

# Regulation F: EDI communication

April 2007

Rev. 1

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

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## Introduction

This regulation sets the standard for data communication – ie exchange of notifications, metered time series, etc. – between Energinet.dk and the players in the market and mutually between market players.

Energinet.dk supports the coordinated use and development of electronic data interchange (EDI) in the Danish energy sector for electricity and gas. The purpose of data interchange is to simplify and streamline business processes in the sector.

This regulation provides a collection of principles and rules describing how to exchange EDI messages in the Danish electricity market.

The regulation is primarily targeted at persons with an IT background and is relevant to both grid companies and balance responsible parties (BRPs).

The regulation is effective within the framework of the Danish Electricity Supply (Consolidated) Act no. 115 of 8 November 2006 as amended.

The regulation has been issued under the provisions of part 3 of Executive Order no. 1463 of 19 December 2005 on transmission system operation and use of the electricity transmission grid etc. (executive order on system operation).

The regulation will be filed with the Danish Energy Regulatory Authority.

Complaints about the regulation can be filed with the Danish Energy Regulatory Authority, Nyropsgade 30, DK-1780 Copenhagen V.

This regulation takes effect on 15 November 2007 and supersedes Eltra's Regulation E1, 'Ediel Regulation', and Regulation E3, 'Emergency procedures in the event of breakdown in normal communication paths', Elkraft System's Regulation F, 'Communication', and 'Ediel-ebIX General Guide for Denmark'.

Requests for additional information and queries should be directed to Energinet.dk's contact person responsible for Regulation F, see Energinet.dk's website at [www.energinet.dk](http://www.energinet.dk), where the latest applicable regulation is also downloadable.

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## 1. Purpose and structure of the regulation

This communications regulation provides a collection of principles and rules describing how to exchange EDI messages in the market.

EDI is short for Electronic Data Interchange, a set of standards for the transfer of electronic data. A key feature of EDI is the fact that data intended for reading by people (eg invoices, orders, etc.) are read by a receiving IT system, which initiates a process corresponding to their contents, eg that an invoice will automatically be entered in the bookkeeping records.

This requires the establishment of a standard or 'language' for both content and structure to leave no doubt as to the data to be transferred.

The regulation is based on problems related to EDI communication, ensuring that the exchange of EDI messages is performed on identical and efficient terms between market players. The target group is players who, in connection with their roles in the market, exchange data with other players through EDI.

All messages are subject to the Danish rules described. In addition, the ebIX rules apply as set out in 'ebIX Common rules and recommendations' <sup>1</sup>. In the event of doubt in a given case, the principles and rules of the regulation will always prevail.

Three documents are appended to the regulation, supporting and explaining central sections in detail. These include the following appendix reports:

1. **Syntax and structure of EDI messages.** A description of the syntax and structure used for XML and EDIFACT messages.
2. **Principles and rules of acknowledgement.** A description of the acknowledgements used in EDI messages in XML and EDIFACT formats.
3. **The Danish role model.** A definition of roles and players in the Danish market. The appendix contains a figure presenting how the players in the market are interrelated.

The regulation contains the following sections:

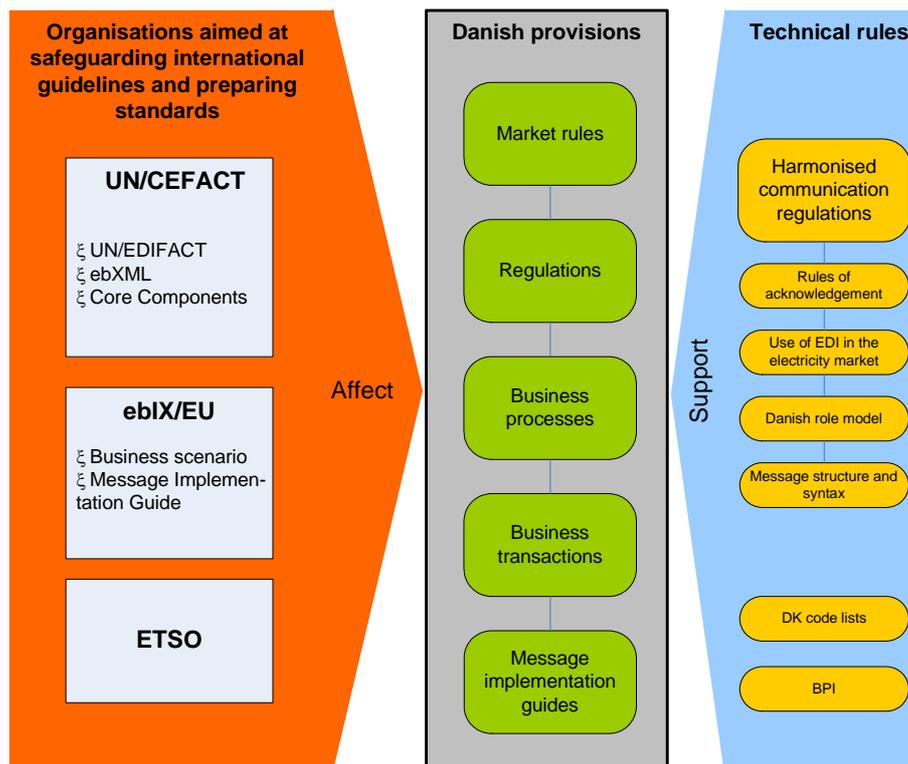
Section	Description
2 - Document hierarchy	An illustration of the ranking of the regulation against related documents and its relation to international standardisation organisations.
3 - Principles of data interchange	Describes the general principles and rules for EDI communication.
4 - General rules for messages	The detailed rules for messages concerning the contents of the messages.
5 - Communication platform	Describes the communication platforms used for the physical exchange of EDI messages.
6 - Web-based system for notifications and schedules	A short description of Energinet.dk's web-based system for notifications and schedules.

