

Description and Use of Metering Data Exchanges for the CDS Operator

The purpose of this document is to explain how to access, understand and use messages containing metering data transmitted by Elia. It describes the content of the messages, how they are transmitted, the type of data transmitted and how this data can be implemented in client's business applications. It describes also the information exchanges to be setup by the Closed Distribution System Operator (CDSO) when at least one of the following situations occurs:

- An Access Point (AP) is declared as an interface between the Elia grid and a Closed Distribution System (CDS) as mentioned in annex 6 of the Access contract. Therefore, the CDS Operator performs the monthly allocation of all energy taken off and/or injected by its CDS.
- The CDS Operator outsources part of its responsibilities relative to data exchange to Elia.
- A CDS Grid User within the CDS offers Elia a flexibility service like mFRR or any other allowed flexibility product.
- A CDS Grid User within the CDS participates in the CRM with a CMU. Introduction to Metering Data exchanges for CDS Operator

This manual should be read by:

- Metering operational staff who need to understand the contents of metering messages
- IT Developers, who need to use the message content in the implementation of custom applications

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Abbreviation	Description
aFRR	automatic Frequency Restoration Reserve
AP	Access Point
BRP	Balance Responsible Party Note: the former term “ARP” (Access Responsible Party) is still used in some documents or file names
BRP _{O.I.}	Balance Responsible Party associated with an Offshore Interconnector
BSP	Balancing Service Provider (generic role)
CD	Calendar Day
CDS	Closed Distribution System
CDSO	Closed Distribution System Operator
CMU	Capacity Market Unit. It corresponds to a unit participating to the CRM.
CRM	Capacity Remuneration Mechanism
CSV	Comma Separated Values
DGO	Distribution Grid Operator
DSO	Distribution System Operator: In this document this term has the same meaning as the DGO
DP	Delivery Point
EAN	European Article Number
EIC	Energy Identification Code
EVMSB2C	Web site allowing to download the metering publications
FTP	File Transfer Protocol
PBO	In French “Pertes de Bouclage”: Loop losses, clearing differences or allocation control
mFRRDP _{su} (mFRRCipu)	manual Frequency Restoration Reserve delivered by Delivery Points DP _{su} (formerly known as CIPU units)
mFRRDP _{pg} (mFRRNonCipu)	manual Frequency Restoration Reserve delivered by Delivery Points DP _{pg} (formerly known as non CIPU units).
SDR	Strategic Demand Reserve
SP	SubAccess Delivery Point

ToE	"Transfer of Energy" as introduced by the Law of 13 th of July 2017
TSO	Transmission System Operator (Elia in this document)
UMIG	Utility Market Implementation Guide
WD	Working Day
XLSX	Microsoft ® Excel format and file qualifier
XML	eXtensible Markup Language

Chapter 1 Introduction to Metering data exchanges for CDS Operator

1.1. Description

The document describes all aspects of metering data provided by Elia (processes and roles responsibilities provided by Elia and CDSO). This includes how to understand metering messages and how to access messages delivered via one of the protocols put at disposal by Elia.

The document describes also the information exchange that needs to be set up between the Transmission System Operator (TSO) and the CDSO to allow each party to fulfil their obligations and how messages have to be set up. A CDSO is a company that operates a Closed Distribution System (CDS). A sufficient delay to implement and realize integration tests between the TSO and the CDSO before the CDS may become active (see Chapter 5 "Start of operations procedure") must be foreseen.

The exchange of these additional data between the TSO and the CDSO can be done following the UMIG standards over sFTP communication protocol to ensure reliability and security of communication. This system is based on the system the TSO already uses for exchanging schedules with the different market parties, such as distribution grid operators (DGO).

The present document does not describe other information exchanges to be set up between CDSO and other stakeholders such as Balancing Responsible Parties (BRP) and Suppliers (SUP) but focuses instead on the data exchanges between the CDSO and the TSO.

This document serves multiple purposes:

- To provide clear understandable explanations of the data contained in metering messages. This information is for the use of operational staff, who need to understand the message's content and its application.
- To explain the use of the <https://evmsb2c.elia.be> web page to the operational staff.
- To provide reference information for IT Developers who need to build business applications for both accessing and using metering data.
- To explain the use of the SFTP protocol, adopted for the transfer of messages from Elia to its clients.

This document is structured as follows:

Chapter 1 describes all the concepts relating to metering messages, as well as the types of clients who can receive them. The terminology used in this chapter should be understood by both operational and development staff.

Chapter 2 describes the different processes and data exchanges for different contractual cases, where the CDSO can outsource to the TSO part of its responsibilities in term of data exchange or where a Grid User connected to the CDS grid can offer to Elia a flexibility or CRM service.

Chapter 3 contains general explanations of the contents of all message types. This information is aimed at the operational staff who need to understand message content. This Chapter contains also detailed information on all the message fields and is targeted more at developers who need to access this information for use in their own business applications. It contains also detailed information on the XML message fields that is targeted more at developers who need to access this information for use in their own business applications.

Chapter 4 provides information about the messages formats that are accepted by Elia for receiving this additional data.

Chapter 5 provides information about the test procedure to be followed before the beginning of operational data exchange.

Chapter 6 explains how to access messages. It describes the different available protocols: it sets out the advantages of the use of the common communication protocol, which is of interest to all recipients, as well as detailed reference sections on the use of the protocol.

1.2. Messages

1.2.1. Message types

The type of messages a client receives depends on the nature of the contract that is held with Elia and the "role" of the client. An overview of the message type by role is available in section 1.2.8. Note that in this document we focus only on the CDSO role. For the other roles, we refer to the respective metering manual available on the Elia website.

1.2.1.1. Access Point (AP)

These messages contain power flow values (aggregated metering data) at specific Access Points. These messages are described in more detail in section 3.1.

1.2.1.2. SubAccess Delivery Point (SP)

These messages contain power flow values at specific SubAccess Delivery Points. The service can be Strategic Demand Reserve (SDR), mFRR DP_{PG}, DA/ID or other services provided to Elia within the framework of balancing, flexibility, or strategic reserves. These messages are described in more detail in section 3.2.

1.2.1.3. CDS Access Point (CDS AP)

These messages contain power transfer values at specific CDS Access Points (Access point into a Closed Distribution System). These messages are described in more detail in section 2.3.

1.2.1.4. CDS Loop losses (PBO)

These messages contain metering data destined for the CDS Operator. These messages contain the calculation and the components of the loop losses (PBO) of the CDS network for a given month. These messages are described in more detail in section 3.4.

1.2.2. Message validity

The initial metering message contains non-validated data. This should not be confused with the quality of the data – for even if all power values are labelled as normal or valid (N) this does not yet mean that they are validated. The validity of the data applies to the complete set of values in the schedule. Data is validated by processes and checks carried out by Elia. When a message is validated, the values are guaranteed to be correct by Elia. If data has to be corrected after they are published as valid (which is quite rare), Elia will always do this together with a written communication by e-mail to make users aware of the publication, together with an explanation on why this was necessary.

1.2.3. Message delivery

The power values transferred over the quarter hour periods are delivered regularly; daily and/or monthly. This pattern applies to all regulated messages.

1.2.4. Daily delivered messages

A message containing all the quarter hour power values for the current month is delivered before 8:00h each day. The day on which the message is sent is the "publication day". The values for and after the "publication day" are set as 0 (quality flag "Inexact"). So, in Figure 1 below, values for all days before Day 2 are published on Day 2.

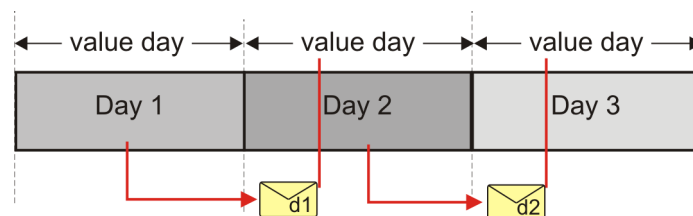


Figure 1 Daily delivery of metering messages

These messages contain non-validated data. The deliveries are listed in section "1.2.8. Regulated messages & message delivery frequency".

1.2.4.1. Monthly validated delivered messages

The delivery of monthly validated messages is illustrated in Figure 2 below.

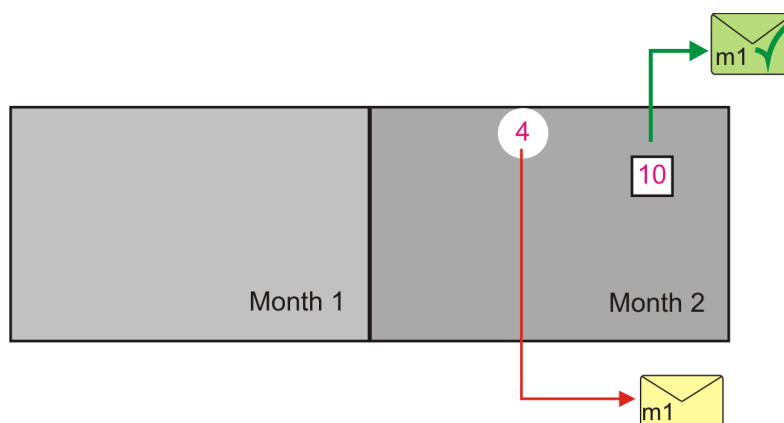


Figure 2 Regular deliveries of monthly messages

When the data is flagged as "validated by Elia", it is no longer updated. In rare cases where corrections need to take place after the publication of validated data, Elia will notify the CDSO and publish an updated message". See section "1.2.8 Regulated messages & message delivery frequency".

1.2.5. Accessing messages – protocols

Messages can be delivered using the SFTP protocol, via the “EVMSB2C” webpage or EPIC. Chapter 6 explains these protocols and provides a reference section for the development of applications to receive metering data messages. Specific for CDSO, automated message processing is most appropriate and thus the sFTP protocol is most important for CDSO.

1.2.6. Accessing messages – formats

Messages are delivered in CSV, XML or Excel (XLSX) formats. The format in which the messages are delivered is defined in the client contract and can be switched if required.

Understanding the contents of messages and the full details on the structure of CSV, XML and XLSX message formats are explained and given in Chapter 3 on “Description of Metering Messages”.

1.2.7. Message formats and protocols independency

The format of messages and the protocols are independent. Technically, it is therefore possible to receive any format type using any protocol. For CDSO the use of XML or CSV is more appropriate for automatic message handling.

More information about the messages formats in Chapter 3 Description of Metering Messages sent by Elia and in Chapter 6 Description of Metering Messages sent by CDSO.

1.2.8. Regulated messages & message delivery frequency

Table 1 lists for the CDSO role, the corresponding regulated messages they can receive and their delivery frequency. For the other possible roles, please read the specific Metering Manual which is available on our website.

Explanation of abbreviations used in the table 1 :

- CD = Calendar Day
- WD = Work Day
- 4thWD-1 = The calendar day before the 4th Work Day
- 10thWD-1 = The calendar day before the 10th Work Day
- Previous month: metering of the previous month sent the current month

Role	Message Type	Message publication frequency		
		Non-validated (Intermediate)	Validated (Final)	
CDSO (Elia to CDSO)	Access Point	Daily, Start on D+1 before 08:00	Published on M+1 CD10 before 08:00	CSV, XML and/or XLSX
	CDS Access Point	Daily, Start on D+1 before 08:00	Published on M+1 WD10 on 08:00. Note: messages are published as unvalidated since the validation responsibility lies with the CDSO.	CSV, XML and/or XLSX
	CDS Loop Losses (PBO)	Daily, Start on D+1 before 08:00	Published on M+1 WD16 on 08:00	CSV, XML and/or XLSX
CDSO (CDSO to Elia)	Injection and Offtake Allocation to BRP	Daily, Start on D+2 before 04:00	Published on M+1 WD15 before 04:00	XML
	Injection and Offtake per real/virtual CDS Market AP	Daily, Start on D+1 before 04:00	Published on M+1 WD10 before 04:00	CSV or XML
	Injection and Offtake per CDS Market AP and SP (in case of flexibility delivery and CRM)	Daily, Start on D+1 before 04:00	Published on M+1 WD10 before 04:00	CSV or XML
BRP, SUP	CDS Access Point	Daily, Start on D+1 before 08:00	Published on M+1 WD10 on 08:00. Note: messages are published as unvalidated since the validation responsibility lies with the CDSO.	CSV, XML and/or XLSX

Table 1 Message delivery frequency

1.3. CDS and Elia grid connection configuration

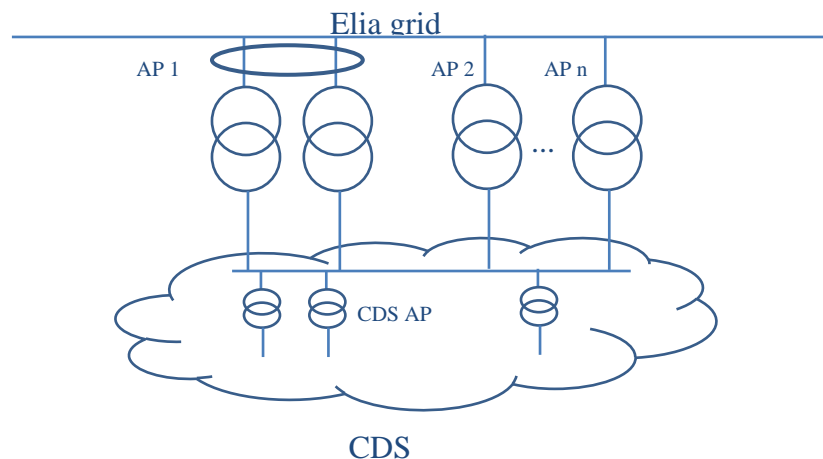


Figure 3 CDS connected directly to the Elia grid

This figure shows the general setup on how the Closed Distribution System is connected directly and exclusively to the Elia grid, as shown in the figure above. The CDS is connected to the Elia grid via one or several Access Points (AP) as mentioned in annex 6 of the Access contract. The CDS has its own Access Points (CDS AP) allowing its customers to connect to its CDS grid.

1.4. Related documents

More info about metering services is available from the Elia website:

- General metering page, including link to the general “Metering Manual” (for all other roles but CDSO):

<https://www.elia.be/en/customers/metering>

- Technical information, documentations, links...:

<https://www.elia.be/en/customers/customer-tools-and-extranet/metering>

For any other information please contact your Elia Key Account Manager or Metering services (email: Metering.Services@elia.be)

1.5. References

- Atrias - UMIG 6.0. (sd). [Current Market model | Atrias](#)
- ENTSO-E. (sd). *Harmonised Role Model*. <https://www.entsoe.eu/data/cim/role-models/>

Chapter 2 Processes and Data exchanges

2.1. Processes and Data exchanges for the settlement of imbalance

For the imbalance settlement process, and as mentioned in the annex 6 of the Access contract, the CDS Operator must perform the monthly allocation of all energy taken off and/or injected by his CDS and to communicate those to the market parties concerned, i.e., suppliers, BRPs and Elia.

Regarding data exchange there are two cases:

- The CDS Operator manages himself both allocation and communication to the market parties (see Section 2.1.1 Data exchange by the CDSO (standard))

The CDS Operator outsources part of its responsibilities about data exchanges to Elia (more particularly the communication to BRPs and suppliers) (see Section 2.1.2

Data exchange service offered by Elia for CDSO)

In the second case, the CDS Operator allocates the energy by virtual or real CDS Market Access Point, transmits these volumes to Elia and Elia communicates these volumes to BRP, SUP and GU (in case of real CDS Market Access Point).

2.1.1. Data exchange by the CDSO (standard)

The CDS Operator performs the monthly allocation of all energy taken off and/or injected by his CDS based on the topology of his network, the metering data of the CDS Grid Users (CDS GU) and their contracts with a supplier. In practice, the CDSO splits, on a quarter-hourly basis, all energy taken off and/or injected by the CDS including grid losses, between all the BRPs active within the CDS. Each CDS GU is included in the perimeter of the BRP designated by this CDS user (BRP 'active' in the CDS).

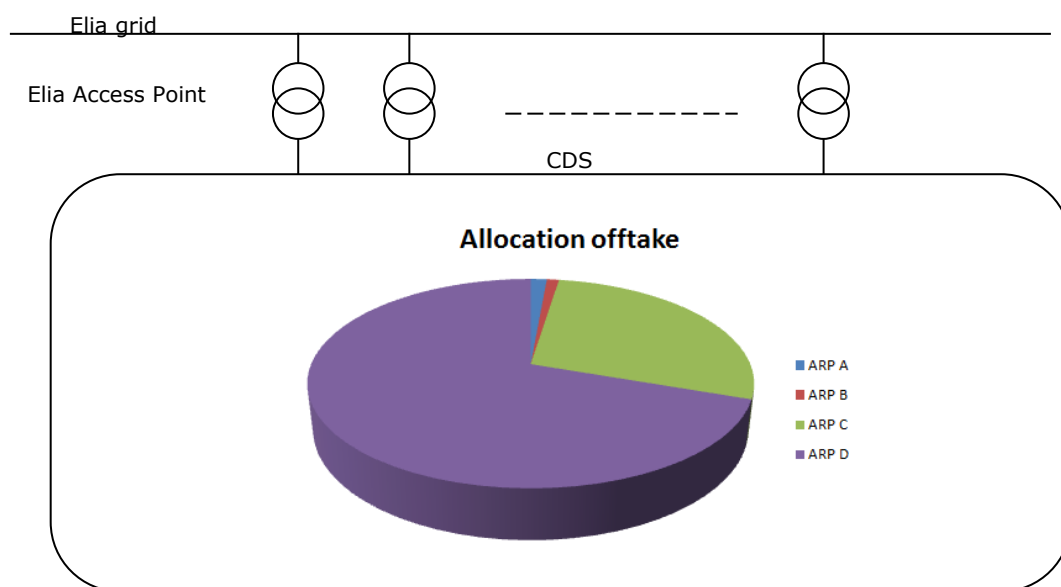


Figure 4 Example of standard CDS situation

Once the energy is allocated, the CDS operator sends these results monthly to the market parties concerned, i.e. suppliers, BRPs and Elia.

- 1) On D+1 before 08:00, Elia communicates to the CDSO the non-validated injected/taken energy by the CDS into/from the Elia grid for the beginning of the current month, per Access Point.

Note this is not a new message due to the transition to CDS, this message is already sent to all direct clients in their role as Grid User. This message is the "Access Point message" described in the GU Metering Manual.

- 2) On D+2 before 4:00, the CDSO communicates to Elia and the BRP a provisional non-validated allocation. This "pre-allocation" provides the split of the energy injected/taken from the Elia grid by the CDS per BRP.
- 3) On M+1 CD10 before 08:00, Elia communicates to the CDSO the validated injected/taken energy by the CDS into/from the Elia grid of the month M, per Access Point.

Note this is not a new message due to the transition to CDS, this message is already sent to all direct clients. This message is the "Access Point message" described in the GU Metering Manual

- 4) On M+1 WD15 before 4:00, the CDSO communicates to Elia the validated allocation per BRP of the energy injected/taken by the CDS into/from the Elia grid.
- 5) Elia controls on WD16 the allocation data and checks that volumes allocated quarterly correspond to offtakes/injections on the Elia grid.

