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ENTSO-E
CGMA DATA EXCHANGE
IMPLEMENTATION GUIDE

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APPROVED DOCUMENT

VERSION 2.1

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89 **NOTE CONCERNING WORDING USED IN THIS DOCUMENT**

90 The force of the following words is modified by the requirement level of the document in which
91 they are used.

92 • SHALL: This word, or the terms “REQUIRED” or “MUST”, means that the definition is
93 an absolute requirement of the specification.

94 • SHALL NOT: This phrase, or the phrase “MUST NOT”, means that the definition is an
95 absolute prohibition of the specification.

96 • SHOULD: This word, or the adjective “RECOMMENDED”, means that there may exist
97 valid reasons in particular circumstances to ignore a particular item, but the full
98 implications must be understood and carefully weighed before choosing a different
99 course.

100 • SHOULD NOT: This phrase, or the phrase “NOT RECOMMENDED”, means that there
101 may exist valid reasons in particular circumstances when the particular behaviour is
102 acceptable or even useful, but the full implications should be understood, and the case
103 carefully weighed before implementing any behaviour described with this label.

104 • MAY: This word, or the adjective “OPTIONAL”, means that an item is truly optional.

105

106 **Revision History**

Version	Release	Date	Comments
1	0	2016-12-07	Approved by MC
2	0	2018-11-08	Enhancements to support external pole splitting and loss calculation process Corrections Approved by MC
2	1	2021-12-01	Adjustments for pole split and loss calculation process Use case updates Role update Corrections. Approved by SOC.

107

Scope

The scope of this implementation guide is to describe how to implement the data exchanges related to the Common Grid Model Alignment (CGMA) platform. These data exchanges can be split in two larger parts: the first is the core CGMA process ending with the provision of balanced netted area positions and balanced gross flows on all (unsplit) DC links - called the initial reference program. The second supports the external pole split and loss calculation for TSOs connected to DC links. It ends with the provision of the final reference program containing netted area positions and balanced flows on DC links (by considering poles and losses).

Terms and Definitions

CGM: Common Grid Model; as of Article 2(2) of Regulation (EU) 2015/1222 the term CGM refers to a Union-wide data set agreed between various TSOs describing the main characteristic of the power system (generation, loads and grid topology) and rules for changing these characteristics during the capacity calculation process.

CGMA: Common Grid Model Alignment; a process that ensures the availability of a set of balanced netted area positions and balanced DC flows for all optimisation areas covered for those target time horizons for which CGMs are built but for which market schedules are not available. CGMA involves applying a set of rules and methods, notably including the CGMA algorithm, to the CGMA input data in order to obtain the CGMA output data (which include the CGMA results).

CGMA input data: For the purposes of this implementation guide, the terms "CGMA input data" and "PPD" can be used interchangeably.

CGMA output data: The CGMA output data have three components: 1. the CGMA results; 2. the CGMA input data originally sent to the CGMA platform; 3. the substituted and / or modified CGMA input data (if applicable).

CGMA results: The CGMA results are the outcome of applying the CGMA algorithm to the CGMA input data (the PPD) and consist of, for each relevant optimisation area and for each relevant scenario, the following elements:

- balanced netted area positions
- balanced gross flows on all DC links (where applicable)

Also, part of the CGMA results are

- indicative AC flows per electrical border
- balanced netted AC area positions

CGMA results are a subset of the CGMA output data.

CGMA target time-horizon: The time period for which CGMA results are to be obtained. In the case of the (D-2) target time-horizon, for example, this will typically encompass the twenty-four individual hours (respectively twenty-three or twenty-five for daylight saving) from 00:00h two days after the day on which the CGMA calculations are run until 24:00h of that day. The CGMA target time horizon will thus typically encompass multiple scenarios.

CGMA platform: The IT System which, among other tasks, runs the CGMA algorithm.

Optimisation area: Basic geographical reference unit for the CGMA process. CGMA input data are provided on the level of optimisation areas and so are the CGMA results. Each optimisation

area corresponds exactly to a geographical area for which an individual grid model is prepared; i.e., there is a one-to-one correspondence between optimisation areas and IGMs.

CGMA area: The CGMA area corresponds to the CGM area. The CGM area is the set of (i) bidding zones whose TSOs contribute their individual grid model (IGM) to the CGM plus (ii) the interconnections linking these bidding zones with bidding zones that do not contribute an IGM to the CGM (i.e., are not part of the CGM Area). Note that in the context of CGMA the term "optimisation area" (rather than "bidding zone") is used. [1] explains the relevant area concepts.

Netted area position: The term "netted area position" (which is used in, for example, the ENTSO-E RG CE Schedule Reporting Process Implementation Guide; version for approval as of 2016-08-10) corresponds to the term "net position" used in [1]. The net position is defined as the "the netted sum of electricity exports and imports for each market time unit for a bidding zone" (Article 2(5) of Regulation 2015/1222). Implicit in this definition is that a "net position" (as opposed to an "AC net position") always comprises both AC and DC flows into and out of a bidding zone. Note that in the context of the CGMA platform and the CGMA algorithm, the term "optimisation area" (rather than "bidding zone") is used. [1] explains the relevant area concepts. The "netted area position" (net position) is expressed in the unit MW. Note that a number of additional concepts are derived from the concept of "netted area position"; namely the preliminary "netted area position"; the "netted area AC position" (see below), the absolute maximum netted area position, the absolute minimum netted area position, and the balanced netted area position.

Netted area AC position: The term "netted area AC position" (which is used in, for example, the ENTSO-E RG CE Schedule Reporting Process Implementation Guide; version for approval as of 2016-08-10) corresponds to the term "AC net position" used in [1]. The "netted area AC position" is obtained by subtracting from the "netted area position" (net position) for an optimisation area all DC flows into and out of that optimisation area.

Feasibility range: A set of two figures expressed in the unit MW that, together with the preliminary netted area position, indicate the range of balanced netted area positions (weakly) greater than and (weakly) smaller than the preliminary netted area position that a TSO accepts ex ante for a given scenario.

DC flow: Flow on a DC link (i.e., direct current link). Any DC flow – i.e., including both preliminary and balanced DC flows – can be stated in terms of the flow at the exporting end of the DC link or the importing end of the DC link. The difference between the export and the import value corresponds to losses on the DC link. DC flows are expressed in the unit MW. In the PPD all DC flows are provided as gross values (flow at the exporting end) for unsplit links whereas the PSLCD contain split poles (where applicable) and implicit losses by using additional scheduling areas identifying an HVDC interconnector.

PPD: Pre-processing data. A set of data that serve as input for the CGMA algorithm. For each scenario and for each optimisation area a separate set of pre-processing data needs to be provided. The following types of data make up the pre-processing data:

- preliminary netted area position (mandatory)
- feasibility range (mandatory)
- preliminary gross DC flows (mandatory for optimisation areas linked to another optimisation area in a different synchronous area by DC link, can optionally be provided for optimisation areas within the same synchronous area)
- maximum gross DC flows (export/import) (mandatory for optimisation areas linked to another optimisation area in a different synchronous area by DC link, can optionally be provided for optimisation areas within the same synchronous area)

- absolute minimum and/or maximum netted area position (optional)

PPD gate closure time: The PPD gate closure time is that time after which the CGMA platform will, in principle, no longer accept pre-processing data for a given set of scenarios. [1] states the PPD gate closure times.

PSLC: Pole split and loss calculation. Refers to the process of pole split and loss calculation after the CGMA platform has delivered balanced gross DC flows. The PSLC can either be external (with the provision of PSLCD) or internal (calculated by CGMA based on capacities and loss factors previously defined in the master data and without providing PSLCD).

PSLCD: Pole split and loss calculation data. Based on the results of the CGMA optimisation all TSOs connected to DC links and being responsible to provide PSLCD will have to submit externally calculated flows for their DC links (on the level of single poles if applicable) if the external PSLC approach has been chosen.

PSLCD gate closure time: The PSLCD gate closure time is that time after which the CGMA platform will, in principle, no longer accept pole split and loss calculation data for a given set of scenarios. [1] states the PSLCD gate closure times.

PSLC results: After validation of the PSLCD (external PSLC) or internal PSLC performed by the CGMA platform the PSLC results will be provided. They contain the netted area position, netted AC area position and values for each DC link (on the level of split poles if applicable).

RSC: Regional Security Coordinator. An organisation providing certain services for and/or on behalf of TSOs. RSCs are also involved in the CGMA business processes and, in this context, are referred to as "Alignment Agents" in [1].

