplied to officials' residences.
- Electricity supplied to third parties.

This ordinary consumption, which is not included in own consumption, must carry its share of the PSO costs.

This definition applies to all plants, but in practice it is most relevant to the central power stations.

Initially, the following metering points will be used:

M0 = consumption = any ordinary consumption (M0') + any own consumption at standstill (M0'').
M1 = net production (> 0).
M2 = supply to the grid.
M3 = supply from the grid.

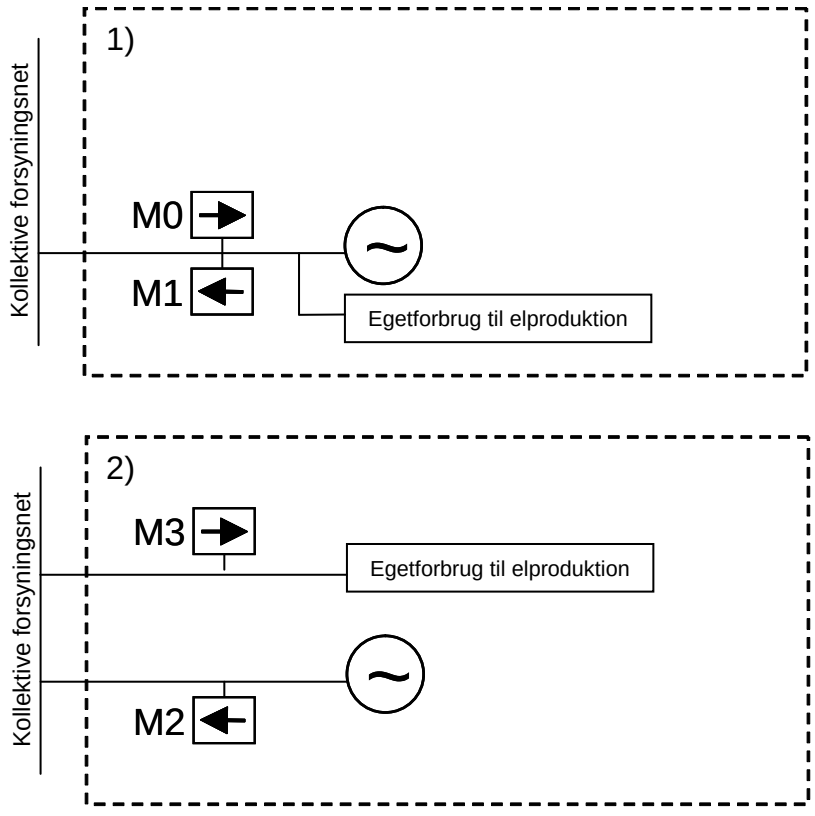
Where large production facilities are concerned, M0 and M1 will, in particular, often be virtual/calculated metering points seen from the grid operator's point of view.

These concepts are to be understood as follows:

1. Net production equals the generator's gross production deducted the own consumption. Net production is never negative as any negative values (own consumption at standstill) by definition are consumption. Own consumption is the consumption necessary for electricity and CHP production.
2. When the plant is at a standstill (net production = 0), own consumption is included in consumption M0.
3. When the plant is generating electricity, (net production > 0), own consumption must instead be deducted in the production. Consumption then solely includes any ordinary consumption by district heating pumps etc. which by definition is not classified as own consumption.

In the following chapters, production and net production are used synonymously. The same applies to consumption and ordinary consumption.

7.2 Direct-connected plants



In this chapter 7.2, it is assumed that the plants are direct-connected and do not use net settlement. In this case, only consumption and production (M0 and M1) must be sent to the DataHub.

The above does not apply to plants using net settlement as described in the memo 'Guidelines for net settlement of autogenerators'.

7.2.1 Calculation of production and consumption

Where direct-connected plants are concerned, the grid operator need only send data for consumption and production (M0 and M1) to the DataHub. For these plants, consumption only comprises own consumption at standstill. Furthermore, the following applies:

1. Where simple plants (drawing 1) such as wind turbines are concerned, own consumption is taken from the same grid connection as is used for production – here M0 and M1 are metered directly.

2. Where other plants (drawing 2) are concerned, own consumption is often taken from a separate grid connection – here M0 and M1 are calculated as virtual/calculated metering points as shown in table 7:

Table 7. Calculation of M0 and M1

M0 =	M1 =
-1*min.(M2-M3; 0)	Max.(M2-M3; 0)

7.2.2 Requirements for the metering and sending of data to the DataHub

M0 must be sent to the DataHub as a consumption metering point as follows:

- Where simple plants (item 1 in chapter 7.2.1) are concerned, M0 need not be metered in 15/60 values, even if this is the case for M1; see chapter 8.
- Where other plants (item 2 in chapter 7.2.1) are concerned, M2 and M3 must be metered in 15/60 values so that M0 and M1 can be calculated using 15/60 values.

M1 must always be metered in 15/60 values that are sent to the DataHub for:

1. Wind turbines and photovoltaic cells with an output larger than 50 kW.
2. Other plants larger than 25 kW.

Where several wind farms metered collectively are concerned, item 1 refers to the total installed capacity of the wind farm. Similarly, item 2 refers to the total installed capacity of the plant if it consists of several units.

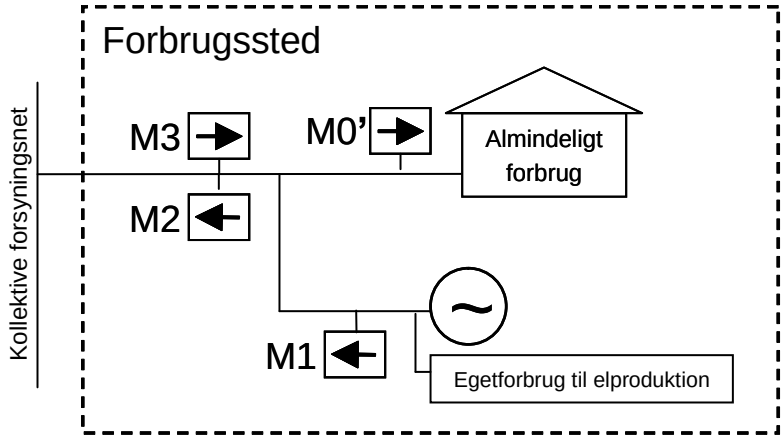
If M1 is not to be metered using 15/60 values, it must instead be read monthly and sent to the DataHub as described in chapter 5.2.

In addition, the following general rules apply with respect to M1:

- A plant can only feed power into one grid area. If the plant is connected to several grid areas, the necessary M2/M3 metering points must also be included as exchanges performed between the grid areas so that M1 can be calculated correctly for one grid area.
- If the plant consists of several production facilities that are interconnected via an internal electricity supply grid, M1 can often not be metered directly for each individual plant. If necessary and following agreement with Energinet.dk, the distribution (distribution in connection with the metering of each plant's gross production, for example) can be estimated.

- If the plant fires several fuels, and price subsidies are granted for the associated electricity production, the grid operator must once a month send a time series to the DataHub indicating how production is distributed on the various fuels; see chapter 5.2.

7.3 Installation-connected plants



In this chapter 7.3, it is assumed that the plants are installation-connected and do not use net settlement. In this case, only consumption and production (M0 and M1) values are to be sent to the DataHub, as is the case with direct-connected plants. As is shown in the following, consumption must in some instances be divided into ordinary consumption (M0') and own consumption at standstill (M0'').

The above does not apply to plants using net settlement as described in the memo 'Guidelines for net settlement of autogenerators'.

7.3.1 Calculation of production and consumption

Where installation-connected plants are concerned, the grid operator must ensure that the relevant metering points M0' or M1, M2 and M3 are metered in terms of any ordinary consumption or net production and supply to/from the grid. The resulting M0 (possibly divided into M0' and M0'') and M1 will often be virtual metering points sent to the DataHub.

As shown in the figure above, M1 can be metered either directly or through direct metering of the ordinary consumption, as is normally done at large plants. If M1 is calculated in this manner, ordinary consumption (M0') and own consumption at standstill (M0'') must be sent separately to the DataHub. This makes it possible to have different types of balance suppliers for the two types of consumption.

M1, M0, M0' and M0'' can be calculated as shown in table 8 in the two instances.

Table 8. Calculation of M0 and M1

'3rd metering':	M0'' =	M0 =	M1 =
M1	-	M1+M3-M2	M1
M0'	-1*min.(M2-M3+M0'; 0)	M0'+M0''	Max.(M2-M3+M0'; 0)

In other words, if the ordinary consumption (M0') is metered, own consumption during standstill M0'' and production M1 can be calculated using a formula for production including own consumption, and subsequently be distributed according to sign, and M0 can then be calculated, possibly divided into the two types of consumption.

7.3.2 Requirements for the metering and sending of data to the DataHub

M1 and M0 (possibly divided into M0' and M0'') must always be sent to the DataHub as a 15/60 value for:

1. Wind turbines and photovoltaic cells with an output larger than 50 kW.
2. Other plants larger than 25 kW.

Item 1 refers to the total installed capacity of the wind farm if several turbines are metered collectively, while item 2 refers to the plant's total installed capacity if the plant consists of several minor units.