The result of this allocation control is called "CDS Loop Losses (PBO)" and is actually a kind of "clearing differences". This result is published to the CDS Operator through the "CDS Loop Losses (PBO)" message described in Section 3.4.

In case of discrepancy, the CDS Operator identifies the source of the problem as quickly as possible and determines its magnitude. He communicates this information to Elia. The problem will either be corrected in a new allocation process or attributed to the BRP in charge of monitoring non-allocated energy. The UMIG re-run criteria¹ can be used to decide on the submission of new allocations. If there is a new allocation, the CDS operator must make the new allocation data available to Elia and the market parties.

No systematic PBO difference of null will be allowed.

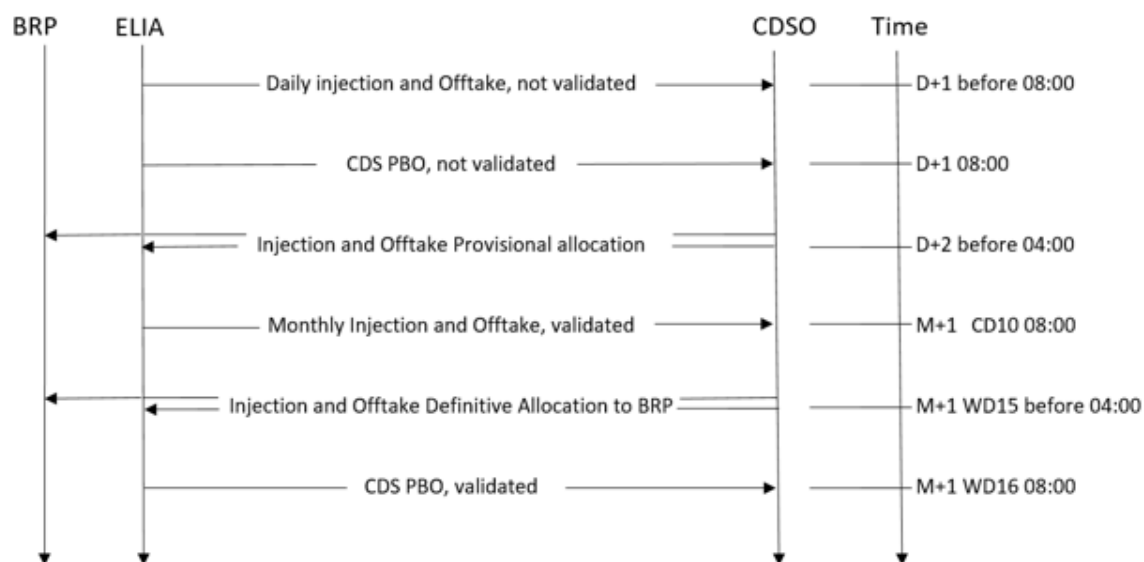


Figure 5 Metering data exchange for standard CDS

¹ UMIG - BR - SE - 02 - Allocation Process Electricity v6.5.1.31 – Paragraph 4.4.5.5.2

2.1.2. Data exchange service offered by Elia for CDSO

In this situation, the CDS Operator is still responsible for the monthly allocation of all energy taken off and/or injected by his CDS based on the topology of his network, the metering data of the CDS Grid Users (CDS GU) and their contract with their supplier.

However, the CDSO can transmit to Elia the injected/taken energy volumes per virtual or real CDS Market Access Points (CDS Market AP) as defined in the Appendix 3 of the Metering Contract between the CDSO and Elia on the exchange of the data required for the provision of the service. In practice, the CDSO splits, on a quarter-hourly basis, all energy taken off and/or injected by the CDS, including grid losses, between the different virtual/real CDS Market AP. Each CDS GU is associated to at least one of these virtual/real CDS Market AP.

Once the energy has been allocated to the virtual/real CDS Market AP, the CDS Operator sends these results on to Elia.

For this to be possible, virtual/real CDS Market AP within the CDS must be defined by the CDSO and an EAN must be attributed to each of those CDS Market AP. The EAN will be used as key between the CDSO and Elia and between Elia and the BRP/Supplier to identify the data to be sent.

Elia will then take the injected/taken energy of these virtual/real Access Points into account in the perimeter of the specified BRP and transmit these on a daily & monthly basis to the BRP and supplier.

The last publication from Elia to the suppliers & BRPs for the month M-1 will be done on the month M+1 WD10.

Elia will take the injected/taken energy of the virtual/real Market Access Points into account in the perimeter of the specified BRP. Elia will also transmit the received virtual/real Market Access Point to the BRP and supplier.

- 1) On D+1 before 04:00 the CDSO should communicate to Elia non-validated injected/taken energy by virtual/real Market Access Point.
- 2) On D+1 before 08:00, Elia communicates:
 - To the CDSO the non-validated injected/taken energy by the CDS into/from the Elia grid for the beginning of the current month, per Access Point.
Note: this is not a new message due to the transition to CDS, this message is already sent to all direct clients.
Note: Should the CDSO not be able to submit the data on D+1 before 04:00, as stated in step 1, but between D+1 04:00 and D+2 04:00, then Elia will only transmit the data to the BRP and SUP on D+2 08:00
 - To the BRP, Supplier and the CDSO non-validated injected/taken energy by virtual/real CDS Market AP into the CDS.
- 3) On M+1 CD10 before 08:00, Elia communicates to the CDSO the validated injected/taken energy by the CDS into/from the Elia grid of the month M, per Access Point.
Note that this is not a new message due to the transition to CDS, this message is already sent to all direct clients. This message is the
- 4) On M+1 WD10 before 04:00, the CDSO should communicate to Elia, the validated injected/taken energy by virtual/real Market Access Point.
- 5) On M+1 WD10 at 08:00, Elia communicates to the BRP, SUP and the CDSO himself the received validated injected/taken energy by virtual/real Market AP into the CDS.
Note these are new messages due to the transition to CDS subcontracted. This message is the "CDS Access Point message" described in the Section 2.4
- 6) Elia verifies on a quarter-hourly basis that the difference between the total volume (validated injected/taken energy) allocated to the virtual/real Market AP provided by the CDSO and the total energy injected/taken into/from the Elia grid is null.

The result of this calculation is called "CDS Loop Losses (PBO)" and is actually a kind of "clearing differences". This result is published to the CDS Operator through the "CDS Loop Losses (PBO)" message described in the Section 2.5

In case of discrepancy, the CDS Operator identifies the source of the problem as quickly as possible and determines its magnitude. He passes this information on to Elia. The problem will

either be corrected in a new allocation process or attributed to the BRP in charge of monitoring non-allocated energy. The UMIG re-run criteria² can be used to decide on the submission of new allocations. If there is a new allocation, the CDS manager must make the new allocation data available to Elia and the market parties.

No systematic PBO difference of null will be allowed.

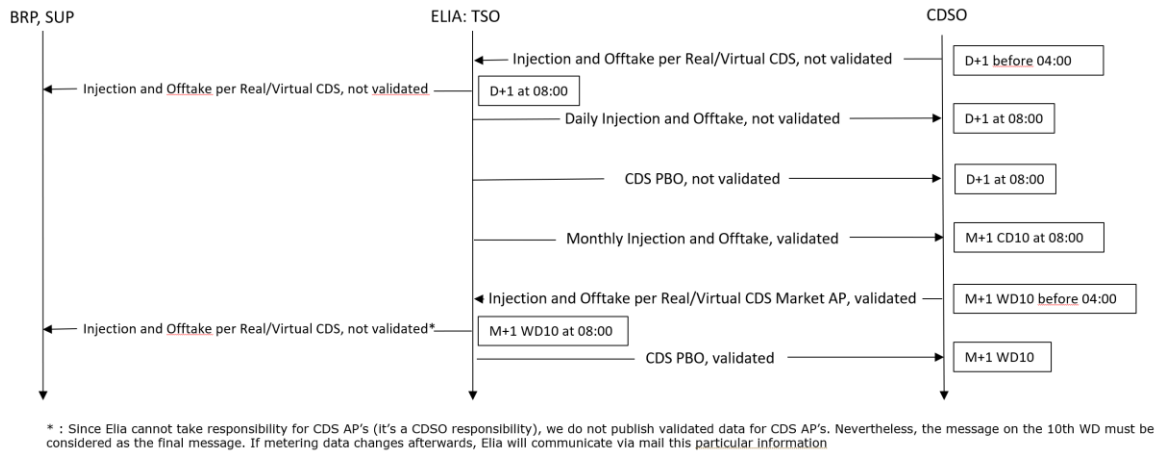


Figure 6 Metering data exchange for CDS having outsourced to Elia the data exchange to BRP & Supplier

² UMIG - BR - SE - 02 - Allocation Process Electricity v6.5.1.31 – Paragraph 4.4.5.5.2

2.1.2.1. Management of real or virtual CDS Market Access Points

The CDSO is responsible for maintaining a list of virtual/real Market Access Points. The identification key in the data exchange is the EAN attributed by the CDSO to the virtual/real CDS Access Points.

The CDSO is responsible for notifying Elia in case of changes in the list of virtual points. At the beginning, an initial table will be defined with the list of known points. An example is shown in Figure 7.

Note that this table is defined in Annex 3 of the "Contract for the provision by Elia of metering and data exchange Services" between the CDSO and Elia.

CDS Market AP EAN	CDS Market AP Name	Supplier GLN	BRP GLN	Start Date	End Date	CDS GU (optional)

Figure 7 Virtual/real CDS (Market) Access Point table

In case of a real CDS Market AP (which is part of the access register of the CDS), the CDS Grid User must be specified. In this case, the mentioned EAN must be the EAN of the access register of the CDS.

In the table, a start date and end date for the validity of the CDS Market Access Point must be specified. The table must be updated according to the evolution of contractual data within the CDS:

- In case a new virtual/real CDS Market AP is applicable, a new line must be added to the table.
- In case a virtual/real CDS Market AP is suppressed before the end date previously specified in the table, the table must be updated with the new end date.

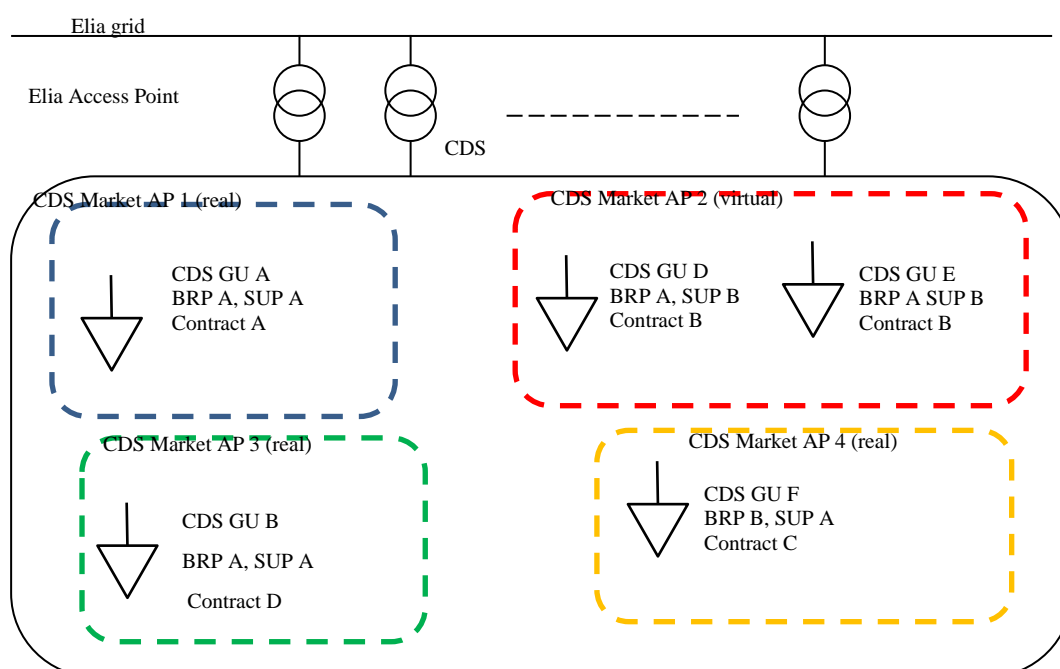


Figure 8 Example of contractual situation

The previous figure shows an example situation: topologically speaking, there are 5 CDS Market Access Points but in the context of this data exchange, the data are aggregated for one of them. Thus, the CDS AP of CDS GU D and CDS GU E can be merged into a single virtual CDS Market Access Point (for example because they share the same BRP, SUP and contract or any other reason defined by the CDS Operator).

2.1.3. Other needs to get started

The CDSO needs to deliver:

- EIC code (which is normally already known)
- 2 GLN codes. 1 GLN to identify his company (if not already known) and one to identify it's closed distribution network.
- 1 EAN code per real/virtual CDS AP
- 1 EAN code per SP (For SP's: Elia can deliver these for free if requested)

Elia has to deliver an FTP login for the test environment where messages are exchanged during the test phase (see further). Once the CDS is going into production, it might be necessary to have a login when the CDSO has not yet another FTP login as a company.

2.2. Processes and Data exchanges for other purposes

2.2.1. Production, Flexibility and CRM services provision within the CDS

For each CDS Grid User providing a flexibility service to Elia or participating to the CRM with a CMU, two points must be defined:

1. the SubAccess Delivery Point (SP)
2. the (real) CDS Market Access Point (CDS Market AP)

by means of an identifier (EAN), defined by the CDSO, and the related metering equation if any. The SubAccess Delivery Point (SP) is the point (or group of points) in the CDS where a flexibility or CRM service is provided.

The CDS Market AP is the real Access Point (part of the CDS access register) where the CDS Grid User provides the flexibility or CRM service. The EAN of the CDS Market AP must be the EAN of the access register of the CDS.

The following figure provides an example situation: in this case the CDS Market AP is made up of an aggregation of three different meters and the SP corresponds to two of them.

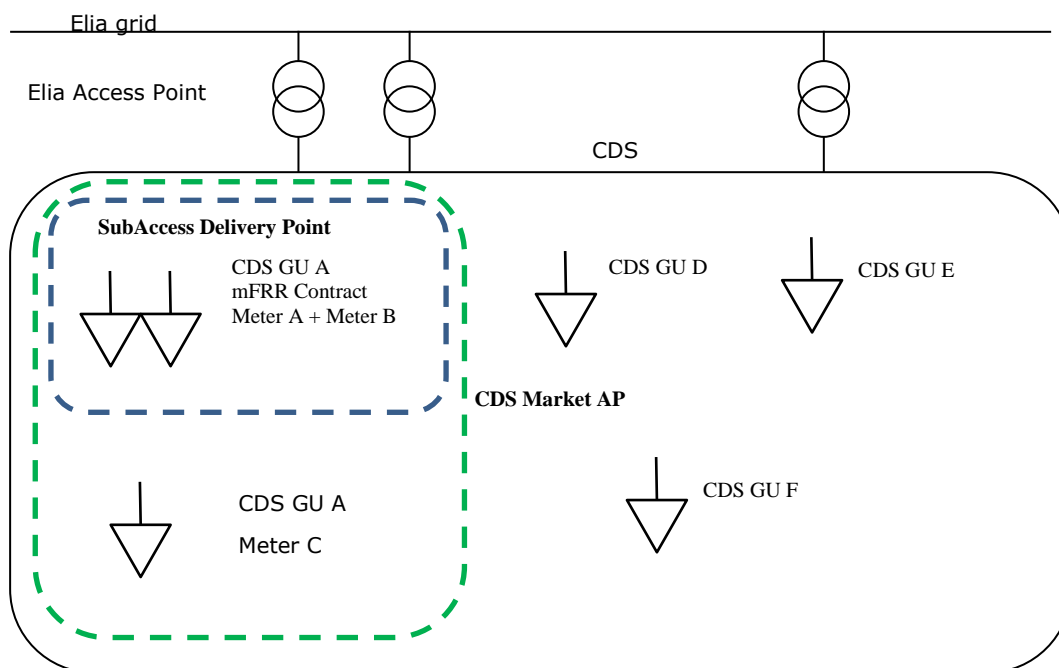


Figure 9 Example situation of SP and CDS Market AP

The data submitted by the CDS Operator (CDSO) must contain the following information:

- file creation date;
- concerned period (only monthly period /file are accepted);
- EAN identifier of the SubAccess Delivery Point and the CDS Market Access Point for which (aggregated) metering data are being sent;
- quarter-hour time series of active power, with a validity status for each quarter-hour.

These files can be sent via CSV or XML (see further in this document, section 4.1.3 and 4.2.2).

The process is as follows:

1. On D+1 before 04:00, the CDSO submits to Elia the injection and offtake energy at the CDS Market AP and the SP.
2. On M+1 WD10 before 04:00, the CDSO submits to Elia the validated injection and offtake energy at the CDS Market AP and the SP.

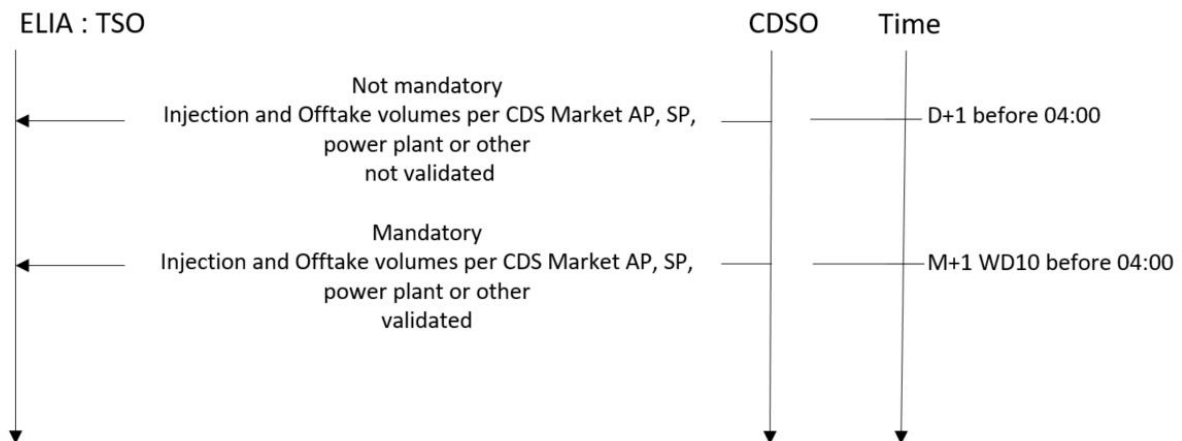


Figure 10 Metering exchange for CDS for other purposes to be sent to Elia

When there are power plants inside the CDS Network for which there are reporting needs (green certificates, transparency regulation, ...), the CDSO has to deliver this power plant data in the same way as it has to be done with SP, namely to deliver validated injection and offtake volumes before M+1 WD10 before 04:00. In general, all metering information except for allocation data has to be retrieved by Elia at M+1 WD10 before 04:00.

