

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Framework for energy market communications –
Part 451-3: Transmission capacity allocation business process (explicit or
implicit auction) and contextual models for European market**

**Cadre pour les communications pour le marché de l'énergie –
Partie 451-3: Processus métier d'attribution de la capacité de transport (vente
aux enchères explicite ou implicite) et modèles contextuels pour le marché
européen**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

**Part 451-3: Transmission capacity allocation business process
(explicit or implicit auction) and contextual models for European market**

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International Standard IEC 62325-451-3 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this standard is based on the following documents:

FDIS	Report on voting
57/1457FDIS	57/1480/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62325 series, published under the general title *Framework forenergy market communications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This standard is one of the IEC 62325 series which define protocols for deregulated energy market communications.

The principal objective of the IEC 62325 series of standards is to produce standards which facilitate the integration of market application software developed independently by different vendors into a market management system, between market management systems and market participant systems. This is accomplished by defining message exchanges to enable these applications or systems access to public data and exchange information independent of how such information is represented internally.

The common information model (CIM) specifies the basis for the semantics for this message exchange.

The European style market profile is based on different parts of the CIM IEC standard. The CIM is defined through a series of standards, i.e. IEC 62325-301, IEC 61970-301 and IEC 61968-11.

This document provides for the European style market profile the transmission capacity allocation business process based on either explicit or implicit auction that can be used throughout a European style market. This standard was originally based upon the work of the European Transmission System Operators (ETSO) Task Force EDI (Electronic Data Interchange) and then on the work of the European Network of Transmission System Operators (ENTSO-E) Working Group EDI.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 451-3: Transmission capacity allocation business process (explicit or implicit auction) and contextual models for European market

1 Scope

This part of IEC 62325 specifies a package for the transmission capacity allocation business process through explicit or implicit auctions and the associated document contextual models, assembly models and XML schema for use within European style markets.

This International standard is based on the European style market contextual model (IEC 62325-351). The scheduling business process covered by this International Standard is described in Clause 5.

The relevant aggregate core components (ACCs) defined in IEC 62325-351 have been contextualised into aggregated business information entities (ABIEs) to satisfy the requirements of these business processes.

The contextualised ABIEs have been assembled into the relevant document contextual models.

Related assembly models and XML schema for the exchange of transmission capacity allocation information between market participants are automatically generated from the assembled document contextual models.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62325-351, *Framework for energy market communications – Part 351: CIM European market model exchange profile*

IEC 62325-450:2013, *Framework for energy market communications – Part 450: Profile and context modeling rules*

IEC 62325-451-1, *Framework for energy market communications – Part 451-1: Acknowledgement business process and contextual model for CIM European market*

IEC 62325-451-2, *Framework for energy market communications – Part 451-2: Scheduling business process and contextual model for CIM European market*

IEC 62361-100, *Power systems management and associated information exchange – Interoperability in the long term – Part 100: Naming and design rules for CIM profiles to XML schema mapping*¹

¹ Under consideration.

3 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 61970-2 apply, as well as the following.

NOTE Refer to International Electrotechnical Vocabulary, IEC 60050, for general glossary definitions.

3.1

already allocated capacity

AAC

total amount of allocated transmission capacity rights, whether they are capacity or exchange programmes depending on the allocation method

3.2

aggregate business information entity

ABIE

aggregate business information entity is a re-use of an aggregate core component (ACC) in a specified business

[SOURCE: ISO/TS 15000-5:2005, Clause 9, modified – modification of the definition]

3.3

aggregate core component

ACC

collection of related pieces of business information that together convey a distinct business meaning, independent of any specific business context

Note 1 to entry: Expressed in modelling terms, this is the representation of an object class, independent of any specific business context.

[SOURCE: ISO/TS 15000-5:2005, Clause 9, modified – modification of the definition]

3.4

application program interface

API

set of public functions provided by an executable application component for use by other executable application components

3.5

assembly model

assembly model is a model that prepares information in a business context for assembly into electronic documents for data interchange

3.6

available transmission capacity

ATC

part of NTC that remains available, after each phase of the allocation procedure, for further commercial activity

Note 1 to entry: ATC is given by the following equation: $ATC = NTC - AAC$.

3.7

based on

IsBasedOn

use of an artefact that has been restricted according to the requirements of a specific business context

[SOURCE: IEC 62325-450:2013, 3.4]

3.8**bid**

request for a given capacity at a given price made by a capacity trader and corresponding to a single time series within a bid document

3.9**business context**

formal description of a specific business circumstance as identified by the values of a set of context categories, allowing different business circumstances to be uniquely distinguished

[SOURCE: UN/Cefact, Unified Context Methodology Technical Specification]

3.10**explicit auctioning**

congestion management method in which only the energy transmission capacity rights are auctioned

3.11**European style market profile****ESMP**

the European style market profile, the object of this International Standard

3.12**implicit auctioning**

congestion management method in which the transmission capacity is included implicitly in the trading of energy in the market

3.13**information model**

representation of concepts, relationships, constraints, rules, and operations to specify data semantics for a chosen domain of discourse

Note 1 to entry: It can provide shareable, stable, and organized structure of information requirements for the domain context.