<sup>1</sup> [www.ebix.org/Documents/ebIX\\_Common\\_rules\\_and\\_recommendations\\_v1r1C.doc](http://www.ebix.org/Documents/ebIX_Common_rules_and_recommendations_v1r1C.doc)

7 - Register of players	A short description of the register of players.
8 - System requirements	Requirements imposed by the regulation on the IT systems processing the EDI messages.
9 - Security of data interchange	A short description of the security of data interchange and related systems.

## 2. Document hierarchy

The regulation forms part of a hierarchy of documents, national and international alike. The figure below shows the principal organisations and documents, ranked with their mutual relationships.



The purpose of subdividing the documents is to simplify the work involved in mapping out and documenting new processes and changing existing ones. It will not be necessary for the business representatives to focus on the technical aspects, whereas the technicians can concentrate on such aspects. The figure components are described below.

### 2.1 Energinet.dk

Energinet.dk is responsible for ensuring well-functioning communication between the players in the market. Energinet.dk supports the coordinated use and development of electronic data interchange (EDI) in the Danish energy sector for electricity and gas. The purpose of data interchange is to simplify and streamline business processes in the sector. Energinet.dk participates at the international level in various organisations such as the Nordic Ediel Group, ebIX (Energy Business Information eXchange) and ETSO, the purpose of which is to support the coordinated proliferation of electronic data interchange in Europe with a view to realising the European single market for energy.

## **2.2 Danish provisions**

Energinet.dk applies, in cooperation with the market players, the international provisions as a basis for national provisions. The provisions are operationalised through various document levels addressing different parts of the business.

### *2.2.1 Market regulations*

Based on the Danish Electricity Supply Act and related regulations, Energinet.dk has drawn up a range of market regulations. The regulations prescribe how all players should interact in relation to their individual roles. Regulations provide a necessary framework for ensuring that market players and infrastructure companies comply with legislation. Market regulations are filed with the authorities in accordance with the Danish Electricity Supply Act. The compilation of regulations also contains the standard agreements and deviations in force from time to time.

### *2.2.2 Business processes (Business Scenario – BS)*

Business processes are descriptions of business rules and procedures for the practical handling of the conditions specified by the regulations. The target group is primarily the players in the market concerned. The description is prepared in the form of sequence diagrams, which illustrate in general terms how data are interchanged between the individual players and what data are interchanged. The business process specifies the framework and requirements. The technical contents of data interchanges are not specified in detail as reference is merely made to one or more business transactions. This means that the need for new and revised business processes is easier to formulate and implement and that market players will therefore be less tied to technical specifications.

### *2.2.3 Business transactions (BT)*

Business transactions are the technical descriptions of business processes and describe the individual messages included. The business transactions further describe the interaction going on with the underlying applications by means of event and activity diagrams. The messages included in the process explicitly appear.

A business transaction is independent of other business transactions and can be included in more than one business process. A business transaction developed for a given business process can be reused in other business processes. The business transactions provide details as to how the individual message must be used in relation to the specific transaction, including how the individual elements and attributes of the message must be used. A business transaction can be included in more than one business scenario.

### *2.2.4 Message implementation guides (MIG)*

A message implementation guide describes, in concrete terms, the contents and structure of one message. The guide is subject to the international standard for syntax and, if applicable, an overall structure for the type of messages. Two formats are used for the message exchange, which the message implementation guides describe as follows:

- **EDIFACT:** The message implementation guides are an integral part of UN/CEFACT's EDIFACT documents.
- **XML:** The message implementation guides are XML schema descriptions of the message in question and to the widest possible extent based on core components specified by UN/CEFACT.

