

Regulation F: EDI communication

BS document:

Handling of notifications and schedules in the Danish electricity market

General business processes between balance responsible parties and Energinet.dk as specified in Regulation C3: 'Handling of notifications and power schedules – daily procedures'

November 2011

Rev. 3

In case of any discrepancy between the Danish text and the English translation, the Danish text shall prevail

memorandum

Table of contents

1.	Introduction.....	4
1.1	Objective and target group	4
1.2	Description of players.....	4
1.3	Comments on changes during the day of operation	5
1.4	Comments on obligations	5
1.5	Comments on special conditions	5
1.5.1	Different conditions between DK1 (Western Denmark) and DK2 (Eastern Denmark)	5
1.5.2	Communication form.....	5
1.5.3	Self-service portal	6
1.5.4	Emergency procedure	6
1.5.5	Format use	6
1.5.6	Units and prices	6
1.6	References.....	6
2.	Notifications (BS-101).....	8
2.1	Initial status before submission of notifications.....	9
2.2	Process of submitting notifications	9
2.3	End status after submission of notifications.....	12
2.4	Rules for notifications.....	12
2.5	Correction of notifications	12
2.6	Trading across the Danish-German border (DK1).....	12
2.7	Deadlines for submitting notifications.....	12
2.8	Confirmation reports in optional formats.....	13
2.9	Data content of a notification	13
2.9.1	Notification	14
2.10	Identification of process and transactions	14
3.	Operational schedules (BS-102)	15
3.1	Initial status before submission of operational schedules	16
3.2	Process of submitting operational schedules.....	16
3.3	End status after submission of operational schedules	18
3.4	Rules for operational schedules	18
3.5	Correction of schedules	18
3.6	Deadlines for submitting operational schedules	18
3.7	Emergency procedure	19
3.8	Data content of an operational schedule	19
3.8.1	Operational schedule	19
3.9	Identification of process and transactions	19
4.	Regulating power bids and orders (BS-103)	20
4.1	Initial status before submission of regulating power bids	22
4.2	Process of submitting regulating power bids.....	22
4.3	Rules for regulating power bids	22
4.4	Correction of bids	22
4.5	Process of submitting regulating power orders	23
4.6	End status after submission of regulating power bids/orders	24
4.7	Deadlines for submitting regulating power bids/orders	24
4.8	Emergency procedure	25

4.9	Data content of a regulating power bid/order	25
4.9.1	Regulating power bid	25
4.9.2	Regulating power order	25
4.10	Data content of an operational schedule	26
4.11	Identification of process and transactions	26
5.	4-week forecasts (BS-104)	27
5.1	Initial status before submission of 4-week forecasts.....	27
5.2	Process of submitting 4-week forecasts	28
5.3	End status after submission of 4-week forecasts.....	28
5.4	Rules for submitting 4-week forecasts	28
5.5	Correction of 4-week forecasts	29
5.6	Deadlines for submitting 4-week forecasts.....	29
5.7	Data content of a 4-week forecast	29
5.7.1	Forecast for facilities producing 25 MW or more.....	29
5.7.2	Forecast for facilities producing less than 25 MW	29
5.8	Identification of process and transactions	30
6.	Daily forecasts (BS-105)	31
6.1	Initial status before submission of daily forecasts	31
6.2	Process of submitting daily forecasts.....	31
6.3	End status after submission of daily forecasts	32
6.4	Correction of daily forecasts.....	32
6.5	Deadlines for submitting daily forecasts.....	32
6.6	Data content of a daily forecast	32
6.6.1	Daily forecast.....	32
6.7	Identification of process and transactions	33 32
7.	Appendix 1 – Overview of possible message types.....	34

1. Introduction

This document describes the processes for exchanging notifications and schedules in the Danish electricity market. The target group includes balance responsible parties (BRPs) required to exchange notifications and schedules with Energinet.dk.

1.1 Objective and target group

The objective of the document is to clarify and describe the business processes for handling notifications and schedules for BRPs operating in the Danish electricity market. The document consists of a set of business processes:

- Notifications (BS-101) targeted at all BRPs
- Operational schedules (BS-102) targeted at BRPs with adjustable production/consumption
- Regulating power bids and orders (BS-103) targeted at BRPs with adjustable production/consumption
- 4-week forecasts (BS-104) targeted at BRPs with adjustable production/consumption
- Daily forecasts (BS-105) targeted at BRPs with adjustable production/consumption.

1.2 Description of players

Each individual player in the electricity market is responsible for its own balance between supply and consumption of electricity and for trading in electricity. A player is identified by a unique ID, irrespective of the individual player's roles.

Balance responsible party (BRP) – An approved BRP is a player approved to handle balance responsibility vis-à-vis Energinet.dk for given electricity generation facilities, consumption or trade. A BRP may have one or more of the following roles:

- **BRP for production** – with responsibility for physical trades and one or more electricity generation facilities.
- **BRP for consumption** – with responsibility for physical trades and all types of consumption within the balance area, including adjustable consumption and grid losses.
- **BRP for trade** – with responsibility for physical trading.

For a complete list of approved BRPs, please see Energinet.dk's website.

Supplier of regulating power – BRPs for consumption and production with adjustable consumption and production may enter into an agreement with Energinet.dk on the supply of regulating power (upward or downward regulation in relation to the original operational schedules of the individual player). Such regulating power may be provided by suppliers already having undertaken to Energinet.dk to provide regulating power and by suppliers voluntarily offering regulating power to the extent possible.

Energinet.dk – Energinet.dk is the transmission system operator. Energinet.dk is responsible for maintaining reliable, efficient electricity supply at a general level in Denmark, which includes ensuring the coordination and fulfilment of a

number of public obligations. Furthermore, Energinet.dk is the owner of the main transmission grid and is also responsible for the transmission of gas.

1.3 Comments on changes during the day of operation

Changes submitted for each commenced day of operation are divided into historical and future time periods. Historical data locked because the time period has elapsed are not affected, whereas future data are changed in relation to the notifications and schedules most recently received by Energinet.dk. The individual BRP must thus be aware that historical data are not affected when notifications and schedules are updated. Consequently changes in historical data will not be dealt with.

1.4 Comments on obligations

- The BRP is under an obligation to ensure that notifications and schedules submitted balance internally and with those of the counterparties on an hour by hour basis.
- The BRP must ensure that notifications and schedules are submitted as quickly as possible.
- The sender is responsible for checking whether the party receiving data has acknowledged receipt as specified in the rules contained in Regulation F, 'EDI communication'. Players expecting an acknowledgement or a regulating power order should call the relevant Energinet.dk web service during a suitable interval¹ to ensure the receipt of acknowledgements/activations.

1.5 Comments on special conditions

In relation to Regulation F, 'EDI communication', a number of specific conditions apply to the business scenarios described in this document.

1.5.1 Different conditions between DK1 (Western Denmark) and DK2 (Eastern Denmark)

Conditions between DK1 (Western Denmark) and DK2 (Eastern Denmark) differ, and these different conditions are described in the respective sections of this document. Appendix 1 contains a list of the individual messages used in DK1 and DK2, respectively.

1.5.2 Communication form

For notifications, the open network or the MPLS² network is used for accessing Energinet.dk. For communication of operational schedules and regulating power bids, only the closed MPLS network is used.

The exchange of data described in this document must be made through a number of web services that enable players to send and receive messages. Data interchange is thus based on system-to-system communication. The web service provided by Energinet.dk contains a number of general methods for sending and receiving messages. Transactions are handled asynchronously. The sender must obtain acknowledgement for a message sent by using a web

¹ A suitable interval is likely to be every 15 seconds for regulating power orders, acknowledgements and confirmation reports.