Substitute data: If one or more elements of the PPD are missing at PPD gate closure time, the missing elements are replaced by substitute (pre-processing) data.

The common grid model alignment (CGMA) business processes

3.1 Overview

The business requirements of CGMA, refer to references [1] and [8], lead to several use cases of data exchange which are described in this chapter. Each use case is supported by one or more document exchange processes, as it is described in later subsections of this chapter.

3.2 Overall business context

CGMA provides, for all relevant target time horizons, a set of balanced netted area positions and balanced gross DC flows which are consistent for the entire CGMA area. It does so by applying the CGMA algorithm to the pre-processing data (CGMA input data).

For each scenario and for each optimisation area a separate set of pre-processing data needs to be provided. The following types of data make up the pre-processing data:

- preliminary netted area position (mandatory)
- feasibility range (mandatory)
- preliminary gross DC flows (mandatory for optimisation areas linked to another optimisation area in a different synchronous area by DC link) at the exporting end
- maximum gross DC flows (export/import) (mandatory for optimisation areas linked to another optimisation area in a different synchronous area by DC link) at the exporting end
- absolute minimum and/or maximum netted area position (optional)

PPD are created by TSOs or by parties acting on behalf of TSOs and are collected by the CGMA platform. There is a gate closure time after which the CGMA platform will, in principle, no longer accept pre-processing data for a given set of scenarios. ("PPD gate closure time").

The set of PPD is complete when PPD are available for all optimisation areas (i.e., the entire CGMA area). If PPD are missing after PPD gate closure time the CGMA platform may use substitute data derived from subscribed data provision from the Pan European Verification Function (PEVF).

The CGMA platform calculates the CGMA results, which consist of a set of

- balanced netted area positions;
- balanced netted area AC positions;
- indicative AC flows per electrical border;
- balanced gross DC flows at the exporting end.

The CGMA results can be used by a TSO or by a party acting on behalf of a TSO to create / update an individual grid model.

For TSOs connected to DC connections linking different synchronous areas the core CGMA process is followed by an additional set of activities called the pole splitting and loss calculation.

After the CGMA platform has provided the CGMA results either the responsible TSO to submit PSLCD will externally calculate the flows on DC links by splitting the DC links into single poles (if applicable) and calculate the losses. The results from this calculation will then be sent back to the CGMA platform by respecting the PSLCD gate closure time and be validated by the CGMA platform. Or the TSO agrees on an internal pole splitting and loss calculation where

CGMA itself is performing the necessary steps based on master data previously defined (pole capacities and loss factors).

The PSLC results provided by the CGMA platform contain

- balanced netted area positions
- balanced netted area AC positions
- balanced DC flows on the level of split poles (if applicable) including implicit losses by using additional scheduling areas

3.3 Use cases

Use cases of CGMA data exchange are schematically presented in Figure 1. More detailed descriptions of individual use cases and the actors involved can be found in Table 1 and Table 2.

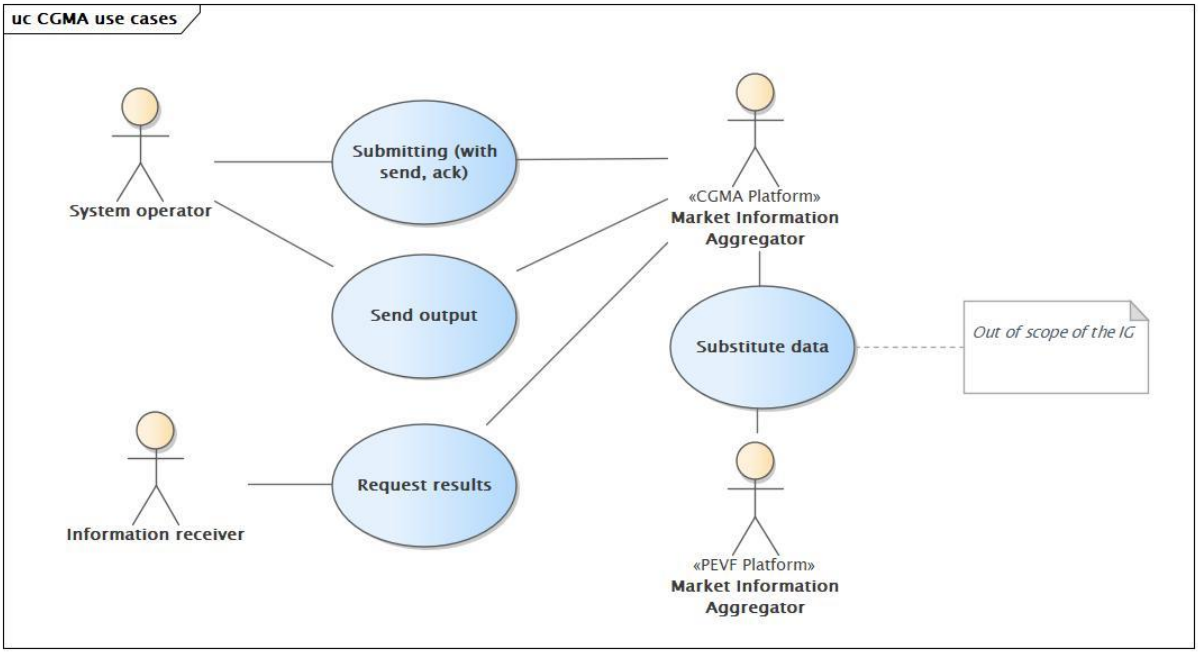

Figure 1 – Use cases

Table 1 gives a list of actors involved in the CGMA data exchange.

Table 1 – Actor labels and descriptions

Actor label	Actor description
System Operator «TSO»	A TSO, or any other actor on behalf of a TSO, who is responsible for providing pre-processing data or pole split and loss calculation data of a particular optimisation area.
Market Information Aggregator «CGMA platform»	The Common Grid Model Alignment platform is responsible for collecting and validating pre-processing data as well as pole split and loss calculation data. It executes the CGMA algorithm, performs the PSLC and provides the results. It maintains input and output data of algorithm runs.
Market Information Aggregator «PEVF platform»	The Pan European Verification Function platform holds matched schedules of exchanges between areas. It may provide netted area positions and DC flows, which serve as substitute data for missing CGMA PPD for D-2.
Information receiver	Any actor, e. g. a TSO or RSC, who wants to use final results provided by CGMA.

276 Table 2 gives a list of use cases for CGMA data exchange.

277 **Table 2 – CGMA data exchange**

Use case label	Actors involved	Action description and assertions
Submitting PPD (with send, ack)	TSO, CGMA platform	A TSO or RSC (on behalf of this TSO) submits a complete set of pre-processing data (PPD) for a particular optimisation area. The CGMA platform checks submitted PPD. It accepts or rejects a set of PPD. The action shall be executed only before PPD gate closure time.
Send CGMA output	TSO, CGMA platform	The CGMA platform provides the TSO with a detailed set of its PPD originally transmitted to the CGMA platform, substituted / modified PPD (if applicable), and CGMA results. In addition, the CGMA platform is generating a similar output for the entire CGMA area containing all optimisation areas. The action shall be executed only after the CGMA algorithm has finally run and has successfully terminated with results for the target time horizon serving as input for the subsequent PSLC (only for scenarios where applicable).
Submitting PSLCD (with send, ack)	TSO, CGMA platform	A responsible TSO or RSC (on behalf of this TSO) submits a complete set of pole split and loss calculation data (PSLCD) for a particular optimisation area which is linked by one or more DC links. The CGMA platform checks submitted PSLCD. It accepts or rejects a set of PSLCD. The action shall be executed only before PSLCD gate closure time and is only applicable to parties having chosen the external PSLC approach
Send PSLC output	TSO, CGMA platform	The CGMA platform provides the TSOs whose optimisation area is connected to a DC link with the results from the PSLC (external / internal) . In addition, the CGMA platform is generating a similar output for the entire CGMA area containing all optimisation areas.
Substitute data	CGMA platform, PEVF platform	The PEVF platform provides netted area positions and DC flows of the whole CGM area to CGMA. CGMA is subscribed to the D-1 data publication provided by PEVF. As there is no specific data exchange apart from consuming the publication, further details are out of scope of the CGMA implementation guide.
Request final results	CGMA platform, Information receiver	An information receiver, e. g. a TSO or RSC, requests final results for any particular optimisation area within the entire CGMA area or for the entire CGMA area (called the final reference program).