### 2.3 Technical rules

The Danish provisions are supplemented with a range of technical documents, rules and process groups as shown below:

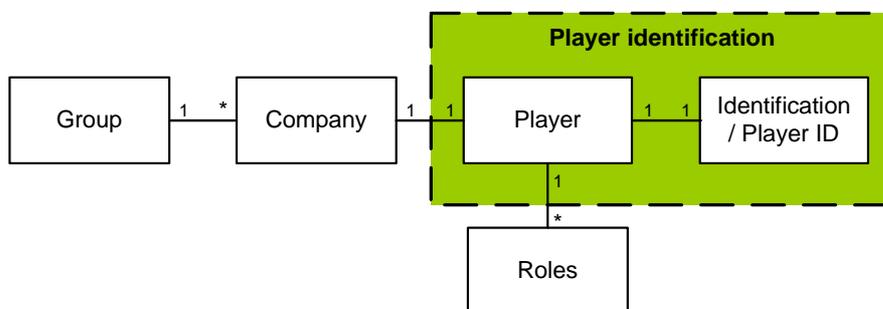
- **Communication regulation** (the present document) describes through principles and rules the processes for data interchange in the Danish market. The regulation includes supplementary sub-documents that specify the principles and rules set out in the regulation.
  - **The rules of acknowledgement** describe the rules and principles governing how to handle data interchange errors.
  - **The Danish role model** describes all roles and players in the Danish electricity market and their mutual relationships.
  - **Message structure and syntax** describes the fundamental rules for data formats used in the electricity market.
- **BPI** (Business Process Identifier) covers various business processes grouped in general BPIs, each with its own identification. The BPI is a technical grouping of messages by type, used for routing and addressing (see section 3.2).
- **DK code lists** provide a description of codes used for interchanging data in the electricity market.

### 3. Principles of data interchange

The electricity market uses EDIFACT (UN/EDIFACT) and XML for the structured building of interchanges between market players. EDIFACT is a standard, and interchanges therefore follow the same rules for structure and processing. XML offers no pre-defined standard messages, and to ensure a standardised structure, it is therefore necessary to adopt a central organisation of the development of messages.

#### 3.1 Player identification

According to the rule for player identification, one player has one player ID in the form of a GLN number (Global Location Number) or an ETSO EIC number (Energy Identification Code). This identification must be used regardless of the number of roles assumed by a player (see the Appendix 'The Danish role model'). The rules for player identification are illustrated in the figure below.

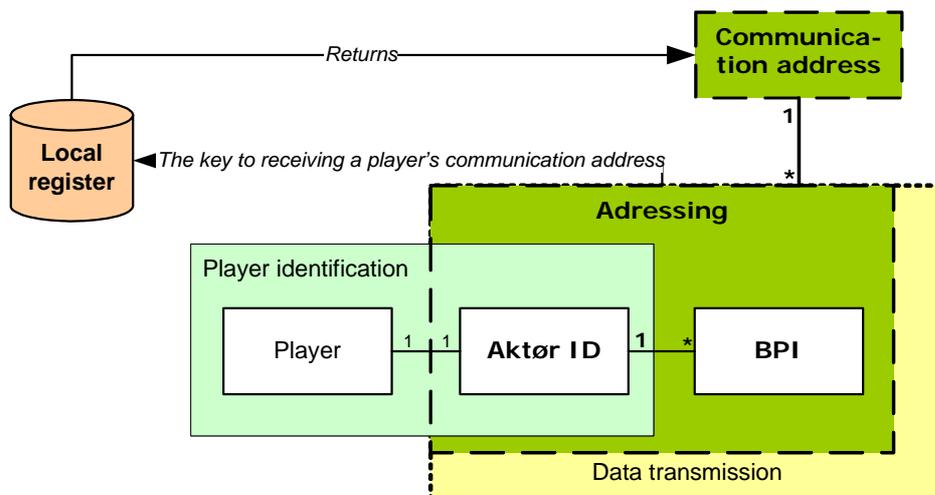


The figure uses some key terms, which – for the purpose of the further description – are defined as follows:

- **Group** – A general term used if a business undertaking comprises two or more companies.
- **Company** – A company has a range of legal obligations and a separate CVR no. By virtue of its commercial status, the company is legally responsible for the player's roles.
- **Player** – A player is responsible for the exchange of EDI messages related to the role.
- **Role** – The roles a player can assume are defined in the Danish role model.
- **Player ID** – The technical identification of a player in the form of a GLN number (Global Location Number) or an ETSO EIC number (Energy Identification Code), see section 4.6.