² A closed network for players in the energy sector.

service, thus meaning that the acknowledgement will not be returned synchronously with the call in which the message is sent.

A reference implementation (including source code in Microsoft.NET) displaying Energinet.dk's web services can be ordered.

1.5.3 Self-service portal

If a player does not want to be responsible for exchanging EDI messages, Energinet.dk provides a system to this end through its self-service portal. This system will allow the individual player to manually enter notifications or schedules or upload a spreadsheet.

Players can also update contact information and select media/formats for confirmations reports. This allows the player to specify whether confirmation reports in connection with notifications should be received as an SMS or by e-mail, for example.

1.5.4 Emergency procedure

If a BRP encounters problems in exchanging EDI messages by following the standard procedure, the BRP must use one of the following methods – in the order stated:

1. Self-service portal. The player enters or uploads its notifications and schedules via this portal. If the player's own Internet connection is not working, it will be possible to use the self-service portal from another location.
2. Spreadsheet. The player sends a spreadsheet with relevant information to Energinet.dk by email. Spreadsheets can be downloaded from the self-service portal, pre-filled for individual communication needs, including notifications, operational schedules, etc. 'Pre-filled' means that various general information already appears in a spreadsheet such as product codes, resolution, unit of measurement and sender/receiver details.

If neither of the two methods is available, contact Energinet.dk by telephone.

1.5.5 Format use

XML can be used only for exchanging the notifications and schedules described in this document.

1.5.6 Units and prices

All energy volumes for notifications and schedules between the system operator and BRPs are stated in MWh to one decimal place. Power schedules are stated in MW to one decimal place. Bids are stated in MW with no decimal places, and prices are stated in DKK or EUR to two decimal places.

1.6 References

The document refers to the following documents:

- *Energinet.dk Regulation C3: 'Handling of notifications and schedules – daily procedures'*
- *Energinet.dk Regulation F: 'EDI communication'*

- *Business transactions for submitting notifications and schedules*

Reference is also made to Energinet.dk's self-service portal to the extent that communication is to take place through that channel.

All references are available on Energinet.dk's website.

2. Notifications (BS-101)

A player can perform one or more of the following roles: BRP for production, BRP for consumption and BRP for trade. So the content of a notification depends on the roles played by the BRP:

- A notification from a BRP for production must contain separate energy notifications for electricity generation, broken down into standard production and adjustable production as well as notifications for trades made.
- A notification from a BRP for consumption must contain notifications for trades made and possibly also separate energy notifications for electricity consumption, broken down into adjustable consumption and non-adjustable consumption.
- A notification from a BRP for trade must contain energy notifications for trades made with approved players in the Danish market.

A notification must contain the relevant BRP's total hourly energy notifications for the BRP's roles.

If a BRP is responsible for both price areas (Western and Eastern Denmark), the BRP must submit one notification for each price area.

Figure 1 and the following description explain the process of submitting and checking notifications.

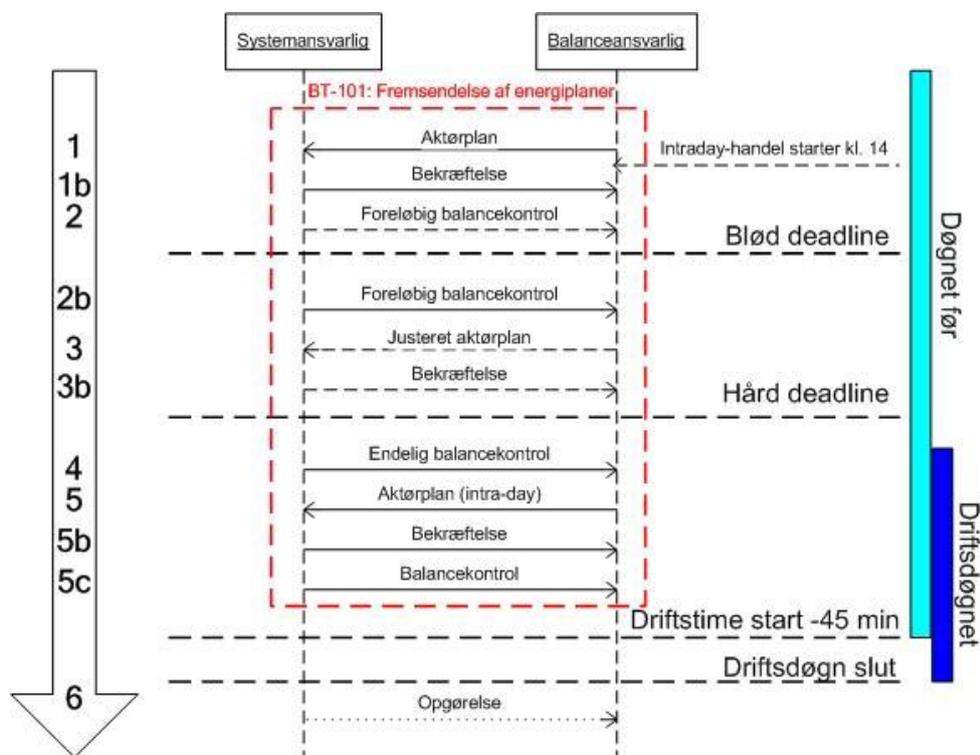


Fig. 1: Submission process for notifications

[System operator; BRP
BT-101: Submission of energy notifications
Notification
Verification
Preliminary confirmation report
Preliminary confirmation report
Adjusted notification
Acknowledgement
Final confirmation report
Notification (intraday)
Acknowledgement
Confirmation report
Final statement
...
Intraday trading starts at 14:00
Soft deadline
Hard deadline
Start of delivery hour -45 min.
End of day of operation
...
Previous 24-hour period
Day of operation]

2.1 Initial status before submission of notifications

A BRP must plan production, consumption and trade for the next day of operation in accordance with its roles before submitting a notification. The BRP uses forecasts (such as consumption and wind) and trades made as input to such planning. The BRP is responsible for ensuring that the notification balances.

2.2 Process of submitting notifications

1. NOTIFICATION

If a BRP has planned production or consumption or has made one or more trades for the next day of operation, the BRP must submit a notification.

The BRP may submit new notifications at any time until the soft deadline (see 2.7). The current notification is the latest notification received by Energinet.dk before the soft deadline.

1B. ACKNOWLEDGEMENT

On receipt of a notification, Energinet.dk will check the content for general errors (for example to see if codes used are correct and whether the necessary message elements are present). The identification of the individual players and the period for which data are submitted (24 hours) will also be checked.

BRPs for consumption may choose freely whether they want to submit consumption time series. For players having chosen to do so total electricity consumption and sales must equal the total purchase made by the BRP for consumption.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated (subsequently requested by the player via a web service).

2. PRELIMINARY CONFIRMATION REPORT

Energinet.dk will check whether each individual notification submitted balances with those of relevant counterparties. The preliminary confirmation report can be issued independently of whether notifications from all players have been received or not. As specified in 2.8, 'Confirmation reports in optional formats', a player can choose between a number of formats for confirmation reports. The preliminary confirmation report will be sent when Energinet.dk finds a discrepancy or when an individual notification balances with other relevant notifications.

If a BRP receives a preliminary confirmation report with discrepancies, the BRP must submit an adjusted notification.

A preliminary confirmation report will be submitted at the soft deadline.

This means that a BRP may receive one or more preliminary confirmation reports during a 24-hour period.

If, after the soft deadline, it turns out that all notifications balance and that trades between all parties match, this will immediately trigger the hard deadline.

2B. PRELIMINARY CONFIRMATION REPORT (AFTER THE SOFT DEADLINE)

A preliminary confirmation report will be made after the soft deadline. See 2 above.