278 ## 3.4 Document exchange processes

279 ### 3.4.1 Overview

280 The use cases are supported by seven document exchange processes:

281 - Submit pre-processing data

282 - Send escalation notification on pre-processing data

283 - Send input data and CGMA results

- Submit pole split and loss calculation data
- Send escalation notification on pole split and loss calculation data
- Send PSLC results
- Request final results

Figure 2 shows a sequence diagram of the three document exchange processes 3.4.2 Submit pre-processing data, 3.4.3 Send escalation notification on pre-processing data, and 3.4.4 Send input data and CGMA results.

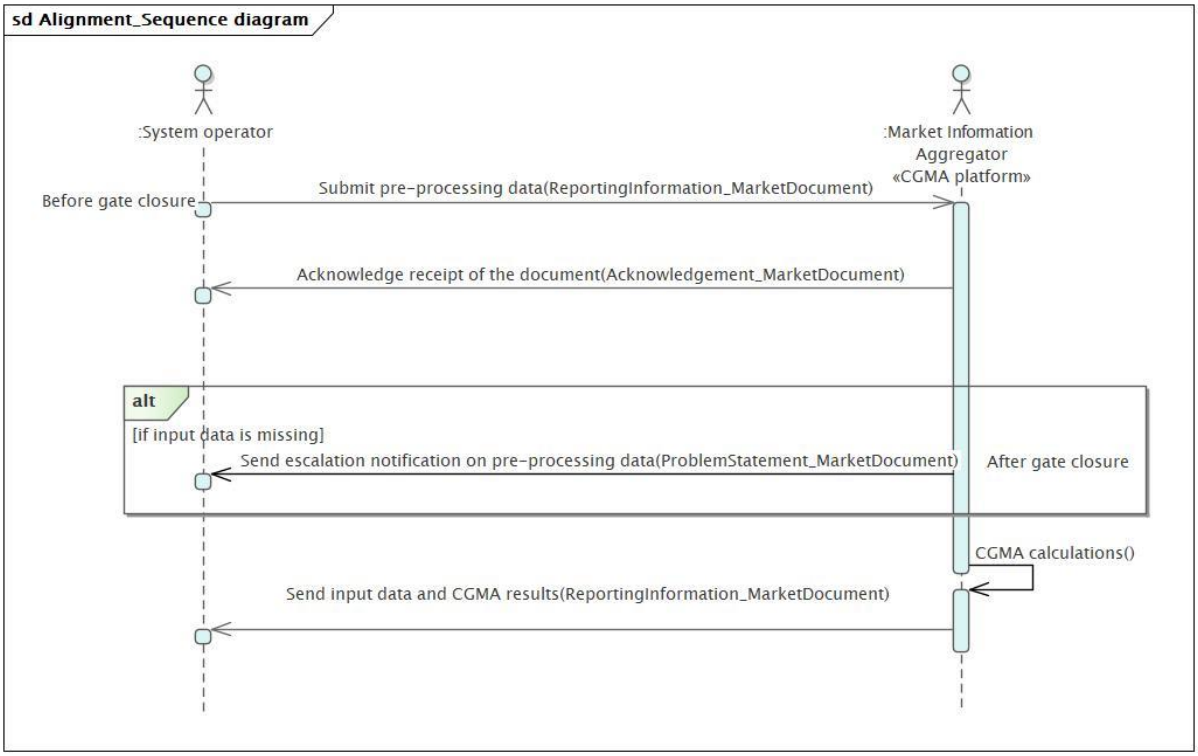

Figure 2 – Sequence diagram for alignment

Figure 3 shows a sequence diagram of the three document exchange processes 3.4.5 Submit pole split and loss calculation data, 3.4.6 Send escalation notification on pole split and loss calculation data and 3.4.7 Send PSLC results.

The PSLC results will always be provided as ReportingInformation_MarketDocument with two different dependency tables depending on whether additional scheduling areas (representing HVDC interconnectors) are used or not. When using additional scheduling areas the output is based on the ReportingInformation_MarketDocument dependency tables used by PEVF to support a unique interface for subsequent IGM creation tools from both platforms with different scenarios (CGMA: D-2, Y-1, PEVF: D-1, ID). Please refer to [6] for more details on this specific implementation of the Reporting Information Market Document. The alternative representation of the PSLC results is not using additional scheduling areas and is similar to the output from the CGMA optimisation by replacing the aggregated DC links with their individual poles (if applicable) and introducing net flows in addition to gross flows.

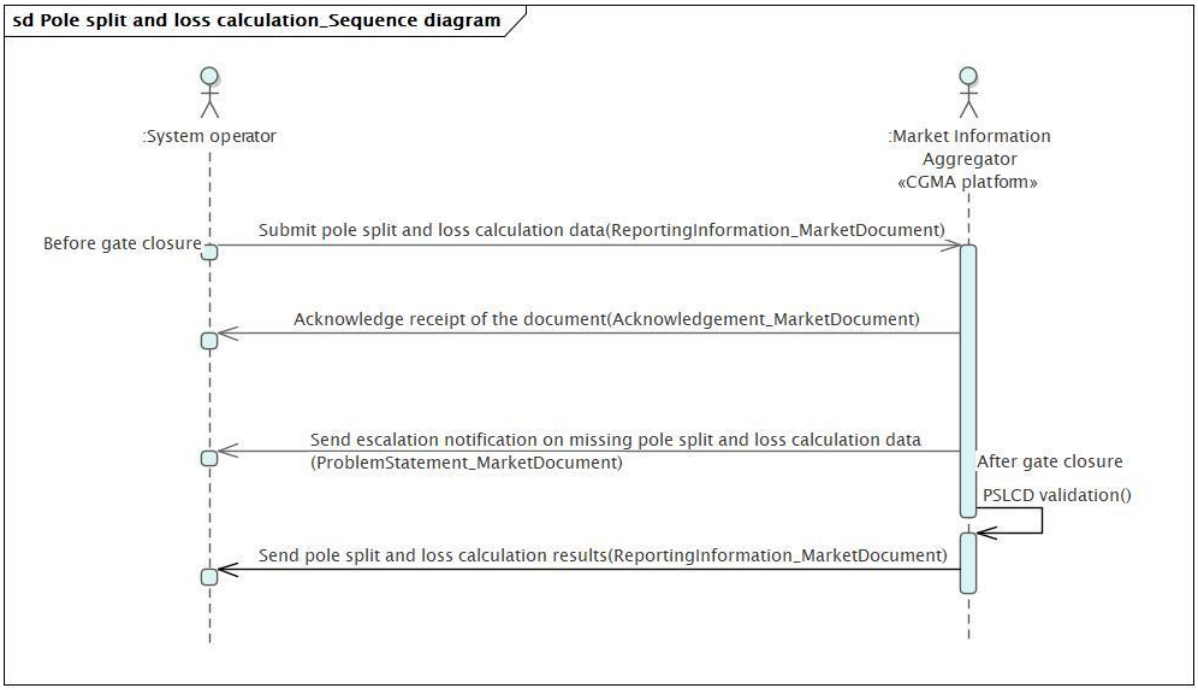

Figure 3 – Sequence diagram for pole split and loss calculation

3.4.2 Submit pre-processing data

Before PPD gate closure time, a TSO should initiate the document exchange by submitting PPD to the CGMA platform. The platform acknowledges the receipt of a PPD document by sending an acknowledgement to the TSO. If the validation of the PPD contained in the submitted document was not fully successful, the acknowledgement contains information about the rejection of the document, time series or values and the reasons for the rejection.

This process may be executed more than once.

A complete set of PPD consists of the time series types listed in Table 3.

Table 3 – Time series types of pre-processing data

Label	Description	BusinessType
Preliminary netted area position	A TSO's best forecast of the netted area position for an optimisation area. The feasibility range of adjustments must also be given and is part of the PPD. However, it is not transmitted as a separate business type. Mandatory.	B65
Minimum value of netted area position	That value which a balanced netted area position must not fall below for a given optimisation area. Optional.	B69
Maximum value of netted area position	That value which a balanced netted area position must not exceed for a given optimisation area. Optional.	B70
Preliminary DC gross flow	A TSO's best forecast of the DC gross flow at the exporting end for a given DC link. Mandatory for each given DC link.	B68

Label	Description	BusinessType
Maximum value of gross DC flow	That value which a balanced DC gross flow must not exceed for a given DC link. Mandatory for each given DC link.	B71

318

3.4.3 Send escalation notification on pre-processing data

After PPD gate closure time, the CGMA platform sends a notification to a TSO if PPD are missing, which is relevant for the TSO's optimisation area.