#### 3.2 BPI, routing and communication address

The figure below illustrates the addressing principle. To show the context in which the addressing principle appears, the connection to the related terms and principles has been included. The addressing principle exclusively relates to the box titled 'Addressing', including the relation to the communication address.



The terms shown in the figure are defined as follows:

- **Player ID** – A unique identification of a player.
- **BPI** (Business Process Identifier) – Various business processes grouped in general BPIs, each with its own identification. The relation between player ID and BPI is a one-to-many relation, 'many' being the number of BPIs the player has. The messages included in the same BPI can be expected to be processed by the same application. The BPI is used for routing and addressing, and reference is made to this in the EDI message, see the following rules:
  - In EDIFACT messages the BPI must appear from the application reference (UNB element S004.0026). UNB-element S004.0032 must be 'DK' to indicate that the Danish provisions apply.
  - In XML messages the BPI must appear from the 'ProcessType' element under the XML header.

BPI	Description
DK-CUS	Change of suppliers expected to take place between the customer information systems.
DK-TIS-SHA	Exchange relating to pro rata figures.
DK-TIS-MET	Exchange relating to time series based on metered data information.
DK-TIS-SCH	Exchange relating to time series based on notifications and schedules.
DK-OP	Operational schedules and bids etc.
DK-GAS-ACD	Summed consumption data exchanged in the Danish gas market.

- **Communication address** – Is the transmission reference to a receiver's system. The key to the right communication address is player ID and BPI. The relation between player ID and BPI on the one hand and the communication address on the other hand is a one-to-many relation. This means in practice that a player can have one communication address per BPI. The communication address can be an e-mail address or web service address. It can be agreed bilaterally to use communication addresses other than those listed in the player register.

- **Local register** – A player is obliged to maintain and keep up to date information about the communicating parties.

## 4. General rules for messages

The section describes the general rules for messages that do not specifically apply to the exchange formats EDIFACT and XML. To the extent that it is relevant, the specific rules are specified in relation to EDIFACT and XML.

### 4.1 EDIFACT and XML

EDIFACT and XML are the two exchange formats used for transmitting data between players in the market. Rules and principles for the data content of messages are described in the following section. An explanation of the two data formats as well as the syntax and structure are described in detail in the Appendix 'Syntax and structure of EDI messages'.

### 4.2 Responsibility for EDI messages

It is the responsibility of the sender to make sure that the EDI message has reached the receiver's system. The Danish business processes require that an EDI message must always have a reply. In the event that the sender has not received a reply within the agreed time limit, he must check his system configuration. If no error is found, the receiver must be contacted to solve the problem.

### 4.3 Error handling and acknowledgements

The business processes will provide a description of reply procedures in connection with the exchange of EDI messages. The normal procedure specifies a reply. If the receiver registers an error during converting or in connection with data handling, an error message must be returned.

For EDIFACT messages, syntax errors are handled by a CONTRL message. When a CONTRL is requested in an EDIFACT message, it must be returned.

An APERAK message is used for handling other errors if it is not specified that a 'real' EDIFACT message must be used as a reply.

For XML an 'Acknowledgement document' is used in case of syntax or data content errors.

The detailed description of rules and principles for errors and acknowledgements appears from the Appendix 'Principles and rules of acknowledgement'.

### 4.4 Time, date and period formats

Terms and their use:

- **UTC:** Universal Time Coordinated. In practice identical to GMT (Greenwich Mean Time).
- **Local time:** Time at the location.

Denmark uses UTC+0. All IT systems must be able to handle the receipt of different offsets to UTC. In EDIFACT time in the C507.2380 UNB element is always expressed in local time.

### Daylight saving time/standard time

The same UTC offset is used in the messages all year round.

UTC+0	Daylight saving time in Denmark	The day runs from 22:00 to 22:00 on the following day.
	Standard time in Denmark	The day runs from 23:00 to 23:00 on the following day.

Denmark moves to daylight saving time on the last Sunday of March and returns to standard time on the last Sunday of October. The day we move to daylight saving time has 23 hours. The day we return to standard time has 25 hours.

### Notation and periods

All time intervals in messages are expressed using an inclusive start date/time and an exclusive end date/time.

For instance, a day is written in EDIFACT syntax as

200610172300200610182300 and an hour as 200610172200200610172300.

### XML date/time formats

All date/time formats in XML are written as follows:

YYYY-MM-DDTHH:MMZ

Format explanation:

'-', ':', and 'T' are separators, and 'Z' specifies no offset to UTC time (UTC-0).