3. ADJUSTED NOTIFICATION (ONLY IF A PREVIOUS NOTIFICATION COULD NOT BE APPROVED)

If Energinet.dk reports an imbalance or any other discrepancy, the BRP must, as soon as possible, submit adjusted notifications to Energinet.dk. Such notifications must cover the next full day of operation.

3B. ACKNOWLEDGEMENT

See 1b above.

4. FINAL CONFIRMATION REPORT

At the hard deadline, Energinet.dk will change the notifications that continue to contain errors. Energinet.dk will change the notifications so that they are first updated for discrepancies between trading notifications and then for imbalances in the individual players' notifications. The notifications will be recreated according to the rules described in Regulation C3.

If the notification of a BRP does not balance, Energinet.dk will add a fictitious trade to the notification. This trade will have Energinet.dk as the counterparty, and the trade values will correspond to the imbalance.

BRPs for consumption having chosen not to submit consumption time series are assumed to always be in balance if their trading notifications balance.

Subsequently, the final confirmation report will be generated for the players (see 2.8 below).

5. NOTIFICATION (INTRADAY AND ELBAS)

From the day before the day of operation at 14:00, a BRP may submit notifications, including bilateral trades and Elbas trades, for the next day. This may also take place throughout the individual day of operation.

A notification must cover the full day of operation, ie both historical and future data, and must be submitted as soon as possible after a player has become aware of an adjustment.

The content of an adjusted notification must match the originally approved notification for the relevant day of operation, supplemented by changes for Elbas or bilateral trades for the purpose of balancing changed consumption or production forecasts or changed trades.

Changes to a notification must be submitted to and received by Energinet.dk not later than 45 minutes before the start of any relevant delivery hour.

The current notification will be the notification most recently received by Energinet.dk before a deadline. Energinet.dk may reject changes to notifications received after the deadline.

If balance requirements have not been met, the BRP(s) will be duly notified as soon as possible.

5B. ACKNOWLEDGEMENT

See 1b above.

5C. CONFIRMATION REPORT

Energinet.dk will check whether notifications submitted by a BRP match those of the counterparty and whether notifications balance. Such checks will include both new, adjusted notifications and already approved (and unchanged) trades from a BRP.

The confirmation report also includes a final check for the next delivery hour as well as a preliminary confirmation report for the remaining delivery hours.

In case of discrepancies or imbalances, the relevant notification for the next delivery hour will be adjusted in accordance with the same principles as those applying to notifications submitted on the day before the day of operation.

In case of bilateral trading, Energinet.dk must receive a notification from either player before the final confirmation report is issued.

For trading on Nord Pool Spot (Elbas market), Energinet.dk must receive two notifications (one from the player and one from Nord Pool Spot).

The content of a notification from a player must match that of the original notification for the relevant day of operation, supplemented by any relevant changes.

2.3 End status after submission of notifications

6. BALANCE SETTLEMENT (NOT FORMING PART OF BT TRANSACTIONS)

The notification submission process will end after the issue of the final confirmation report. Energinet.dk will send a balance statement at the end of the individual day of operation to BRPs for production and consumption. This will typically take place five business days after the end of the day of operation.

2.4 Rules for notifications

The following signs are used in notifications:

+ Purchase	- Sale
- Consumption	+ Production

Table 1: Signs used for purchase, sale, consumption and production

2.5 Correction of notifications

If a notification is changed, the entire notification must be resubmitted, including any changes.

To delete a trade, the player must exclude the current energy notification for the trade from the new notification.

If a new trade has been made, the player must add the current energy notification for the trade to the new notification.

If a trade has been changed, the player must send the updated current energy notification together with the new notification.

To delete the entire notification (all energy notifications), the player must submit an empty notification, ie a notification containing only general information such as player ID and the relevant day of operation.

For intraday and Elbas trades, previously submitted trades and new trades will be merged. Non-affected trades will continue in an unchanged form.

2.6 Trading across the Danish-German border (DK1)

For trading across the border between Denmark and Germany, capacity must be purchased in advance. A player may trade with only one counterparty for cross-border trading.

In cooperation with the German system operator (E.ON Netz) a website has been launched to collect information about auctions of capacity on the Danish-German border. For further information, please see Energinet.dk's website.

2.7 Deadlines for submitting notifications

The deadlines for BRPs' submission of notifications for the next day of operation are specified below. Unless otherwise stated, all times refer to the 24-hour period before the day of operation for which the notifications contain data. Such times are deadlines, but submission by BRPs must in practice be made as soon as possible, just as confirmation reports will be issued as soon as Energinet.dk

is able to do so. In other words, a hard deadline may occur sooner than described below if all notifications balance, however not sooner than 15:00.

15:00 Soft deadline. The BRP must submit a notification for the next day of operation before this time. The hard deadline may be activated immediately after the soft deadline provided that all notifications balance and all trades match.

16:00 Hard deadline. Notifications that do not yet balance and trades that do not match must be changed according to the rules described in Regulation C3. At the request of Energinet.dk, the hard deadline may be postponed to a specified time.

Delivery hour -45 minutes. This deadline applies to the submission of notifications, including intraday trades, by BRPs.

2.8 Confirmation reports in optional formats

Energinet.dk offers to send preliminary and final confirmation reports in a number of optional formats to BRPs. These formats are XML, PDF by email and a simplified form: SMS. Information about the individual player's choice of formats must be given via the Energinet.dk self-service portal.

Using the PDF solution by email, a BRP may choose between always receiving preliminary confirmation reports or only receiving such reports if the BRP's notifications do not balance or if the BRP's trading notifications do not match those of the counterparty.

All confirmation reports are stored as XML files to be downloaded at the request of the player.

The email subject field and the SMS will contain one of the following messages:

Preliminary confirmation report:

- *'Preliminary confirmation report OK for yyyy-mm-dd'* applying to a preliminary confirmation report if the notification balances and all trading notifications match those of the counterparties.
- *'Preliminary confirmation report NOT OK for yyyy-mm-dd'* for a preliminary confirmation report if the notification does not balance.

Final confirmation report:

- *'Final confirmation report OK for yyyy-mm-dd'* applying to a final confirmation report if the notification balances and all trading notifications match those of the counterparties.
- *'Final confirmation report has produced changes for yyyy-mm-dd'* applying to a final confirmation report if the notification did not balance before the deadline or if an electricity trading notification did not match that of a counterparty.

Preliminary and final confirmation reports can be sent to a BRP via an optional number of email addresses and mobile telephone numbers. Non-Danish BRPs may choose to receive confirmation reports in Danish or in English.

2.9 Data content of a notification

Below follows a description of the data content of a notification.

2.9.1 Notification

The following data elements are included in a notification:

- BRP
- Day of operation
- Price area in Denmark (10YDK-1-----W or 10YDK-2-----M)
- Notification (standard production, non-adjustable production, standard consumption, adjustable consumption, trading and trading with Germany)
- Product (energy)
- Balance-responsible counterparty (only for trades)
- Counterparty's area in connection with trading
- Unit of measurement (MWh to one decimal place)
- Volumes (24 hourly values (shift between daylight saving time and standard time: 23 and 25 hourly values, respectively))

2.10 Identification of process and transactions

The following table lists the unique names of the business process and the transactions used.

BS ID	BS-101
BS name	Notification
BS version	1
BS release	1
BS date	2007-01-22
Business transactions	
BT ID	DK-BT-101
BT name	Submission of energy notifications
BT version	1

3. Operational schedules (BS-102)

This section solely describes the processing of operational schedules for Western Denmark (DK1) and Eastern Denmark (DK2).