Chapter 3 Description of Metering Messages sent by Elia

This chapter describes the structure of metering message types sent by Elia to the CDSO. It describes how the parameters and type of metered data introduced in the Metering Manual Concepts are incorporated into the messages and is targeted principally at operational staff.

Note: the delivery frequency of the messages is summarized at section "1.2.8 Regulated messages & message delivery frequency". Please look to the other metering manuals on Elia's website to find the messages delivered for other roles than the CDSO role.

3.1. Access Point

An Access Point (AP) corresponds to an Injection and/or Offtake Point to the Elia Grid. Every Access Point is associated with one or more meter(s).

Clients receive messages containing the aggregated metering data values for each Access Point specified in their contracts with Elia.

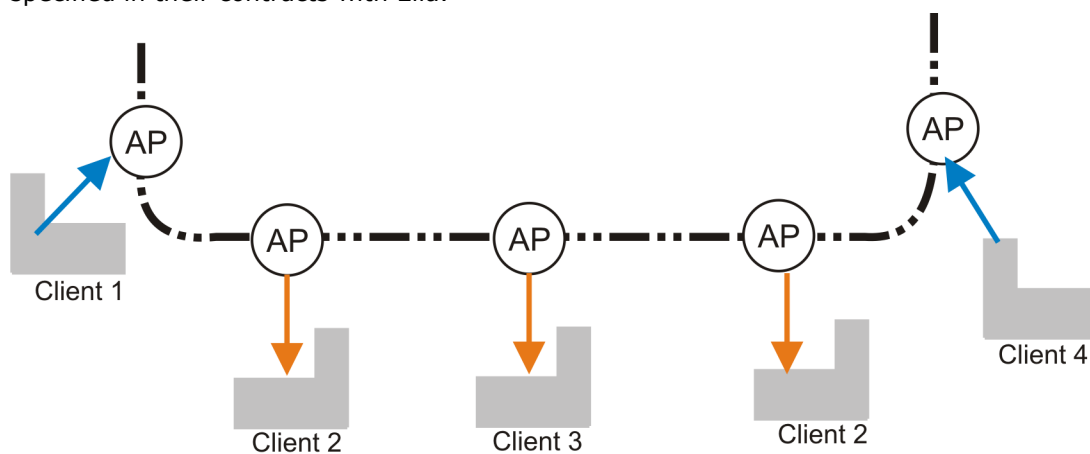


Figure 11 Access Points

Access Point messages are received by clients who can be producers or consumers of energy, or both. The direction of the energy flow is indicated in the message and the values are always positive. These messages identify the client, the Access Point, and all the parameters describing the power transferred as well as the actual power values.

All parameters used to describe power values are explained in the Metering Manual Concepts.

Access Point messages identify the client, the Access Point, the time period, all the parameters used to describe the power values and the actual power values. This message content can be delivered in one of three formats: CSV described in section 2.1.1 below, XML format described in section 2.1.2 and Excel (XLSX) format described in section 2.1.3.

3.1.1. CSV Access Point

Access Point messages contain a [header] row, a [data] row, [schedule] sections and an [end] row. An example of a CSV Access Point message is shown below. This example contains three [data] sections each referring to different power types (Active, Capacitive, and Inductive) at one Access Point.

```
[header];10X1001A1001A094;22XXXXXXXXXXXXC;2005-06-08T06:03:17+02:00
[data];10X1001A1001A094;CONS;541453105585999982
[schedule];2005-06-06T22:00:00Z;1440;15;A;N;NC;ALP;W;False; 0;N; 0;N; 0;N; 0;N;
0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N;
0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N;
0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N;
0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N; 0;N;
0;N; 0;N
[end]
```

Example 1 CSV Access Point message

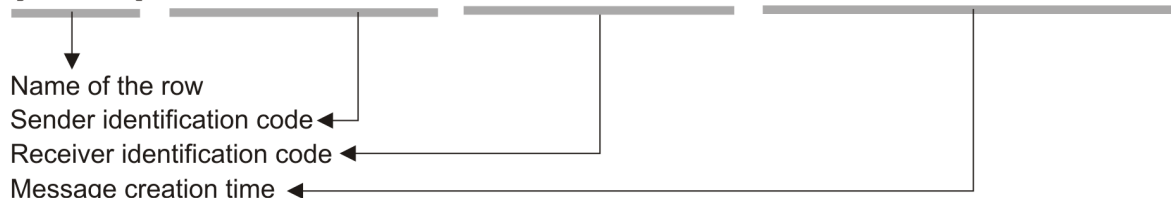
Note that this example's presentation shows the overall message structure rather than the complete contents. Only the first of the power values is shown in each of the [schedule] sections. The Access Point Message consists of the following sections:

- [header]
- [data]
- [schedule]
- [end] – which is the last line indicating the end of the message. All characters following [end] must be ignored.

3.1.1.1. [header]

The [header] row contains information about the sender and the receiver of the message as well as the time of creation of the message. There is only one [header] row in the message.

[header];10X1001A1001A094;22XXXXXXXXXXXXC;2005-06-08T06:03:17+02:00



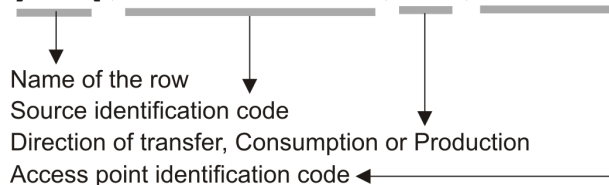
Field	Name	Data type	Comment
1	Name of the row	String	Fixed. Always [header]
2	Sender identification code	String	EIC company code of the sender of the message i.e. Elia
3	Receiver identification code	String	EIC company code of the receiver of the message.
4	Message creation time	Date	Date and time of the file creation in Iso format.
5	Message type	String (optional)	This optional field is reserved for future use but may contain the type of message.
6	Version	String (optional)	This optional field is reserved for future use but may contain the version of the message.

Table 2 CSV Access Point [header] fields

3.1.1.2. [data]

A [data] row contains information about metering values. A [data] section is always followed by at least one [schedule] section. There can be several [data] sections that correspond to different directions. The [data] section identifies the source of the metering data, the direction in which the power flows and the Access Point.

[data] ;10X1001A1001A094;CONS;541453105585999982



Many [data] rows may be used for different schedules

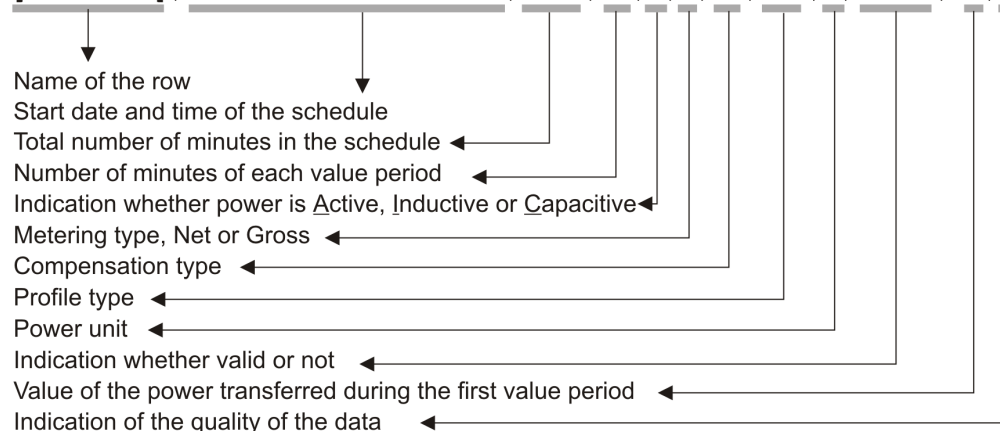
Field	Name	Data type	Comment
1	Name of the row	String	Fixed. Always [data]
2	Source identification code	String	EIC company code of the source of the metering data (Elia)
3	Direction of transfer	String	Identification of the direction of flow (see section Metering Manual Concepts). Possible values are: - PROD: Production of active energy (flow from client to Elia) - CONS: Consumption of active energy (flow from Elia to client)
4	Access Point identification code	String	EAN (18-digit) code of the Access Point at which the data is metered.

Table 3 CSV Access Point [data] fields

3.1.1.3. [schedule]

A [schedule] section contains the actual power values transferred over the specified time period and identifies the type of power. For any one Access Point (identified in the [data] section) there can be a number of [schedules], those distinguishing the separate transfer of Active and Inductive power for example. The fields contained in the [schedule] are listed below; the general meaning of these fields can be found in The Metering Manual Concepts.

[schedule] ;2005-06-06T22:00:00Z;1440;15;A;N;NC;ALP;W;False; 0;N;...



Only positive power values are allowed in the Access Point message.

Field	Name	Data type	Comment
1	Name of the row	String	Fixed. Always [schedule]
2	Start date and time	Date	Start date and time of the schedule in ISO 8601 format (see section "3.5.2 XML elements")
3	Duration	Integer	Total number of minutes in the schedule.
4	Period	Integer	Number of minutes for each value period. Always 15.
5	Power type	String	Identification of the type of power (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • A: Active • I: Inductive • C: Capacitive
6	Metering type	String	Indication as to whether the values are net, gross or specific (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • N: Net • G: Gross • GG: "Green Gross"
7	Compensation type	String	Indication as to whether the values compensated or not (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • NC: Non-Compensated. Used for metering purposes. • C: Compensated. Used for billing purposes • A: Reserved for future use • CC: Compensated Corrected Used for specific purposes
8	Profile type	String	Indication of the load profile. This field is reserved for possible future use and has no significant meaning. Possible values are: <ul style="list-style-type: none"> • ALP: Aggregated Load Profile • ULP: Undefined load profile
9	Power unit	String	Unit in which the power values are defined. Possible values are: <ul style="list-style-type: none"> • KWT, KVR, • W, KW, MW, • VAR, KVAR, MVAR
10	Validation	Boolean	Indication as to whether the values are validated or not (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • True: validated by Elia • False: not validated by Elia
11 to 203 in steps of 2	Value	Unsigned Decimal	Value of the transferred power. The value is always positive. The value is expressed in the defined unit and contains a maximum of 3 digits after the decimal point.

12 to 204 in steps of 2	Quality	1 char	<p>Indication as to the quality of the metered data (see Metering Manual Concepts).</p> <p>Possible values are:</p> <ul style="list-style-type: none"> • N: Normal • I: Inexact • S: Substituted (Estimated replacement).
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Table 4 CSV Access Point [schedule] fields

3.1.2. XML Access Point

Access Point metering data is delivered in an XML file with the root element <AccessPointValues>. The <AccessPointValues> file consists of a <header> element, which refers to the message and a <data-list> element which contains the power transfer data.

```
<?xml version="1.0" encoding="iso-8859-1"?>
<AccessPointValues xmlns="http://www.elia.be/namespaces/public/evms/b2bmsg">
  + <header>
  + <data-list >
</AccessPointValues>
```

Example 2 XML Access Point message root

3.1.2.1. <header>

The single <header> element contains information about the sender of the message (Elia) and the receiver as well as the time when the message was created.

```
<header>
+ <sender> (contains fields identifying the sender)
+ <receiver> (contains fields identifying the receiver)
  <timestamp>2004-02-05T09:31:10Z</timestamp>
</header>
```

Example 3 XML Access Point message <header>

The contents of the <header> element are listed in the table below.

Element name	Element content	Content type	Cardinality	Description
<sender>	elements	<party> elements, (see section 3.5.2.1).	mandatory	Identification of message sender
<receiver>	elements		mandatory	Identification of message receiver
<timestamp>	text	date	mandatory	Creation time of the message

Table 5 XML <header> element for Access Point messages

3.1.2.2. <data-list>

The <data-list> can contain one or more <data> element.

```
<data-list>
+ <data>
</data-list>
```

Example 4 XML Access Point message <data-list>

The <data> element describes the flow of the power (from and to the parties concerned), the schedule of actual power values and the Access Point. The direction of the transfer of power is indicated by the optional <partyFrom> and <partyTo> elements.

```
<data>
+ <partyFrom> (fields defining the flow of energy)
+ <partyTo>
  <schedule-list>
  + <schedule> (describes the power and the values)
  </schedule-list>
+ <point> (contains fields identifying the Access Point)
</data>
```

Example 5 XML Access Point message <data>

The general meaning of these fields is given in The Metering Manual Concept. The contents of each <data> element are listed in the table below.

Element name	Element content	Content type	Cardinality	Description
<partyFrom>	elements	<party> elements, (see section 3.5.2.1).	mandatory	Fields identifying the party FROM which the power is flowing.
<partyTo>	elements		mandatory	Field identifying the party TO which the power is flowing
<schedule-list>	elements	<schedule> elements (see section 3.5.2.3).	mandatory	Fields identifying the characteristics of the transferred power and the values.
<point>	elements	<point> elements (see section 3.5.2.2).	mandatory	Fields identifying the Access Point

Table 6 XML <data> element for Access Point messages

3.1.3. Excel (XLSX) Access Point

The Excel file contains one sheet named from the Access Point EAN code: this sheet contains all information about the Access Point at the given month.

The top rows contain information about the receiver, the Access Point code and name and the time of creation (last update) of the message.

Subsequent area of the sheet is divided into columns:

- The first lines of the columns give information about the metering data (direction of the flow, power type, metering type, compensation type)
- The quarter hourly values give the power value and the quality for the mentioned metering data

An example of Excel format Access Point message is shown below. This example contains four metering columns each referring to diverse types of metering at one Access Point.

	A	B	C	D	E	F	G	H	I	J	K
1	Company	22XXXXXXXXXXC		Test company							
2	Meterable	541453167414516216		Access Point test							
3	Last Update	23-04-2014									
4	Validation Status	Non validated by Elia									
5											
6	Meterable type			Outgoing Active Gross		Outgoing Active Net		Incoming Active Gross		Incoming Active Net	
7				Compensated	Quality	Compensated	Quality	Compensated	Quality	Compensated	Quality
8											
9											
10	Monthly energy			0 KWh	Invalid	0 KWh	Invalid	0 KWh	Invalid	0 KWh	Invalid
11											
12	Quarter hourly values										
13	Date	From	To	W		W		W		W	
14	01-01-2015	00:00	00:15	0	I	0	I	0	I	0	I
15	01-01-2015	00:15	00:30	0	I	0	I	0	I	0	I
16	01-01-2015	00:30	00:45	0	I	0	I	0	I	0	I
17	01-01-2015	00:45	01:00	0	I	0	I	0	I	0	I
18	01-01-2015	01:00	01:15	0	I	0	I	0	I	0	I
19	01-01-2015	01:15	01:30	0	I	0	I	0	I	0	I
20	01-01-2015	01:30	01:45	0	I	0	I	0	I	0	I
21	01-01-2015	01:45	02:00	0	I	0	I	0	I	0	I
22	01-01-2015	02:00	02:15	0	I	0	I	0	I	0	I
23	01-01-2015	02:15	02:30	0	I	0	I	0	I	0	I
24	01-01-2015	02:30	02:45	0	I	0	I	0	I	0	I
25	01-01-2015	02:45	03:00	0	I	0	I	0	I	0	I
26	01-01-2015	03:00	03:15	0	I	0	I	0	I	0	I
27	01-01-2015	03:15	03:30	0	I	0	I	0	I	0	I
28	01-01-2015	03:30	03:45	0	I	0	I	0	I	0	I

Figure 12 Sheet in a CSV Access Point message

The Access Point Excel sheet consists of the following sections:

- A header section.
- A set of columns headers.
- A set of columns values.

3.1.3.1. Header

The header contains reference of the Access Point and the receiver.

	A	B	C	D
1	Company	22XXXXXXXXXXXXC		Test company
2	Meterable	541453167414516216		Access Point test
3	Last Update	23-04-2014		
4	Validation Status	Non validated by Elia		

Figure 13 Access Point message header

Excel Cell	Name	Data type	Comment
B1:C1 (merged cells)	Receiver identification code	String	EIC company code of the receiver of the message.
D1:F1 (merged cells)	Receiver name	String	Name of the company receiver of the message. Note this is a "display name" that can be different from the official name of the company
B2:C2 (merged cells)	Access Point identification code	String	EAN (18-digit) code of the Access Point at which the data is metered.
D2:F2 (merged cells)	Access Point name	String	Name of the Access Point at which the data is metered
B3:C3 (merged cells)	Last update date	Date and time	Date and time of the creation of the highest version of this document.
B4:C4 (merged cells)	Validation	String	Indication as to whether the values are valid or not (see Metering Manual Concepts) Possible values : <ul style="list-style-type: none"> "validated by Elia" "Non-validated by Elia"

Table 7 Excel Access Point header fields

3.1.3.2. Columns header

From the 4th column, 2 columns identify the source of each metering data metered at the Access Point. An Excel sheet can contain 1 or more sets of columns.

For one column (example Column 4):

	A	B	C	D
6	Meterable type			Outgoing
7				Active
8				Gross
9				Compensated

Figure 14 CSV Access Point message – columns header

The content of the header is listed in the table below:

Line	Name	Data type	Comment
6	Direction of transfer	String	Identification of the direction of flow (see Metering Manual Concepts). Possible values are: "Incoming": Production of active energy (flow from client to Elia) "Outgoing": Consumption of active energy (flow from Elia to client)
7	Power type	String	Identification of the type of power (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • Active • Inductive • Capacitive
8	Metering type	String	Indication as to whether the values are net or gross or specific (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • N: Net • G: Gross • GG: "Green Gross"
9	Compensation type	String	Indication as to whether the values compensated or not (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • NC: Non-Compensated. Used for metering purposes. • C: Compensated. Used for billing purposes • A: Reserved for future use • CC: Compensated Corrected Used for specific purposes
10	Sum of the monthly energy		Excel formula = the sum of all quarter hourly values and related unit
13	Power unit	String	Unit in which the power values are defined. Possible values are: <ul style="list-style-type: none"> • KWT, KVR, • W, KW, MW, • VAR, KVAR, MVAR

Table 8 Excel Access Point column metering reference

3.1.3.3. Columns values

The same columns (starting from the 4th column), contain the metering values and their quality (in the next column) All the quarter hourly values of the month are present. Only positive power values are allowed in the Access Point message.

Column	Name	Data type	Comment
4, 6, 8, 10, 12, etc.	Value	Unsigned Decimal	Value of the transferred power for the given quarter. The value is always positive. The value is expressed in the defined unit and contains a maximum of 3 digits after the decimal point. If there is no decimal, then no decimal point
5, 7, 9, 11, 13, etc.	Quality	1 char	Indication as to the quality of the metered data for the given quarter (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none">• N: Normal• I: Inexact• S: Substituted (Estimated replacement).

Table 9 Excel Access Point columns cells

Remark: The decimal point, in Excel, being subject to the settings, it can be different from the figure shown in this document.

3.2. SubAccess Delivery Point

The SubAccess Delivery Point (SP), also known as Submetering Delivery Point refers to a point:

- within the electrical facilities of a grid user downstream of an Access Point connected to the Elia Grid
- or within a CDS connected to the Elia Grid

from which a flexibility service can be delivered to Elia. Every SubAccess Delivery Point is associated with one or more meter(s).