If M1-M3 are not metered using 15/60 values, M1 must be read monthly and sent to the DataHub. The resulting consumption M0 is handled as a virtual profile-settled metering point. Where minor installation-connected plants using net settlement are concerned, some exceptions apply. These exceptions, which concern M1 and M2, are dealt with in the memo 'Guidelines for net settlement of autogenerators'.

In addition, the same general rules regarding plants connected to several grid areas etc., as mentioned in chapter 7.2.2, apply.

If M0' is metered and used to calculate M0 and M1, M0', M2 and M3 must always be metered using 15/60 values.

7.4 Summary of requirements

Where direct-connected plants not using net settlement are concerned, the grid operator must send values for net production and consumption, ie M1 and M0, to the DataHub.

Where installation-connected plants not using net settlement are concerned, the grid operator must likewise send values for net production M1 and consumption M0 to the DataHub.

Own consumption at standstill must be treated as ordinary consumption. As such, net production must never be negative.

If own consumption is metered separately, the same time resolution that was used for metering M1 must be used.

All ordinary consumption at the plant which is connected direct to the local grid operator's grid without being connected in any way to the plant's internal grid is not included in the plant's consumption.

If M1 and M0 are calculated by metering ordinary consumption (M0'), this and other types of metering must be performed using 15/60 values.

Other requirements are:

- Collective metering of production facilities can take place only if they belong to the same plant and are settled in accordance with the same rules, and separate metering is not required for subsidy-related reasons.

- Collective metering of wind turbines can take place only if the individual wind turbines are settled in accordance with the same rules.

- Wind turbines which have been connected to the grid after 20 May 2003 must be metered separately and can therefore not form part of wind farms; see Danish Executive Order no. 1063 of 7 September 2010.

- Wind turbines larger than 50 kW must be metered using 15/60 values. For other plants, the limit is 25 kW.

- The limits refer to the wind farm's total installed capacity if several turbines are metered collectively and to the plant's total installed capacity if the plant consists of several minor units.

7.5 Estimate of production for the purposes of balance settlement etc.

For production facilities that are not metered using 15/60 values but read monthly (see chapter 5.2), Energinet.dk uses estimated values in the first fixation of the preliminary basis for balance and wholesale settlement. The estimates are recalculated prior to refixation by means of the monthly readings available.

The estimates are based on a 24-hour energy profile, which is calculated on the basis of a representative group of plants using online metering. The profile is scaled to correspond to that of a production facility with an installed capacity of 1 kW. One profile will be calculated for wind turbines, one profile for photovoltaic cells and another profile for other electricity-generating facilities in each of the two price areas DK1 and DK2. The estimated 15/60 value for the individual production facility is calculated as follows:

Estimate in Western Denmark = ((production facility's installed capacity)/4) * (profile's quarter-hourly value)

Estimate in Eastern Denmark = ((production facility's installed capacity)) * (profile's hourly value)

The recalculated estimates are generated by scaling the estimates when the monthly readings are available so that the total energy read for the month tallies with the sum of the 15/60 values in the recalculated estimate.

The estimated 15/60 values for the metering points affected are sent to the grid companies via the DataHub at 11.00 on the day after the day of operation so that they may be incorporated into the consumption forecasts etc. prepared by the grid companies on an ongoing basis.

The recalculated 15/60 values are calculated on the basis of the fixation for the last day of the month and are distributed immediately after they are calculated.

8. Settlement metering – consumption

8.1 Hourly settled metering points

Consumption metering points must always be metered using 15/60 values when:

1. Consumption takes place in local grid areas where the annual consumption exceeds the mandatory limit; see Regulation H2: 'Profile settlement'. In this instance, however, hourly metering is always sufficient.
2. Consumption takes place for flex-settled metering points:
3. Consumption takes place at autogenerators in groups 1-3 using net settlement, regardless of the size of the consumption, as described in the memo 'Guidelines for net settlement of autogenerators'.
4. Electricity production facilities' own consumption is metered separately using 15/60 values; see chapter 7.4.
5. Electricity production facilities' ordinary consumption is metered, and the consumption is used for calculating M1 and M0; see chapter 7.4.
6. Consumption takes place which is purchased at voltage levels higher than the 0.4 kV grid.

8.2 Profile-settled metering points

8.2.1 Rules for reading etc.

The grid operator must ensure that ordinary ('periodic') reading is carried out at least once a year. If this is a remote-read metering point which is not covered by yearly-based net settlement, it must be read four times a year.

1. Periodic reading can be replaced by a non-periodic reading if this is time-stamped within plus/minus 28 calendar days from the nominal reading date of the periodic reading.
2. Furthermore, additional ('non-periodic') reading must be performed in connection with a change of supplier, move-in/move-out, change of settlement method and meter replacement.
3. In addition, readings may be performed for control purposes etc. if this is deemed necessary by the balance supplier and/or the customer. All readings sent to the DataHub is used for settlements.
4. In the cases mentioned in item 2, the reading must be performed at the effective date. If this is not possible, the reading must be corrected and time-stamped at 00.00 on the effective date in question. A metered or estimated reading must thus always be available at the effective date.
5. In all other cases, the reading must be time-stamped from the actual reading date at 00.00.

The consumption value sent by the grid operator to the DataHub must never be negative; see chapter 6.2.2.

8.2.2 Estimate of time distribution

The time distribution of annual or monthly consumption, for example, must always be estimated using the distribution curve. In case of any corrections to customer account settlements, this principle can be derogated from, if:

1. The authorities, for example the Danish Energy Regulatory Authority, require otherwise.
2. Specific information is available about the metering point allowing a more accurate estimate, for example information to the effect that the metering point has been disconnected for part of the period concerned.

These exceptions have no bearing on the settlement between the market participants.

8.2.3 Negative consumption data

In some situations, the electricity meter may have been read/estimated incorrectly, which may subsequently result in a negative statement. This problem is illustrated in the example below.

Example of negative consumption data

– Reading on 1 January 2011: 145,000 kWh, which is read by the customer
– 'Reading' on 1 January 2012: 155,000 kWh, which is estimated by the grid operator

On the basis of the above readings, the grid operator sends a statement to the customer's electricity supplier with a combined consumption of 10,000 kWh.

The grid operator is later contacted by the customer that wants to move out on 1 July 2012.

– Reading on 1 July 2012: 154,000 kWh, which is read by the customer

The grid operator promptly computes consumption on 1 July 2012 at -1,000 kWh.

In this and similar cases, the grid operator must not send the negative consumption to the DataHub as described in chapter 6.2.2. Instead, the grid operator must reperiodise the total consumption of 9,000 kWh for the entire period from 1 January 2011 to 1 July 2012.

The grid operator must then send a corrected consumption statement for the period 1 January 2011 to 1 January 2012 and an original consumption statement (move-out statement) for the period 1 January 2012 to 1 July 2012.

Negative consumption data may also occur if the meter 'runs backwards' for customers using annual net settlement for RE facilities of 6 kW or lower. In this case, consumption is set to 0 and production as having run backwards as described in the memo 'Guidelines for net settlement of autogenerators'. Only the actual meter readings are stated on the customer's electricity bills.

8.2.4 Hourly read profile-settled metering points

The grid operator may send time series for hourly read profile-settled metering points.

If the grid operator collects hourly time series from a profiled-settled metering point, they must be sent to the DataHub.

If the hourly values are sent to the DataHub, it must in all circumstances be done on the following conditions:

1. 'Gaps' in hourly values are acceptable; there is no requirement for assessing missing hourly values.
2. These time series cannot be used for settlement purposes and therefore cannot replace readings; see chapter 8.2.1.

8.3 Sending of meter readings to the DataHub

Grid operator

Meter readings for metering points with a physical meter must be sent as described below.

The grid operator must send meter readings for flex-settled metering points at least once a year; however, no more than once a month. Meter readings for flex-settled metering points must also be sent in connection with statements of consumption at move-in/move-out, change of supplier etc.

For profile-settled metering points, meter readings must be sent in connection with statements of consumption. The time limits for sending meter readings are the same as those applying to sending statements of consumption for profile-settled metering points. The grid operator must estimate the consumption and the meter reading if this is necessary to comply with the time limits.

For hourly settled metering points, the grid operator may send meter readings once a month as a maximum.

Meter readings must also be sent in the following cases:

- Upon the connection of a newly established metering point in the DataHub, the initial meter reading for the meter must be sent.
- In connection with meter replacement, the final meter reading for the dismantled meter as well as the initial meter reading for the new meter must be sent.
- In connection with the cancellation of a metering point (dismantling/deregistration), the meter reading for the dismantled/deregistered meter must be sent.
- In the event of a request by the balance supplier in order to fulfil a customer's request for an itemised bill in accordance with the current Executive Order on electricity trader's invoicing of costs to electricity consumers (*Bekendtgørelse om elhandelsvirksomheders fakturering af omkostninger over for elforbrugere*).