An operational schedule contains a BRP's set of schedules for adjustable production, consumption and wind power reduction for a 24-hour period.

In the following, a facility is either an electricity generation facility, an adjustable consumption source, or a group of wind turbines.

For facilities of the adjustable production and adjustable consumption types (exceeding 10 MW), the following power schedules must be submitted:

- A production schedule for each facility
- A current minimum capacity schedule for each facility
- A current maximum capacity schedule for each facility.

BRPs having entered into an agreement with Energinet.dk on the supply of ancillary services and regulation reserves must, in addition to the above-mentioned schedules, also, as agreed individually, submit one or more of the following time series at an hourly level:

For DK1:

- LFC reserves (MW)
- Primary reserves (MW)

For DK2:

- Fast reserves (15 minutes) (MW)
- Slow reserves (60 minutes) (MW)
- Slow reserves (90 minutes) (MW)
- Frequency-controlled normal operation reserves (MW)
- Frequency-controlled disturbance reserves (MW)

For DK1 and DK2:

- Regulating power for upward regulation (MW)
- Regulating power for downward regulation (MW).

For facilities capable of exploiting overload areas, additional power schedules must be submitted³:

- Current possible maximum load, including overload (TOTMAX)
- Current possible minimum load, technical minimum (TOTMIN).

For facilities of the adjustable production and adjustable consumption types (less than 10 MW), the following power schedules must be submitted:

- A production schedule for the sum of all facilities
- A current minimum capacity schedule for the sum of all facilities
- A current maximum capacity schedule for the sum of all facilities.

³ 'Total maximum' and 'Total minimum' are theoretical limit values for output generated by a power station unit in the overload area and partly in the low-load area without the unit being taken completely out of operation. Output generated need not meet the requirements for manual reserves (15 minutes).

For wind turbines participating in the Elspot, intraday or regulating power markets, the following time series must be submitted:

- Amount of installed capacity withheld (MW).

Figure 2 and the following description explain the process of submitting operational schedules.

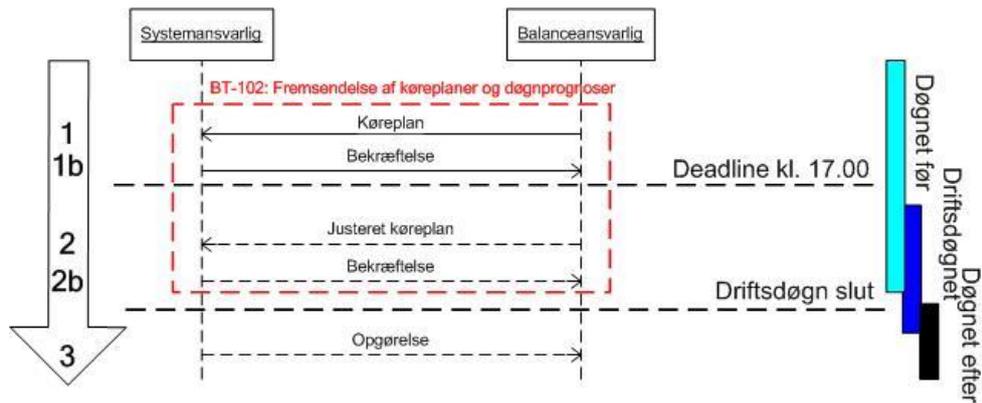


Fig. 2: Submission process for operational schedules (Western Denmark)

```
[System operator; BRP
BT-102: Submission of operational schedules and daily forecasts
Operational schedule
Acknowledgement
Adjusted operational schedule
Acknowledgement
Final statement
...
Deadline at 17:00
End of day of operation
...
Previous 24-hour period
Day of operation
Subsequent 24-hour period]
```

3.1 Initial status before submission of operational schedules

Before submitting an operational schedule, a BRP must plan production for the next day of operation, and the related notification must be in place.

3.2 Process of submitting operational schedules

1. OPERATIONAL SCHEDULE

All BRPs for production and BRPs for consumption with adjustable consumption must submit individual operational schedules for the next day of operation. An operational schedule must always describe how operation is expected to be implemented for the facilities for which a BRP holds responsibility. An operational schedule must always cover a full day of operation.

However, the first operational schedule submitted must reach Energinet.dk before the deadline (see Figure 2). In case of operational changes, the BRP must submit an adjusted operational schedule.

The adjusted operational schedule is 'merged' with previously submitted schedules. When an operational schedule is adjusted and submitted to Energinet.dk, changes from the previous to the adjusted schedule will take place during a period known as a 'delay'. The last value before the 'delay' period will refer to the previous operational schedule, whereas the first value after the 'delay' period will refer to the adjusted operational schedule. Energinet.dk thus merges the two operational schedules to form a new schedule, which will be the sum of the previous schedule adjusted in relation to the adjusted schedule.

Figure 3 below illustrates the merging of the two operational schedules. The red solid line shows the final operational schedule.

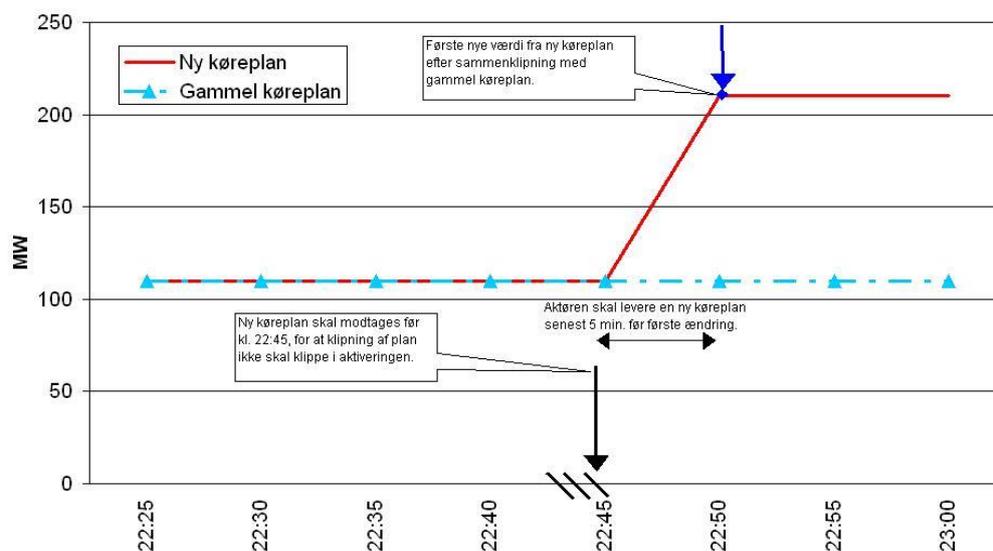


Fig. 3: Merging to form a new operational schedule. The example shows that the player wanting changes to be made to the operational schedule at 22:50 must submit a revised operational schedule to Energinet.dk not later than 22:45

[New operational schedule; Old operational schedule
 First new value from new operational schedule after merging with old operational schedule.
 A new operational schedule must reach Energinet.dk before 22:45 to prevent merging from changing activation.
 The player must submit a new operational schedule not later than 5 minutes before the first change.]

1B. ACKNOWLEDGEMENT

On receipt of an operational schedule, Energinet.dk will check the content for general errors (for example to see if codes used are correct and whether the necessary message elements are present). The identification of the individual players and the period for which data are submitted (24 hours) will also be checked.

If facilities producing more than 10 MW submit an operational schedule including values below 10 MW, such schedule will, however, be accepted.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated (subsequently requested by the player via a web service).

2. ADJUSTED OPERATIONAL SCHEDULE

If the BRP carries out operational changes or receives a regulating power order, the BRP must submit an adjusted operational schedule, as mentioned above, as soon as the player becomes aware of such changes.