The metering data are published to the flexibility supplier via the generic role of the Balance Service provider (BSP) /Flexibility Service Provider (FSP) if the SubAccess Delivery Point delivers flexibility services.

The flexibility service can be:

- Strategic Demand Reserve (SDR)
- mFRR DP_{PG}
- DA/ID service
- Any future service

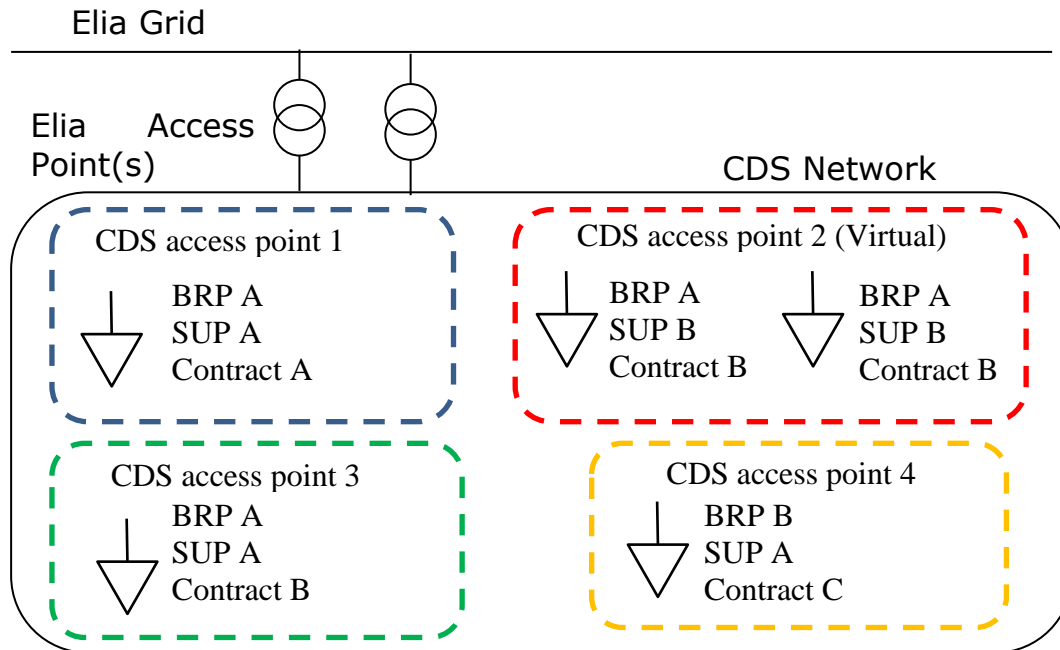
All parameters used to describe power values are explained in The Metering Manual Concept.

The SubAccess Delivery Point message contains the same information and follow the same structure as the Metering Point message described in Section 2.3.

Only the name of the file contains "SP" and not "MP".

3.3. CDS Access Point

A 'Closed Distribution System Access Point' or 'CDS Access Point' is the access point to the Closed Distribution System of a Closed Distribution System User, where all its physical Injections and/or Off-takes of Active Power within the Closed Distribution System can be aggregated (virtually if applicable).



Metering data messages are sent by the CDS Operator to Elia and – in the case Elia is the outsourced party by the CDSO – republished by Elia to the CDS grid user (only in case of real Access Point), BRP, Supplier and BSP according to the contracts of these clients.

CDS Access Point messages identify the client, the CDS Access Point, the time period, all the parameters used to describe the power values and the actual power values. They follow the "Metering Point" format.

All parameters used to describe power values are explained in The Metering Manual Concept. Full details on all the descriptive fields and the possible values they can take can be found in:

- section 3.3.1 (for the CSV format messages)
- Section 3.3.2 (for the XML format messages)
- section 3.3.3 (for the XLSX format messages)

3.3.1. CSV CDS Access Point message

CDS Access Point messages contain a [header] row, a [data] row and [schedule] sections. An example of a CSV CDS Access Point message is shown below.

```
[header];10X1001A1001A094;22XXXXXXXXXX--Z;2007-02-15T07:59:33+01:00
[data];10X1001A1001A094;CONS;541453114157831663
[schedule];2006-12-31T23:00:00Z;1440;15;A;;;ALP;KW;False; 133.6;N; 85.2;N; 95.6;N;
211.2;N;-621.6;N; 164.8;N;-1231.6;N; 150;N; 148.4;N; 203.6;N; 31.2;N; 278;N;
176.8;N; 292.4;N; 344.4;N; 63.6;N; 206;N; 191.2;N; 176;N; 143.6;N; 174.4;N;
123.6;N; 212;N; 24;N;-52;N; 24.8;N; 47.6;N; 32;N; 203.6;N; 13.2;N;-0.8;N;-58.8;N;
402.8;N; 132;N; 131.2;N;-25.2;N;-120.4;N;-8;N;-157.2;N;-226.8;N;-97.6;N;-148;N;-
200;N;-105.6;N;-72.8;N; 27.6;N;-128;N;-253.2;N;-518;N;-20.4;N; 42.8;N;-37.2;N;
163.6;N;-9.2;N; 342.8;N; 8;N; 2.8;N; 143.6;N; 71.2;N; 250.8;N;-81.6;N; 40;N;
152.4;N;-72.8;N; 7.2;N;-63.2;N;-132;N;-362.4;N;-615.6;N;-430.8;N;-49.6;N;-96;N;
141.6;N; 51.6;N; 103.2;N; 63.6;N; 144.4;N;-38;N; 17.6;N; 130;N; 172;N; 107.2;N;-
24.8;N; 182.8;N; 37.2;N; 148.8;N; 22;N; 147.6;N;-637.2;N; 42.4;N; 852;N; 62.4;N;-
281.2;N; 334.4;N; 324.8;N; 223.2;N
[schedule];2007-01-01T23:00:00Z;1440;15;A;;;ALP;KW;False; 231.2;N; 162.4;N;-1094;N;
182.8;N;-338;N; 281.6;N; 123.2;N; 283.2;N;-411.6;N; 281.6;N; 364;N; 207.6;N;
217.6;N; 101.2;N; 166.4;N; 39.6;N; 117.6;N; 110.8;N;-29.6;N; 16.8;N;-100.4;N;
52;N;-84.8;N;-54.8;N;-536;N;-1352.8;N;-352.4;N;-600.8;N;-30.8;N;-396;N;-372;N;-
44.4;N; 197.6;N;-459.6;N; 239.2;N;-315.6;N; 99.2;N;-493.6;N;-350.4;N;-165.6;N;-
142.4;N; 70.4;N;-98.8;N; 2;N;-247.6;N;-172;N;-139.2;N;-131.6;N;-334.4;N; 57.6;N;
203.2;N;-3.6;N; 194.4;N;-20;N; 572.8;N; 341.2;N; 176.8;N;-382;N;-240.4;N;-62.8;N;
261.2;N;-46.4;N; 74.8;N;-267.6;N;-60.4;N;-79.6;N;-182.4;N;-350;N;-280.4;N;-
290.8;N;-426.4;N;-31.6;N;-116;N; 188.8;N; 273.6;N; 170.4;N; 17.6;N; 278.4;N;-
187.2;N; 219.2;N; 630.4;N; 80;N;-483.2;N; 204.8;N; 375.2;N; 279.6;N; 352.8;N;
340;N;-542.8;N; 299.2;N; 538;N; 315.6;N; 32;N; 204.8;N; 144;N; 470.8;N
[end]
```

Example 6 CSV CDS Access Point message

CDS Access Point messages follow the same structure as Metering Points. See Section 2.3.

3.3.1.1. [header]

The [header] of the message defines the sender and receiver of the message as well as the time of its creation. There is only one [header] row in the message.

[header] ;10X1001A1001A094;22XXXXXXXXXX--Z;2007-02-15T07:59:33+01:00

↓
Name of the row
Sender identification code
Receiver identification code
Message creation time

3.3.1.2. [data]

Each [data] section identifies the source of the metering data, the direction of the power flow and the access (metering) point to which the data relates.

[data] ;10X1001A1001A094;CONS;541453114157831663

↓
Name of the row
Source identification code
Direction of transfer, Consumption or Production
Access point identification code

3.3.1.3. [schedule]

The [schedule] section contains the metered values for the corresponding [data] section. Each [schedule] section identifies all the parameters used to describe the metered quantity as well as the actual metered values.

[schedule] ;2006-12-31T23:00:00Z;1440;15;A;;;ALP;KW;False;133.6;N;...

↓
Name of the row
Start date and time of the schedule
Total number of minutes in the schedule
Number of minutes of each value period
Indication whether power is Active, Inductive or Capacitive
Metering type, Net or Gross
Compensation type
Profile type
Power unit
Indication whether valid or not
Value of the power transferred during the first value period
Indication of the quality of the data

Details on all the values that these fields can take are given in section 2.3.1.

3.3.2. XML CDS Access Point message structure

Closed Distribution System Access Point metering data is delivered in an XML file with the root element <MeteringPointValues>

```
<?xml version="1.0" encoding="iso-8859-1"?>
<MeteringPointValues xmlns="http://www.elia.be/namespaces/public/evms/b2bmsg">
  + <header>
  + <data-list >
</MeteringPointValues >
```

Example 7 XML CDS Access Point message root

The single <header> element contains information about the sender of the message (Elia) and the receiver as well as the time when the message was created.

```
<header>
  + <sender> (contains fields identifying the sender)
  + <receiver> (contains fields identifying the receiver)
  <timestamp>2004-02-05T09:31:10Z</timestamp>
</header>
```

Example 8 XML CDS Access Point message <header>

The <data-list> can contain one or more <data> element.

```
<data-list>
  + <data>
</data-list>
```

Example 9 XML CDS Access Point message <data-list>

The <data > element describes the flow of the power (from and to the parties concerned), the schedule of actual power values and the Access Point.

```
<data>
  + <partyFrom> (fields defining the flow of energy)
  + <partyTo>
  <schedule-list>
    + <schedule> (describes the power and the values)
  </schedule-list>
  + <point> (contains fields identifying the Access Point)
</data>
```

Example 10 XML CDS Access Point message <data>

The general meaning of these fields is given in The Metering Manual Concepts and a full description of all the fields and the values they can take is given in section 2.1.2.

3.3.3. Excel CDS Access Point message structure

The Excel file contains one sheet named from the CDS Access Point EAN code: This sheet contains all information about the CDS Access Point for the given month:

The top rows contain information about the receiver, the CDS Access Point EAN code and name and the time of creation (last update) of the message.

Subsequent areas of the sheet are divided into columns. The first lines of the columns give information about the metering data (direction of the flow, power type, metering type, compensation type)

	A	B	C	D	E	F
1	Company					
2	Meterable	541453138157290220				
3	Last Update	23-04-2014				
4	Validation Status	Non validated by Elia				
5						
6	Meterable type			Incoming		
7				Active		
8				Net		
9				Alternative	Quality	
10	Monthly energy			0 KWh	Invalid	
11						
12	Quarter hourly values					
13	Date	From	To	W		
14	01-01-2015	00:00	00:15	0	I	
15	01-01-2015	00:15	00:30	0	I	
16	01-01-2015	00:30	00:45	0	I	
17	01-01-2015	00:45	01:00	0	I	
18	01-01-2015	01:00	01:15	0	I	
19	01-01-2015	01:15	01:30	0	I	
20	01-01-2015	01:30	01:45	0	I	
21	01-01-2015	01:45	02:00	0	I	
22	01-01-2015	02:00	02:15	0	I	
23	01-01-2015	02:15	02:30	0	I	
24	01-01-2015	02:30	02:45	0	I	
25	01-01-2015	02:45	03:00	0	I	
26	01-01-2015	03:00	03:15	0	I	
27	01-01-2015	03:15	03:30	0	I	
28	01-01-2015	03:30	03:45	0	I	
29	01-01-2015	03:45	04:00	0	I	

Example 11 Excel (XLSX) CDS Access Point message

CDS Access Point messages follow the same structure as Metering Points. See Section 2.3.

3.4. CDS Loop Losses (PBO)

As mentioned in appendix 6 and 6bis of the Access Contract, Elia controls the allocation data and checks that volumes allocated quarter-hourly correspond to offtakes/injections on the Elia grid.

The result of this allocation control is called "CDS Loop Losses (PBO)" and is actually a kind of "clearing differences". This result is published to the CDS Operator through the "CDS Loop Losses (PBO)" message and the BRP through the "imbalance message" (see 2.5.7 "Imbalance components").

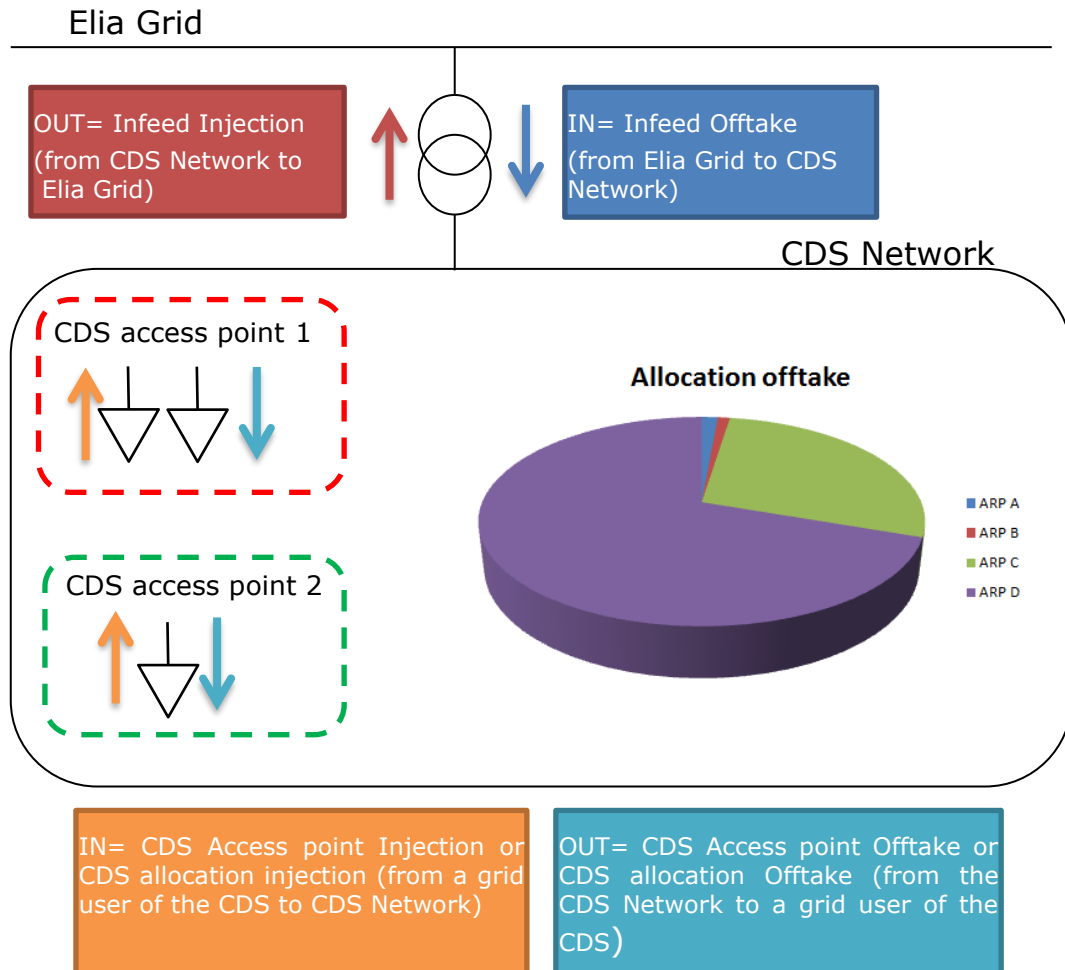


Figure 15: CDS Loop losses (PBO) directions

As the difference of "classical" messages explained before in this document, the "CDS Loop Losses (PBO)" message contains components. A component within a message represents a business flow. This is the same concept as the components within the Imbalance message (see 3.4.7 "Imbalance components"). Each component is supposedly well known by the recipient and published to facilitate the analysis in case of error: its detailed business meaning is not described in this document. The list of components is given in "3.4.1 CDS Loop Losses (PBO) components". Each component is considered as having a direction: the section "3.4.3 CDS Loop Losses (PBO) components added parameters" shows the possible direction with following meaning:

- IN = The energy is coming in the CDS from the Elia Grid or from a grid user of the CDS (through a CDS Access Point)
- OUT = The energy is going out the CDS to the Elia Grid or to a grid user of the CDS (through a CDS Access Point)

Full details on all the descriptive fields and the possible values they can take can be found in section 3.4.4 (for the CSV format messages), section 3.4.5 (for the XML format messages) and section 3.4.6 (for the XLSX format messages).

3.4.1. CDS Loop Losses (PBO) components

The business concepts behind each component are explained in the contractual document given to the CDS Operator. This manual gives only a brief description.

The CDS Loop Losses (PBO) components that are part of the message:

Component	Description
CDSLoopLosses	Loop losses (PBO) of a CDS Network give the result of the allocation control and is given by the following equation: $\Sigma \text{ direction IN} - \Sigma \text{ direction OUT}$ (of subcomponents explained here below). This component can have as well positive as negative values.
CDSInfeedOfftakeTotal	Total energy coming from Elia network to CDS network through the Elia Access Points feeding the CDS network
CDSInfeedInjectionTotal	Total energy coming from the CDS network to Elia network through the Elia Access Points feeding the CDS network
CDSAllocationOfftakeTotal	Total of allocations offtake for a CDS Network (OUT = means energy coming from the CDS to the BRP)
CDSAccessPointsOfftakeTotal	Total of the CDS Access Points in the direction Offtake (OUT = energy going out the CDS network to a CDS Grid User) The CDS Access Points are defined in the CDS data exchange contract.
CDSAllocationInjectionTotal	Total of allocations injection for a CDS Network (IN = means energy coming from the BRP to the CDS)
CDSAccessPointInjectionTotal	Total of the CDS Access Points in the direction Injection (IN = energy coming in the CDS network from a CDS Grid User) The CDS Access Points are defined in the CDS data exchange contract.

Remarks:

This list could vary if new components of the CDS Loop Losses (PBO) are identified, or some components removed following the contract of the CDS Operator or new market rules. It is highly recommended that the system that will read the message has not to be based on the order of the components but on the components, criteria's explained here below.

3.4.2. CDS Loop losses (PBO) components criteria

In the following list the columns must be understood as:

- **Component:** See here below
- **Flow direction:** the flow of energy within the CDS: See beginning of this section.
- **Possible negative value?:** Normally the energy follows the flow indicated within the column 'Flow direction' in the table below, but the result of the allocation control can flow in the other direction. In this case, the quarter value is negative.

Component	Flow direction	Possible negative values?
CDSLoopLosses	In	Yes
CDSInfeedOfftakeTotal	In	No
CDSInfeedInjectionTotal	Out	No
CDSAllocationOfftakeTotal	Out	No
CDSAccessPointsOfftakeTotal	Out	No
CDSAllocationInjectionTotal	In	No
CDSAccessPointInjectionTotal	In	No

3.4.3. CDS Loop losses (PBO) components added parameters

Each component of the CDS Loop Losses (PBO) message concerns the CDS area and refers to its CDS network EAN (these EAN codes are also used in the nomination system).