In case no PPD have been provided the CGMA platform will use the matched D-1 schedules from PEVF to substitute missing PPD (if available). The results from PEVF are obtained by being subscribed to the publication of results from PEVF in the OPDE environment. Whenever PEVF is publishing a new reference program it is processed by CGMA and kept acting as substitution input if required.

3.4.4 Send input data and CGMA results

After the CGMA platform has successfully terminated a CGMA run with results for the target time horizon, it sends to the TSO the CGMA algorithm input and CGMA results which are relevant for the TSO's optimisation area. In case of any modification of PPD provided by a TSO (by the CGMA platform and/or an RSC) the document will contain both the original input data and the modified input data reporting the changes using the marketObjectStatus entity.

The document can be provided for individual optimisation areas or the whole CGMA area. The time series types of input data and CGMA results are listed in Table 4 and Table 5.

Table 4 – Time series types of input data

Label	Description	BusinessType
Preliminary netted area position	The netted area position of an optimisation area used as input to the CGMA algorithm. It may be substituted with values from PEVF (if applicable for the target time horizon) or modified by an RSC. A feasibility range of adjustments must also be given. However, it is not transmitted as a separate business type. It may be modified by an RSC or the CGMA platform. Mandatory. Repeated occurrence in case of modifications.	B65
Minimum value of netted area position	The minimum netted area position of an optimisation area used as input to the CGMA algorithm. It may be modified by an RSC or the CGMA platform. Optional. Repeated occurrence in case of modifications.	B69
Maximum value of netted area position	The maximum netted area position of an optimisation area used as input to the CGMA algorithm. It may be modified by an RSC or the CGMA platform. Optional. Repeated occurrence in case of modifications.	B70
Preliminary DC gross flow	A DC gross flow at the exporting end for a given DC link used as input to the CGMA algorithm. It may be substituted with values from PEVF (only D-2) or modified by an RSC or the CGMA platform. Mandatory for each given DC link. Repeated occurrence in case of modifications.	B68
Maximum value of gross DC flow	A maximum DC gross flow for a given DC link used as input to the CGMA algorithm. It may be modified by an RSC or the CGMA platform. Mandatory for each given DC link. Repeated occurrence in case of modifications.	B71

337 **Table 5 – Time series types of CGMA results**

Label	Description	BusinessType
Balanced netted area position	The balanced netted area position of an optimisation area. A balanced netted area position is characterised by the fact that the sum of all netted area positions of the entire CGMA area is zero. Mandatory.	B65
Balanced netted AC area position	The balanced netted AC area position of an optimisation area is obtained by subtracting from the balanced netted area position all balanced DC flows into and out of that optimisation area. Mandatory.	B64
Indicative AC flow	It is the hypothetical flow on the aggregate of all AC tie lines of an electrical border between two optimisation areas. It results from the adjustments to the preliminary netted area positions of all optimisation areas made by the CGMA algorithm. Indicative AC flows are an artefact of the CGMA algorithm, and do not correspond to physical flows. Mandatory.	B73
Balanced DC gross flow	The flow at the exporting end of the DC link. Mandatory for each given DC link.	B68

338 ### 3.4.5 Submit pole split and loss calculation data

339 Before the PSLC gate closure time, only TSOs being responsible to submit PSLCD for DC links
340 connected to their optimisation areas and having chosen the external PSLC approach should
341 initiate a document exchange by submitting a PSLCD document for each single optimisation
342 area with DC interconnectors for which the TSO is responsible containing the DC flows (the
343 document type is Reporting_MarketDocument labelled as “B26 = Aggregated netted external
344 schedules” for consistency with PEVF data formats) per pole for each of the DC links to the
345 CGMA platform.

346 The platform acknowledges the receipt of a PSLCD document by sending an acknowledgement
347 to the TSO. If the validation of the PSLCD contained in the submitted document was not fully
348 successful, the acknowledgement contains information about the rejection of the document,
349 time series or values and the reasons for the rejection.

350 Losses are implicitly considered by using additional scheduling areas where the additional
351 scheduling area is consuming them (by definition the gross flow is always the flow into the
352 additional scheduling area while the flow from the additional scheduling area is always a loss-
353 corrected net flow).

354 This process may be executed more than once before the PSLC gate closure time.

355 A complete set of PSLCD consists of the time series types listed in Table 6.

356 **Table 6 – Time series types of pole split and loss calculation data**

Label	Description	BusinessType
Aggregated netted external schedule	The DC flow (labelled as aggregated netted external schedule) for each pole of a DC link by using additional scheduling areas. Mandatory.	B63

357 ### 3.4.6 Send escalation notification on pole split and loss calculation data

358 After the PSLCD gate closure time, the CGMA platform sends a notification to each TSO being
359 responsible to submit PSLCD for the TSO’s optimisation area(s) if PSLCD are missing.

360

3.4.7 Send PSLC results

After the CGMA platform has performed the PSLC (external / internal) it will create the PSLC results and provide them in two different types of documents. The first of the document types is giving the results in a similar fashion as the PEVF does (by using the same business types and additional scheduling areas) to enable the use of only one interface between the two applications supplying the reference program for different scenarios (CGMA and PEVF) and the tools used for the model creation / update by TSOs.

The final results can be provided for individual optimisation areas or the whole CGMA area.

The final PSLC document based on additional scheduling areas contains the following time series types.

Table 7 – Time series types of PSLC results with additional scheduling areas

Label	Description	BusinessType
Balanced Netted area position	The netted area position for an optimisation area. Mandatory.	B65
Balanced netted area AC position	The netted AC area position for an optimisation area. Mandatory.	B64
Aggregated netted external schedule	The DC flow (labelled as aggregated netted external schedule) for each boundary point of a DC link on the level of poles by using additional scheduling areas. Mandatory for each given pole.	B63

The second document type is an alternative representation of the PSLC results and based on the document type used to provide the CGMA results from the alignment process with a slight enhancement in terms of a dedicated business type for HVDC net flows (B67). It contains the following time series types.

Table 8 – Time series types of PSLC results without additional scheduling areas

Label	Description	BusinessType
Balanced netted area position	The netted area position of an optimisation area. A balanced netted area position is characterised by the fact that the sum of all netted area positions of the entire CGMA area is zero. Mandatory.	B65
Balanced netted AC area position	The balanced netted area AC position of an optimisation area is obtained by subtracting from the balanced netted area position all balanced gross DC flows into and out of that optimisation area. Note that small deviation between the gross flows from the alignment and from the PSLCD will be accepted and do not trigger a recalculation of the balanced netted AC area position. Mandatory.	B64
Indicative AC flow	It is the hypothetical flow on the aggregate of all AC tie lines of an electrical border between two optimisation areas. It results from the adjustments to the preliminary netted area positions of all optimisation areas made by the CGMA algorithm. Indicative AC flows are an artefact of the CGMA algorithm, and do not correspond to physical flows. Mandatory.	B73
Balanced DC net flow	The flow at the importing end of the DC link. Mandatory for each given DC link on the level of poles. May optionally be provided for the complete DC link (aggregated poles).	B67
Balanced DC gross flow	The flow at the exporting end of the DC link.	B68

	Mandatory for each given DC link on the level of poles. May optionally be provided for the complete DC link (aggregated poles).	

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3.4.8 Request final results

Figure 4 shows a sequence diagram.