In case of changes/deviations exceeding 10% of the installed capacity for individual facilities or 10% of the sum for facilities producing less than 10 MW for a period of more than 10 minutes, the BRP must submit a new operational schedule to Energinet.dk. However, there is a minimum limit of 10 MW.

2B. ACKNOWLEDGEMENT

See 1b above.

3.3 End status after submission of operational schedules

3. STATEMENT (NOT FORMING PART OF BT TRANSACTIONS)

Energinet.dk will send a statement listing production and consumption for the individual BRPs at the end of the day of operation (when metered data for settlement are available). The difference between a power schedule and metered data will be settled at special prices (see Energinet.dk Regulation C2, 'Balance market and balance settlement').

The process of submitting an operational schedule will stop at the end of the day of operation and be completed finally by a settlement of the overall operational schedule in relation to metered data.

3.4 Rules for operational schedules

The following signs are used in operational schedules:

+	-
operational schedules for production	operational schedules for consumption

Table 2: Signs used in operational schedules

3.5 Correction of schedules

In case of changes to an operational schedule, the individual player must resubmit the entire schedule, including any changes, to Energinet.dk.

To delete a schedule, the player must exclude it from the new operational schedule.

To delete the entire operational schedule (all schedules), the player must submit an empty operational schedule, ie a schedule containing only general information such as player ID and the relevant day of operation.

3.6 Deadlines for submitting operational schedules

17:00 All BRPs for production and BRPs for consumption with adjustable consumption must submit individual operational schedules for the next

day of operation before the deadline. There are no deadlines for the submission of adjusted operational schedules during the day of operation.

3.7 Emergency procedure

A BRP holding balance responsibility for electricity generation facilities other than those based on non-adjustable wind power or holding balance responsibility for adjustable consumption must employ a person who can be contacted on a 24-hour basis in case of irregularities. That person may be a production engineer at one of the BRP's power plants.

To ensure effective communication, there can only be one contact (or one place of contact) per BRP.

3.8 Data content of an operational schedule

Below follows a description of the data content of an operational schedule.

3.8.1 Operational schedule

- BRP
- Day of operation
- Name or type of facility
- Schedule (such as a production schedule or a technical minimum)
- Product (power)
- Unit of measurement (MW to one decimal place)
- Price area in Denmark (DK1 or DK2)
- Volumes (values for every five minutes). A total of $(\text{hours during the day} \times 12) + 1$ values, 00:00 and 24:00, both included for power schedules. For energy notifications, a total of 24 values (23 and 25 values for standard/daylight saving time, respectively) must be submitted.

3.9 Identification of process and transactions

The following table lists the unique names of the business process and the transactions used.

BS ID	BS-102-DK1
BS name	Operational schedule
BS version	1
BS release	2
BS date	2011-11-11
Business transactions	
BT ID	DK-BT-102
BT name	Submission of operational schedules and daily forecasts
BT version	

4. Regulating power bids and orders (BS-103)

This section describes the processing of regulating power bids and orders for Western Denmark (DK1) and Eastern Denmark (DK2).

Regulating power suppliers may submit regulating power bids. In case of an imbalance in the power system, Energinet.dk can settle the imbalance by activating regulating power bids. This process takes place through bid activation by Energinet.dk via a regulating power order.

Some regulating power suppliers have undertaken to Energinet.dk to guarantee a specific volume of upward and/or downward regulation (manual regulation reserves), if necessary. Such suppliers must always submit regulating power bids to Energinet.dk matching at least this obligation. In addition, all regulating power suppliers may, without any agreement obligations, also submit regulating power bids to Energinet.dk.

All regulating power suppliers may submit spontaneous regulating power bids to Energinet.dk.

The minimum bid is 10 MW of upward/downward regulation for one hour. The bid does not necessarily contain any information about the facilities capable of providing such regulation.

All bids submitted to Energinet.dk form part of the common Nordic regulating power market (NOIS). Yet Energinet.dk will always be the body that activates regulating power bids in Denmark, irrespective of the origin of such needs.

Regulating power must be activated via schedules as specified in Energinet.dk Regulation C3. The following figure and description explain the processes of placing regulating power bids and ordering regulating power via schedules.

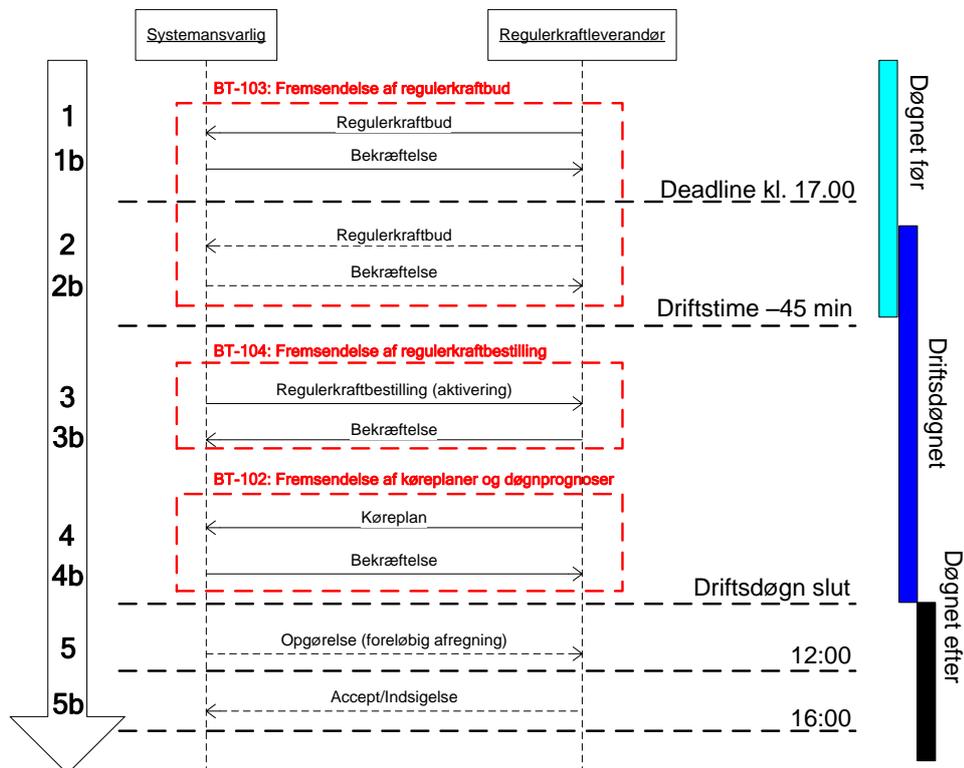


Fig. 4: Submission process for regulating power bids and orders

```

[System operator; Regulating power supplier
BT-103: Submission of regulating power bids
Regulating power bid
Acknowledgement
Regulating power bid
Acknowledgement
BT-104: Submission of regulating power orders
Regulating power order (activation)
Acknowledgement
BT-102: Submission of operational schedules and daily forecasts
Operational schedule
Acknowledgement
Statement (preliminary settlement)
Acceptance/objection
...
Deadline at 17:00
Delivery hour -45 minutes
...
End of day of operation
12:00
16:00
...
Previous 24-hour period
Day of operation
Subsequent 24-hour period]

```

4.1 Initial status before submission of regulating power bids

The regulating power supplier has planned the next day of operation and is fully aware of any reserve capacity at the individual time. This condition may change during the process.

4.2 Process of submitting regulating power bids

1. REGULATING POWER BID

Regulating power suppliers under an obligation to supply ancillary services and regulation reserves must submit a bid matching the relevant obligation to Energinet.dk before the deadline.