Sending of meter readings for child metering points can take place and must comply with the rules on settlement method applying to the parent metering point.

Balance supplier
If the customer informs the balance supplier of the meter reading, eg through a consumption statement, the balance supplier may send the meter reading to the grid operator via the DataHub. The grid operator will then decide whether the meter reading should be updated in the DataHub.

9. Settlement metering – exchange

Neighbouring grid companies must make agreements clarifying which of the parties is responsible for performing metering on the border between each point of exchange.

The following points of exchange must be metered:

1. Exchange with foreign countries (in 400 kV, 220 kV, 150 kV, 132 kV, 60 kV and 50 kV nodes, connected to the foreign countries via interconnections).

2. Exchange in 400/150 kV and 400/132 kV substations. As a main rule, metering takes place on the 150 V/132 kV side of the transformers[6].

3. Exchange in 150/60 kV, 150/10 kV, 132/50 kV, 132/30 kV or 132/10 kV substations, metered on the low-voltage side of the transformers.

4. Exchange with neighbouring grids to and from 60 kV or 50 kV grid areas if a separate 60/50 kV grid operator services several local grid companies in a 60/50 kV region[7].

5. Exchange with neighbouring grids to and from local grid areas at 60 kV, 50 kV, 33 kV and 10 kV level.

The grid operator sends 15/60 values for each exchange metering point to the DataHub. Where time series with metered data for exchange are concerned, 'From-Grid' and 'To-Grid' must be stated. Only positive values can be used. A point of exchange in the grid must, if necessary, be divided into two metering points, switching around the values for 'From-Grid' and 'To-Grid'.

The DataHub calculates a total sum of exchange for each individual grid area.

To determine the direction of the exchange between two grid areas, the following rule applies:

1. 'To-Grid' always indicates the grid area which imports the metered energy.
2. 'From-Grid' always indicates the grid area which exports the metered energy.

9.1 Metering on interconnections between local grid areas

All lines must be metered using 15/60 values. Dispensation can be granted if:

1. The exchange takes place between two local grid areas belonging to the same 50/60 kV region.
2. The two neighbouring grid companies agree that the exchange is financially insignificant.

If the exchange on an interconnection following the granting of dispensation does not form part of the energy statement of the exchange for two neighbouring grid areas, all Energinet.dk's statements will be prepared as if the interconnection does not exist. This also applies to the settling of public service

[6] All 400/132 or 400/150 kV transformer bays are equipped with energy meters for monitoring the reactive power balance ($tg\varphi$) in the metering point. Exchange metering in the 400/132 kV or 400/150 kV substations is of value in grid analyses, but is unimportant in terms of settlement as 400 kV and 132/150 kV grid losses are settled collectively (by Energinet.dk).

[7] As far as the 50/60 kV grid is concerned, attention is drawn to the fact that, if restructuring work is being carried out in order to divide the grid between local grid companies, it is also a requirement that new metering sites be established in order to meet the metering requirements for data category 5 in the above list.

obligations relating to the calculated electricity consumption. The neighbouring grid companies' own eliminations, which can be based on annual registrations, are of no concern to Energinet.dk.

Known examples of interconnections with considerable exchange:

1. As part of a grid operator's geographical grid area, it may historically have been most convenient to solely work with a permanent supply via a connection to the neighbouring grid operator's grid.

2. An electricity production facility – such as a wind turbine – is located in the geographical grid area of one grid operator but right at the border with the grid area of another grid operator. The wind turbine feeds one line (in this instance a generator feeder) that solely or predominantly supplies the electricity production facility. However, the line crosses the border between the grid companies and feeds electricity direct into the grid of the neighbouring grid operator.

There are two possible solutions to the problems described in these two examples:

Solution A: The exchange in the interconnection is metered as a normal cross-border exchange[8].

Solution B: The grid area is redefined for this particular purpose so that the electricity production facility/'enclave' and line as a whole are computed by the neighbouring grid operator, and therefore no cross-border exchange takes place on paper.

[8] The electricity production facility in example 2 is of course metered in the same manner as other electricity production facilities and is computed for the grid operator to which the grid area belongs. In example 2, there will be situations where both figures (electricity production and grid-flow contribution) are registered by the same meter.

10.Settlement of corrections after refixation

10.1 General

The grid operator may send corrections for metered data per metering point to the DataHub for up to three years back in time. Unless otherwise provided by legislation, the DataHub will afterwards no longer be open to receive corrections.

The DataHub sends all corrections per metering point received to be settled to the balance supplier. The grid operator should therefore not send corrections to the DataHub if the Danish Energy Regulatory Authority's practice dictates that the relevant corrections should not be settled.

The description below concerns corrections made to data for the past three years using the DataHub.

Corrections made after the three-year period can only be made manually between the customer's balance supplier and the grid operator's supplier of grid loss.

10.2 Correction of flex and hourly settled metered data – grid loss correction

Corrections of metered data received by the DataHub after final refixation are not included in the balance settlement. Instead, settlement is made according to the following principles:

1. Settlement is made between affected balance suppliers upon the completion of the balance settlement.
2. The refixed residual consumption and the corresponding distributed consumption will therefore not be recalculated even if the underlying hourly values for exchange, production and flex and hourly settled consumption are corrected. Reconciliation is therefore not affected.
3. All corrections are offset against the grid loss of the balance supplier of grid loss, as positive or negative differences in metered values occurring after a metering point correction for flex and hourly settled metering points are continuously added up and make up the total corrected grid loss after refixation – a grid loss correction.
4. The grid loss correction is 0 after refixation.
5. The corrections for the affected balance suppliers and the grid loss correction, or possibly the difference to the most recent grid loss correction, are settled using the Elspot price in the price area in question.

The principle for settlement of corrected metered data for flex and hourly settled metered data against the grid loss appears from table 10, which shows three different cases.

If the change has an opposite sign, the sign of the consequence will also change.

Table 10. Correction principle

Type of change	Consequence
1) 'Import' from neighbouring grid is reduced – this means that grid area consumption and thereby grid loss are reduced.	– Balance supplier of grid loss is compensated – Balance supplier(s) of grid loss in neighbouring grid(s) must pay
2) Local production is reduced – this means that grid area consumption and thereby grid loss are reduced.	– Balance supplier of grid loss is compensated – 'Balance supplier' for local generator must pay plus any subsidy etc.

3) Flex and hourly settled consumption is reduced – this means that residual consumption and thereby grid loss are increased.	– Balance supplier of flex-settled consumption is compensated – Balance supplier of hourly settled consumption is compensated – Balance supplier of grid loss must pay

As all corrections are thus settled between two balance suppliers, this is a zero-sum redistribution, which is not comprised by the reconciliation.

The total result in kWh for the balance supplier and the BRP must always be the same as if a second correction settlement was made instead, including recalculation of the refixed residual consumption and distributed consumption.

The following procedure applies:

1. The grid operator sends corrected values to the DataHub.
2. The DataHub identifies the balance suppliers involved and sends them corrected metered data.
3. As a minimum, the DataHub carries out a correction settlement in connection with reconciliation and three years after the month of operation. To the extent possible, the correction takes place at the same time for all grid companies to maximise the financial elimination of the balances between the balance suppliers.

10.3 Correction of profile data after reconciliation

The correction of profile data after reconciliation takes place by recalculation of the reconciliation, but otherwise in accordance with the same principles as those applying to hourly and flex-settled metering points; see above.

However, the first recalculation for calendar year x does not take place until at the beginning of year x+2, as no distinction is made between grid companies that use continuous reading and those using concurrent reading.

10.4 Correction of tariffs as a result of changes in consumption

In connection with all corrections of consumption after refixation, a corresponding correction of the settlement basis is carried out on the basis of the grid companies' and Energinet.dk's tariffs as described in Regulation H3: 'Settlement of wholesale services and taxes'.

11.Overview of obligations and sanctions

The regulation sets out a number of obligations which the market participants comprised by this regulation must meet; see chapter 2.1.
Two tables have been inserted below, which specify the provisions that are subject to sanctions and to which market participant the rule applies.

Overview 1: Sanctions relating to market participant obligations which follow from Section 31(2) or Section 22(3) of the Danish Electricity Supply Act
Sanctions relating to obligations which follow from Section 31(2) of the Danish Electricity Supply Act – applicable to market participants with the exception of grid companies
If market participants grossly or repeatedly violate their obligations that follow from Section 31(2) of the Danish Electricity Supply Act, Energinet.dk may issue orders in accordance with Section 31(3) of the Danish Electricity Supply Act. In the event of failure to comply with an injunction, Energinet.dk may decide to fully or partially exclude market participants from using Energinet.dk's services until the market participants comply with the injunction. The sanctions imposed by Energinet.dk as a result of the market participants' violation of their obligations under the regulation are thus based on Energinet.dk's statutory obligation to ensure the functioning of the market, including the use of Energinet.dk's services.