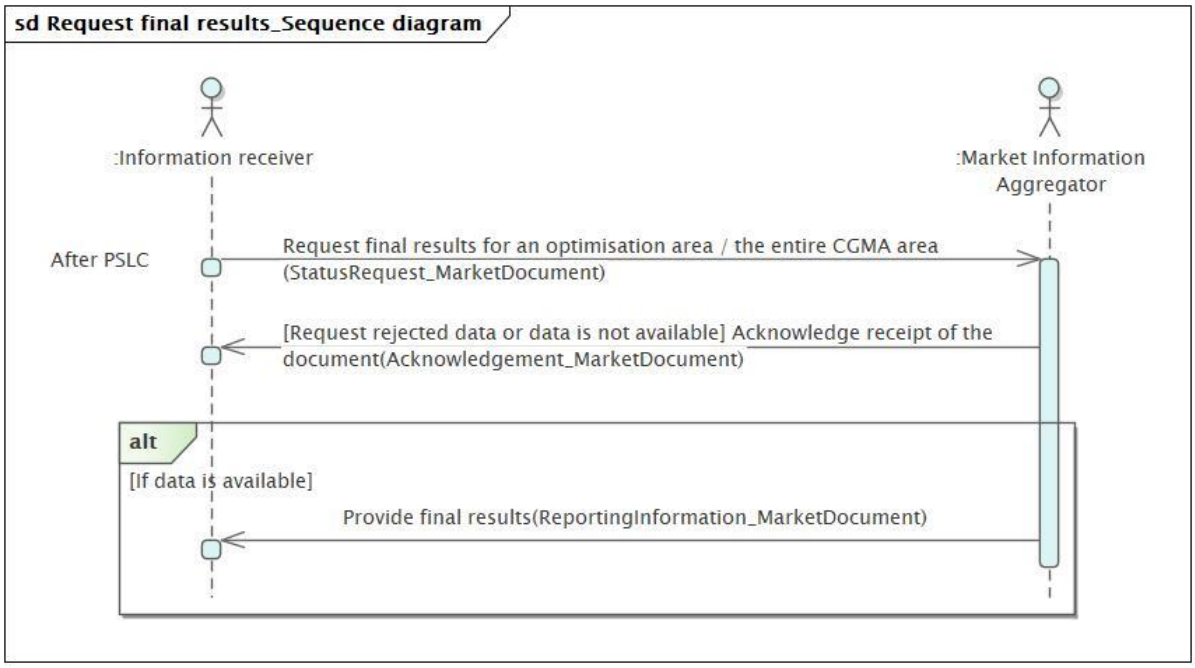

Figure 4 – Sequence diagram for request final results

The process may only be executed after the final results are available from CGMA.

The Document exchange is initiated by the Information receiver requesting final result data from the CGMA platform. The CGMA platform replies by sending final results, if these data are available. In any other case, the CGMA platform replies an Acknowledgement_MarketDocument with problem details.

The information receiver is requesting data of a certain document type (type = B19 or B29), a target period (time_Period.timeInterval), a scenario (process.processType), and area (domain.mRID with either a certain optimisation area or the whole CGMA area).

According to the request the final results are either given with or without using additional scheduling areas. If the request is for the final results with additional scheduling areas (type = B19) the final results consist of the time series types listed below in the table.

Table 9 – Time series types of final results with additional scheduling areas

Label	Description	BusinessType
Balanced Netted area position	The netted area position for an optimisation area. Mandatory.	B65
Balanced netted AC area position	The netted AC area position for an optimisation area. Mandatory.	B64
Aggregated netted external schedule	The DC flow (labelled as aggregated netted external schedule) for each boundary point of a DC link by using additional scheduling areas. Mandatory for each given boundary point.	B63

In case the request is for the results without additional scheduling areas (type = B29) the following time series types will be provided.

Table 10 – Time series types of final results without additional scheduling areas

Label	Description	BusinessType
Balanced netted area position	The netted area position of an optimisation area. A balanced netted area position is characterised by the fact that the sum of all netted area positions of the entire CGMA area is zero. Mandatory.	B65
Balanced netted AC area position	The balanced netted AC area position of an optimisation area is obtained by subtracting from the balanced netted area position all balanced gross DC flows into and out of that optimisation area. Note that small deviation between the gross flows from the alignment and from the PSLCD will be accepted and do not trigger a recalculation of the balanced netted AC area position. Mandatory.	B64
Indicative AC flow	It is the hypothetical flow on the aggregate of all AC tie lines of an electrical border between two optimisation areas. It results from the adjustments to the preliminary netted area positions of all optimisation areas made by the CGMA algorithm. Indicative AC flows are an artefact of the CGMA algorithm, and do not correspond to physical flows. Mandatory.	B73
Balanced DC net flow	The flow at the importing end of the DC link. Mandatory for each given DC link on the level of poles. May optionally be provided for the complete DC link (aggregated poles).	B67
Balanced DC gross flow	The flow at the exporting end of the DC link. Mandatory for each given DC link on the level of poles. May optionally be provided for the complete DC link (aggregated poles).	B68

General rules for document exchange

4.1 General rules

The document exchange processes of CGMA described in the previous chapter require sending and receiving various EDI documents. The EDI documents to be used are

- Reporting_MarketDocument, refer to reference [5];
- ReportingInformation_MarketDocument, refer to reference [7];
- Acknowledgement_MarketDocument IEC62325-451-1, refer to reference [2];
- ProblemStatement_MarketDocument IEC62325-451-5, refer to reference [3];
- StatusRequest_MarketDocument IEC62325-451-5, refer to reference [4].

These EDI documents shall be used to carry out the communication tasks

- **submit** - The document contains data to be processed by the receiver.
- **get** - The document specifies a request for data to be provided by the receiver.
- **reply** - It is the reaction to receiving a submit or get document.
- **send** - The document contains data which may be processed by the receiver.

Table 11 gives an overview, which EDI document shall be used to carry out the communication tasks of document exchange processes (DEP). Note that dependency tables of using ReportingInformation_MarketDocument are provided in chapter 5 of this document. The abbreviations used in the table (e.g., RID) are explained below the table.

415

416 **Table 11 – List of documents for CGMA process exchanges**

DEP chapter	DEP label	send/submit/get document	reply document	reply conditions
3.4.2	Submit pre-processing data	RID	EAD	RID accepted (completely or with errors correctable by CGMA).
				RID fully rejected due to non-correctable error(s) in PPD or fully rejected due to closed PPD submission gate.
3.4.3	Send escalation notification on pre-processing data	EPSD	none	
3.4.4	Send input data and CGMA results	RID	none	
3.4.5	Submit pole split and loss calculation data	RD	EAD	RD accepted (completely or with errors correctable by CGMA).
				RD fully rejected due to non-correctable error(s) in PSLCD or fully rejected due to closed PSLCD submission gate.
3.4.6	Send escalation notification on pole split and loss calculation data	EPSD	none	
3.4.7	Send PSLC results	RID	none	
3.4.8	Request final results	ESR	RID	ESR fully accepted and requested data available.
			EAD	Syntax error or semantic error in ESR header or error in request attributes.
			EAD	Requested data not available.

417 Note: **RD** - Reporting_MarketDocument; **RID** - ReportingInformation_MarketDocument; **EAD** - Acknowledgement_MarketDocument;
418 **EPSD** - ProblemStatement_MarketDocument; **ESR** - StatusRequest_MarketDocument

419 ## 4.2 Notes about using StatusRequest_MarketDocument in CGMA document exchange

420 The header of StatusRequest_MarketDocument shall contain the information listed in Table 12.

421 **Table 12 – StatusRequest_MarketDocument header values**

Attribute	Value
mRID	Identification of the request.
type	B20: Status request for a reporting information market document
sender_MarketParticipant.mRID	The identification of the sender.
sender_MarketParticipant.marketRole.type	The role of the sender.
receiver_MarketParticipant.mRID	The identification of the receiver (CGMA platform).
receiver_MarketParticipant.marketRole.type	The role of the receiver. A32: Market Information Aggregator.

Attribute	Value
createdDateTime	UTC time of document creation.

The body of StatusRequest_MarketDocument shall contain a list of attribute-value pairs. Allowed attributes and their dependencies are listed in Table 13.

Table 13 – StatusRequest_MarketDocument AttributeInstanceComponent values

attribute	values dependencies	description
type	B19: Reporting information market document. B29: PS&LC results document Mandatory.	Type of the reply document. Can be either the final results without additional scheduling areas (B19) or with additional scheduling areas B29). Only final results will be provided (no initial reference program from the CGMA optimisation will be available via a Status Request).
domain.mRID	EIC of single optimisation area / EIC of CGMA area. Mandatory.	Reply document shall contain data relevant for that optimisation area / the entire CGMA area.
Process.processType	A33: Year ahead. A32: Month ahead. A31: Week ahead. A45: Two days ahead. Mandatory.	
time_Period.timeInterval	UTC time. Mandatory.	Start and end time of CGMA target time interval.

4.3 Notes about using ProblemStatement_MarketDocument as an escalation notification

The header of ProblemStatement_MarketDocument shall contain the information listed in Table 14.

Table 14 – ProblemStatement_MarketDocument header values

Attribute	Value
mRID	Unique identification of the document.
revisionNumber	Version of the document.
type	A34: Escalation document
sender_MarketParticipant.mRID	The identification of the sender (CGMA platform).
sender_MarketParticipant.marketRole.type	The role of the sender. A32: Market Information Aggregator.
receiver_MarketParticipant.mRID	The identification of the receiver.
receiver_MarketParticipant.marketRole.type	The role of the receiver. A04: System operator.
createdDateTime	UTC time of document creation.
period.timeInterval	CGMA target time interval covered by the document.