1B. ACKNOWLEDGEMENT

On receipt of a bid message, Energinet.dk will check the content for general errors (for example to see if codes used are correct and whether the necessary message elements are present). The identification of the individual players as well as the duration and period will also be checked.

If a bid is lower than 10 MW, it will be rejected.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated (subsequently requested by the player via a web service).

2. REVISED REGULATING POWER BID (NOT MANDATORY)

Players may submit new bids or change existing bids several times during the day, but only until half an hour before the start of the relevant delivery hour. This point in time is considered to commence from the receipt of the bid by Energinet.dk. The current bid will be the latest bid message received by Energinet.dk.

2B. ACKNOWLEDGEMENT

See 1b.

4.3 Rules for regulating power bids

The following signs are used in regulating power bids.

+ upward regulation	- downward regulation
------------------------	--------------------------

Table 3: Signs used for upward/downward regulation of regulating power bids

4.4 Correction of bids

In case of changes to a bid, all bids, including any changes, must be resubmitted to Energinet.dk.

To delete a bid, the player must exclude it from the new message.

To delete all bids, the player must submit an empty message, ie a message containing only general information such as player ID and the relevant day of the bids in question.

4.5 Process of submitting regulating power orders

3. REGULATING POWER ORDER, IF NEEDED (ACTIVATION)

Energinet.dk may choose to activate a regulating power bid for balance regulation. This process takes place by Energinet.dk generating a regulating power order for the relevant regulating power supplier (subsequently requested by the player in question).

A regulating power order is a power schedule (5-minute resolution) for the player with or without indication of facility. The power schedule is a supplement to the latest operational schedule submitted by the player and may activate a given bid in part. The regulating power order contains a reference to the bid to be activated in full or in part.

3B. ACCEPTANCE

The regulating power supplier will check the order for general errors (for example to see if codes used are correct and whether the necessary message elements are present). The identification of the individual players as well as the duration and period will also be checked.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated for Energinet.dk and be sent by the player via a web service.

4. OPERATIONAL SCHEDULE

On the basis of the regulating power order, the player will plan the regulation and submit an operational schedule to Energinet.dk that includes such regulation.

The revised operational schedule from the player will be 'merged' with the existing schedule (see Figure 5). If an order covers a span of time beginning before and ending after midnight, two operational schedules must be submitted – one for the 24-hour period before midnight and one for the 24-hour period after midnight.

The figure shows the result of 'merging' an operational schedule and a regulating power order. As shown in the example, the order regulating a bid in full at 22:50 must reach the player before 22:40. Energinet.dk must receive a revised operational schedule from the player by 22:45 for the bid to be regulated in full at 22:50.

The result of merging an existing operational schedule and a bid will form the basis of the subsequent statement (see step 5).

4B. ACKNOWLEDGEMENT

On receipt of an operational schedule, Energinet.dk will check the content for general errors (for example to see if codes used are correct and whether the necessary message elements are present).

The purpose of checking the message content is to verify that the identification of the individual player exists, that the unit of measurement and number of decimal places are correct and also that the period is correct, etc.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated (subsequently requested by the player via a web service).

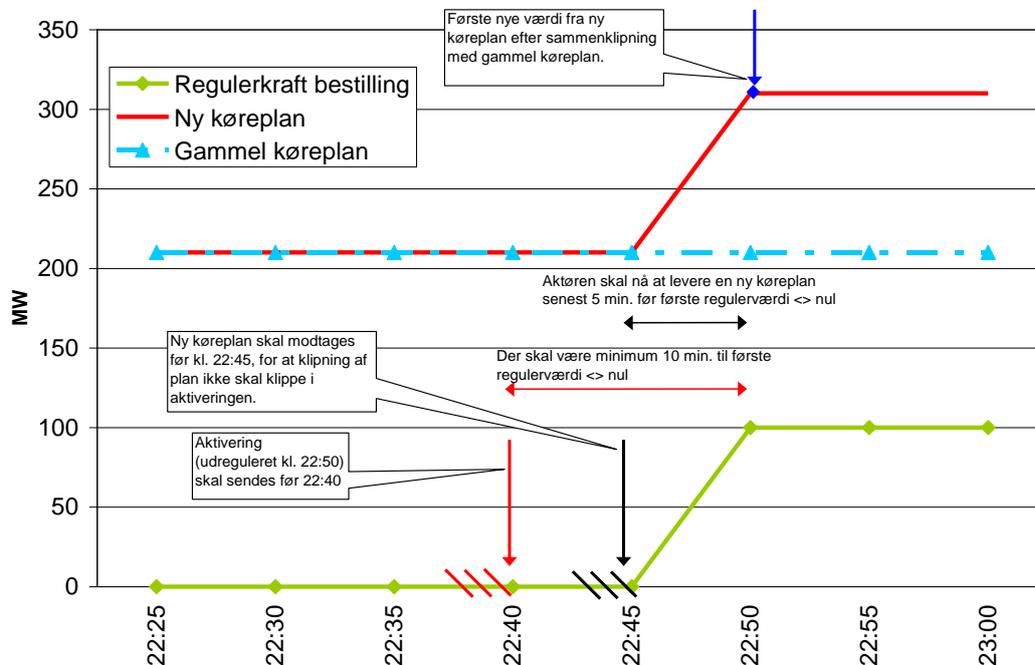


Fig. 5: Ordering of regulating power and merging into a new operational schedule

[Regulating power order; New operational schedule; Old operational schedule
 First new value from new operational schedule after merging with old operational schedule.
 The player must submit a new operational schedule not later than 5 minutes before the first regulating value \neq zero.
 A period of at least 10 minutes must pass until the first regulating value \neq zero.
 A new operational schedule must reach Energinet.dk before 22:45 to prevent merging from changing activation.
 Activation (regulated in full at 22:50) to be sent before 22:40]

4.6 End status after submission of regulating power bids/orders

5. STATEMENT (BT-106 SUBMISSION OF REGULATING POWER STATEMENT)

The regulating power process will end by a preliminary statement being sent to the regulating power suppliers. The business transaction takes place in BT-106 Submission of regulating power statement.

4B. ACCEPTANCE/OBJECTION (NOT FORMING PART OF BT TRANSACTIONS)

The regulating power supplier will either accept the preliminary statement or make objections.

4.7 Deadlines for submitting regulating power bids/orders

The deadlines for regulating power suppliers' submission of regulating power bids for the next day of operation are specified below.

17:00 Deadline. The regulating power suppliers having undertaken to supply regulating power (manual regulation reserves) must submit their regulating power bids for the next day of operation before the deadline.

Delivery hour -45 minutes. Energinet.dk must receive regulating power bids for the relevant delivery hour not later than 45 minutes before the start of the delivery hour.

12:00 The next day after the day of operation. The deadline for Energinet.dk to send a statement of power ordered and energy consumption to be settled at specific prices.

16:00 The next weekday after the day of operation. The deadline for regulating power suppliers to draw attention to any discrepancies between the statement from Energinet.dk and the players' own statement. Any such discrepancies must be settled as soon as possible and not later than 16:00 on the same day. After this time, discrepancies will be processed according to non-standard procedures.

4.8 Emergency procedure

A BRP must employ a person who can be contacted on a 24-hour basis in case of irregularities.

4.9 Data content of a regulating power bid/order

Below follows a description of the data content of a regulating power bid/order.

4.9.1 Regulating power bid

- BRP
- Day of operation
- Price area in Denmark (DK1 and DK2)
- Unique bid reference
- Currency
- Delay for regulation (minimum time from placing of order to start of regulation)
- Start and stop gradients for regulation (MW to one decimal place per minute)
- Name of facility (optional)
- Contract ID (reference to agreements with Energinet.dk)
- Time resolution (one-hour intervals)
- Volume of regulating power in whole MW
- Price of regulating power in DKK/MWh or EUR/MWh.