The assessment of whether a company grossly or repeatedly violates its obligations must in practice be based on a procedural approach:

- If the TSO discovers that obligations have been violated, the TSO sends a message to the relevant company concerning the non-fulfilment of the obligation(s). The company will also be requested to rectify the situation within a time limit of eight working days.

- If the time limit of eight working days is not met, a new reminder is sent by registered mail addressed to the company's CEO containing an ultimate time limit of eight working days for remedying the violation(s). The reminder will also state that failure to meet the time limit will lead to a gross violation of the company's obligations and to the company being excluded from using Energinet.dk's services.

Decisions made under Section 31(3) of the Danish Electricity Supply Act will thus be based on the above reminder procedures and an objective observation of non-compliance with the time limits set.

Sanctions relating to obligations which follow from Section 31(2) of the Danish Electricity Supply Act – applicable to grid companies
If obligations which follow from Section 31(2) of the Danish Electricity Supply Act are violated and if these obligations concern the company's licensed activities, Energinet.dk must inform the Danish Minister for Energy, Utilities and Climate thereof in accordance with Section 31(3), second and third sentence, of the Danish Electricity Supply Act.

Sanctions relating to obligations which follow from Section 22(3) of the Danish Electricity Supply Act – applicable to grid companies
If obligations under Section 22(3) of the Danish Electricity Supply Act concerning electricity metering are violated, this may result in an injunction being issued as stated in Section 85 c(1) of the Danish Electricity Supply Act and possibly in daily or weekly default fines being imposed by the Danish Energy Regulatory Authority in accordance with Section 86(1) of the Danish Electricity Supply Act. If Energinet.dk becomes aware/is made aware that obligations under Section 22(3) of the Danish

Electricity Supply Act have been violated, the violation will be dealt with according to the following formal procedure:

- If the TSO discovers that obligations have been violated, the TSO sends a message to the relevant company concerning the non-fulfilment of the obligation(s). Moreover, the violation will be reported to the Danish Energy Regulatory Authority for further investigation.

OVERVIEW 2: Sanctions relating to other market participant obligations with respect to use of the regulations

If Energinet.dk becomes aware/is made aware of other violations of market participant obligations with respect to the use of the regulations, such violations will be reported to the Danish Energy Regulatory Authority or the Danish Energy Agency, depending on where the competence lies.
In these cases, the violations do not impact Energinet.dk's duty to ensure the functioning of the market, including the use of Energinet.dk's services. It follows that Energinet.dk is not entitled to sanction the violations, and Energinet.dk will therefore register and report the violations to the Danish Energy Agency/Danish Energy Regulatory Authority. It will thus be up to the Danish Energy Agency/Danish Energy Regulatory Authority to determine if and what further action is required.

Grid operator is abbreviated GC, balance responsible party BRP and balance supplier ES.

OVERVIEW 1: Sanctions relating to market participant obligations which follow from Section 31(2) or Section 22(3) of the Danish Electricity Supply Act

Chapter	Sanctioned rules	At whom is the rule aimed?	Sanctioning provision
3.2	*Metered data collector* The grid operator acts as the metered data collector for all the metering points in its grid area that directly or indirectly form part of the settlement performed with the balance supplier/BRP, grid operator and/or Energinet.dk. The grid operator is thus obliged to: - Obtain and remote-read metered data; alternatively estimate metered data. - Check that the metered data are correct. - Send metered data per metering point to the DataHub. - Check the correctness of metered data in the DataHub. - Guarantee confidentiality and discretion in respect of metered data.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
3.4	Other requirements: - These market participants must also guarantee confidentiality/discretion in respect of metered data.	ES BRP	Section 31(3), see Section 31(2), of the Danish Electricity Supply Act
4.1.1	The period until 21.00 on the fifth working day after the day of operation can be divided into two sub-periods: 1. 'Collection period', at 10.00 on the first-third working day: In this period, the grid operator remote-reads 15/60 values for all hourly settled metering points making registrations using a resolution of 15/60 values. Collected hourly values must be sent all days of the week without undue delay, and all values must be available at the end of the period, if necessary in the form of estimates. For the same reason, missing values are only acceptable until the end of the period. 2. 'Control period', at 21.00 on the third-fifth working day: In this period, the affected market	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

	participants check the data sent/received. If this check gives rise to corrections, the same procedures as were used for the original data will in principle be repeated. The grid operator must send metered data for all child metering points (physical and virtual) linked to the individual hourly settled metering point as soon as possible; however, no later than within the time limits specified in items 1 and 2 above.		
4.1.2	Metered data from flex-settled metering points must be sent to the DataHub according to the following procedure: - First-fifth working day at 21.00: In this period, the grid operator remote-reads hourly values for all flex-settled metering points. Collected hourly values must be sent all days of the week without undue delay, and all values must be available at the end of the period, if necessary in the form of estimates. A maximum of 5% of metered data may be estimated values. On the fifth working day, the DataHub will check the proportional share of estimated metered values; see appendix 7, 'Key performance indicators (KPI)'. For flex-settled metering points, missing values are acceptable until 21.00 on the fifth working day after the month of operation. The grid operator must send metered data for all child metering points (physical and virtual) linked to the individual flex-settled metering point as soon as possible; see the time limit specified above.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
4.1.3	*Before data are sent to the DataHub* The grid operator must on a daily basis remote-read metered data per metering point for all production, flex and hourly settled consumption and exchange. In addition, any other metered flow to and from the transmission grid, including reactive metering, must also be sent individually. The specific rules on the different metering types are outlined in chapters 6-9. Before sending data to the DataHub, the grid operator must check the data and if necessary replace any missing and incorrect/unreliable data with the best possible estimates. As such, the grid operator must check data for: 1. Missing values (NULL). 2. Sign errors; see chapter 6.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

	3. Zero sequences where, based on the grid operator's knowledge of the metering point, the value should not constantly be zero. 4. Min./max. check, ie as to whether the metered value lies within a defined, plausible interval. Estimates may be used for a maximum of three months for a single metering point before metered hourly values must be sent.		
4.1.3	The estimates must be prepared using one of the following methods: 1. Using data from a check meter (is mandatory if check meters are available). 2. Using metered data for the same metering point for a previous day of operation resembling the current one, for example the previous day or the same day a week earlier. 3. Rescaling metered data from another metering point of the same type. 4. Distributing the total daily meter reading on 15/60 values on the basis of empirical values if daily meter readings are available 5. Using estimates based on specific knowledge about the metering point concerned, for example outage. In all cases, the estimated value must be probable in light of the grid operator's specific knowledge. The value can only be set to 0, for example, if it is a probable value in light of the grid operator's specific knowledge. When sending metered data per metering point to the DataHub, the grid operator must state in its status code whether the value has been read, estimated or is missing (NULL). The last option (missing) must be used only until 10.00 on the third working day for hourly settled metering points, and until 21.00 on the fifth working day for flex-settled metering points. If metered data are corrected after the expiry of the time limits, the new data must be checked using one of the methods outlined above.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
4.1.3	When sending metered data per metering point to the DataHub, the grid operator must state in its status code whether the value has been read, estimated or is missing (NULL). The last option (missing) must be used only until 10.00 on the third working day for hourly settled metering points, and until 21.00 on the fifth working day for flex-settled metering points.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

4.1.3	For flex and hourly settled metering points, the balance supplier and the grid operator must both, before fixation, carry out checks of the 15/60 values per metering point already sent and of aggregated sums. For that reason, it may be necessary to correct the data already sent.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
4.1.4	If the balance supplier discovers errors in metered data per metering point and/or values deviating from the expected values of metered data per metering point, the balance supplier must contact the grid operator. This can be done either directly using the contact information specified in the register of market participant master data or – if the balance supplier does not want to reveal its identity to the grid operator – by sending a query to the DataHub using a web form which the DataHub passes on to the grid operator. In the event of any inconsistencies between the metered data per metering point and the sum per balance supplier, the balance supplier must contact Energinet.dk.	ES	Section 31(3), see Section 31(2), of the Danish Electricity Supply Act
4.1.4	*BRP* If the BRP discovers any inconsistencies between the sums per balance supplier and per BRP, the BRP must contact Energinet.dk.	BRP	Section 31(3), see Section 31(2), of the Danish Electricity Supply Act
4.1.4	*Grid operator* If the grid operator discovers errors in the sent metered data per metering point, the grid operator sends the corrected data to the DataHub.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
4.1.5	If errors and defects are found during this check, the following procedure must be used: 1. The DataHub sends a negative acknowledgement to the grid operator indicating the error. 2. The grid operator then sends the missing or corrected data as quickly as possible, unless item 3 applies.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
4.3.1	*Checking of metered data* The checking of metered data already sent entails the following: 1. The grid operator is responsible for reviewing the values per metering point sent to the	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity

	DataHub and checking whether metered data for flex-settled metering points lie within a plausible interval. Any incorrect values must be replaced with metered or estimated values no later than at the end of the second month after the month of operation.		Supply Act
4.3.2	*Corrections* If the DataHub receives corrected metered data between fixation and refixation, such data will form part of the balance and wholesale settlement. The following procedure must be used: 1. In the event of corrections, the grid operator must send the corrected data to the DataHub (only time series containing corrections may be sent).	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
5.1.1	If the meter reading exceeds the mandatory limit for hourly metering applying to the grid area, it must always be checked if this is the result of an error or due to the most recently read consumption being higher than normal or if it is a virtual metering point for grid loss with a consumption above the current mandatory limit etc. In the master data for the metering point, the grid operator must specify whether it is acceptable for the metering point to exceed the current mandatory limit.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
5.1.1	*Sending of data to the DataHub* The time limit for sending metered data per metering point for profile-settled metering points is 35 calendar days from the nominal reading date. This applies to both ordinary readings and readings carried out as a result of a move-in/move-out, change of supplier etc.; see chapter 8.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
5.1.1	The grid operator must send a consumption statement and meter reading per consumption metering point as well as meter readings for any other physical metering points (child metering points) in connection with both ordinary readings and readings carried out as a result of move-in/move-out, change of supplier etc. The time limit for sending data is no later than 35 calendar days from the nominal reading date for the consumption metering point. If the metering point is remote-read, a consumption statement and a meter reading must as a minimum be sent four times a year and when reading the meter in connection with a move-in/move-out, change of supplier etc.[9] Meter readings must be sent for physical metering points	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

[9] See Section 72a(3), second sentence, of the Danish Electricity Supply Act.

	only. Irrespective of the reading method, statements of consumption may only be sent for profile-settled metering points using yearly-based net settlement once a year in connection with ordinary annual statements and in connection with move-ins/move-outs and changes of supplier. The grid operator must send metered data (hourly data) for all child metering points (physical and virtual) linked to the individual profile-settled metering point according to the time limits for flex-settled metering points; see chapter 4.1.2.		
5.1.1	When sending metered data for profile-settled metering points, the grid operator must – as it does for flex and hourly settled metering points – always state in its status code whether the value has been read or estimated, as 'missing' does not apply.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
5.1.2	If any errors and deficiencies are discovered, the same procedure as for 15/60 values is used; see chapter 4.1.4: 1. The DataHub sends a negative acknowledgement to the grid operator indicating the error. 2. The grid operator then sends the missing or corrected data as quickly as possible, unless item 3 applies.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
5.1.4	*Correction of metered data* When sending corrections for metered data, the following procedure is used: 1. For corrections of *consumption* for periods where the start and end dates for the period are not changed, the grid operator must send corrected values to the DataHub as a correction notice. The balance supplier will then receive the corrected consumption from the DataHub. 2. For corrections of *reading times,* the grid operator cancels all previously sent readings up to and including the period in which the new reading is to apply. The cancellation is carried out successively, starting with the cancellation of the most recent reading period. When the cancellation is completed, the grid operator sends the correct readings in the correct order as usual.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

5.2	**Metered data for monthly read production** *Monthly read metering points* The grid operator reads the metering point no later than on the first working day after the end of a month and sends the meter reading as a monthly EDI time series to the DataHub no later than at 10.00 on the third working day after the end of a month. *RE production from multi-fuel units* The separate monthly time series for RE production at multi-fuel units must be sent to the DataHub no later than at 10.00 on the fifth working day after the end of a month.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
6.1.2	Grid losses must always be represented by a virtual metering point.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
6.2.1	*General* Settlement metering must be performed in real time. For example, it is not allowed to even out previous metering faults in 15/60 values registered at a later date. In order to enable the internal settlement between two grid companies or the registration of the production of electricity-production facilities with displaced settlement point (see chapter 7), it is allowed to up- or downscale the 'rough' 15/60 values using a well-defined fixed proportional factor (that does not change over time) before the metered values are redistributed. The same could occur on the consumption side following agreement between the customer and the grid operator.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
6.2.2	*Sign convention* The following sign convention applies: - Metered data per metering point are always positive, regardless of the type of metering point for which metered data are sent. Exchange per metering point is always positive as well as it indicates direction. Aggregations are normally always positive, except for the sum of exchanges for a grid area which is indicated by using a positive sign for 'import' and a negative sign for 'export'.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

7.2.2	In addition, the following general rules apply with respect to M1: - A plant can only feed power into one grid area. If the plant is connected to several grid areas, the necessary M2/M3 metering points must also be included as exchanges performed between the grid areas so that M1 can be calculated correctly for one grid area. - If the plant consists of several production facilities that are interconnected via an internal electricity supply grid, M1 can often not be metered directly for each individual plant. If necessary and following agreement with Energinet.dk, the distribution (distribution in connection with the metering of each plant's gross production, for example) can be estimated.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
7.5	Where direct-connected plants not using net settlement are concerned, the grid operator must send values for net production and consumption, ie M1 and M0, to the DataHub. Where installation-connected plants not using net settlement are concerned, the grid operator must likewise send values for net production M1 and consumption M0 to the DataHub. Own consumption at standstill must be treated as ordinary consumption. As such, net production must never be negative. If own consumption is metered separately, the same time resolution that was used for metering M1 must be used. (…) If M1 and M0 are calculated by metering ordinary consumption (M0'), this and other types of metering must be performed using 15/60 values. Other requirements are: – Collective metering of production facilities can take place only if they belong to the same plant and are settled in accordance with the same rules, and separate metering is not required for subsidy-related reasons. – Collective metering of wind turbines can take place only if the individual wind turbines are settled in accordance with the same rules.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

	– Wind turbines which have been connected to the grid after 20 May 2003 must be metered separately and can therefore not form part of wind farms; see Danish Executive Order no. 1063 of 7 September 2010. – Wind turbines larger than 50 kW must be metered using 15/60 values. For other plants, the limit is 25 kW. – The limits refer to the wind farm's total installed capacity if several turbines are metered collectively and to the plant's total installed capacity if the plant consists of several minor units.		
8.1	**Hourly settled metering points** Consumption metering points must always be metered using 15/60 values when: 1. Consumption takes place in local grid areas where the annual consumption exceeds the mandatory limit as described in Regulation H2: 'Profile settlement etc.'. In this instance, however, hourly metering is always sufficient. 2. Consumption takes place for flex-settled metering points: 3. Consumption takes place at autogenerators in groups 1-3 using net settlement, regardless of the size of the consumption, as described in the memo 'Guidelines for net settlement of autogenerators'. 4. Electricity production facilities' own consumption is metered separately using 15/60 values; see chapter 7.4. 5. Electricity production facilities' ordinary consumption is metered, and the consumption is used for calculating M1 and M0; see chapter 7.4. 6. Consumption takes place which is purchased at voltage levels higher than the 0.4 kV grid.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
8.2.1	*Rules for reading etc.* The grid operator must ensure that ordinary ('periodic') reading is carried out at least once a year. If this is a remote-read metering point which is not covered by yearly-based net settlement, it must be read four times a year. 1. Periodic reading can be replaced by a non-periodic reading if this is time-stamped within plus/minus 28 calendar days from the nominal reading date of the periodic reading. 2. Furthermore, additional ('non-periodic') reading must be performed in connection with a change of supplier, move-in/move-out, change of settlement method and meter replacement. (…)	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

	4. In the cases mentioned in item 2, the reading must be performed at the effective date. If this is not possible, the reading must be corrected and time-stamped at 00.00 on the effective date in question. A metered or estimated reading must thus always be available at the effective date. The consumption value sent by the grid operator to the DataHub must never be negative; see chapter 6.2.		
8.3	*Grid operator* Meter readings for metering points with a physical meter must be sent as described below. The grid operator must send meter readings for flex-settled metering points at least once a year; however, no more than once a month. Meter readings for flex-settled metering points must also be sent in connection with statements of consumption at move-in/move-out, change of supplier etc. For profile-settled metering points, meter readings must be sent in connection with statements of consumption. The time limits for sending meter readings are the same as those applying to sending statements of consumption for profile-settled metering points. The grid operator must estimate the consumption and the meter reading if this is necessary to comply with the time limits. For hourly settled metering points, the grid operator may send meter readings once a month as a maximum. Meter readings must also be sent in the following cases: - Upon the connection of a newly established metering point in the DataHub, the initial meter reading for the meter must be sent. - In connection with meter replacement, the final meter reading for the dismantled meter as well as the initial meter reading for the new meter must be sent. - In connection with the cancellation of a metering point (dismantling/deregistration), the meter reading for the dismantled/deregistered meter must be sent. - In the event of a request by the balance supplier in order to fulfil a customer's request for an itemised bill in accordance with Executive Order no. 821 of 27 June 2014 on electricity trader's invoicing of costs to electricity consumers. Sending of meter readings for child metering points can take place and must comply with the rules on settlement method applying to the parent metering point.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

9	The following points of exchange must be metered: 1. Exchange with foreign countries (in 400 kV, 220 kV, 150 kV, 132 kV, 60 kV and 50 kV nodes, connected to the foreign countries via interconnections). 2. Exchange in 400/150 kV and 400/132 kV substations. As a main rule, metering takes place on the 150 V/132 kV side of the transformers[10]. 3. Exchange in 150/60 kV, 150/10 kV, 132/50 kV, 132/30 kV or 132/10 kV substations, metered on the low-voltage side of the transformers. 4. Exchange with neighbouring grids to and from 60 kV or 50 kV grid areas if a separate 60/50 kV grid operator services several local grid companies in a 60/50 kV region[11]. 5. Exchange with neighbouring grids to and from local grid areas at 60 kV, 50 kV, 33 kV and 10 kV level. The grid operator sends 15/60 values for each exchange metering point to the DataHub. Where time series with metered data for exchange are concerned, 'From-Grid' and 'To-Grid' must be stated. Only positive values can be used. A point of exchange in the grid must, if necessary, be divided into two metering points, switching around the values for 'From-Grid' and 'To-Grid'.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act
10.2.1	The following procedure applies: 1. The grid operator sends corrected values to the DataHub.	GC	Section 86(1) and Section 85 c(1), see Section 22(3), of the Danish Electricity Supply Act

[10] All 400/132 or 400/150 kV transformer bays are equipped with energy meters for monitoring the reactive power balance (tgφ) in the metering point. Exchange metering in the 400/132 kV or 400/150 kV substations is of value in grid analyses, but is unimportant in terms of settlement as 400 kV and 132/150 kV grid losses are settled collectively (by Energinet.dk).