### Time series start and end dates

In certain types of messages the period must be specified in the form of a start and end date in the message header. This period is needed for control purposes. In case a period in the retail section is outside this period, the message must be rejected.

### Time synchronisation

It is important that IT systems that generate and process messages is within 1 minute +/- of local time.

## 4.5 Opening hours for EDI messages

The following service rules apply to IT systems related to messages exchanged:

Business days are Monday through Friday, excluding public holidays and the following days: 24 December, 31 January, 5 June, 1 May and the Friday following the Day of Ascension.

In principle EDI systems are always open and so are e-mail systems or web services for processing messages. Other rules may apply to some business processes. Business processes subject to DK-CUS and DK-TIS-SHA are only obliged to open their systems in the period 08:00 to 20:00.

Support can only be expected within normal working hours (8:00-16:00).

It is up to the player to minimise the down time and plan major system changes so as to cause the least inconvenience to the market.

Regardless of time/date, the down time must be notified to the affected players in due course, for instance by e-mail. When the system is up again, this must also be notified.

Some systems may be subject to tighter uptime requirements, which will be described in the business processes. This applies for instance to business processes for operational schedules and the market for regulating power.

#### 4.6 Identification

Below follows a description of the identification systems used in the electricity market. A unique identification of players, areas, metering points, etc. is needed.

##### 4.6.1 Global Location Number (GLN)<sup>2</sup>

The GLN number is used for providing a unique identification of a player. The numbers are globally administered by GS1. In Denmark GLN numbers are allocated by GS1 Denmark and are composed of 13 digits:

- **Positions 1-3:** The three first digits are always the prefix (country code), which is 579 in Denmark's case.
- **Positions 3-12:** The following positions are allocated consecutively according to the Modulus 10 rules and are administered by GS1.
- **Position 13:** The last digit (K) is a check digit calculated on the basis of an algorithm (Modulus 10). The check digit for the GLN number is an integral part of the location number. The check digit is calculated on the basis of the preceding characters by means of a Modulus 10 algorithm.

Example: 5790000705245

##### 4.6.2 EIC<sup>3</sup>

The European Identification Code, just like the GLN number, is used for providing a unique player identification. EIC numbers are administered by a unit under the ETSO organisation. Moreover, ETSO's members benefit from local administrative units who are authorised to issue EIC numbers.

Depending on what the EIC number identifies, different structures have been established. Basically, the number is made up of 16 characters and is structured as follows for the player identification code:

- **Positions 1-2:** The two first characters refer to the issuing entity allocated by ETSO.
- **Position 3:** Identifies that it is a player identification number in the form of the letter 'X'.
- **Positions 4-15:** 12 characters in uppercase letters allocated by the issuing entity.

<sup>2</sup> www.GS1.dk

<sup>3</sup> For more information, see - <http://www.edi.etso-net.org/eic/eic-v3r0.pdf>

- **Position 16:** Check character.

Example: 11XRWENET123452

#### 4.6.3 Changes to GLN/EIC codes

A player who wants to change GLN/EIC codes must notify the market players at least five business days before the change takes effect.

#### 4.6.4 Identification of consumption metering points

**GSRN** (Global Service Relation Number)<sup>4</sup> is a uniquely defined number series allocated by GS1, which provides a unique identification of a metering point and consumer portfolios within a distribution company's distribution system. The number is used as identification in EDI messages. All metering points (active, virtual and passive) must be identified by means of the GSRN number, which should be stable over time. It must not be changed in the event of a change of suppliers, for instance.

#### Structure of the 18 digits of GSRN

Position	Example	Explanation
Pos 1-2:	57	GS1 Denmark.
Pos 3-7:	13131	5 digits fixed for the entire Danish electricity supply sector for identification of metering points.
Pos 8-10:	676	Number for the electricity supply company.
Pos 11-17:	XXXXXXX	7 digits for consecutive numbering of the individual metering points allocated by the electricity supply company.
Pos 18:	X	Check digit.

#### 4.6.5 Identification of time series

All grid companies have been allocated 10,000 numbers for unique identification of time series in relation to Energinet.dk. The time series number is used in relation to production metering, exchange metering and pro rata figures.

#### 4.6.6 Identification of grid areas

Any grid area has a metering point identification composed of three digits (DE number) to be capable of identifying the area in relevant messages. The DE number is allocated by the Association of Danish Energy Companies and must be used for grid area identification.

### 4.7 Use of signs

Sign rules in relation to Energinet.dk.