4.9.2 Regulating power order

- Bid reference
- BRP
- Day of operation
- Name of facility (optional)
- Schedule
- Product (power)
- Unit of measurement (in whole MW)
- Elspot area (DK1 or DK2)

- Volumes (values for every five minutes, ie '(hours during the day x 12) + 1' values, 00:00 and 24:00 both included).

4.10 Data content of an operational schedule

Reference is made to operational schedule BS-102 for a description of the data content of an operational schedule.

4.11 Identification of process and transactions

The following table lists the unique names of the business process and the transactions used.

BS ID	BS-103
BS name	Regulating power bids and orders
BS version	1
BS release	1
BS date	2011-11-11
Business transactions	
BT ID	DK-BT-103
BT name	Submission of regulating power bids
BT version	
BT ID	DK-BT-104
BT name	Submission of regulating power orders
BT version	
BT ID	DK-BT-102
BT name	Submission of operational schedules and daily forecasts
BT version	
BT ID	DK-BT-106
BT name	Submission of regulating power statement
BT version	

5. 4-week forecasts (BS-104)

A 4-week forecast contains information about the operating condition of one or more facilities for a given BRP for production. A 4-week forecast lists facilities expected to be operational in an upcoming 4-week period.

A 4-week forecast must contain information for each of the individual four weeks. For facilities producing less than 25 MW, the relevant player must submit a total sum for all facilities used. For facilities producing 25 MW or more, the relevant player must submit individual forecasts for the facilities used. A forecast must include information about nominal capacity and expected capacity per week.

If deviations are expected within any given part period, the player must include a brief description of the reason for restrictions, if any.

Figure 6 and the following description explain the process of submitting 4-week forecasts.

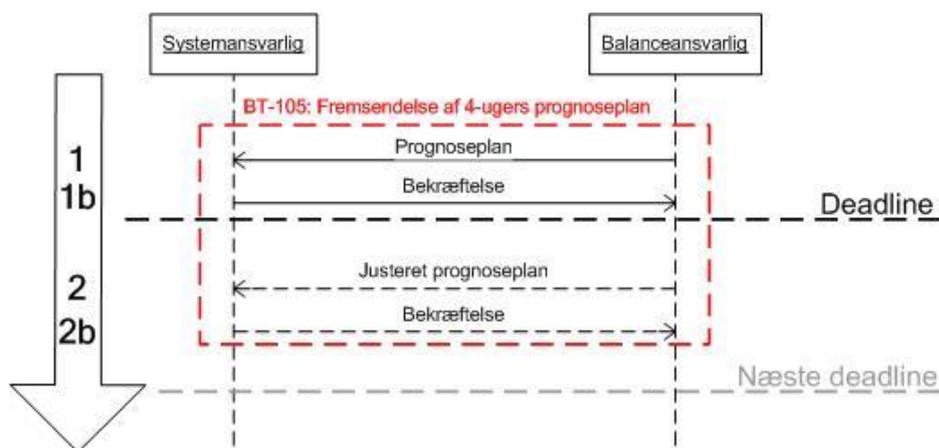


Fig. 6: Submission process for 4-week forecasts

```
[System operator; BRP
BT-105: Submission of 4-week forecasts
Forecast
Acknowledgement
Revised forecast
Acknowledgement
...
Deadline
Next deadline]
```

5.1 Initial status before submission of 4-week forecasts

The individual BRP for production has a general overview of the operating condition of its facilities for the upcoming 4-week period. This may change during the process.

5.2 Process of submitting 4-week forecasts

1. FORECAST

BRPs for production must submit individual forecasts for the next 4-week period. A forecast must always describe the expected operating condition of all facilities for which a BRP holds responsibility.

The first forecast submitted must reach Energinet.dk before the deadline (see Figure 6). A BRP for production may submit new forecasts as needed before the deadline.

1B. ACKNOWLEDGEMENT

On receipt of a 4-week forecast, Energinet.dk will check the content for general errors (for example to see if codes used are correct and whether the necessary message elements are present). The identification of the individual players and the period will also be checked.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated (subsequently requested by the player via a web service).

2. ADJUSTED FORECAST

In case of material changes, the BRP for production must submit an adjusted forecast before the deadline as soon as the BRP becomes aware of such changes. The forecast must cover the same four weeks as originally accepted.

2B. ACKNOWLEDGEMENT

See 1b above.

5.3 End status after submission of 4-week forecasts

The process will end after the last submitted forecast.

5.4 Rules for submitting 4-week forecasts

One of the following conditions is available to describe the operating condition of the individual facilities:

- **Operational:** The electricity generation facility is immediately operational and can start from completely cold condition in the time specified in the technical data for the facility. Reduced capacity must be described briefly.
- **Conditionally operational:** The electricity generation facility is not immediately operational due to restrictions caused by, for example, staff issues, plant defects, fuel, environment etc. A brief description must be given of the restriction, and its estimated duration must be stated.
- **Maintenance:** The electricity generation facility is inoperational for maintenance according to the approved maintenance schedule. A timetable must be included in the description.
- **Out of order:** The electricity generation facility is inoperational. A timetable for repair and commissioning must be included in the description.
- **Mothballed:** The electricity generation facility is not available. The earliest date when it can be expected to be operational again must be stated in the description.

- **Not yet commissioned:** The electricity generation facility is under construction. Estimated time of commissioning must be specified in the description.
- **Scrapped:** The production facility is in the process of being scrapped and will no longer be available.

5.5 Correction of 4-week forecasts

A forecast cannot be deleted. In case of changes to a forecast, the entire 4-week forecast must be resubmitted, including any changes. Resubmitted forecasts will thus overwrite previously submitted forecasts.

5.6 Deadlines for submitting 4-week forecasts

The deadlines for BRPs' submission of forecasts are specified below. The forecasts must be updated and submitted at least once a week (by Thursday at the latest). The forecasts must cover the following four weeks beginning next Monday at 00:00.

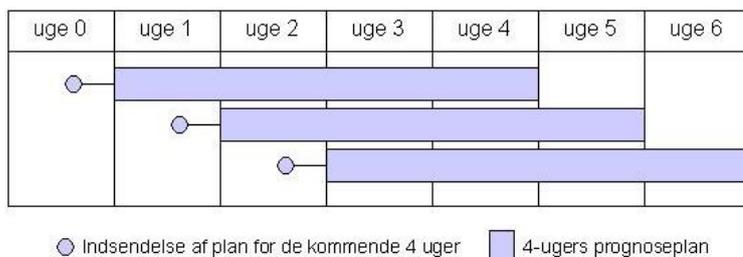


Fig 7: Example of the process of submitting 4-week forecasts

[Week 0; Week 1; Week 2; Week 3; Week 4; Week 5; Week 6
Submission of forecast for the next four weeks
4-week forecast]

Thursday at 17:00 will be the deadline for the next 4-week period.

5.7 Data content of a 4-week forecast

Below follows a description of the data content of a 4-week forecast for facilities producing 25 MW or more and for facilities producing less than 25 MW.

5.7.1 Forecast for facilities producing 25 MW or more

- BRP
- Period
- Name of facility
- Product (energy)
- Price area in Denmark
- Operating condition of facility (see 5.4)
- Nominal capacity (MW)
- Estimated maximum capacity in expected operational mode (MW)
- Brief description of cause of restrictions, if any.