Attribute	Value
expected_MarketDocument.type	B19: Reporting information market document (for missing PPD). B26: Aggregated netted external schedule document (for missing PSLCD).
expected_MarketDocument.createdDateTime	UTC time. The gate closure time for the missing document.
expected_MarketDocument.process.processType	A33: Year ahead. A32: Month ahead. A31: Week ahead. A45: Two days ahead.
domain.mRID	The optimisation area of concern.
Reason.code	A91: Expected document not received.

4.4 Notes about using Reporting_MarketDocument to submit pole split and loss calculation data

Table 15 gives the rules governing attributes and elements of Reporting_MarketDocument header. Please refer to [5] for more details on the implementation of the Reporting Market Document.

Table 15 – Reporting_MarketDocument header

	Attribute	Description and dependencies
Reporting_MarketDocument	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B26: Aggregated netted external schedule document.
	process.processType	A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender.
	sender_MarketParticipant.marketRole.type	The role of the sender. A04: System operator.
	receiver_MarketParticipant.mRID	The identification of the receiver (CGMA platform).
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A32: Market Information Aggregator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern.
	Subject_Domain.mRID	The optimisation area of concern.

The document should contain one or more elements of TimeSeries class.

Table 16 gives the rules governing the attributes and sub-elements of Reporting_MarketDocument.TimeSeries elements.

440 **Table 16 – Reporting_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies	
		DC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.	
	businessType	B63: Aggregated netted external schedule. Mandatory.	
	product	8716867000016: Active Power. Mandatory.	
		import	**export**
	in_Domain.mRID	Identification of the importing optimisation area. Mandatory.	Identification of the importing area (always a scheduling area). Mandatory.
	out_Domain.mRID	Identification of the exporting area (always a scheduling area). Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource .mRID	Identification of the DC link on the level of a pole. Mandatory.	
	quantity_Measure_Unit.name	MAW: MW Mandatory.	
	curveType	A01: Sequential fixed size block. A02: Point. A03: Variable block. Mandatory.	
.Period	timeInterval	Time interval covered by elements of Point class.	
	resolution	Resolution used in the Point class. PT1H or PT1M or PT60M. Mandatory.	
.Period.Point	position	Position in the time series. Mandatory.	
	quantity	Value of the flow quantity (no signed value). Mandatory.	

441

Using the ReportingInformation_MarketDocument in CGMA

5.1 Overview

According to Table 11, the ReportingInformation_MarketDocument is used in five different processes of CGMA document exchange. For each process, specific rules for using ReportingInformation_MarketDocument, so called dependencies, are defined in subsections of this chapter.

5.2 Rules governing ReportingInformation_MarketDocument to submit pre-processing data (PPD)

Table 17 gives the rules governing attributes and elements of ReportingInformation_MarketDocument header.

Table 17 – ReportingInformation_MarketDocument header

	Attribute	Description and dependencies
ReportingInformation_MarketDocument	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B19: Reporting information market document.
	process.processType	A33: Year ahead. A32: Month ahead. A31: Week ahead. A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender.
	sender_MarketParticipant.marketRole.type	The role of the sender. A04: System operator.
	receiver_MarketParticipant.mRID	The identification of the receiver (CGMA platform).
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A32: Market Information Aggregator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern.
	dataset_MarketDocument.mRID	Not used.
	dataset_MarketDocument.revisionNumber	Not used.
	docStatus	Not used.
	referenced_DateAndOrTime.date	Not used.
	referenced_DateAndOrTime.time	Not used.
	Reason	Not used.

The document should contain one or more elements of TimeSeries class.

455 Table 18 gives the rules governing the attributes and sub-elements of
456 ReportingInformation_MarketDocument.TimeSeries elements.

457 **Table 18 – ReportingInformation_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies			
		Netted area position or maximum and minimum netted area position values		DC flow or maximum and minimum DC flow values	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B65: Netted area position. Mandatory.		B68: DC gross flow. Mandatory.	
		B70: Maximum netted area position. B69: Minimum netted area position. Optional.		B71: Maximum DC gross flow. Mandatory.	
	product	8716867000016: Active Power Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of optimisation area. Mandatory.	Not used.	Identification of the importing optimisation area. Mandatory.	Identification of the importing optimisation area. Mandatory.
	out_Domain.mRID	Not used.	Identification of optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource.mRID	Not used.		Identification of the DC link. Mandatory.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A02: Point. Mandatory.			
	marketObjectStatus.status	Not used.			
	Reason	Not used.			
.Period	timeInterval	Time interval covered by elements of Point class. Mandatory.			
	resolution	Resolution used in the Point class. PT1H. Mandatory.			
.Perio	position	Position in the time series. Mandatory.			

	Attribute	Description and dependencies			
		Netted area position or maximum and minimum netted area position values		DC flow or maximum and minimum DC flow values	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B65: Netted area position. Mandatory.		B68: DC gross flow. Mandatory.	
		B70: Maximum netted area position. B69: Minimum netted area position. Optional.		B71: Maximum DC gross flow. Mandatory.	
	product	8716867000016: Active Power Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of optimisation area. Mandatory.	Not used.	Identification of the importing optimisation area. Mandatory.	Identification of the importing optimisation area. Mandatory.
	out_Domain.mRID	Not used.	Identification of optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource.mRID	Not used.		Identification of the DC link. Mandatory.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A02: Point. Mandatory.			
	marketObjectStatus.status	Not used.			
	Reason	Not used.			
	quantity	Value of the netted area position, flow or minimum / maximum (no signed value). Mandatory.			

458

.Period.Point	posFR_Quantity.quantity	Positive feasibility range (no signed value). Mandatory for BusinessType B65. Not used otherwise.	Not used.
	negFR_Quantity.quantity	Negative feasibility range (signed value). Mandatory for BusinessType B65. Not used otherwise.	Not used.
	Reason	Not used.	

5.3 Rules governing ReportingInformation_MarketDocument to send input data and CGMA results

Table 19 gives the rules governing attributes and elements of ReportingInformation_MarketDocument header.

Table 19 – ReportingInformation_MarketDocument header

	Attribute	Description and dependencies
ReportingInformation_MarketDocument	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B19: Reporting information market document.
	process.processType	A33: Year ahead. A32: Month ahead. A31: Week ahead. A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender (CGMA platform).
	sender_MarketParticipant.marketRole.type	The role of the sender. A32: Market Information Aggregator.
	receiver_MarketParticipant.mRID	The identification of the receiver.
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A04: System operator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern or the whole CGMA area.
	dataset_MarketDocument.mRID	Not used.
	dataset_MarketDocument.revisionNumber	Not used.
	docStatus	A01: Intermediate. A02: Final (only used in case the optimisation area has no DC link with external or internal PSLC).
	referenced_DateAndOrTime.date	Not used.
	referenced_DateAndOrTime.time	Not used.
	Reason	Not used.

The document should contain one or more elements of TimeSeries class.

Table 20 gives the rules governing the attributes and sub-elements of ReportingInformation_MarketDocument.TimeSeries elements.

467 **Table 20 – ReportingInformation_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies			
		netted (AC) area position or maximum and minimum netted area position values		**DC flow or maximum and minimum DC flow values or indicative AC flow**	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. Mandatory. B69: Minimum netted area position. B70: Maximum netted area position. Optional and only used when domain.mRID is an optimisation area (not the CGMA area)		B68: DC gross flow B73: Indicative AC flow. Mandatory. B71: Maximum DC gross flow. Mandatory only when domain.mRID is an optimisation area. Not used when domain.mRID is the whole CGMA area.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Not used.	Identification of the importing optimisation area. Mandatory.	Identification of the importing optimisation area. Mandatory.
	out_Domain.mRID	Not used.	Identification of the optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource.mRID	Not used.		Identification of the DC link. Mandatory for B68: DC gross flow and B71: Maximum DC gross flow. Not used for B73: Indicative AC flow.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A02: Point. Mandatory.			
	marketObjectStatus.status	Coded description of a time series. A29: Submitted. (The object was submitted to be processed by CGMA platform.) A30: Substituted. (CGMA platform used data originating from PEVF platform.) A31: Modified. (The values were modified by RSC or CGMA platform.) A32: Result. (The values are the result of the CGMA optimisation (only used for B64, B65, B68 and B73.)) Mandatory. A29, A30 and A31 are not used when domain.mRID is the whole CGMA area.			

	Reason	Not used.