Description	Sign
Production in the area	+
Area consumption	-
Energy supplied to area, including purchases	+

<sup>4</sup> GS1 administers the number series in Denmark. For more information, see - [http://www.ean.dk/EAN\\_Sys/ADC/EAN\\_GSRN.htm](http://www.ean.dk/EAN_Sys/ADC/EAN_GSRN.htm)

Energy out of area, including sales	-
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Sign rules in relation to business processes for a Danish change of suppliers.

Description	Sign
Consumption metering	+
Pro rata figures	+

The use of signs will be specified in the individual business processes (BS<sup>5</sup>).

#### 4.8 Identification of price areas

Denmark is divided into two general market price areas to which reference can be made in EDI messages, see the table below.

Area	Reference (EIC)	Alternative reference
Western Denmark (Jutland/Funen)	10YDK-1-----W	DK1
Eastern Denmark (Zealand and Bornholm)	10YDK-2-----M	DK2

The use is described in greater detail in the related business processes and documents.

#### 4.9 Rules for rounding, digits and decimals

The following principles for rounding should be used regardless of interchange format:

##### Rounding rules

The usual rules for rounding are applied. Values less than 5 are rounded down, and 5 and above are rounded up. Any rest value resulting from rounding is ignored.

##### Separators and digits

- Full stop (.) is used as decimal separator. If a decimal separator is included in a value, the separator must be both preceded and followed by at least one digit. For instance, it is not allowed to send .5 – instead it should be 0.5.
- A decimal separator may be used only where it is allowed, see the message implementation guide applied.
- Triad separators are not allowed in data interchange.
- A numeric value must not contain special characters.

##### Characters

- If a value has leading zeros (0), these will not be transmitted.
- Leading and trailing blanks will not be transmitted. If, for instance, a field has 20 characters available, but only five characters are used, only the five characters will be transmitted.

<sup>5</sup> Business Scenarios

#### 4.10 Versioning of business transaction (BT<sup>6</sup>)

The versioning of a business transaction refers to changes in the business transaction concerned, which will affect the implementation guide for a given message. An IT system must be capable of handling the two latest versions of a business transaction (applies to both EDIFACT and XML messages). All players must regularly update the player register with the version of the implementation guide they use.

Business transaction number is specified in the message in UNH, element 0068.

The business transaction and the version of the transaction are identified by a 13-character string structured in the following format: CC-GGGGGG-NNN.

CC	Two letters indicating country code – ISO 3166.
GGGGGG	Six characters to identify the business transaction based on a combination of the letters A-Z (uppercase) and the numbers 0-9 and the separator '-'. and the separator '-'.
NNN	Implementation guide version number with trailing zeros.

#### 4.11 IT system errors

In the event of serious errors affecting other players' IT systems, the affected players must be contacted and informed of the consequence of the error. The players must be contacted by phone or e-mail.

#### 4.12 Discrepancies between players

If an error occurs in the data interchange between two players, the players must:

1. Contact each other with a view to identifying and correcting the error. If this fails, the players should proceed to paragraph 2.
2. Contact Energinet.dk, who will initiate all necessary measures (for instance test of IT systems, consultant's survey, etc.), depending on the situation.

If Energinet.dk contributes to identifying the error, the players may be instructed to pay the expenses incurred for tests or external consultant's surveys. The total expenses will be payable by the player who turns out to be responsible for the error. The player in question will also be instructed to correct the error within a time limit set by Energinet.dk.

<sup>6</sup> Business Transaction

## 5. Communication platform

The electronic communication between market players is made by means of specified communication protocols depending on the type of interchange. The protocols transmit the interchanges from sender to receiver and ensure that the interchanges reach the intended receiver intact. If an error occurs in the transmission, the communication protocols must inform the sender (sender's system).

If it is not possible to send the interchanges electronically, reference is made to separate documents with business scenarios that describe alternative ways of communication.

The following sections describe the protocols applied.

### 5.1 SMTP (e-mail)

EDIFACT interchanges transmitted through the SMTP protocol over the Internet (non-encrypted) must contain a MIME header (RFC 1767 / RFC 822), the use of which is specified below.

MIME header	Contents	Comments
MIME version 1.0		
Content type:	Application/EDIFACT	
	Application/octet stream	
Content transfer encoding	QUOTED PRINTABLE	QUOTED PRINTABLE is readable in the form of the ASCII character set.
	BASE64	BASE64 encoded files are a subset of the ASCII character set, which must be decoded before use.
Content disposition	Attachment name = 'file name'	<i>(optional, not recommended)</i>

The following rules and recommendations apply to the use of the SMTP protocol for EDIFACT interchanges:

- Only one EDIFACT interchange per e-mail is allowed.
- The contents of the e-mail subject field are of no importance as the field is not processed by the receiving IT system.
- The body text of the e-mail is not processed either and should therefore not be used.
- The EDIFACT file must be sent as one long string without HEX 0A (line feed) and HEX 0D (carriage return).
- The EDIFACT file must not contain routing information that needs to be read as a precondition for a successful data interchange from sender to receiver.