See: [Nominations \(elia.be\)](http://Nominations.elia.be) for the complete list.

Currently following CDS Networks are available:

541453185522017586	-	DNB Brussels Airport	_	Zaventem
541453176864035840	-	BASF Antwerpen		
541453173171146450	-	ArcelorMittal Belgium	_	Seraing
541453118417028657	-	ArcelorMittal Belgium	_	Ramet
543000348105915000	-	Nyrstar Belgium		Balen

3.4.4. CSV CDS Loop Losses (PBO) Value

PBO messages contain a [header] row, a [data] row describing the component, a [schedule] per day and an [end] sections. An example of a CSV CDS Loop Losses (PBO) message is shown below:

```
[header];10X1001A1001A094;22XCDSOPERATOR-4;2015-11-22T23:00:00Z;CDSPBO;10;Final
[data];CDSTotalInfeedOfftake;IN;541416004540000143
[schedule];2015-07-31T22:00:00Z;1440;15;A;KW;695939,469;N;542630,839;N;...
[end]
```

Example 12 CSV CDS Loop losses (PBO) message

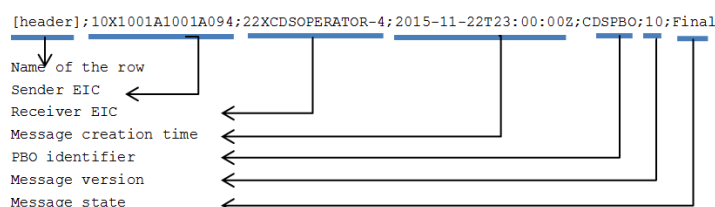
The CDS Loop Losses (PBO) Message consists of the following sections:

- a [header] section described on Section 2.5.4.1
- [data] sections described on Section 2.5.4.2
- [schedule] sections described on Section 2.5.4.3
- [end] – which is the last line indicating the end of the message. All characters following [end] must be ignored.

Note that it might be possible when you read the CSV file of the Looplosses via notepad in windows, that the file might look unreadable. When you open the file via another program (like notepad++, wordpad, Microsoft word ...), you'll notice the file is readable. It's not possible for Elia to solve this issue.

3.4.4.1. [header]

The [header] row contains information about the sender and the receiver of the message as well as the time of creation, the version number, state of the message and the fact that this is a CDS Loop Losses (PBO) message. There is only one [header] row in the message.



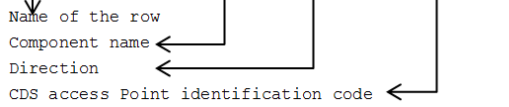
Field	Name	Data type	Comment
1	Name of the row	String	Fixed. Always [header]
2	Sender identification code	String	EIC code (Energy Identification Code) of the TSO (Elia): 10X1001A1001A094
3	Receiver identification code	String	EIC code (Energy Identification Code) of the receiver of the message
4	Message creation time	Date	Date and time of the file creation in Iso format
5	Message type	String	Fixed. Always CDSPBO
6	Version	String	The version of the message: An integer within range [1...999]. Note: The first message sent is not guaranteed to have version 1.
7	Message status	String	Indicate if the message is: <ul style="list-style-type: none">• 'Intermediate': non-validated• 'Final' : validated

Table 10 CSV CDS Loop Losses (PBO) [header] fields

3.4.4.2. [data]

A [data] row contains information about the component and related criteria's. A [data] section is always followed by at least one [schedule] section. There are several [data] sections that correspond to different components.

```
[data];CDSTotalInfeedOfftake;IN;541416004540000143
```



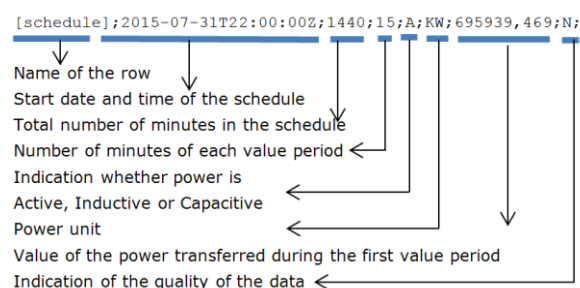
Field	Name	Data type	Comment
1	Name of the row	String	Fixed. Always [data]
2	Component	String	Name of the component: See 2.5.1 CDS Loop Losses (PBO) components "
3	Direction of Power flow	String	Identification of the direction of flow Possible values are: <ul style="list-style-type: none">• OUT: the energy is going out the CDS• IN: the energy is coming in the CDS
4	CDS network identification code	String	EAN (18-digit) code of the CDS for which the PBO is calculated.

Table 11 CSV CDS Loop Losses (PBO)message [data] fields

3.4.4.3. [schedule]

A [schedule] section contains the power values transferred over the specified time period and identifies the type of power. The Time period constitutes 1 day of 23, 24 or 25 hours. For any component identified in the [data] section, there can be a number of [schedules].

The fields contained in the [schedule] are listed below; the general meaning of these fields can be found in The Metering Manual Concepts.



Field	Name	Data type	Comment
1	Name of the row	String	Fixed. Always [schedule]
2	Start date and time	Date	Start date and time of the schedule in ISO 8601 format
3	Duration	Integer	Total number of minutes in the schedule.
4	Period	Integer	Number of minutes for each value period. Always 15.
5	Power type	String	Identification of the type of power* (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • A: Active • I: Inductive • C: Capacitive * Normally only Active power type are part of the CDS Loop Losses (PBO) message but theoretically other power type could also exist
9	Unit	String	Unit in which the metered values are defined. Normally always KW
10 to 202 in steps of 2	Value	Signed Decimal	Value of the metered quantity in the unit defined in Field 9 above with a maximum of 3 digits after the decimal point. <ul style="list-style-type: none"> • If the value is positive then no "+" sign is added • If the value is negative then "-" sign is added
11 to 203 in steps of 2	Quality	1 char	Indication as to the quality of the metered data (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none"> • N: Normal • I: Inexact • S: Substituted (Estimated replacement).

Table 12 CSV PBO message [schedule] fields

3.4.5. XML CDS Loop losses (PBO)

The XML CDS Loop Losses (PBO) message respects the **IEC standard 62325-451-4**. The structure therefore is briefly explained in this document but whole description is available on the IEC web store: <https://webstore.iec.ch/publication/29116>.

The XSD Schema reference is available on "3.5.1 Reference XSD".

```
<EnergyAccount_MarketDocument xsi:schemaLocation="urn:iec62325.351:tc57wg16:451-4:energyaccountdocument:4:0 iec62325-451-4-settlement_v4.xsd"
xmlns="urn:iec62325.351:tc57wg16:451-4:energyaccountdocument:4:0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
</EnergyAccount_MarketDocument>
```

Example 13 XML CDS Loop losses (PBO) message root

3.4.5.1. XML CDS Loop Losses (PBO) Header fields

The message begins with information about the sender of the message (Elia) and the receiver as well as the time when the message was created plus some information about the state of this message: This header is valid for all the Time Series.

Remark: the XML comments indicated in the message here below are for the reader comprehension and can be not available in the message sent by Elia;

```
<mRID>CDSPBO_20150801_20150831</mRID>
<revisionNumber>10</revisionNumber>
<type>Z01<!--CDS PBO--></type>
<docStatus><value>A02</value><!--Final--></docStatus>
<process.processType>A05</process.processType>
<!--Metered data aggregation-->
<process.classificationType>A01</process.classificationType>
<!--Detail-->
<sender_MarketParticipant.mRID
codingScheme="A01">10X1001A1001A094</sender_MarketParticipant.mRID>
<sender_MarketParticipant.marketRole.type>CDSO</sender_MarketParticipant.marketRole
.type>
<receiver_MarketParticipant.mRID codingScheme="A01">22XCDSOPERATOR-
4</receiver_MarketParticipant.mRID>
<receiver_MarketParticipant.marketRole.type>Z01</receiver_MarketParticipant.marketR
ole.type> <!--Closed Distribution System Operator-->
<createdDateTime>2015-11-22T23:00:00Z</createdDateTime>
<period.timeInterval><start>2015-07-31T22:00Z</start><end>2015-08-
30T22:00Z</end></period.timeInterval>
<domain.mRID codingScheme="A01">10YBE-----2</domain.mRID><!--domain = Belgium
Area-->
<TimeSeries>
```

Example 14 XML CDS Loop Losses (PBO) message header

The following header fields are mandatory and are listed in the table below.

Element name	Content type	Description
mRID	String [1..35]	The unique identification of the document. Currently: "CDSPBO_[First day of the period covered:YYYYMMDD]_[Last day of the covered period:YYYYMMDD]" Example: CDSPBO_20150801_20150831 Remark: the only constraint of this field is to be unique for a given period. It could therefore change in the future.
revisionNumber	Integer [1...999]	The version number of the document: A more recent document has a higher version number. It is not guaranteed that first document received by the Recipient has version number 1.
type	String [3]	Fixed. Always Z01 (PBO document)
docStatus	String [3]	The status of the PBO document. Possible values: <ul style="list-style-type: none"> • A01 - Intermediate : used for non-validated messages • A02 – Final : used for validated message • A03 – Final Modified : used for corrections after publication of a validated message See "1.1.8 Regulated messages & message delivery frequency".
process.processType	String [3]	The type of the PBO document. Possible values: <ul style="list-style-type: none"> • A05 - Metered data aggregation
process.classificationType	String [3]	The classification mechanism used to group a set of objects together within a business process. Possible values: <ul style="list-style-type: none"> • A01 - Detail • A02 - Summary Normally only A01 is used within the PBO message but theoretically other classificationType could also exist
sender_MarketParticipant.mRID	codingScheme: String [3] Value: String [16]	Fixed: <ul style="list-style-type: none"> • codingScheme: A01 (EIC code) • 10X1001A1001A094 (Elia EIC code)
sender_MarketParticipant.marketRole.type	String [3]	Fixed: Always A04 (System operator)
receiver_MarketParticipant.mRID	codingScheme: String [3] Value: String [16]	<ul style="list-style-type: none"> • codingScheme: Fixed A01 (EIC code) • Value : EIC code of the CDS Operator
receiver_MarketParticipant.marketRole.type	String [3]	Fixed: Always Z01 (CDS Operator)
createdDateTime	Date and time	Time at which the message was created.
period.timeInterval	Start / End: Date	Covered Period: Normally this is exactly one month (in UTC time). Example for the month August 2015: Start time is 31/7/2015 at 22h. End time is 31/8/2015 at 22h However any period is theoretically possible.
Domain.mRID	codingScheme: String [3]	Fixed: <ul style="list-style-type: none"> • codingScheme: A01 (EIC code)

	Value: String [16]	<ul style="list-style-type: none">10YBE-----2 (Belgian Area)
--	-----------------------	--

Table 13 XML headers elements for PBO messages

3.4.5.2. XML CDS Loop Losses (PBO) TimeSeries fields

The <TimeSeries> element describes the flow of the power for one component and related criteria and the schedule of actual power values.

```
<TimeSeries>
<mRID>Z01541416004540000143</mRID>
<businessType>Z01</businessType>
<!--IN=loop losses of a CDS Network = direction IN - direction OUT (of sub
components) : the normal case is a IN (the CDS network has received too much energy
and this energy must go to the BRP CDS losses)-->
<product>8716867000016</product>
<objectAggregation>A01</objectAggregation>
<area_Domain.mRID codingScheme="A01">541416004540000143</area_Domain.mRID>
<measure_Unit.name>KWT</measure_Unit.name>
<Period>
</TimeSeries>
```

Example 15 XML CDS Loop losses (PBO) message TimeSeries

The general meaning of these fields is given in The Metering Manual Concepts. All elements are mandatory and listed in the table below.

Element name	Content type	Description
mRID	String [1..35]	Time series unique identification within the current message
businessType	String [3]	Fields identifying the characteristics of the component defined in 2.5.1 CDS Loop Losses (PBO) components "
product	String [1..35]	Fixed. Always 8716867000030
objectAggregation	String [3]	Fixed. Always A01
area_Domain.mRID	String [1..18]	The EAN code of the CDS Access Point
marketParticipant.mRID	String [1..18]	Currently not used
measure_Unit.name	String [3]	Power unit. Always KWT
Period	See "3.4.5.3 XML CDS Loop Losses (PBO) Period fields	

Table 14 XML <data> element for CDS Loop Losses (PBO) messages

Component	Business Type	Flow direction
CDSLoopLosses	Z01 - Clearing Difference	In
CDSInfeedOfftakeTotal and CDSInfeedInjectionTotal	A66 - Energy flow	Out and In
CDSAllocationOfftakeTotal and CDSAllocationInjectionTotal	A14 - Aggregated energy data	Out and In
CDSAccessPointsOfftakeTotal and CDSAccessPointsInjectionTotal	A65 - Accounting Point Relevant data	In and Out

Table 15 XML CDS Loop Losses (PBO) Time Series component and related data

3.4.5.3. XML CDS Loop Losses (PBO) Period fields

The <Period> element contains information to characterize the power value and quality for a period.

```
<Period>
<timeInterval>
  <start>2015-07-31T22:00Z</start>
  <end>2015-08-30T22:00Z</end>
</timeInterval>
<resolution>PT15M</resolution>
<Point>
```

All elements are mandatory and listed in the table below.

Element name	Content type	Description
period.timeInterval	Start / End: Date	Covered Period: Normally this is exactly one month in ISO 8601 format (see section "3.5.2 XML elements").
resolution	String	Total number of minutes in the schedule. (! See also section 4.5, on the effect of daylight saving.)
Point	See below	

Table 16 XML CDS PBO Time Series component and related data

3.4.5.4. XML CDS Loop Losses (PBO) Point fields

The <Point> element contains information to characterize the power value and quality for a position.

```
<Point>
<position>2</position>
<in_Quantity.quantity>113423.485</in_Quantity.quantity>
<in_Quantity.quality>A04</in_Quantity.quality>
<out_Quantity.quantity>542630.839</out_Quantity.quantity>
<out_Quantity.quality>A04</out_Quantity.quality>
</Point>
```

Element name	Cardinality	Content type	Description
position	Mandatory	Integer [1...2884]	The position of the quarter within the covered period
in_Quantity.quantity	Optional	Double	Value for the direction IN (if possible for the component) or the element is not present
in_Quantity.quality	Optional	Element	Quality for the direction IN (if possible for the component) or the element is not present Possible values: <ul style="list-style-type: none">• Normal : "A04"• Inexact: "A02"• Substituted: "A01"
out_Quantity.quantity	Optional	Double	Value for the direction OUT (if possible for the component) or the element is not present
out_Quantity.quality	Optional	Element	Quality for the direction OUT (if possible for the component) or the element is not present Possible values: <ul style="list-style-type: none">• Normal : "A04"• Inexact: "A02"• Substituted: "A01"

Table 17 XML <Point> element for PBO messages

3.4.6. Excel CDS Loop Losses (PBO) Value

The Excel file contains one sheet named with the EAN code of the CDS network: This sheet contains all information about each component and related criteria's for a given month:

- The top rows contain information about the receiver, the EAN of the CDS network, the status of the message and the time of creation (last update) of the message and the fact that this sheet follow the PBO message format
- Subsequent area of the sheet is divided into columns
- The first lines of the columns give information about the component name, Direction and Power Flow) described in Section 2.5.1.
- The quarter hourly values give the power value and the quality for the mentioned metering data

	A	B	C	D	E
1	Company	22XCDSOPERATOR-4		CDS Operator Company	
2	Meterable	541416004540000143		CDS Test1	
3	Last Update	23-11-2015		PBO	
4	Status	Final			
5	Version	10			
6					
7	Component			CDS Total Infeed Offtake	
8	Meterable type			IN	
9				Active	
10				Value	Quality
11	Monthly energy			516.064 KWh	Valid
12	Quarter hourly values				
13	Date	From	To	W	
14	01-07-2015	00:00	00:15	521.914	N
15	01-07-2015	00:15	00:30	514.735	N
16	01-07-2015	00:30	00:45	500.378	N
17	01-07-2015	00:45	01:00	494.607	N
18	01-07-2015	01:00	01:15	490.948	N
19	01-07-2015	01:15	01:30	491.089	N
20	01-07-2015	01:30	01:45	502.490	N
21	01-07-2015	01:45	02:00	511.828	N

Example 16 Excel CDS Loop Losses (PBO) message sheet

The PBO metering message consists of the following sections:

- A header.
- A set of columns headers.
- A set of columns values.

3.4.6.1. header

The header contains reference of the BRP and the state, version.

	A	B	C	D	E
1	Company	22XCDSOPERATOR.4		CDS Operator Company	
2	Meterable	541416004540000143		CDS Test1	
3	Last Update	23-11-2015		PBO	
4	Status	Final			
5	Version	10			

Figure 16 Excel CDS Loop Losses (PBO) message - header

Excel Cell	Name	Data type	Comment
B1:C1 (merged cells)	Receiver identification code	String	EIC company code of the receiver of the message.
D1:F1 (merged cells)	Receiver name	String	Name of the company receiver of the message. Note this is a "display name" that can be different from the official name of the company
B2:C2 (merged cells)	Meterable EAN	String	The EAN of the CDS Access Point
D2:F2 (merged cells)	Meterable name	String	The name of the CDS Access Point
B3:C3 (merged cells)	Last update date	Date and time	Date and time of the creation of the highest version of this document.
D3:F3 (merged cells)	Message type	String	Fixed : "PBO"
B4:C4 (merged cells)	Message status	String	Indicate if the message is 'Final' or 'Intermediate' See "1.1.8 Regulated messages & message delivery frequency "
B5:C5 (merged cells)	version	Integer [1..999]	The version of the message: An integer within range [1...999]. Note: The first message sent is not guaranteed to have version 1.

Table 18 Excel CDS Loop Losses (PBO) message - header fields

3.4.6.2. Columns header

From the 4th column, a set of 2 columns identifies the source of each metering data for one component. An Excel sheet can contain many sets of columns.

For one column (example Column 4 and 5):

6					
7	Component Meterable type			CDSTotalInfeedOfftake	
8				IN	
9				Active	
10				Value	Quality
11	Monthly energy			516.064 KWh	Valid
12	Quarter hourly values				
13	Date	From	To	W	

Figure 17 Excel CDS Loop Losses (PBO)message –columns header

Line	Name	Data type	Comment		
7	Component	String	One of the possible components. See "2.5.1 CDS Loop Losses (PBO) components "		
8	Direction	String	Identification of the direction of flow Possible values are: <ul style="list-style-type: none">OutgoingIncoming		
9	Energy type	String	Fixed = "Active"		
10	Titles	Strings	even column	odd column	
			Fixed : "Value"	Fixed : "Quality"	
11	Totals	Formula and string	even column	odd column	
			The sum of all values in this column divided by 4	Possible value: <ul style="list-style-type: none">Valid: if all quality flags are validInvalid if at least one quality flag is Inexact	
13	Power unit	String	Unit in which the power values are defined. Possible value: W		

Table 19 Excel CDS Loop Losses (PBO) message - column metering reference

3.4.6.3. Columns values

The same columns (starting from the 4th column), contain the metering values and their quality (on the next column) All the quarter hourly values of the month are present

Column	Name	Data type	Comment
4, 6, 8, 10, 12, etc.	Value	Signed Decimal	Value of the transferred power for the given quarter. The value is expressed in the defined unit and contains a maximum of 3 digits after the decimal point. In case of negative value the sign '-' is added
5, 7, 9, 11, 13, etc.	Quality	1 char	Indication as to the quality of the metered data for the given quarter (See Metering Manual Concepts). Possible values are: <ul style="list-style-type: none">• N: Normal• I: Inexact• S: Substituted (Estimated replacement).