468

.Period	timeInterval	Time interval covered by elements of Point class. Mandatory.	
	resolution	Resolution used in the Point class. PT1H. Mandatory.	
.Period.Point	position	Position in the time series. Mandatory.	
	quantity	Value of the netted (AC) area position, flow or minimum / maximum (no signed value). Mandatory.	
	posFR_Quantity.quantity	Positive feasibility range (no signed value). Mandatory for BusinessType B65 and marketObjectStatus.status not A32 and when domain.mRID is an optimisation area. Not used otherwise.	Not used.
	negFR_Quantity.quantity	Negative feasibility range (signed value). Mandatory for BusinessType B65 and marketObjectStatus.status not A32 and when domain.mRID is an optimisation area. Not used otherwise.	Not used.
	Reason.code	May optionally be provided in case of marketObjectStatus.status A30: Substituted, or A31: Modified. A63: Time Series modified.	
	Reason.text	Optionally used to provide additional information about the reason for modification.	

469 ## 5.4 Rules governing ReportingInformation_MarketDocument to send PSLC results

470 Table 21 gives the rules governing attributes and elements of
471 ReportingInformation_MarketDocument header when using additional scheduling areas for the
472 HVDC interconnectors.

473 **Table 21 – ReportingInformation_MarketDocument header**

ReportingInformation_MarketDocument	Attribute	Description and dependencies
	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B29: PS&LC results document.
	process.processType	A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender (CGMA platform).
	sender_MarketParticipant.marketRole.type	The role of the sender. A32: Market Information Aggregator.
	receiver_MarketParticipant.mRID	The identification of the receiver.
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A04: System operator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern or the whole CGMA area.
	dataset_MarketDocument.mRID	Not used.
	dataset_MarketDocument.revisionNumber	Not used.
	docStatus	A02: Final.
	referenced_DateAndOrTime.date	Not used.
	referenced_DateAndOrTime.time	Not used.
	Reason	Not used.

474 The document should contain one or more elements of TimeSeries class.

475

476 Table 22 gives the rules governing the attributes and sub-elements of
477 ReportingInformation_MarketDocument.TimeSeries elements when using additional scheduling
478 areas for the HVDC interconnectors.

479 **Table 22 – ReportingInformation_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies			
		Netted area position		DC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. Mandatory.		B63: Aggregated netted external schedule. Mandatory.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Identification of the synchronous area. Mandatory.	Identification of the importing optimisation area. Mandatory.	Identification of the importing area (always a scheduling area). Mandatory.
	out_Domain.mRID	Identification of the synchronous area. Mandatory.	Identification of the optimisation area. Mandatory.	Identification of the exporting area (always a scheduling area). Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource .mRID	Not used.		Identification of the DC link on the level of poles. Mandatory.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A03: Variable block. Mandatory.			
	marketObjectStatus.status	A32: Result. (The values are the result from the CGMA optimisation). Mandatory.		Coded life cycle status of a time series. A29: Submitted. (The values were submitted to be validated by the CGMA platform.) A31: Modified. (The values were computed by the CGMA platform.) A32: Result. (The values are the result from the PSLC.) Mandatory.	
	Reason	Not used.			
.Perio	timeInterval	Time interval covered by elements of Point class. Mandatory.			

	Attribute	Description and dependencies			
		Netted area position		DC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. Mandatory.		B63: Aggregated netted external schedule. Mandatory.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Identification of the synchronous area. Mandatory.	Identification of the importing optimisation area. Mandatory.	Identification of the importing area (always a scheduling area). Mandatory.
	out_Domain.mRID	Identification of the synchronous area. Mandatory.	Identification of the optimisation area. Mandatory.	Identification of the exporting area (always a scheduling area). Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource .mRID	Not used.		Identification of the DC link on the level of poles. Mandatory.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A03: Variable block. Mandatory.			
	marketObjectStatus.status	A32: Result. (The values are the result from the CGMA optimisation). Mandatory.		Coded life cycle status of a time series. A29: Submitted. (The values were submitted to be validated by the CGMA platform.) A31: Modified. (The values were computed by the CGMA platform.) A32: Result. (The values are the result from the PSLC.) Mandatory.	
	Reason	Not used.			
	resolution	Resolution used in the Point class. PT1M Mandatory.			

480

.Perio	position	Position in the time series. Mandatory.

	quantity	Value of the netted (AC) area position or flow (no signed value). Mandatory.	
	posFR_Quantity.quantity	Not used.	
	negFR_Quantity.quantity	Not used.	
	Reason		Not used.

Table 23 gives the rules governing attributes and elements of ReportingInformation_MarketDocument header when not using additional scheduling areas for the HVDC interconnectors.

Table 23 – ReportingInformation_MarketDocument header

	Attribute	Description and dependencies
ReportingInformation_MarketDocument	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B19: Reporting information market document.
	process.processType	A33: Year ahead. A32: Month ahead. A31: Week ahead. A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender CGMA platform).
	sender_MarketParticipant.marketRole.type	The role of the sender. A32: Market Information Aggregator.
	receiver_MarketParticipant.mRID	The identification of the receiver.
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A04: System operator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern or the whole CGMA area.
	dataset_MarketDocument.mRID	Not used.
	dataset_MarketDocument.revisionNumber	Not used.
	docStatus	A02: Final.
	referenced_DateAndOrTime.date	Not used.
	referenced_DateAndOrTime.time	Not used.
	Reason	Not used.

The document should contain one or more elements of TimeSeries class.

Table 24 gives the rules governing the attributes and sub-elements of ReportingInformation_MarketDocument.TimeSeries elements when not using additional scheduling areas for the HVDC interconnectors.

489 **Table 24 – ReportingInformation_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies			
		Netted (AC) area position		DC flow or indicative AC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. The net AC and DC position of the optimisation area. Mandatory.		B67: DC net flow. B68: DC gross flow. B73: Indicative AC flow. Mandatory.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Not used.	Identification of the importing optimisation area. Mandatory.	Identification of the importing optimisation area. Mandatory.
	out_Domain.mRID	Not used.	Identification of the optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource.mRID	Not used.		Identification of the DC link on the level of poles and optionally of the DC link itself. Mandatory for B67: DC net flow and B68: DC gross flow Not used for B73: Indicative AC flow.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A02: Point. Mandatory.			
	marketObjectStatus.status	A32: Result. (The values are the result from the CGMA optimisation). Mandatory.		Coded life cycle status of a time series. A29: Submitted. (The values were submitted to be validated by the CGMA platform.) A30: Substituted. (The values were computed by the CGMA platform.) A32: Result. (The values are the result from the PSLC.) Mandatory.	
	Reason	Not used.			
.Perio	timeInterval	Time interval covered by elements of Point class. Mandatory.			

	Attribute	Description and dependencies			
		Netted (AC) area position		DC flow or indicative AC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. The net AC and DC position of the optimisation area. Mandatory.		B67: DC net flow. B68: DC gross flow. B73: Indicative AC flow. Mandatory.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Not used.	Identification of the importing optimisation area. Mandatory.	Identification of the importing optimisation area. Mandatory.
	out_Domain.mRID	Not used.	Identification of the optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource.mRID	Not used.		Identification of the DC link on the level of poles and optionally of the DC link itself. Mandatory for B67: DC net flow and B68: DC gross flow Not used for B73: Indicative AC flow.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A02: Point. Mandatory.			
	marketObjectStatus.status	A32: Result. (The values are the result from the CGMA optimisation). Mandatory.		Coded life cycle status of a time series. A29: Submitted. (The values were submitted to be validated by the CGMA platform.) A30: Substituted. (The values were computed by the CGMA platform.) A32: Result. (The values are the result from the PSLC.) Mandatory.	
	Reason	Not used.			
	resolution	Resolution used in the Point class. PT1H Mandatory.			

.Period.Point	position	Position in the time series. Mandatory.
	quantity	Value of the netted (AC) area position or flow (no signed value). Mandatory.
	posFR_Quantity.quantity	Not used.
	negFR_Quantity.quantity	Not used.
	Reason.code	May optionally be provided in case of marketObjectStatus.status A30: Substituted and domain.mRID is an optimisation area (not the whole CGMA area). A63: = Time Series modified.
	Reason.text	Optionally used to provide additional information about the reason for modification.

5.5 Rules governing ReportingInformation_MarketDocument to reply final results

Table 25 gives the rules governing attributes and elements of ReportingInformation_MarketDocument header when using additional scheduling areas for the HVDC interconnectors.