5.7.2 Forecast for facilities producing less than 25 MW

- BRP

- Period
- Type of facility
- Product (energy)
- Price area in Denmark
- Total nominal capacity for facilities expected to be in operation (MW)
- Estimated total maximum capacity expected to be available (MW)
- Brief description of cause of restrictions, if any.

5.8 Identification of process and transactions

The following table lists the unique names of the business process and the transactions used.

BS ID	BS-104
BS name	4-week forecasts
BS version	1
BS release	1
BS date	2007-02-22
Business transactions	
BT ID	DK-BT-105
BT name	Submission of 4-week forecasts
BT version	

6. Daily forecasts (BS-105)

A daily forecast contains information about the operating condition of one or more facilities for a given BRP for production. A daily forecast lists facilities expected to be operational on the next day of operation.

For facilities producing less than 25 MW, the player must submit an overall sum for all facilities broken down into a forecast for current minimum capacity and a forecast for current maximum capacity.

For facilities producing 25 MW or more, the relevant player must submit individual forecasts for facilities used. Forecasts need to be submitted for current minimum and current maximum capacity of the individual facilities.

Figure 8 and the following description explain the process of submitting daily forecasts.

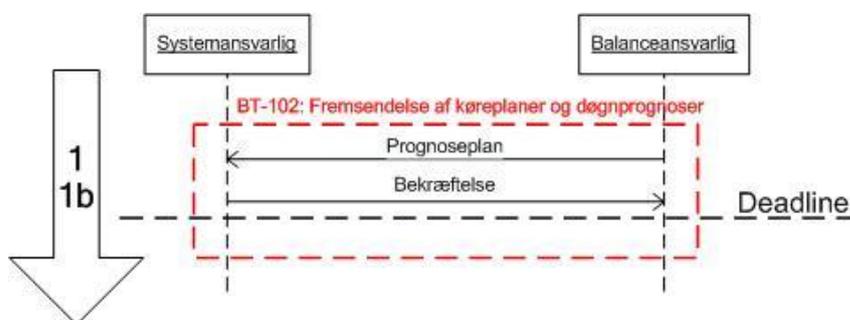


Fig. 8: Submission process for daily forecasts

```
[System operator; BRP
BT-102: Submission of operational schedules and daily forecasts
Forecast
Acknowledgement
...
Deadline]
```

6.1 Initial status before submission of daily forecasts

The individual BRP for production has a general overview of the operating condition of its facilities for the next 24-hour period.

6.2 Process of submitting daily forecasts

1. FORECAST

BRPs for production must submit individual daily forecasts for the next day of operation. A daily forecast must always describe the expected operating condition of all facilities for which a party holds responsibility.

The first daily forecast submitted must reach Energinet.dk before the deadline (see Figure 8). A BRP for production may submit new daily forecasts as needed before the deadline.

1B. ACKNOWLEDGEMENT

On receipt of a daily forecast, Energinet.dk will check the content for general errors (for example to see if codes used are correct and whether the necessary message elements are present). The identification of the individual players and the period will also be checked.

Depending on whether errors are found or not, a positive or negative acknowledgement will be generated (subsequently requested by the player via a web service).

6.3 End status after submission of daily forecasts

The process will end after the last submitted daily forecast before the deadline. Subsequent changes must be handled in operational schedules.

6.4 Correction of daily forecasts

In case of changes to a daily forecast, the entire forecast must be resubmitted, including any changes. To delete a specific facility from a daily forecast, the player must exclude the facility from the new forecast. To delete the entire forecast, the player must submit an empty forecast, ie a forecast containing only general information such as player ID and the relevant day of the forecast.

6.5 Deadlines for submitting daily forecasts

07:30 The deadline is the day before the day of operation. BRPs must submit daily forecasts for the next day of operation before the deadline.

6.6 Data content of a daily forecast

Below follows a description of the data content of a daily forecast.

6.6.1 Daily forecast

- BRP
- Day of operation
- Name of facility (for facilities > 25 MV) or type of facility (for facilities < 25 MV)
- Schedule (technical minimum/technical maximum)
- Product (energy)
- Unit of measurement (MWh to one decimal place)
- Price area in Denmark
- Volumes (24 hourly values (shift from daylight saving time and standard time: 23 and 25 hourly values, respectively))

6.7 Identification of process and transactions

The following table lists the unique names of the business process and the transactions used.

BS ID	BS-105
BS name	Daily forecasts
BS version	1
BS release	1
BS date	2007-02-22
Business transactions	
BT ID	DK-BT-102
BT name	Submission of operational schedules and daily forecasts
BT ID	DK-BT-102

7. Appendix 1 – Overview of possible message types

Message type	Western Denmark					Eastern Denmark				
	USE	UNIT	RES.	DEC.	IND..	USE	UNIT	RES.	DEC.	IND.
Notifications (day ahead + intraday)										
<i>Header</i>										
Adjustable production	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Non-adjustable production	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Adjustable consumption	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Non-adjustable consumption	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Trading	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Operational schedules										
<i>Header</i>										
Expected production	Yes	MW	5 min.	1	Step	Yes	MW	5 min.	1	Step
Expected consumption	Yes	MW	5 min.	1	Step	Yes	MW	5 min.	1	Step
Minimum	Yes	MW	5 min.	1	Step	Yes	MW	5 min.	1	Step
Maximum	Yes	MW	5 min.	1	Step	Yes	MW	5 min.	1	Step
TotMin (technical minimum)	As agreed	MW	5 min.	1	Step	As agreed	MW	5 min.	1	Step
TotMax (maximum load, including overload)	As agreed	MW	5 min.	1	Step	As agreed	MW	5 min.	1	Step
Fast reserves (15 minutes)	No	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Slow reserves (60 minutes)	No	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Slow reserves (90 minutes)	No	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Frequency-controlled normal operation reserves	No	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Primary reserves	As agreed	MW	1 hour	1	Interval	No	MW	1 hour	1	Interval
LFC reserves	As agreed	MW	1 hour	1	Interval	No	MW	1 hour	1	Interval
Frequency-controlled disturbance reserves	No	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Available upward regulation purchased via opt. market	As agreed	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Available downward regulation purchased via opt. market	As agreed	MW	1 hour	1	Interval	As agreed	MW	1 hour	1	Interval
Installed capacity withheld	Yes	MW	5 min.	1	Step	Yes	MW	5 min.	1	Step
4-week forecasts										
<i>Header</i>										
Reason for reduced operation	Yes	(free text)	(4 weeks)		Interval	Yes	(free text)	(4 weeks)		Interval
Nominal capacity	Yes	MW	(4 weeks)	1	Interval	Yes	MW	(4 weeks)	1	Interval
Maximum	Yes	MW	1 week	1	Interval	Yes	MW	1 week	1	Interval
Operating status	Yes	(status)	1 week		Interval	Yes	(status)	1 week		Interval
Daily forecasts										
<i>Header</i>										
Minimum	Yes	MW	1 hour	1	Interval	Yes	MW	1 hour	1	Interval
Maximum	Yes	MW	1 hour	1	Interval	Yes	MW	1 hour	1	Interval
Regulating power orders										
<i>Header</i>										
Regulating power order	Yes	MW	5 min.	1	Step	Yes	MW	5 min.	1	Step
Confirmation report (day ahead + intraday)										
<i>Header</i>										
Adjustable production	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Non-adjustable production	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Adjustable consumption	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Non-adjustable consumption	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Trading	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
TSO adjustment	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval
Bids										
<i>Header</i>										
Bid	Yes	MW	1 hour	0	Interval	Yes	MW	1 hour	0	Interval
Regulating power statement										
<i>Header</i>										
RegulationReportData	Yes	MWh	1 hour	1	Interval	Yes	MWh	1 hour	1	Interval