Table 20 Excel CDS Loop Losses (PBO) message - [schedule] fields

3.4.7. Imbalance components

The business concepts behind each component are explained in the contractual document given to the BRP. This manual gives only a brief description.

The imbalance components that can be counted to the BRP are:

Component	Description
CrossBorderExportTotal	Total cross border export position of the BRP: Total energy going out the BRP balance perimeter on the Elia grid
CrossBorderImportTotal	Total cross border import position of the BRP: Total energy coming in the BRP balance perimeter on the Elia grid
HubSalesTotal	Total of the sales of the BRP on Elia Hub (included its sales on the Power Exchanges)
HubPurchasesTotal	Total of the purchase (buy) of the BRP on Elia Hub (included its purchases on the Power Exchanges)
aFRRUpCorrTotal	Compensation for activation of aFRR upward (positive).
aFRRDownCorrTotal	Compensation for activation aFRR downward (negative).
OtherUpCorrTotal	Additional Upward balancing compensation: This component represents additional upward compensation in the case of a specific agreement.
OtherDownCorrTotal	Additional Downward balancing compensation: This component represents additional downward compensation in the case of a specific agreement.
DGOInjectionTotal	Total of injection of the BRP for all DGO Network
DGOOfftakeTotal	Total of offtake of the BRP for all DGO Network
DGOLossesTotal	Total of losses of the BRP related to its clients on DGO Networks
DGOInjection	Allocation injection of the BRP for one DGO Network
DGOOfftake	Allocation offtake of the BRP for one DGO Network
DGOLoopLossesTotal	Total of Loop losses (Clearing difference) for the DGO Network attributed to the BRP
DGOLoopLosses	Loop losses (Clearing difference) of a DGO Network
CDSInjectionTotal	Total of injection of the BRP for all CDS Network
CDSOfftakeTotal	Total of offtake of the BRP for all CDS Network
CDSLosesTotal	Total of losses of the BRP related to its clients on CDS Networks
CDSInjection	Allocation injection of the BRP for one CDS Network
CDSOfftake	Allocation offtake of the BRP for one CDS Network
CDSLoopLossesTotal	Total of Loop losses Clearing Difference for the CDS network attributed to the BRP
CDSLoopLosses	Loop losses (Clearing difference) of a CDS Network
TSOOfftakeTotal	Total offtake of the BRP for its clients on the TSO network
TSOInjectionTotal	Total injection of the BRP from its clients on the TSO network
TSOLossesTotal	Total losses of the BRP related to its clients on the TSO network
ImbalanceResultofthePooling	The imbalance of the pooling. (The Imbalance counted to the BRP "head of Pool". Is the sum of individual imbalance of the member of the pool in case of pooling agreement)
OffshoreInterconnectionOfftakeTotal	Total offtake of the BRP _{O.I.} associated with this Offshore Interconnection
OffshoreInterconnectionInjectionTotal	Total injection of the BRP _{O.I.} associated with this Offshore Interconnection

ImbalanceRecipient	Total Imbalance of the BRP
mFRRDPpg&DA/IDBrpBspCorrTotal	Compensations of the BRP _{BSP} performed in the context of mFRR DP _{PG} (former non CIPU units) activations (Upward & Downward) in DA/ID. This component corresponds to the mFRRDPpg&DA/IDDownBrpbspCorr component minus the mFRRDPpg&DA/IDUpBrpbspCorr component.
mFRRDPpg&DA/IDBrpSourceCorrTotal	Compensations of the BRP _{Source} performed in the context of mFRR DP _{PG} (former non CIPU units) activations (Upward & Downward) in DA/ID.
mFRRDPpg&DA/IDDownBrpbspCorr	Compensations of the BRP _{BSP} performed in the context of mFRR DP _{PG} (former non CIPU units) downward activations in DA/ID.
mFRRDPpg&DA/IDTotal	Sum of the compensations (BRP _{Source} & BRP _{BSP}) performed in the context of mFRR DP _{PG} (former non CIPU units) activations (Upward & Downward) in DA/ID. This component corresponds to the sum of the mFRRDPpg&DA/IDBrpSourceCorrTotal & mFRRDPpg&DA/IDBrpBspCorrTotal components.
mFRRDPpg&DA/IDUpBrpbspCorr	Compensations of the BRP _{BSP} performed in the context of mFRR DP _{PG} (former non CIPU units) upward activations in DA/ID.
mFRRDPsuUpCorr Total	Compensations of the BRP performed in the context of mFRR DP _{SU} (former CIPU units) upward activations. This component together with the "RedispatchingUpCorr Total" component are replacing the former "mFRRCipuAndCipuUpCorrTotal" component.
mFRRDPsuDownCorr Total	Compensations of the BRP performed in the context of mFRR DP _{SU} (former CIPU units) downward activations. This component together with the "RedispatchingDownCorr Total" component are replacing the former "mFRRCipuAndCipuDownCorrTotal" component.
RedispatchingUpCorr Total	Compensations of the BRP performed in the context of Redispatching upward activations. This component together with the "mFRRDPsuUpCorr Total" component are replacing the former "mFRRCipuAndCipuUpCorrTotal" component.
RedispatchingDownCorr Total	Compensations of the BRP performed in the context of Redispatching downward activations. This component together with the "mFRRDPsuDownCorr Total" component are replacing the former "mFRRCipuAndCipuDownCorrTotal" component.

Remarks:

This list can always vary when new components of the Imbalance could be created based on new market rules.

Elia does not guarantee the order of components within the message.

3.5. XML format messages

3.5.1. Reference XSD

Elia XML messages allow automatic validation by the client application using only the “XML Schemas” (XSD).

Schema	Description
http://nedi1.elia.be/namespaces/public/metering/Publication.xsd	<ul style="list-style-type: none">Access Point messages
http://nedi1.elia.be/namespaces/public/metering/ELIA-iec62325-451-4-settlement.xsd http://nedi1.elia.be/namespaces/public/Metering/urn-entsoe-eu-wgedi-codelists.xsd http://nedi1.elia.be/namespaces/public/Metering/urn-entsoe-eu-local-extension-types.xsd	Local implementation of the standard where 2 fields (meteringType and calculationMethod) and local codes have been added

3.5.2. XML elements

This section describes the XML elements that are contained within other elements. These include:

- “party” elements
- “point” elements
- “schedule” elements

3.5.2.1. Party elements

Party elements refer to:

- <sender> the sender of the metering message
- <receiver> the receiver of the metering message
- <partyFrom> the party from which the power is flowing
- <partyTo> the party to which the power is flowing

An example of a <sender> is shown below:

```
<sender>
  <code>5499770302608</code>
  <codeType>C01</codeType>
  <friendlyName>ELIA</friendlyName>
  <role>R01</role>
</sender>
```

Example 17 XML Party elements

The contents of the party element are listed in the table below. Details on the different data types are given in section 3.5.2.

Element	Cardinality	Data type	Description
<code>	mandatory	string	Party identification code
<codeType>	mandatory	string	Code type. Possible values are: <ul style="list-style-type: none"> • C01: EAN code *(see note below) • C02: DVG code • C03: EIC code *(see note below) • C11: ELIA proprietary coding scheme
<friendlyName>	optional	string	Name to easily identify the party
<role>	mandatory	string	Role of the party. Possible values are: <ul style="list-style-type: none"> • R01: Transmission System Operator (TSO) • R02: Metering Reading Company (MRCO) • R03: Grid User (GU) • R04: Access Contract Holder (ACH) • R05: Access Responsible Party (BRP) • R06: Distribution Grid Operator (DGO) • R07: Supplier • R08: ENergy COordinator (ENCO) • R09: Metering Contract Holder (MCH)

Table 21 XML Party element contents

* For messages concerning MRCO and DGO, the EAN code is used. For messages concerning direct clients, the EIC code is used.

3.5.2.2. Point elements

Point elements are used to identify access or Metering Points. An example of an Access Point description is shown below:

```
<point>
  <code>8400001000009</code>
  <codeType>C01</codeType>
  <friendlyName>accessPoint4</friendlyName>
</point>
```

The contents of the <point> element are listed in the table below. Details on the different data types are given in section 3.5.2.

Element	Cardinality	Data type	Description
<code>	mandatory	string	Point identification code
<codeType>	mandatory	string	Fixed. Always C01 : EAN code
<friendlyName>	optional	string	Name to easily identify the point.

Table 22 XML Point element contents

3.5.2.3. Schedule elements

<schedule> elements contain all the fields that describe the metered data as well as the data values themselves. They occur in all message types.

An example of a <schedule> element is given below. Not all data values are shown.

```
<schedule>
  <beginDateTime>2001-12-31T23:00:00Z</beginDateTime>
  <duration>4320</duration>
  <period>15</period>
  <unit>W</unit>
  <powerType>A</powerType>
  <meteringType>N</meteringType>
  <compType>C</compType>
  <profile>ULP</profile>
+ <v-list>
  <v>4000.000</v>
  Etc: not all values represented in this example
  <v>2874000.000</v>
</v-list>
+ <q-list>
  <q>N</q>
  Etc: not all quality flags represented in this example
  <q>N</q>
</q-list>
  <validated>false</validated>
</schedule>
```

Example 18 XML <schedule> element

The contents of the <schedule> element is listed in the table below. Details on the different data types are given in section 3.5.2.

Elements	Cardinality	Data type	Description
<beginDateTime>	mandatory	Date time	Date and time of the beginning of the schedule
<duration>	mandatory	integer	Total number of minutes of the schedule. This must be a multiple of a period.
<period>	mandatory	integer	The number of minutes for each value period. This always has the value 15 minutes.
<unit>	mandatory	string	Unit in which the values are defined. These are usually units of power (see Metering Manual Concepts) but can be other units for Metering Point messages.
<powerType>	optional	string	Identification of the type of power* (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none">• A: Active• I: Inductive• C: Capacitive * this has no meaning for Metering Point messages containing non-power values.
<meteringType>	Optional (default=N)	string	Indication as to whether the values are net or gross* (see Metering Manual Concepts). Possible values are: <ul style="list-style-type: none">• N: Net

			<ul style="list-style-type: none"> G: Gross <p>* this has no meaning for Metering Point messages containing non-power values. ** FOR DGOs and MRCOs only Net is used.</p>
<compType>	Optional (default=NC)	string	<p>Indication as to whether the values are compensated* or not (see Metering Manual Concepts). Possible values are:</p> <ul style="list-style-type: none"> NC: Non-Compensated. Used for metering purposes. C: Compensated. Used for billing purposes <p>* this has no meaning for Metering Point messages containing non-power values.</p>
<profile>	Optional (default=ULP)	string	<p>Indication of the load profile. This is field is only for information purposes and is ignored by the Metering Application.</p>
<v>	0 <= n	list of decimal	<p>Value of the transferred power. The value is always positive. The value is expressed in the defined unit and contains a maximum of 3 digits after the decimal point. The number of values = duration/period.</p>
<q>	0 <= n	list of string	<p>Indication as to the quality of the metered data (see Metering Manual Concepts). Possible values are:</p> <ul style="list-style-type: none"> N: Normal I: Inexact S: Substituted (Estimated replacement). <p>Number of values must be =duration/period.</p>
<validated>	mandatory	boolean	<p>Indication as to whether the values are valid or not (see Metering Manual Concepts). Possible values are:</p> <ul style="list-style-type: none"> True: validated by Elia False: not validated by Elia

Table 23 XML Schedule element contents

3.5.3. Data types

The following table describes all the data types allowed in XML data structure specifications.

Data type	Typical XML representation	Lexical pattern	Comments
string		.*	The following constraints can be expressed: minimum length, maximum length, pattern, choice of valid values
int	-1, 0, 126789675 +100000	[-+]?[0-9]+	The following constraints can be expressed: minimum value, maximum value. Values must be between 2147483647 and -2147483648 inclusive.
decimal	-1.23, 12678967.54323 3, +100000.00, 210	[-+]?[0-9]+(\.[0-9]+)?	The following constraints can be expressed: minimum value, maximum value. Values must have at most 28 digits.
boolean	1, 0, true, false	1 0 true false	
code		.*	This is similar to string, but allowed values must be part of a documented "code table". The actual signification of the code table constraint is application-dependent.
datetime	1999-05-31T13:20:00+02:00	[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}?(?=[+-])[0-9]{2}(:[0-9]{2})??	Represents a time instant. If the time zone offset is not indicated, UTC is assumed. See section 4.5.2 on time formatting and daylight saving time handling.
time	13:20:00+02:00	[0-9]{2}:[0-9]{2}:[0-9]{2}?(?=[+-])[0-9]{2}(:[0-9]{2})??	Represents a time instant in the day. If the time zone offset is not indicated, UTC is assumed. See section 4.5.2 on time formatting and daylight saving time handling.
date	1999-05-31	[0-9]{4}-[0-9]{2}-[0-9]{2}	Represents a calendar date. See section 4.5.2 on time formatting and daylight saving time handling.
binary		Encoded binary data (the default encoding is base64)	Used to transfer data that is not unicode text.

Table 24 Data types in XML formatted messages

Chapter 4

Description of Metering Messages sent by CDSO

4.1. Allocation messages

4.1.1. Purpose in Elia-CDS information exchange

These messages will be used by the CDSO to communicate the allocation result to Elia.

The UMIG 6.0 Meter Read Continuous allows for simultaneous submission of data through an XML file. The XSD (XML Schema Definition) is available on Atrias Website³ For the submission of metering data of the different points, such as the SP and CDS AP in the case of flexibility or CRM services, or the virtual/real CDS Access Point in the case of outsourcing to Elia of part of the CDS activities, the message is simplified and some of the information required by the standard XSD is not mandatory.

4.1.2. Allocation process

See also section 2.1 where the timings of message exchanged was already explained.

The CDSO – when he didn't outsource this task to Elia - has to deliver on a daily basis Provisional allocation data. The first message should be delivered on the 2nd calendar day of the current month M. On the 15th working day of M+1, the validated allocation data should be published via the allocation result message.

The only file format which is accepted is the MIG 6 XML message.

4.1.3. XML Allocation messages (MIG 6)

For further documentation, please visit www.atrias.be > Current documentation and look for process UMIG-IM-SE-05. In the "message detail" excel, one can find more information in tab "ProvisionalAllocationResultsForTSO" and "AllocationresultsforTransmissionSystemOperatorElectricity".

Following fields are most important to parametrize well in the files:

Type	Parameter
SenderBEEnergyParty	GLN of the sender (=GLN CDSO)
RecipientBEEnergyParty	GLN of the receiver (=GLN Elia)
IssuerBEEnergyParty	GLN of the issuer (=GLN CDSO)
AddresseeBEEnergyParty	GLN of the addressee (=GLN Elia)
BalanceResponsibleInvolvedBEEnergyParty	GLN of the BRP to which the energy is allocated
GridAccessProviderInvolvedBEEnergyParty	GLN of the CDS Network
ProductIncludedProductCharacteristic	8716867000016 (=active energy)
QualificationCharacteristicQualificationCharacteristic	E17 (offtake) or E18 (injection)
ObservationPeriodTimeSeriesPeriod	Start and end period of the data serie
QuantityQuality	By convention we chose the value 21 (Temporary) for provisional allocations and 86 (Ratified) for the allocation Result.

³ Atrias.be/current-documentation > Current documentation > XML Schema's > MIG – IM – XD – 05 – XML Schemas vx.x.x.x.zip > XSD > AllocationResultsForTransmissionSystemOperatorElectricity_xx-xxpxxx

4.1.3.1. Message example

The following figure shows an example of such a message header.