- It is the sender's duty to make sure that a message is not too big for the receiver's IT system to receive<sup>7</sup>. If the receiver has special restrictions, the sender should be informed of these.
- Energinet.dk does not use secure SMTP communication.

## 5.2 Web service

Energinet.dk's web services are an initiative designed to provide the framework for the exchange of messages over the Internet in a secure and reliable manner. The web services in question are targeted at the players who want to exchange messages over the Internet. The following terms are used in relation to web services.

<b>Web service:</b> Open XML standard for data interchange from application to application over the Internet. The service is typically designed to function with a specific interchange type.
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<b>SOAP:</b> An XML protocol for exchanging structured data against a web service. SOAP ensures the data transmission over the HTTP protocol.
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<b>WSDL:</b> A structured XML model for describing the web service, containing information about the correct format of calls to the web service.
--

Energinet.dk provides web services to which the players can send their messages and from which they can collect messages. The service runs at a fixed, defined address, which enables the sender to design a fixed SOAP header. Messages are received by calling the web service, which then returns the messages ready for transmission.

Calls to Energinet.dk's web services are made over an SSL connection with a user logon facility. This ensures that the requirements set out in the Danish Data Protection Agency's recommendation for secure communication are observed.

When a message has been sent to the web service, it will be syntax validated, and in the same session the sender will be informed whether the message has been correctly received and whether its syntax is correct.

<sup>7</sup> For the time being a message must not exceed 5 MB saved as a file. E-mails will be larger than the attached file when SMTP is used. We therefore recommend setting up firewalls and/or mail systems so that they can accept e-mails up to 10 MW. In the future the current limits will be shown on Energinet.dk's self-service portal.

## **6. Web-based system for notifications and schedules**

As an integral part of Energinet.dk's portal solution, a web-based system for submission of notifications and schedules has been established (notifications, operational schedules, regulating power bids and regulating power orders). The system enables the players to submit notifications and schedules without having access to EDI communication.

The purposes of the system are:

- To meet the needs of players who find it inexpedient to submit notifications and schedules through EDI.
- To make an alternative form of exchange available to players who are affected by system failures.

The players can use the system free of charge. If the system is inaccessible against expectations, it is the player's responsibility to submit notifications and schedules to Energinet.dk in a different way.

## **7. Register of players**

In connection with the self-service portal, Energinet.dk will establish a register of players with the information necessary for the practical data interchange to function. Energinet.dk will place the register at the disposal of the players in the market. The register will also be made available to the public at large to the extent that the information is of public interest. The register will contain corporate information and EDI technical information as well as statutory and financial requirements to be met by the players.

In the forthcoming register of players, the players in the electricity market will themselves be responsible for:

- Maintaining their own information in the register.
- Keeping up to date on changes in the register.

The players must keep up to date on changes, either by subscribing to notifications of changes or by regularly allowing the IT systems to collect the information in the register of players. In the latter case, the IT systems must support the possibility of collecting data made available by the register.

## **8. IT system requirements**

Energinet.dk has adopted requirements for the IT systems in the electricity market. These requirements are listed in the following sections as requirements for functionality and tests, respectively.

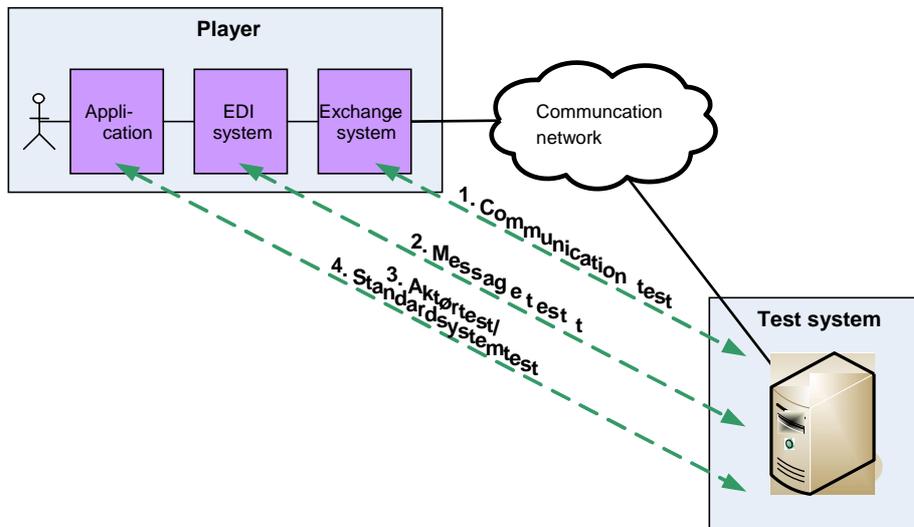
### **8.1 Requirements for functionality**