Table 25 – ReportingInformation_MarketDocument header

	Attribute	Description and dependencies
ReportingInformation_MarketDocument	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B29: PS&LC results document
	process.processType	A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender (CGMA platform).
	sender_MarketParticipant.marketRole.type	The role of the sender. A32: Market Information Aggregator.
	receiver_MarketParticipant.mRID	The identification of the receiver.
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A04: System operator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern or the whole CGMA area.
	dataset_MarketDocument.mRID	Not used.
	dataset_MarketDocument.revisionNumber	Not used.
	docStatus	A02: Final.
	referenced_DateAndOrTime.date	Not used.
	referenced_DateAndOrTime.time	Not used.
	Reason	Not used.

The document should contain one or more elements of TimeSeries class.

Table 26 gives the rules governing the attributes and sub-elements of ReportingInformation_MarketDocument.TimeSeries elements when using additional scheduling areas for the HVDC interconnectors.

500 **Table 26 – ReportingInformation_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies			
		Netted area position		DC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. Mandatory.		B63: Aggregated netted external schedule. Mandatory.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Identification of the synchronous area. Mandatory.	Identification of the importing optimisation area. Mandatory.	Identification of the importing area (always a scheduling area). Mandatory.
	out_Domain.mRID	Identification of the synchronous area. Mandatory.	Identification of the optimisation area. Mandatory.	Identification of the exporting area (always a scheduling area). Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource .mRID	Not used.		Identification of the DC link on the level of poles. Mandatory.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A03: Variable block. Mandatory.			
	marketObjectStatus.status	A32: Result. (The values are the result from the CGMA optimisation). Mandatory.		Coded life cycle status of a time series. A29: Submitted. (The values were submitted to be validated by the CGMA platform.) A30: Substituted. (The values were computed by the CGMA platform.) A32: Result. (The values are the result from the PSLC.) Mandatory.	
	Reason	Not used.			
.Period	timeInterval	Time interval covered by elements of Point class. Mandatory.			
	resolution	Resolution used in the Point class. PT1M Mandatory.			

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.Period.Point	position	Position in the time series. Mandatory.
	quantity	Value of the netted (AC) area position or flow (no signed value). Mandatory.
	posFR_Quantity.quantity	Not used.
	negFR_Quantity.quantity	Not used.
	Reason	Not used.

Table 27 gives the rules governing attributes and elements of ReportingInformation_MarketDocument header when not using additional scheduling areas for the HVDC interconnectors.

Table 27 – ReportingInformation_MarketDocument header

	Attribute	Description and dependencies
ReportingInformation_MarketDocument	mRID	Document identification.
	revisionNumber	Version of the document.
	type	B19: Reporting information market document.
	process.processType	A33: Year ahead. A32: Month ahead. A31: Week ahead. A45: Two days ahead.
	sender_MarketParticipant.mRID	The identification of the sender CGMA platform).
	sender_MarketParticipant.marketRole.type	The role of the sender. A32: Market Information Aggregator.
	receiver_MarketParticipant.mRID	The identification of the receiver.
	receiver_MarketParticipant.marketRole.type	The role of the receiver. A04: System operator.
	createdDateTime	UTC time of document creation.
	time_Period.timeInterval	CGMA target time interval covered by the document.
	domain.mRID	The optimisation area of concern.
	dataset_MarketDocument.mRID	Not used.
	dataset_MarketDocument.revisionNumber	Not used.
	docStatus	A02: Final.
	referenced_DateAndOrTime.date	Not used.
	referenced_DateAndOrTime.time	Not used.
	Reason	Not used.

The document should contain one or more elements of TimeSeries class.

Table 28 gives the rules governing the attributes and sub-elements of ReportingInformation_MarketDocument.TimeSeries elements when not using additional scheduling areas for the HVDC interconnectors.

510 **Table 28 – ReportingInformation_MarketDocument.TimeSeries elements**

	Attribute	Description and dependencies			
		Netted (AC) area position		DC flow or indicative AC flow	
TimeSeries	mRID	Identification of the time series. Mandatory.			
	businessType	B64: Netted AC area position. B65: Netted area position. The net AC and DC position of the optimisation area. Mandatory.		B67: DC net flow. B68: DC gross flow. B73: Indicative AC flow. Mandatory.	
	product	8716867000016: Active Power. Mandatory.			
		import	**export**	**import**	**export**
	in_Domain.mRID	Identification of the optimisation area. Mandatory.	Not used.	Identification of the importing optimisation area. Mandatory.	Identification of the im-porting optimisation area. Mandatory.
	out_Domain.mRID	Not used.	Identification of the optimisation area. Mandatory.	Identification of the ex-porting optimisation area. Mandatory.	Identification of the exporting optimisation area. Mandatory.
	connectingLine_RegisteredResource .mRID	Not used.		Identification of the DC link on the level of poles and optionally of the DC link itself. Mandatory for B67: DC net flow and B68: DC gross flow Not used for B73: Indicative AC flow.	
	measurement_Unit.name	MAW: MW Mandatory.			
	curveType	A02: Point. Mandatory.			
	marketObjectStatus.status	A32: Result. (The values are the result from the CGMA optimisation). Mandatory.		Coded life cycle status of a time series. A29: Submitted. (The values were submitted to be validated by the CGMA platform.) A30: Substituted. (The values were computed by the CGMA platform.) A32: Result. (The values are the result from the PSLC.) Mandatory.	
	Reason	Not used.			
.Perio	timeInterval	Time interval covered by elements of Point class. Mandatory.			

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	resolution	Resolution used in the Point class. PT1H Mandatory.
.Period.Point	position	Position in the time series. Mandatory.
	quantity	Value of the netted (AC) area position or flow (no signed value). Mandatory.
	posFR_Quantity.quantity	Not used.
	negFR_Quantity.quantity	Not used.
	Reason	Not used.

5.6 Additional rules governing the use of TimeSeries

For the time series data used in the data exchange of documents of type B19 the netted AC area position and netted area position of an optimisation area are always provided using two time series except when all positions of a time series are larger than zero (only import or only export).

- One time series for import into the optimisation area A with in_Domain.mRID = “mRID_A” and out_Domain.mRID not used.

- One time series for export from the optimisation area A with in_Domain.mRID not used and out_Domain.mRID = ”mRID_A”.

- These two time series shall have the same Period.resolution and the same Period.timeInterval. For a given Point.position, the Point.quantity of one time series must be zero, whereas the Point.quantity of the other time series may have a value larger than zero (pair of netted values). Point.quantity of both time series must be zero when the netted area position of the optimisation area is zero for the given Point.position.

- A feasibility range (Point.posFR_Quantity.quantity and Point.negFR_Quantity.quantity) shall be provided for every point.quantity. If PPD contain more than one time series of BusinessType A65 (import and export values in one document), the TSO has to make sure that the feasibility ranges for a given Point have the same values in both time series. Otherwise the PPD will be rejected due to inconsistency. This applies to all kinds of net positions (zero, import, export).

DC flows as well as indicative AC flows of an optimisation area A towards another area B are always provided through the use of two time series except when all positions of a time series are larger than zero (only import or only export).

- One time series for import into the optimisation area A with in_Domain.mRID = “mRID_A” and out_Domain.mRID = ”mRID_B”.

- One time series for export from the optimisation area A with in_Domain.mRID = ”mRID_B” and out_Domain.mRID = ”mRID_A”.

- These two time series shall have the same Period.resolution and the same Period.timeInterval. For a given Point.position, the Point.quantity of one time series must be zero, whereas the Point.quantity of the other time series may have a value larger than zero (pair of netted values).Point.quantity of both timeseries must be zero when there is no flow between the two areas for the given target time interval.

5.7 ReportingInformation_MarketDocument XML schema

The XSD file to be used with this implementation guide is urn:iec62325.351:tc57wg16:451-n: reportinginformationdocument:2:1. Further details on the UML model and schema can be found in [7].

References

[1] All TSO's Common Grid Model Alignment Methodology in accordance with Article 25 (3)(c) of the Common Grid Model Methodology

[2] Acknowledgement_MarketDocument (EAD) IEC 62325-451-1

[3] ProblemStatement_MarketDocument (EPSD) IEC 62325-451-5

[4] StatusRequest_MarketDocument (ESR) IEC62325-451-5

[5] Reporting Document UML Model and Schema Version 1.0 (19th January 2017)

[6] PEVF Implementation Guide Version 01 / Release 00 (11th April 2018)

[7] Reporting Information Document UML Model and Schema Version 1.0 (19th January 2017)

[8] CGMA Business Requirements Specification 1.0 (20th May 2020)