For energy taken of the CDS GLN should be used as the Sender and Elia GLN must be included as sender and recipient parties respectively

```
<?xml version='1.0' encoding='UTF-8'>
<rsm:AllocationResultsForTransmissionSystemOperatorElectricity xmlns:rsm="un:unece:260:data:EEM:02-02-AllocationResultsForTransmissionSystemOperatorElectricity"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <rsm:HeaderBEEnergyDocument>
    <rsm:Identification>0a2b989b-057e-445d-813b-83c51eb4cabd</rsm:Identification>
    <rsm:DocumentType listAgencyIdentifier="260">E31</rsm:DocumentType>
    <rsm:Creation>2023-02-09T22:49:02.428+01:00</rsm:Creation>
    <rsm:SenderBEEnergyParty>
      <rsm:Identification schemeAgencyIdentifier="9">5414567999991</rsm:Identification>
    </rsm:SenderBEEnergyParty>
    <rsm:RecipientBEEnergyParty>
      <rsm:Identification schemeAgencyIdentifier="9">5414531999996</rsm:Identification>
    </rsm:RecipientBEEnergyParty>
    <rsm:IssuerBEEnergyParty>
      <rsm:Identification schemeAgencyIdentifier="9">5430000544054</rsm:Identification>
    </rsm:IssuerBEEnergyParty>
    <rsm:AddresseeBEEnergyParty>
      <rsm:Identification schemeAgencyIdentifier="9">5414531999996</rsm:Identification>
    </rsm:AddresseeBEEnergyParty>
    <rsm:DocumentStructureRevision>02-02.004</rsm:DocumentStructureRevision>
    <rsm:DocumentProcessing listAgencyIdentifier="260" listIdentifier="BEL">BH8</rsm:DocumentProcessing>
    <rsm:DocumentSequence>1</rsm:DocumentSequence>
    <rsm:OverallReport>622f8a96-b0ab-4939-9c97-750fdc6d286c</rsm:OverallReport>
  </rsm:HeaderBEEnergyDocument>
  <rsm:ProcessBEEnergyContext>
    <rsm:EnergyBusinessProcess listAgencyIdentifier="260">E44</rsm:EnergyBusinessProcess>
    <rsm:EnergyIndustryClassification listAgencyIdentifier="6">23</rsm:EnergyIndustryClassification>
  </rsm:ProcessBEEnergyContext>
  <rsm:PayloadBEEnergyTimeSeries>
    <rsm:Identification>dd0e0d37-2b99-4c52-a048-971c2549962d</rsm:Identification>
    <rsm:Function listAgencyIdentifier="6">9</rsm:Function>
    <rsm:CalculationIdentification>1.0.0.0</rsm:CalculationIdentification>
    <rsm:ObservationPeriodTimeSeriesPeriod>
      <rsm:Start>2022-12-01T00:00:00.000+01:00</rsm:Start>
      <rsm:End>2022-12-02T00:00:00.000+01:00</rsm:End>
      <rsm:ResolutionDuration>PT15M</rsm:ResolutionDuration>
    </rsm:ObservationPeriodTimeSeriesPeriod>
    <rsm:BalanceResponsibleInvolvedBEEnergyParty>
      <rsm:Identification schemeAgencyIdentifier="9">4260510010005</rsm:Identification>
    </rsm:BalanceResponsibleInvolvedBEEnergyParty>
    <rsm:GridAccessProviderInvolvedBEEnergyParty>
      <rsm:Identification schemeAgencyIdentifier="9">5414567999991</rsm:Identification>
    </rsm:GridAccessProviderInvolvedBEEnergyParty>
    <rsm:ProductIncludedProductCharacteristic>
      <rsm:Identification schemeAgencyIdentifier="9">8716867000016</rsm:Identification>
      <rsm:UnitType listAgencyIdentifier="6">KWT</rsm:UnitType>
    </rsm:ProductIncludedProductCharacteristic>
    <rsm:QualificationCharacteristicQualificationCharacteristic>
      <rsm:MeteringPointType listAgencyIdentifier="260">E17</rsm:MeteringPointType>
      <rsm:StandardLoadProfileType listAgencyIdentifier="260" listIdentifier="BEL">S99</rsm:StandardLoadProfileType>
    </rsm:QualificationCharacteristicQualificationCharacteristic>
    <rsm:ObservationIntervalBEObservationPeriod>
      <rsm:Sequence>1</rsm:Sequence>
      <rsm:ObservationDetailBEEnergyObservation>
        <rsm:EnergyQuantity>1289.2238149166</rsm:EnergyQuantity>
        <rsm:QuantityQuality listAgencyIdentifier="6">86</rsm:QuantityQuality>
      </rsm:ObservationDetailBEEnergyObservation>
    </rsm:ObservationIntervalBEObservationPeriod>
    <rsm:ObservationIntervalBEObservationPeriod>
      <rsm:Sequence>2</rsm:Sequence>
    </rsm:ObservationIntervalBEObservationPeriod>
  </rsm:PayloadBEEnergyTimeSeries>
</rsm:AllocationResultsForTransmissionSystemOperatorElectricity>
```

Figure 18 - Sample message, header and part of payload for an Allocation result

```

<!-- Payload -->
▼ <rsm:PayloadBEEnergyTimeSeries>
  <rsm:Identification>dd0e0d37-2b99-4c52-a048-971c2549962d</rsm:Identification>
  <rsm:Function listAgencyIdentifier="6">9</rsm:Function>
  <rsm:CalculationIdentification>1.0.0.0</rsm:CalculationIdentification>
  ▼ <rsm:ObservationPeriodTimeSeriesPeriod>
    <rsm:Start>2022-12-01T00:00:00.000+01:00</rsm:Start>
    <rsm:End>2022-12-02T00:00:00.000+01:00</rsm:End>
    <rsm:ResolutionDuration>PT15M</rsm:ResolutionDuration>
  </rsm:ObservationPeriodTimeSeriesPeriod>
  ▼ <rsm:BalanceResponsibleInvolvedBEEnergyParty>
    <rsm:Identification schemeAgencyIdentifier="9">4260510010005</rsm:Identification>
  </rsm:BalanceResponsibleInvolvedBEEnergyParty>
  ▼ <rsm:GridAccessProviderInvolvedBEEnergyParty>
    <rsm:Identification schemeAgencyIdentifier="9">5414567999991</rsm:Identification>
  </rsm:GridAccessProviderInvolvedBEEnergyParty>
  ▼ <rsm:ProductIncludedProductCharacteristic>
    <rsm:Identification schemeAgencyIdentifier="9">8716867000016</rsm:Identification>
    <rsm:UnitType listAgencyIdentifier="6">KWT</rsm:UnitType>
  </rsm:ProductIncludedProductCharacteristic>
  ▼ <rsm:QualificationCharacteristicQualificationCharacteristic>
    <rsm:MeteringPointType listAgencyIdentifier="260">E17</rsm:MeteringPointType>
    <rsm:StandardLoadProfileType listAgencyIdentifier="260" listIdentifier="BEL">S99</rsm:StandardLoadProfileType>
  </rsm:QualificationCharacteristicQualificationCharacteristic>
  ▼ <rsm:ObservationIntervalBEObservationPeriod>
    <rsm:Sequence>1</rsm:Sequence>
    ▼ <rsm:ObservationDetailBEEnergyObservation>
      <rsm:EnergyQuantity>1289.2238149166</rsm:EnergyQuantity>
      <rsm:QuantityQuality listAgencyIdentifier="6">86</rsm:QuantityQuality>
    </rsm:ObservationDetailBEEnergyObservation>
  </rsm:ObservationIntervalBEObservationPeriod>
  ▼ <rsm:ObservationIntervalBEObservationPeriod>
    <rsm:Sequence>2</rsm:Sequence>
    ▼ <rsm:ObservationDetailBEEnergyObservation>
      <rsm:EnergyQuantity>1241.0105389594</rsm:EnergyQuantity>
      <rsm:QuantityQuality listAgencyIdentifier="6">86</rsm:QuantityQuality>
    </rsm:ObservationDetailBEEnergyObservation>
  </rsm:ObservationIntervalBEObservationPeriod>

```

Figure 19 - Payload detail, with data for two consecutive quarter hours for an allocation result

4.2. Other metering messages (CDS AP, SP, Power Plant, ...)

4.2.1. Purpose in the Elia-CDS information Exchange

As a CDS Network, it might be the necessary to report metering data of different points inside the CDS network.

Examples are:

- Flexibility services: SubAccess Delivery Point (SP), CDS Market AP data in order to settle the service.
- CRM service supply
- (Green) Power plants to report to government or to fulfill Transparency needs etc.
- Real/Virtual CDS AP data in case of outsourcing to Elia of part of the CDSO activities.

This can be done by XML messages (type "MeterReadContinuous") or CSV (type "Export92") messages.

The messages have a header with the basic description of the message, a body with the payload data and ends with a footer for integrity and error check. This format also requires a validity status to be sent for each quarter hour.

4.2.2. CSV messages (EXPORT92)

4.2.2.1. Header

Column 1 [Subject]	Column 2 The export type: 'EXPORT92'	Column 3 MIG version of the file: 'MIGv4.1'	Column 4 '9'=original UTILTS file '5'=update UTILTS file	Column 5 Export catalog version : '1.0'
[Time zone]	Offset from UTC: '+0100'			
[Created On]	Date of file creation: HH24:MI DDMMYYYY			
[Market]	23			
[To]	Elia EIC			
[From]	CDSO EIC			
[MS]	Third party sender EIC(if any)			
[File ID]	Unique identifier of the file (this number is different from the sequence number in the file name)			

4.2.2.2. Message body

CSV column	Content	Remarks
1	Start timestamp of the time series (according to the time zone which is specified in the header)	Format DDMMYYYY HH:MI Time is always 00:00 during winter time Time is always 23:00 during summer time
2	End timestamp of the time series (according to the time zone which is specified in the header)	Format DDMMYYYY HH:MI Time is always 00:00 during winter time Time is always 23:00 during summer time
3	In case of calculated time series: EAN-GRN of the virtual access point	GSRN (18 digits) e.g. 541449500001452165
4	Serial number of the metering device	Not required
5	In case of calculated time series: Calculated meter counter ID In case of a physical time series (submetering): Physical counter ID	Not required
6	Energy type	<ul style="list-style-type: none"> - A+= active power, direction netuser. - I+= reactive inductive power, direction netuser. - C-= reactive capacitive power, direction netuser. - A-= active power, direction net. - I-= reactive inductive power, direction net. - C+= reactive capacitive power, direction net.
7	Measured direction	<ul style="list-style-type: none"> - E12-E17= consumption - E12-E18= production (injection)
8	Measurement unit	<ul style="list-style-type: none"> - KWT= kW - KVR= kVAr - KWH=kWh
9	Reason of measurement	Always 'E23' for periodical meter reading
10-109	Value for each interval. Electricity: Each 15 minutes has a value.	<p>The value is always with max 3 digits after the comma. There are 200 columns per day of data (100 for values and 100 for quality codes):</p> <ul style="list-style-type: none"> - For a normal day: only the first 96 columns are used and the last four are filled with 0, and 'Z03' as quality code. - For a short day: only the first 92 columns are used and the last eight are filled with 0, and 'Z03' as quality code. - For a long day: 100 columns are used. <p>The values are always in chronological ordering by the time zone specified in the header.</p>
110-209	Quality code for each interval and the corresponding reason Each 15 minutes has a quality code.	<p>Possible quality codes in combination with the reason: Original AMR metering data:</p> <ul style="list-style-type: none"> - 'H'= original unvalidated value (MIG STS 81).

- 2

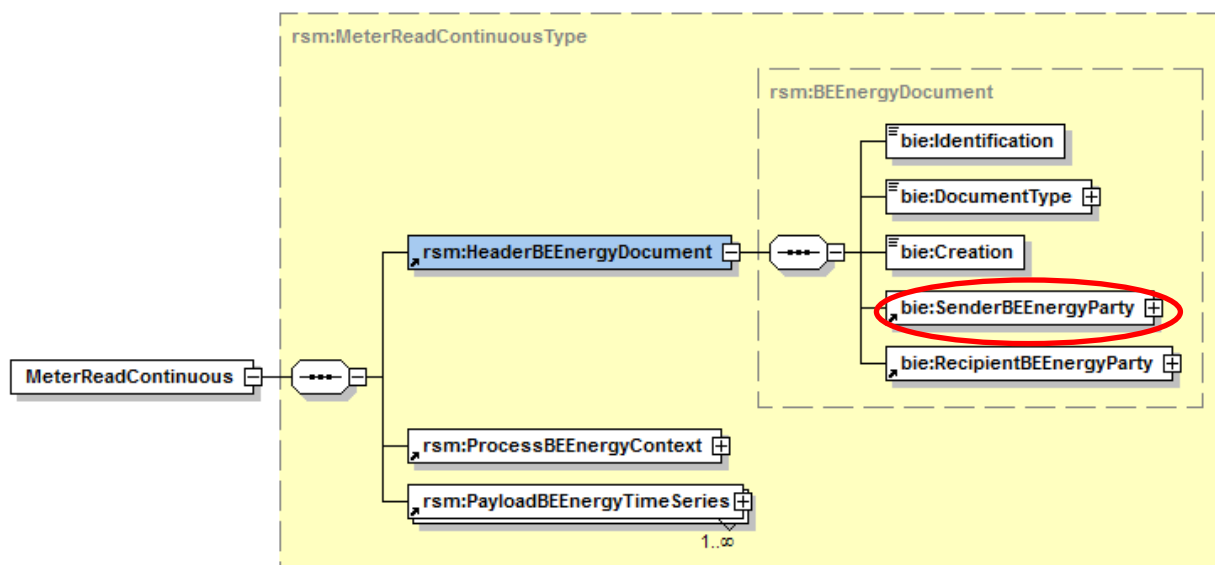


Figure 21 - Meter Read Continuous top structure

The metering data is in the payload part of the message. In this part, different point's identifiers (EAN) can be provided as the Head Point Identification highlighted in the figure here below. The same message can contain one or more payloads. It is possible, but not mandatory, to send in a single message the data for the "SubAccess Delivery Point" and the "CDS Access Point". In order to send the two simultaneously, the message has to have a Payload Energy Time Series for the SP and for the CDS AP.

4.2.3.1. Message validity

A validity status (QuantityQuality in XML) is mandatory for each sample (qh) sent. The UMIG standard proposes several values for this validity status, with different semantics. But in this context, we only need to statuses: non-validated and validated. By convention we chose the values "81 (validated) and 86 (validated – corrected)" for validated values and the "56" for non-validated values.

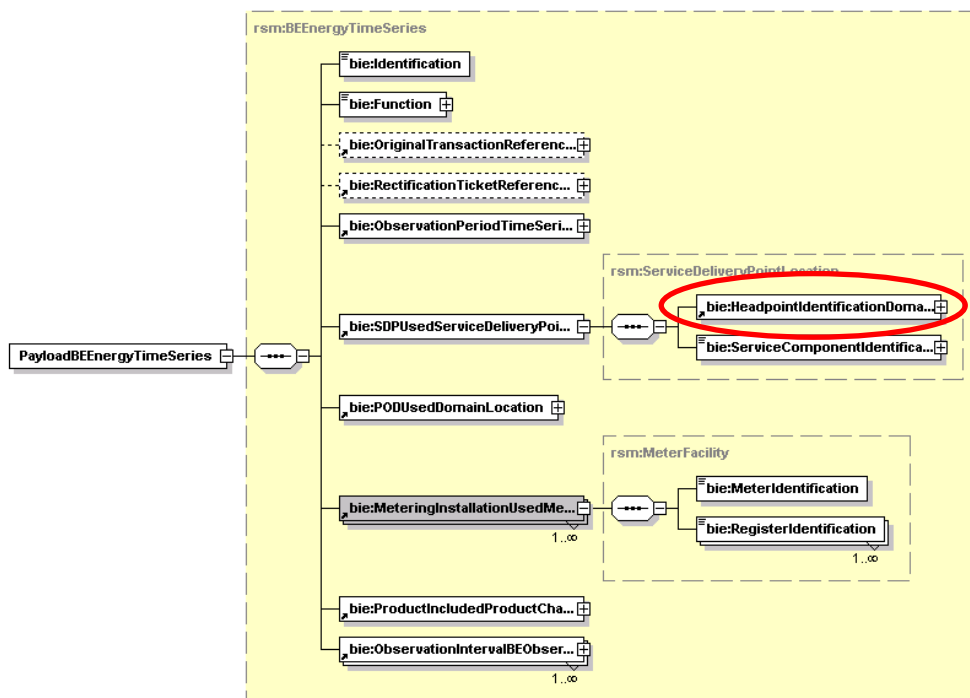


Figure 22 – PayloadBEEnergyTimeSeries

4.2.3.2. Message example

The following figure shows an example of such a message header.

The CDS GLN and Elia GLN must be included as sender and recipient parties respectively, and the different (virtual) points (SP and CDS AP) must be included in the Head Point Identification.

```

▼<ns0:MeterReadContinuous xmlns:ns0="un:unece:260:data:EEM-MeterReadContinuous">
  ▼<ns0:HeaderBEEnergyDocument>
    <ns0:Identification>EEF2B989-539B-4E20-9006-D4AE43C14A2A</ns0:Identification>
    <ns0:DocumentType listAgencyIdentifier="260">E13</ns0:DocumentType>
    <ns0:Creation>2023-02-01T07:26:28+01:00</ns0:Creation>
    ▼<ns0:SenderBEEnergyParty>
      <ns0:Identification schemeAgencyIdentifier="9">5414498[REDACTED]</ns0:Identification>
    </ns0:SenderBEEnergyParty>
    ▼<ns0:RecipientBEEnergyParty>
      <ns0:Identification schemeAgencyIdentifier="9">5499770302608</ns0:Identification>
    </ns0:RecipientBEEnergyParty>
  </ns0:HeaderBEEnergyDocument>
  ▼<ns0:ProcessBEEnergyContext>
    <ns0:EnergyBusinessProcess listIdentifier="BEL" listAgencyIdentifier="260">E23</ns0:EnergyBusinessProcess>
    <ns0:EnergyIndustryClassification listAgencyIdentifier="6">23</ns0:EnergyIndustryClassification>
  </ns0:ProcessBEEnergyContext>
  ▼<ns0:PayloadBEEnergyTimeSeries>
    <ns0:Identification>2FF7FA37-2BEA-4232-B8C4-993AB9C8CCFA</ns0:Identification>
    <ns0:Function listAgencyIdentifier="6">9</ns0:Function>
    ▼<ns0:ObservationPeriodTimeSeriesPeriod>
      <ns0:ResolutionDuration>P15M</ns0:ResolutionDuration>
      <ns0:Start>2022-12-31T23:00:00+01:00</ns0:Start>
      <ns0:End>2023-01-31T23:00:00+01:00</ns0:End>
    </ns0:ObservationPeriodTimeSeriesPeriod>
    ▼<ns0:SDPUsedServiceDeliveryPointLocation>
      ▼<ns0:HeadpointIdentificationDomainLocation>
        <ns0:Identification schemeAgencyIdentifier="9">54152990200[REDACTED]</ns0:Identification>
      </ns0:HeadpointIdentificationDomainLocation>
      <ns0:ServiceComponentIdentification schemeAgencyIdentifier="86">SC_OFFTAKE</ns0:ServiceComponentIdentification>
    </ns0:SDPUsedServiceDeliveryPointLocation>
    ▼<ns0:PODUsedDomainLocation>
      <ns0:Identification schemeAgencyIdentifier="9"/>
    </ns0:PODUsedDomainLocation>
    ▼<ns0:MeteringInstallationUsedMeterFacility>
      <ns0:MeterIdentification/>
      <ns0:RegisterIdentification/>
    </ns0:MeteringInstallationUsedMeterFacility>
    ▼<ns0:ProductIncludedProductCharacteristic>
      <ns0:Identification schemeAgencyIdentifier="9">8716867000016</ns0:Identification>
      <ns0:UnitType listAgencyIdentifier="6">KWT</ns0:UnitType>
    </ns0:ProductIncludedProductCharacteristic>
    ▼<ns0:ObservationIntervalBEObservationPeriod>
      <ns0:Sequence>1</ns0:Sequence>
      ▼<ns0:ObservationDetailBEEnergyObservation>
        <ns0:EnergyQuantity>3600.000</ns0:EnergyQuantity>
        <ns0:QuantityQuality listAgencyIdentifier="6">81</ns0:QuantityQuality>
        <ns0:MeterReadingOriginType listAgencyIdentifier="379">BV2</ns0:MeterReadingOriginType>
      </ns0:ObservationDetailBEEnergyObservation>
    </ns0:ObservationIntervalBEObservationPeriod>
  </ns0:PayloadBEEnergyTimeSeries>

```

Figure 23 - Sample message, header and part of payload

```

▼<ns0:ObservationIntervalBEObservationPeriod>
  <ns0:Sequence>2</ns0:Sequence>
  ▼<ns0:ObservationDetailBEEnergyObservation>
    <ns0:EnergyQuantity>3609.000</ns0:EnergyQuantity>
    <ns0:QuantityQuality listAgencyIdentifier="6">81</ns0:QuantityQuality>
    <ns0:MeterReadingOriginType listAgencyIdentifier="379">BV2</ns0:MeterReadingOriginType>
  </ns0:ObservationDetailBEEnergyObservation>
</ns0:ObservationIntervalBEObservationPeriod>
▼<ns0:ObservationIntervalBEObservationPeriod>
  <ns0:Sequence>3</ns0:Sequence>
  ▼<ns0:ObservationDetailBEEnergyObservation>
    <ns0:EnergyQuantity>3588.000</ns0:EnergyQuantity>
    <ns0:QuantityQuality listAgencyIdentifier="6">81</ns0:QuantityQuality>
    <ns0:MeterReadingOriginType listAgencyIdentifier="379">BV2</ns0:MeterReadingOriginType>
  </ns0:ObservationDetailBEEnergyObservation>
</ns0:ObservationIntervalBEObservationPeriod>

```

Figure 24 - Payload detail, with data for two consecutive quarter hours

4.3. Information regarding messages

Following information might be interesting when developing the necessary files.