IT systems (EDI systems, applications, etc.) directly or indirectly involved in data interchange between players must meet the following requirements:

- The systems must be simultaneously capable of receiving two main versions of a business transaction (see separate documents for description of business transactions).
- Systems designed to communicate with foreign players not covered by the Danish rules must be capable of handling other formats and codes (including time zones) than those described in section 4.
- The systems must provide logging of outgoing and incoming messages to facilitate documentation of all data interchange. The logging must be of such a quality that it is able to contribute to troubleshooting and error correction.
- Earlier messages must be retrievable in readable form (ie non-encrypted) as and when needed through an easily accessible user interface.
- For three years the systems must store the individual messages or copies of messages in the format in which the messages were originally sent.
- The systems must be capable of passing an IT system test as defined by Energinet.dk. A central system will be established with specifications for testing of IT systems. Until this system has been established, detailed information about the test can be obtained by contacting Energinet.dk.
- The systems must either contain a parallel test system or provide an opportunity to perform tests in the production environment without affecting production data.

### **8.2 Requirements for tests**

IT systems in the electricity market must be approved before they are used for electronic data interchange with other market players. Energinet.dk defines the required tests and participates, to the necessary extent, with guidance on testing and administration of the test system. The following figure shows the four types of test.



**Figurtekster:**

Message test  
 Player test/Standard system test

*8.2.1 Purposes of individual tests*

Market players must generally perform three types of test before the systems are put into operation. The purposes of the individual tests are described below:

1. **The communication test** is designed to test whether communication between the players functions as intended, ie that the specification for the relevant communication protocol is met, for instance the SMTP protocol or web service. The test includes messages sent as well as messages received.
2. **The message test** is designed to ensure that correct syntax is used for the messages sent. This means that the structure and part elements of the message comply with specifications. The test includes testing of messages sent by the player.
3. **The player test** is designed to test whether the individual functions of, and interaction between, the players' IT systems and business procedures operate correctly. One of its purposes is to check whether the players have configured their IT systems correctly. In the test the player checks that the system makes correct registrations and actions on the basis of data received, for instance that the system sends correct verifications, rejections, etc.

System suppliers of jointly developed standard systems must perform a test as defined by Energinet.dk before the systems are installed and tested at the premises of the individual market players. The purpose of this test is described below:

4. **The standard system test** is designed to ensure that the standard systems have been tested before being installed at the players' premises. The test is practically identical to the player test, but has been extended to include additional error test messages.

### *8.2.2 Test performance in practice*

All tests described are performed by the market player or system supplier against an automated test system established by Energinet.dk. To the necessary extent, Energinet.dk participates in the test performance by providing guidance on and administering the test system. Energinet.dk also makes requirements for the content of the individual tests.

The individual test is performed in the sense that the market player or system supplier:

1. Contacts Energinet.dk and agrees to perform the test.
2. Performs the test against the automated test system.
3. Performs error correction and retesting, if necessary, until all errors have been eliminated.
4. Contacts Energinet.dk to receive a verification message that the test has been approved.

A player needs to have passed both the communication test and message test before initiating the player test, and all three tests mentioned must be passed before the player uses its system for communicating with other players. The message test should be performed as early as possible to identify fundamental errors, if any.

The standard system test is exclusively targeted at suppliers of jointly developed standard systems. The test must be performed before the system is installed at the premises of the market players. Players with an in-house developed system and players where the IT supplier has not been separately approved are subject to a more comprehensive test.

## 9. Security of data interchange

All player communication must comply with the statutory requirements (including the Danish Act on Processing of Personal Data). Furthermore, Energinet.dk's IT security requirements for player communication must be implemented.

The following examples of information will be regarded as non-confidential:

- Companies' metering data for continuous consumption
- Information about suppliers and annual consumption (in the event of a change of suppliers)
- General personal data which, according to the Act on Processing of Personal Data, may be sent in non-encrypted form.

Confidential business information is included in player communication in the notifications and schedules submitted in the electricity and gas markets. Energinet.dk will allow data interchange in encrypted form.

When confidential business information is included in the communication, Energinet.dk will offer data interchange in encrypted form. This will take place through the following communication paths:

- Web services
- The SESAM player portal

Energinet.dk will not increase security in connection with SMTP communication.