[11] As far as the 50/60 kV grid is concerned, attention is drawn to the fact that, if restructuring work is being carried out in order to divide the grid between local grid companies, it is also a requirement that new metering sites be established in order to meet the metering requirements for data category 5 in the above list.

OVERVIEW 2: Sanctions relating to other market participant obligations with respect to use of the regulation

Chapter	Sanctioned rules	At whom is the rule aimed?
4.1.3	*Checking of metered data* The checking of metered data already sent entails the following: 1. The balance supplier is responsible for checking the metered data per metering point and the consistency between the metered data per metering point and the sum per balance supplier. 2. The BRP is responsible for checking the consistency between the sum per balance supplier and the sum per BRP. 3. The grid operator is responsible for reviewing the values per metering point sent to the DataHub and checking whether values are still missing by mistake, as well as checking the consistency between the metered data per metering point and the sums per grid area. 4. Energinet.dk reviews the time series sent and received for the purpose of validation and checking. Energinet.dk also checks, for example, if the status codes have been entered correctly, if metered data comply with the sign convention and if the summarised and calculated values, such as residual consumption, are consistent and comply with the sign convention etc.	ES GC BRP
4.1.4	If the balance supplier discovers errors in metered data per metering point and/or values deviating from the expected values of metered data per metering point, the balance supplier must contact the grid operator. This can be done either directly using the contact information specified in the register of market participant master data or – if the balance supplier does not want to reveal its identity to the grid operator – by sending a query to the DataHub using a web form which the DataHub passes on to the grid operator.	ES
4.1.4	When sending metered data to the DataHub, sending corrected time series together with non-corrected time series is not allowed. Exceptionally, from 10.00 on the third working day after the day of operation until fixation takes place (at 21.00 on the fifth working day), it is possible for a grid operator to send all time series if a grid operator's initial sending of time series was incomplete. This typically occurs in connection with an IT system breakdown.	GC

5.1.1	*Before data are sent to the DataHub* Before data are sent to the DataHub, the grid operator must first perform a quality check comprising the following elements (see chapter 4.1.3): 1. No reading 2. Sign errors 3. Min./max. check. It must be checked that all metering points have been read/estimated as indicated in the master data per metering point. This also applies to metering points that have been disconnected throughout the reading period and where the consumption must therefore typically be set at 0.	GC
5.1.1	The grid operator must respond to incorrect/unreliable readings by carrying out a control reading.	GC
5.1.1	Within the time limit of 35 calendar days, the customer must, if necessary, be reminded to perform the reading so the time limit can be met. The grid operator must always estimate the consumption and the meter reading if this is necessary to comply with the time limit.	GC
5.1.3	*Procedures used by the balance supplier* If the balance supplier discovers errors and/or values deviating from expectations, the procedure is the same as the one outlined in chapter 4.2.3. This means that the balance supplier must contact the grid operator directly or anonymously via the DataHub using a web form which the DataHub passes on to the grid operator.	ES
6.2.1	15/60 values are distributed in kWh with up to three decimals.	GC
7.5	All ordinary consumption at the plant which is connected direct to the local grid operator's grid without being connected in any way to the plant's internal grid is not included in the plant's consumption.	GC
8.2.1	In all other cases, the reading must be time-stamped from the actual reading date at 00.00.	GC
8.2.2	*Estimate of time distribution* The time distribution of annual or monthly consumption, for example, must always be estimated	GC

	using the distribution curve. In case of any corrections to customer account settlements, this principle can be derogated from, if: 1. The authorities, for example the Danish Energy Regulatory Authority, require otherwise. 2. Specific information is available about the metering point allowing a more accurate estimate, for example information to the effect that the metering point has been disconnected for part of the period concerned.	
8.2.4	The grid operator may send time series for hourly read profile-settled metering points. If the grid operator collects hourly time series from a profiled-settled metering point, they must be sent to the DataHub.	GC
9	Neighbouring grid companies must make agreements clarifying which of the parties is responsible for performing metering on the border between each point of exchange.	GC
9.1	All lines must be metered using 15/60 values. Dispensation can be granted if: 1. The exchange takes place between two local grid areas belonging to the same 50/60 kV region. 2. The two neighbouring grid companies agree that the exchange is financially insignificant.	GC
10.1	The DataHub sends all corrections per metering point received to be settled. Corrections should therefore not be sent to the DataHub if the Danish Energy Regulatory Authority's practice dictates that the relevant corrections should not be settled.	GC

Appendix 1: 'Grid operator, grid areas, metered data collector etc.'

Grid operator
Pursuant to the definition of grid operators set out in the Danish Electricity Supply Act, grid owners without a licence are not considered grid operators. This applies to transformer associations, owners of generator feeders, electricity generators owning internal grids and end consumers owning internal grids. For settlement purposes, all grid owners without a licence will be administered by the grid operator in which grid area their grids are located.

Grid areas
As an elaboration of the definition in chapter 1, grid areas can physically and/or for settlement purposes be divided into the following:

- Local grid areas (0.4-33 kV grid and possibly 50/60 kV grid).
- Regional grid areas (50/60 kV grid) – only relevant for Funen and Western Jutland.
- Transmission grid areas (132/150/400 kV grid).
- Special grid areas established by Energinet.dk for settlement purposes.

A grid operator will typically be responsible for one grid area, but this may comprise several geographically separate grid areas. A geographically coherent electricity supply grid may also be divided into several grid areas for various reasons, for example for settlement purposes.

The number of grid areas is thus determined by Energinet.dk in cooperation with the grid operator on the basis of settlement requirements. If the grid operator comprises several grid areas, Energinet.dk computes the electricity consumption separately for each individual grid area.

Metering responsibility
The following general rules apply to the grid operator's responsibility for performing metering:

1. Grid operators are responsible for settlement metering and technical metering. Technical metering is metering performed for the purposes of operation monitoring and operation analysis as described in further detail in Energinet.dk's technical regulations.

2. Grid operators are responsible for ensuring that the correct metered data are obtained and for maintaining the meters. In addition, the grid operators must comply with Regulation D2: 'Technical requirements for electricity metering'.

3. The grid operator must always have access to all metering points for which it acts as the metered data collector.

4. Each metering point has one metered data collector. When metered data are exchanged between two grid areas, the responsibility for performing metering must be unequivocally agreed upon for each individual point of exchange between the two grid companies concerned.

Especially in connection with the metering of production facilities, the grid operator may be responsible for performing metering in internal electricity supply grids which it does not own itself. This applies, for example, to net settlement and more generally to the metering of consumption in the internal electricity supply grids of electricity production facilities which cannot be included in the facilities' own consumption for electricity production.

In such instances, the plant owner is obliged to provide the grid operator with information about plant structure and an assessment as to where the meters should be placed. If it is necessary to convert the meter system because of the introduction of new rules or the plant owner wants to change settlement method, the plant owner must pay the cost of this.

Checking of metered data in the DataHub
The grid operator's responsibility for checking the correctness of metered data in the DataHub as stated in chapter 3.2.1 applies to all those metering points for which the grid operator is responsible. The check must be split into meter readings for profile, flex and hourly settled metering points.

Checking of metering for profile-settled metering points
The grid operator must at least once a month check whether the metered data for profile-settled metering points available in the DataHub up to three years back in time are identical to the ones in the grid operator's own systems. The grid operator must as a minimum perform this check in the following way:

1) Once a month, a random sample of at least 400 metering points three years back in time must be taken, irrespective of the amount of data involved for the grid operator in question.
2) If the entire sample is error-free, no further action is required. However, if there is the slightest inconsistency, all data in the two databases three years back in time are checked as the grid operator resends all data that are not identical.

Alternatively, the grid operator may skip the random sampling and in every case check the consistency of all data each month, see item 2.