GLN Elia: 5414531999996

Chapter 5 Start of operations procedure

When an Elia Grid User expresses interest in becoming an active CDS or that a CDS Grid User offers a flexibility or CRM service to Elia (or has a power plant which has to report metering data), there are several steps that need to be fulfilled. The following figure provides an overview of these steps. The three first steps can start in parallel. The next subsection provides more detail on each of these.

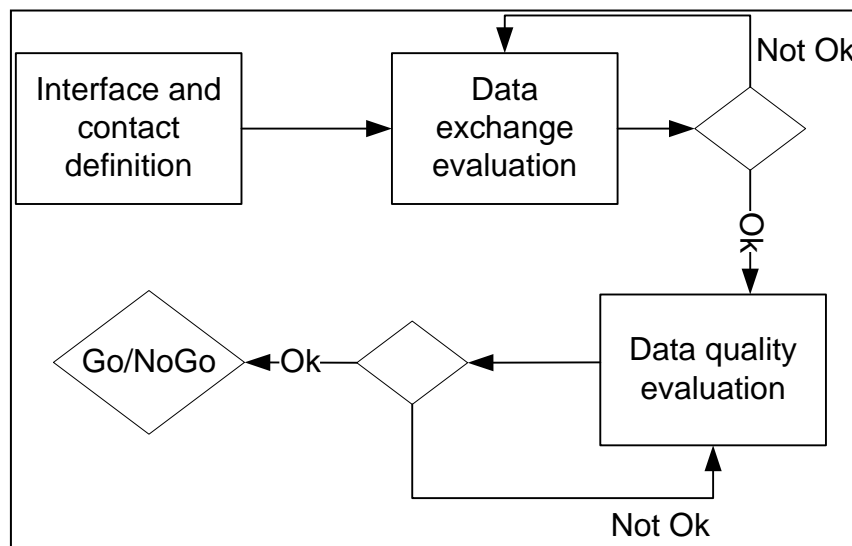


Figure 25 Start of operations procedure

5.1. Interface and contact definition

The contact person on the CDS side, responsible for data exchanges, is defined in Annex 6 of the Access contract.

The communication protocol for metering data exchanges must be sFTP. If necessary, specific parameters needed (FTP server, EIC, message recipient contact...) for exchanging this data will also be defined during this phase.

For initiating this step, the CDSO needs to contact his Key Account Manager to discuss the goal and initiate the process.

The CDSO must also request an EIC and at least 2GLN codes (one as a company and one for the CDS Network itself) if it does not have already one. If necessary, also a login to the sFTP can be asked via the request form on the Elia website.

It is very important that Elia and the client define in detail the setup of the CDS and whether the client source out the data exchange to Elia or not. It has to be done in detail in order to prepare the necessary setup in the information systems and the setup of the necessary metering messages.

All information related communication protocols are available in the metering extranet:

<https://www.elia.be/en/customers/customer-tools-and-extranet/metering>

5.2. Data exchange evaluation

Following, or during, the contractual process, some technical tests between CDSO and Elia must take place to ensure that the necessary technical mechanisms are in place for the information exchange.

During this phase, Elia will verify that the CDSO can send the necessary information to Elia (as described above). During this phase, CDSO also needs to make sure that the incoming messages from Elia are correctly received by their system.

This phase should take no more than one working week.

5.3. Data quality evaluation

When the data exchange evaluation is finished, the CDSO and Elia can concentrate on the correctness of the data being exchanged. During this phase, Elia will for example verify that the simulated Loop Losses (PBO) are null or that the CDS Market AP and/or SP metering is complete and plausible. This phase could last a complete month or require the CDSO to produce data for a month in the past, prior to the CDS operations.

- Elia will evaluate whether the data is complete: data has been sent for every quarter-hour in a month, without missing a quarter-hour in the time-series and as well for offtake as injection direction.
- Validation status usage: Elia will check that the data's validity status is present and that the CDSO can send valid data for a complete month.
- Elia will evaluate if the timings as described earlier in this document are respected.
- Elia will evaluate if the dataflow is continuously and the systems are robust.
- Plausible: The metering data submitted by the CDSO are coherent with Elia meters
 - o In the case of allocated energy, Elia will simulate a Loop Losses (PBO) calculation. The PBO should be null.
 - o In the case of flexibility or CRM provision: Elia will compare the CDS Market AP and the SP metering. The SP offtake/injection must be coherent with the CDS Market AP offtake/injection.

5.4. Go/No Go for operations

Based on the status of the contractual process and on the data quality evaluation, Elia will officially notify the CDSO whether the CDSO is ready for starting operations with Elia.

Chapter 6 Accessing messages

Elia provides 2 different protocols to deliver the messages to the clients:

- "EvmsB2C": The client can access on a dedicated metering website using the HTTP protocol. He can manually download the messages on this web page. This protocol is dedicated to Business operational persons wishing to easily download a few metering messages. Elia does not recommend implementing any automated way to download messages through "EvmsB2C"
- "SFTP": Clients can access their messages through the Elia SFTP servers.

6.1. Characteristics of the different protocols

The 2 protocols have their own advantages and disadvantages.
Here is a summary of the different advantages and disadvantages.

Protocol	Description	Advantages	Disadvantages
EVMSB2C	Web site	No investment from the client Zero learning time: Only a web browser is needed	The download is manual.
SFTP	Secure File Transfer Protocol	Existing protocol Allow full automatic connection to download the metering message in the client application	This protocol is not widely permitted: Some IT department block the use of this protocol The password must be updated every 120 days if no certificate is provided by the client: See 7.3.1 Use of certificates: Public key – private key "

6.2. The EVMSB2C protocol

Elia provides a proprietary application allowing clients to access their metering data using the HTTP protocol. This is the Elia Validated Metering system for Business to Consumer ("EvmsB2C"). Clients can manually download their metering messages and save them on their disks



Figure 26 Delivery of metering data via the EVMSB2C web site

This delivery method is straightforward: When logged in, only one page is available with the last messages to be downloaded. A simple search can be used to easily retrieve the needed message

6.3. SFTP protocol

In addition to the EVMSB2C protocol (described in sections 6.2), Elia can also publish the metering messages on a secure FTP server.

SFTP or “Secure File Transfer Protocol” is a standard network protocol used to exchange files over a network. The protocol is easy to implement and is available on all types of computers and operating systems.

Using FTP has the following advantages:

- it is a well-known standard
- it is easy to implement
- it is Operating System independent
- it provides a secured file transfer
- SFTP works with a user id /password (exception: see Section 4.3.1)

To manage the metering messages, the diverse types are stored in separate subfolders. The client can list the contents of each folder. The messages (or files) can be read and stored locally on the file system and can be deleted after successful treatment.

The figure below shows a typical screenshot of a graphical user interface (SFTP client) showing the different subfolders.

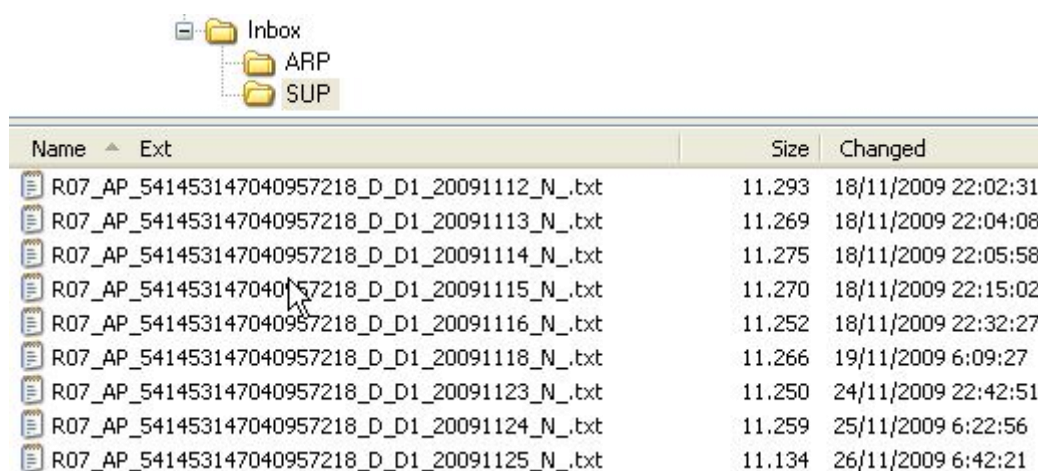


Figure 27 Folder structure on the Elia FTP client

Please contact your KAM or “metering Services” (see coordinates on the first page) to obtain a username and password to access the Elia FTP server.

6.3.1. Use of certificates: Public key – private key

One of the problems with the SFTP server is the use of a password: This password has an expiration time. Even if a reminder email can be sent to the client, it arrives that the password is expired, and the client is blocked if this one has an automated way to retrieve the messages.

To avoid the use of passwords, the client may use a certificate.

The certificate implements the concept of public and private key for authorization and authentication:

- A public key can be viewed as a lock device.
- A private key can be viewed as an actual key. This is the device used to open the 'lock' (Public key) that is stored on the other machine.

Like a regular key, the private key must be kept secret, safe, and out of the wrong hands.



Figure 28 Private and public key images

Just like a real-life key system, it is not a problem if there are hundreds of the same 'lock' on many systems, if the private key stays ... private.

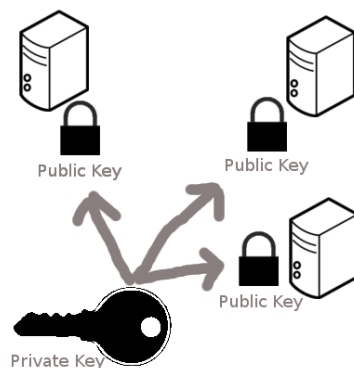


Figure 29 Private and public key on computers

This public key can therefore be distributed anywhere. Currently most companies have such a certificate composed of a private and public key: check with your IT department as it is your company that should generate a key-pair that generates a *.pub file. When this public key is put on the Elia SFTP server, this one will be used and no longer the password. The use of certificates is not difficult. Even via the ssh-keygen command in Windows, one could generate one. (note: RSA 4096 bit for example would work)

Please contact your KAM or "metering Services" (see coordinates on the first page) to place your public key on the Elia's SFTP server.

6.4. Metering messages name

Each protocol uses a name (title) to allow distinguishing the message: It can be the file name downloaded from the EVMSB2C or the SFTP server.

This chapter lists, for each protocol how each file name or “message type” is constructed

6.4.1. EVMSB2C message file names

This section is not applicable for CDSO.

6.4.2. FTP Metering message file names

The file name of the metering message. It is constructed according to the following pattern:

[RecipientRole]_[MsgType]_[EAN-code]_M_M1_[schedule-time]_Validity_Id.Extension

- [RecipientRole]:

[Recipient Role]	Description
R03	Grid User (GU)
R04	Access Contract Holder (ACH)
R05	Balance Responsible Party (BRP)
R06	Distribution Grid Operator (DGO)
R07	Supplier
R08	Producer
R09	Metering Contract Holder (MCH)
R10	CDSO
R11	Reserved
R12	Balance Service provider (BSP) / Flexibility Service Provider (FSP)

- [MsgType] refers to the type of the message and can take the values:

[MsgType]	Description	Remark
AP	Access Point & Real-Time DGO Allocation	
CA	CDS Access Point	Same format as Access Point
SP	SubAccess Delivery Point	Same format as Access Point

- [EAN-code] is the EAN code identifying the point referenced by this message. If there is no such object then “000000000000000000” is used
- [schedule-time]: yyymm
- [Validity] indicate if the message is validated or not

[Validity]	Description
V	Validated
N	Not Validated

- Id = unique identifier of the message
- Extension] is the publication format and can take the values:

[PubFormat]	Description
CSV	Comma Separated Values
XLSX	Excel file
XML	eXtensible Markup Language

Examples of non-validated filenames:

- R03_AP_541453166475361582_M_M1_200603_N_1716367.txt
- R04_AP_541453199001109600_M_M1_200603_N_1720579.txt
- R09_MP_541453155970400575_M_M1_200603_N_1720367.txt
- R10_CDSPBO_541453184162545206_M_M1_201507_N_569095.xlsx

Example of validated filename:

- R03_AP_541453132606828217_M_M1_200602_V_1716404.txt
- R12_AP_541453104544500333_M_M1_201508_V_178954.txt
- R12_SP_541453104544500340_M_M1_201611_V_123456.xlsx
- R12_MP_541453104544500357_M_M1_201712_V_78954.xml
- R10_CDSPBO_541453184162545206_M_M1_201508_V_15112320.xml

6.5. Time formatting and Daylight saving

This section describes the format of times and dates used in metering messages and deals with the issues arising from daylight saving.

6.5.1. Time and date formatting

Times and dates are presented in the ISO 8601 format in CSV and XML formats. Date and time are expressed in UTC (Coordinated Universal Time) usually denoted by the letter Z. Time zones are expressed as an offset from UTC.

ISO 8601 format is:

`yyyy-mm-ddThh:nn:ssZ` or `yyyy-mm-ddThh:nn:ss+xx:yy`

Where:

`yyyy` = year
`mm` = month
`dd` = day
`T`: flag to indicate Time
`hh` = hour
`nn` = minute
`ss` = second
`Z` = Flag indicating that the time is in UTC

Or:

`+` = a flag to indicate the positive offset of the time from UTC
`xx:yy` = is the offset from UTC expresses in xx hours and yy minutes.

If the time zone offset is not indicated, UTC is assumed.

Examples

A local time of 1:20 pm on May 31st, 2009 in Brussels (which is 2 hours ahead of UTC) is written in UTC notation as:

`2009-05-31T11:20:00Z`

Or:

`2009-05-31T13:20:00+02:00`

The date, May the 31st 2019, is written as: `2019-05-31`

6.5.2. Daylight saving

Due to daylight saving measures, twice during the year the local time is changed by one hour, meaning one day contains only 23 hours and another 25 hours. This has implications on the contents of metering messages.

Date and time are expressed in UTC (Coordinated Universal Time).

So, during winter time, the day begins at 23:00h UTC (the equivalent of 00:00h local time). During summer time, the day begins at 22:00h UTC (the equivalent 00:00h local time).

For example, in summer time:

Local time	ISO format	UTC
1:20 pm on May 31st, 2009	2009-05-31T13:20:00+02:00	2009-05-31 11:20:00

In winter time

Local time	ISO format	UTC
1:20 pm on January 31st, 2009	2009-01-31T13:20:00+01:00	2009-05-31 12:20:00

The example below shows the transition from summer time to winter time in Belgium on the 31st of October in 2010.

Local time	ISO format	UTC
0h	2010-10-31 00:00+02	2010-10-30 22:00
1h	2010-10-31 01:00+02	2010-10-30 23:00
2h	2010-10-31 02:00+02	2010-10-31 00:00
at 3h it is 2h	2010-10-31 02:00+01	2010-10-31 01:00
3h	2010-10-31 03:00+01	2010-10-31 02:00

The example below shows the transition from winter time to summer time in Belgium on the 28th of March in 2010.

Local time	ISO format	UTC
0h	2010-03-28 00:00+01	2010-03-27 23:00
1h	2010-03-28 01:00+01	2010-03-28 00:00
at 2h it is 3h	2010-03-28 03:00+02	2010-03-28 01:00
4h	2010-03-28 04:00+02	2010-03-28 02:00

6.5.3. Value periods in a message

The metering messages are composed of power values for each quarter ('value periods') of each day of a month. The number of value periods in a message depends on the number of hours in the day and the number of days in the month.

For a 'normal' 24 hour day:

number of minutes = 1440

number of value periods $1440 / 15 = 96$

All 96 values and qualities are consecutive.

For a 23 hour day:

number of minutes = 1380

number of value periods $1380 / 15 = 92$

The value periods between 2h and 3h are omitted. There are therefore 4 less value periods in the daily message and the corresponding message.

For a 25 hour day:

number of minutes = 1500

number of value periods $1500 / 15 = 100$

Four additional values periods are inserted after the 2h-3h value periods. There are 4 additional values periods in both the daily message and the corresponding message

For a 28 day month:

number of minutes = 40320

number of value periods $40320 / 15 = 2688$

For a 29 day month:

number of minutes = 41760

number of value periods $41760 / 15 = 2784$

For a 30 day month:

number of minutes = 43200

number of value periods $43200 / 15 = 2880$

For a 31 day month:

number of minutes = 44640

number of value periods $44640 / 15 = 2976$

In Excel files, on 23 hours day, the hour is not present:

96	29-03-2014	23:30	23:45	7,360,478	N	560,082	N	
97	29-03-2014	23:45	00:00	7,085,324	N	280,774	N	1
98	30-03-2014	00:00	00:15	6,991,489	N	0	N	2
99	30-03-2014	00:15	00:30	6,782,802	N	610,176	N	
100	30-03-2014	00:30	00:45	6,464,641	N	804,201	N	
101	30-03-2014	00:45	01:00	6,337,327	N	800,291	N	
102	30-03-2014	01:00	01:15	6,170,427	N	824,727	N	
103	30-03-2014	01:15	01:30	6,160,408	N	815,686	N	
104	30-03-2014	01:30	01:45	6,175,070	N	808,844	N	
105	30-03-2014	01:45	03:00	6,031,384	N	810,554	N	
106	30-03-2014	03:00	03:15	6,000,350	N	774,388	N	
107	30-03-2014	03:15	03:30	5,902,849	N	766,813	N	

In Excel files, on 25 hours day, the hour is present 2 times with an asterisk

Appendix A. Glossary of terms

Client

A company that holds a contract with Elia, which entitles the latter to metering messages. The messages received depend on the market "roles" that the client has. One client may perform several roles. A client receives metering messages for each of its market roles.

Injection

Energy (produced by a producer) that is injected into the Elia grid

Non-regulated metering

A message containing specific metering data requested by a client and defined in a contract. This one can contain values for quantities other than power.

Offtake

Consumption of energy by a client connected to the Elia Grid

PBO

"Perte de Bouclage" or "Clearing difference" between 2 quantities. For example, the difference between the Elia Infeed on a distribution point and the sum of all offtakes by the DGOs at this distribution point.

Protocol

A set of rules governing the format of messages that are exchanged between computers

Receiver

The recipient of a metering message

Region

A region within Belgium that is controlled by a specific regulator

Role

A function executed by a client, as defined in a contract

Schedule

The series of values contained in a metering message. A schedule contains values for each day of a month. The time is indicated by the value of the duration field which is given in minutes.

Sender

Party who sends a metering message

Source

The provider of the metering data

Validation

This is the process whereby the quantities referred to in a message are deemed to be correct. See section Metering Manual – Metering Concepts

Volt-Amperes-Reactive

Unit of reactive power (VAR)

Watt

Unit of active power (W)