Checking of flex and hourly settled 15/60 metering
The grid operator must at least once a month check whether the monthly sums for flex and hourly settled 15/60 metering available in the DataHub up to three years back in time are identical to the ones in the grid operator's own systems. The grid operator must as a minimum perform this check in the following way:

1) Once a month, a random sample of monthly sums for 15/60 metering for at least 400 metering points three years back in time must be taken, irrespective of the amount of data involved for the grid operator in question.
2) If the entire sample is error-free, no further action is required. However, if there is the slightest inconsistency, all data in the two databases three years back in time are checked as the grid operator resends all data that are not identical.

Alternatively, the grid operator may skip the random sampling and in every case check the consistency of all data each month, see item 2.

Meter data responsible
Assuming metering responsibility entails practical metering tasks for the grid operator which can be delegated to one or more external meter data responsibles, but the actual metering responsibility cannot be delegated.

A grid operator delegating a metering task to a meter data responsible is still financially and legally responsible and must ensure that all practical tasks are handled by the meter data responsible. The meter data responsible must guarantee that metered data are treated in confidence. As such, the

grid operator must prepare written procedures which in case of doubt can demonstrate that the conditions have been met.

Appendix 2: Merger of grid companies and grid areas

Energinet.dk's regulations set out various terms, conditions, numerical values etc. to be specified individually by each grid operator within a fixed framework. When two or more grid operators merge, it must be defined how terms, conditions, numerical values etc. are handled in the transition to becoming one grid operator when there are basic differences between the grid operators before the merger.

On the effective date of the merger, the new grid operator will normally not be able to function as one grid operator in every respect, and it is therefore necessary that the company can continue to function as two or more grid companies as far as rights and obligations in the market are concerned.

In connection with the completion of the legal merger and the subsequent organisational adjustments, a number of things must be in place:

- **Grid operator master data**: All master data for the merged grid operator must be determined and registered to ensure unique identification of one grid operator. The grid operator's GLN no. is quite essential in this respect.
- **Market participant master data**: The merged grid operator's master data must be reported to the register of market participant master data.
- **IT applications**: Configurations must be adapted to error-free servicing of the merged grid operator before an actual merger is carried out in relation to the electricity market.
- **Metering responsibility and legal problems relating to ownership of meters, grids etc.**: Before one grid licence can be established, all ownership issues must be identified, and responsibility for performing metering on the borders with adjacent grids must be agreed with all neighbouring grid companies.

A merger in relation to the electricity market cannot be completed until the grid licences for the grid companies' geographical areas have been gathered under one licence granted to one market participant.

The market regulations do not prevent a grid operator from dividing its licence area into several *grid areas* if appropriate. It is therefore essential to note when the market regulations refer to requirements relating to conditions or data for a *grid operator,* ie the entire grid operator's geographical licence area, and when the regulations refer explicitly to a *grid area*.

Therefore, a merger of grid operators in relation to the electricity market can be divided into two steps:

1. Merger of grid operators resulting in the transfer of future and historical rights and obligations in relation to all metering points defining a grid area from one market participant (grid operator) to another market participant (grid operator). The grid area itself will not be changed.
2. Merger of grid areas where all metering points defining a grid area are moved to another grid area.

It should be noted that a merger of grid areas requires a merger of grid operators so that the grid operator registered for the merged grid area also has rights and obligations in relation to the metering points in the historical grid areas, for example for sending metered data for the period before the merger and for settling wholesale services for the original grid areas.

1. Merger of grid companies

A merger of grid operators means that all grid operator references to grid areas, metering points and wholesale services are changed from the previous grid operator/operators to the continuing grid operator.

The time for registration of the merger of grid operators in the DataHub must be agreed no later than two months in advance between the involved grid operators and Energinet.dk. Energinet.dk will inform all market participants of the merger through the DataHub market portal no later than one month before the merger is registered in the DataHub.

The merger is registered with immediate effect on the agreed date outside the DataHub's critical business hours.

Once the merger has been registered, the continuing grid operator is responsible for all data for the involved grid areas, including historical data:

- wholesale-related master data
- metering point-related master data
- metered data

The settlement responsibility/right is changed for the period preceding the registration of the grid operator merger so that a wholesale settlement sent before the merger which has not been settled in full must be settled with the continuing grid operator as future wholesale settlement runs, such as new refixation for the historical period, will refer to the new grid operator.

The aggregations/fixation carried out for balance and wholesale settlements are not fundamentally changed in the event of a merger of grid operators – only the reference to the grid operator (GLN number) in which it is included. However, it should be noted that if the price element IDs in the merged grid operators overlap, it will be necessary to rename them, which will also result in a change in aggregations/fixation for the period preceding the merger.

2. Merger of grid areas

A merger of grid areas is the combination of two or more grid areas into one grid area. This entails that the individual metering points refer to a new grid area, and for example supplier and balance sums will have a new data basis with more metering points than before.

The time for registration of the commencement of the merger (market effective date) must be agreed no later than four months in advance between the involved grid companies and Energinet.dk.

In accordance with the market's settlement processes, the market effective date for the merger of grid areas must always be the first day of a calendar month.

Energinet.dk will inform all market participants of the merger through the DataHub market portal no later than three months before completion of the merger.

A merger of grid companies, see item 1 above, must be completed no later than at the time of the registration of the merger of grid areas.

In connection with the merger of grid areas, the following applies:

- **The mandatory limit for hourly settlement** must be the same for all customers within the merged grid area – for instance the lowest limit in the original grid areas. If this engenders insoluble problems with regard to meter installation, the grid operator may be granted a temporary exemption. It is recommended that the date for meter installation not be deferred more than one year from the market effective date.
- **Balance suppliers may have only one BRP for consumption** in the merged grid area. If the BRP is not the same in the original grid areas, the balance supplier must remedy the situation before the market effective date.

After the market effective date, the following applies:

- Only one set of load shares exists for the merged grid area.
- Only one residual curve and distribution curve are calculated for the merged grid area.
    - After the market effective date, periodisation is effected using the grid operator's distribution curve for the merged grid area.
    - Before the market effective date, periodisation is effected using the distribution curves for the original grid areas.

Appendix 3: Definition of working days

The time: 'No later than at 10.00 on the third working day after the day of operation' should be interpreted as follows:

Day of operation	***At 10.00 on the third working day after the day of operation***
Monday	Thursday
Tuesday	Friday
Wednesday	Monday
Thursday	Tuesday
Friday	Wednesday
Saturday	Wednesday
Sunday	Wednesday

Days that are not considered to be working days:

- Weekends (Saturday and Sunday).
- Maundy Thursday, Good Friday, Easter Monday, fourth Friday after Easter, Ascension Day and the day after Ascension Day and Whit Monday.
- 1 January, 5 June, 24, 25, 26 and 31 December.

A calendar specifying which days are working days can be found at www.energinet.dk.

Appendix 4: Reminders and correction reports

Reminders

Metered data per metering point

If the time limit for the grid operator's sending of metered data to the DataHub is exceeded, the DataHub sends a reminder to the grid operator. In practice, the reminder is prepared as a combined daily statement for each grid operator of the flex, hourly and profile-settled metering points. A reminder is also sent for child metering points for which there are no metered data and where price elements are linked to the wholesale settlement between grid operator and balance supplier. No reminder is sent for missing meter readings.

The statement does not take into account whether one or more reminders for the metering point concerned have already been sent. A reminder will thus be sent every day until the metered data are received.

- For hourly settled metering points and/or any linked child metering points, a first reminder will be sent after 10.00 on the third working day after the day of operation if no data have been received.
- For flex-settled metering points and/or any linked child metering points, a first reminder will be sent after 21.00 on the fifth working day after the day of operation if no data have been received.
- For profile-settled statements of consumption, a first reminder will be sent 21 calendar days after the nominal reading date or effective date for a change of supplier, move-in/move-out etc. No reminder is sent for periodic readings if there is a non-periodic reading available to replace it as described in chapter 8.1.1. For any linked child metering points which are to be included in the wholesale settlement between grid operator and balance supplier, the first reminder will be sent after 21.00 on the fifth working day after the day of operation.
- No reminder is sent for calculated metering points.

The sending of reminders is registered on the DataHub market portal, and this enables the balance supplier to see for which of the balance supplier's metering points reminders have been sent to a given grid operator for failing to send metered data for hourly, flex and profile-settled metering points, respectively, and any child metering points. The DataHub will not do anything else, not even if the balance supplier sends a reminder to the DataHub. The balance supplier may contact Energinet.dk if the balance supplier is of the opinion that metered data are missing and Energinet.dk (DataHub) has not sent a reminder via the DataHub market portal.

The DataHub's sending of reminders is suspended in the event of problems or errors in the DataHub when it comes to receiving metered data from the grid operator concerned. If any problems/errors in the DataHub are ascertained at a later stage, the unjustified reminders will be removed from the grid operator's performance statistics.

Calculated metered data

Balance suppliers and BRPs should contact Energinet.dk if the time limit for sending aggregated metered data is exceeded.

Drawing

Aftagenummer	dato	Gentagelser	Årsag	Evt. statuskode eller kommentar
74112121212	31. maj 2010	5	mangler skabelonforbrug	flytning
74112121212	ecember 2010	150	mangler skabelonforbrug	alm. aflæsning
74112121212	20.oktober	210	mangler skabelonforbrug	leverandørskift
74111111111	22.maj 2010	14	mangler timeforbrug	
74123123123	3.april 2009	425	mangler timeforbrug	
74110101010	3. juni 2010	1	mangler timeforbrug	

Correction report

Market participants can set up automatic sending of correction reports by submitting corrections for flex and hourly settled metering points as well as the related child metering points after a given time defined by the market participant.

The correction report will contain the following data:

1. Metered data ID.
2. Time for sending of correction report (yyyy-mm-dd hh:mm).
3. Start and end time for the period for which data are corrected (yyyy-mm-dd hh:mm).
4. Original energy volume (kWh) – fixed (respectively refixed) value.
5. New energy volume (kWh).
6. Difference (kWh).

Comments:

Re 3. Start and end time will be in the same month. If the correction encompasses a period stretching over several months, a report must be sent for each of the months concerned.

Appendix 5: Managing metering tasks and consumption at central power stations

Introduction

This appendix deals with the metering of production facilities as described in chapter 7, using the central power stations as an example.

At the central power stations, many things are more complicated than at small plants as they are normally connected to several grid areas and have a large number of meters (internally and externally). Their own consumption is normally also considerably more 'complicated' than that of small plants.

Today, all rules about metering are in principle the same for central power stations and all other plants.

Central power stations

In this regulation, the central power stations are defined as follows:

- Ensted Power Station, unit 3
- Fynsværket Power Station, units 3 and 7
- Nordjylland Power Station, units 2 and 3 and the gas turbine
- Skærbæk Power Station, unit 3
- Studstrup Power Station, units 3 and 4 and the gas turbine
- Esbjerg Power Station, unit 3
- Herning Power Station, unit 1
- H.C. Ørstedsværket Power Station, units 1, 4, 7 and 8
- Svanemølle Power Station, units 1, 3 and 7
- Amager Power Station, units 1, 2 and 3
- Asnæs Power Station, units 2, 4 and 5 (unit 4 will be unavailable from 2008 onwards)
- Stigsnæs Power Station, units 1 and 2 (unit 1 will be unavailable from 2008 onwards)
- Avedøre Power Station, units 1 and 2
- Kyndby Power Station, units 21, 22, 41, 51 and 52
- Rønneværket, units 5 and 6

Metered data to be obtained

All metered data must be obtained using a 15/60 time resolution.

All exchange with the public grid must be metered.

Metered data making it possible to compute the production for each power station unit must be obtained.

Consumption that is not own consumption but 'ordinary' consumption must be metered.

Where own consumption is concerned, there are two options: Own consumption is either metered separately, or the production meter is placed in such a way that own consumption is deducted from the production. If the last option is used, own consumption must also be metered during standstill. Own consumption during standstill is treated as 'ordinary' consumption.

External own consumption is own consumption for electricity and CHP production, eg pumps placed outside the plot of land concerned – possibly many kilometres away. This is included as own consumption at the power station. This means that, on paper, the metering performed is considered to cover the supply of electricity to the power station's internal electricity supply grid. This must also be metered.

Exchange

All metered data to be exchanged with the transmission grid must be sent to the DataHub as individual time series.

Production

All metered data in respect of production must be calculated so that the production of each individual unit can be computed.

If own consumption (inclusive of external own consumption) is metered separately, it must be deducted from the production time series. If own consumption exceeds production, the production time series must be set to 0, and the negative value must be included in the ordinary consumption.

Legitimate recipients of production time series are Energinet.dk (DataHub) and the balance supplier (production).

End consumption

There are two ways of computing a power station site's ordinary consumption and own consumption at standstill:

1. Consumption can be changed so that, on paper, it is connected direct to the local grid operator's grid. In this case, consumption is in all respects treated as ordinary consumption by the grid operator. In this case, the grid operator decides whether the consumption can be distributed on several BRPs.

2. Energinet.dk assigns the balance responsibility. The PSO, grid and system tariffs are charged direct to the power station owner by the balance supplier on behalf of the grid operator or Energinet.dk. In this case, all end consumption must be attributable to the same BRP. If a party wants to change BRP, Energinet.dk must be notified of this at one month's notice in accordance with the normal rules for changing BRP for consumption.

If method 1 is used, the consumption must be included in the local grid operator's ordinary consumption statements. The consumption must also be included in the exchange between the grid from which electricity is actually drawn and the local grid operator.

If method 2 is used, own consumption at standstill is aggregated into one time series, while consumption not constituting own consumption for electricity production is aggregated into one time series. Legitimate recipients of these time series are Energinet.dk (DataHub), the BRP for consumption and the balance supplier (consumption).

Metering responsibility and payment

The responsibility for carrying out metering at central power station sites rests with the local grid operator or the transmission company in whose grid area the power station site is located. If this is

not clear, the responsibility for metering is decided between the affected grid companies and Energinet.dk.

Appendix 6: Postponement of the ordinary fixation/refixation

Situations resulting in the fixation/refixation being postponed
In certain situations, Energinet.dk reserves the right to postpone fixation or refixation.

Incidents which may postpone fixation or refixation include:

1. Technical disturbances or other incidents at Energinet.dk which make it impossible to carry out the necessary calculations at the time when the planned fixation/refixation takes place, ie at 21.00 on the fifth working day after the day/month of operation.
2. Missing metered data as a result of technical disturbances or other problems at one or more grid companies which cause serious errors in the residual consumption profile.

Re 1. Irregularities at Energinet.dk

Energinet.dk aims at limiting outage time (non-availability) in connection with faults in operating equipment, software etc. as much as possible.

Similarly, Energinet.dk endeavours to plan the rearrangement and upgrading of operating equipment and software in a manner that limits outage time as much as possible.

Re 2. Irregularities at the grid operator

Likewise, the grid operator should aim at limiting outage time etc. as much as possible.

It would be highly disadvantageous for the market participants if the fixed data basis for a given day of operation results in a highly distorted *residual consumption profile*.
Energinet.dk will postpone the fixation if the residual consumption in one or more grid companies is severely distorted, eg an incorrect sign has been assigned to the consumption or if the shape of the curve deviates substantially from expectations.

Situations not resulting in the ordinary fixation or refixation being postponed

A few missing *time series for flex or hourly settled consumption* for a given grid area will not normally distort the residual consumption profile to any significant extent, but the energy distribution between the metered end consumption and residual consumption may become abnormal.

Missing *exchange time series* may dramatically distort the residual consumption. This will not necessarily be the case where missing *time series for electricity production facilities* are concerned.

Missing *metered data for other metering points* have no impact on the fixation/refixation of the residual consumption. However, it may impact the settlement of wholesale services between grid operator and balance supplier.

The most important parameter in connection with the decision to postpone the *fixation/refixation* is the appearance of the residual consumption profile.

Information about the postponement of fixation or refixation

If the fixation/refixation is postponed, information about this will be available on the DataHub market portal no later than at the time when fixation/refixation normally takes place.

If a grid operator encounters sudden problems as mentioned under item 2 or is planning to rearrange or upgrade operating equipment and software which will result in outage time at a later stage, Energinet.dk must be informed thereof as soon as possible.

This allows Energinet.dk to continuously provide information about current delays from day to day or expected delays at a later stage.

Appendix 7: Key performance indicators (KPI)

Performance indicator

The following information must be calculated but not necessarily published:

Flex and hourly settled grid companies

Grid operator:

- IFIM (after five working days)
- How much of the fixed hourly settled data were available in the DataHub after one to five working days (as a percentage and percentage volume)?
- How much of the fixed flex-settled data were available in the DataHub after one to five working days (as a percentage and percentage volume)?
- How many of the flex-settled metering points were estimated on the fifth working day (as a percentage)?
- How much data were caught with/without reason by the DataHub control procedures (as a percentage)?
- How much do corrections between fixation and refixation constitute (as a percentage volume)?
- How many reminders were sent to a grid operator after three working days for hourly settled metering points and/or any child metering points (as a percentage)?
- How many reminders were sent to a grid operator after five working days for flex-settled metering points and/or any child metering points (as a percentage)?

DataHub:

- Time (average and fractiles) that passes from the DataHub receiving and sending metered data per metering point, excluding the data caught in the DataHub control procedures, see chapter 4.1.3.
- How often has the DataHub sent data that have resulted in a negative acknowledgement (as a percentage)?

Profile-settled

Grid operator:

- How much data were received after seven to 35 calendar days (as a percentage)?
- How much data were caught with/without reason by the DataHub control procedures (as a percentage)?
- How many reminders were sent to a grid operator after 21 calendar days (as a percentage)?

DataHub:

- Time (average and fractiles) that passes from the DataHub receiving and sending metered data per metering point, excluding the data caught in the DataHub control procedures, see chapter 5.1.1.
- How often has the DataHub sent data that have resulted in a negative acknowledgement (as a percentage)?