[SOURCE: IEC 62325-450:2013, 3.6]

3.14**market management system****MMS**

computer system comprised of a software platform providing basic support services and a set of applications providing the functionality needed for the effective management of the electricity market

Note 1 to entry: These software systems in an electricity market may include support for capacity allocation, scheduling energy, ancillary or other services, real-time operations and settlements.

3.15**message business information entity****MBIE**

aggregation of a set of ABIEs that respects a define set of assembly rules

3.16**net transfer capacity****NTC**

maximum exchange between two areas compatible with security standards applicable in both areas and taking into account the technical uncertainties on future network conditions

Note 1 to entry: $NTC = TTC - TRM$.

3.17

nomination

firm declaration of the transmission capacity rights to be used

3.18

profile

basic outline of all the information that is required to satisfy a specific environment

[SOURCE: IEC 62325-450:2013, 3.7]

3.19

transmission capacity rights

rights of usage of a certain amount of transmission capacity in a potentially congested border between market areas

3.20

transmission reliability margin

TRM

security margin that copes with uncertainties on the computed TTC values arising from either unintended deviations of physical flows during operation due to the physical functioning of load-frequency regulation, or emergency exchanges between system operators to cope with unexpected unbalanced situation in real time

3.21

total transfer capacity

TTC

maximum exchange program between two areas compatible with operational security standards applicable at each system if future network conditions, generation and load patterns were perfectly known in advance

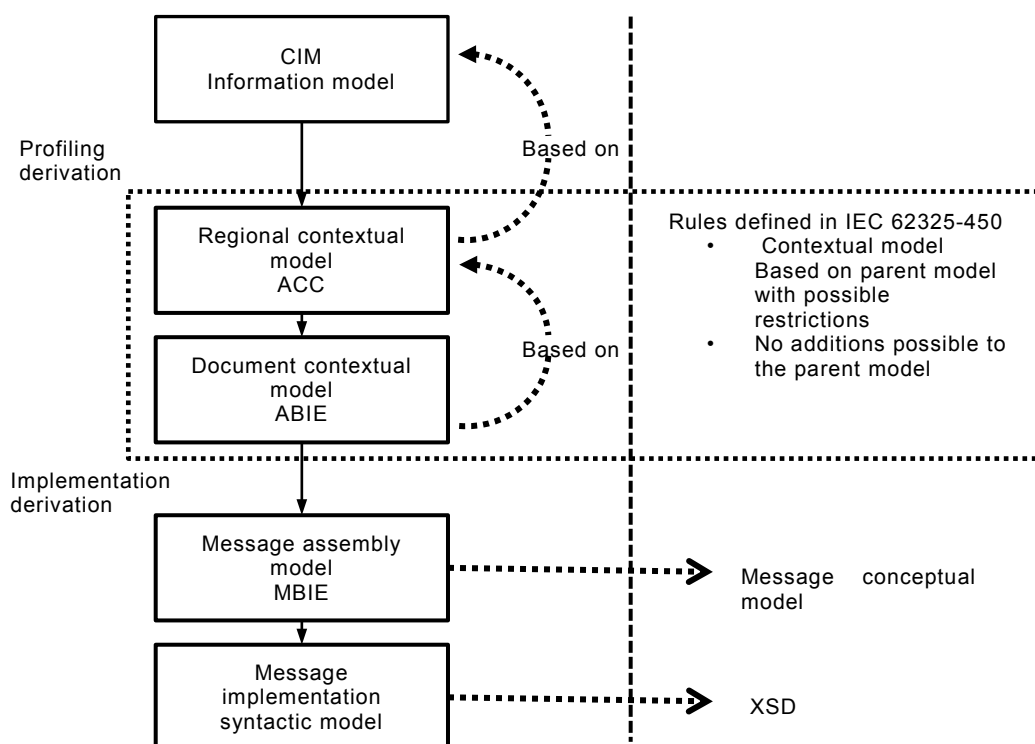
4 Document contextual model and message assembly model basic concepts

4.1 Overview

IEC 62325-450 defines a set of CIM profiles that follows a layered modelling framework as outlined in Figure 1 going from the common information model (CIM), to different regional contextual models and their subsequent contextualized documents for information exchange; the final step being the message specifications for information interchange.

The regional contextual models are the basic core components that are necessary to build electronic documents for information interchange. This is defined in the European style market contextual model (IEC 62325-351). These core components are also termed aggregate core components (ACCs).

A document contextual model is based upon a specific business requirements specification and is constructed from the contextualisation of the ACCs that can be found in the European style market contextual model. The contextualised ACCs at this stage are termed aggregate business information entities (ABIEs) These ABIEs are the constructs that are assembled together into a specific electronic document to satisfy the information requirements outlined in the business requirements specification. The transformation from an ACC to an ABIE shall respect the rules defined in IEC 62325-450.



IEC 2134/14

Figure 1 – IEC 62325-450 modelling framework

Once a document contextual model has been built that satisfactorily meets the business requirements, a message assembly model can be automatically generated from it. The automatic generation respects the rules defined in IEC 62325-450.

XML schema then may be automatically generated from the message assembly model. If necessary specific mapping can take place at this stage to transform the CIM class and attribute names into more market legacy names.

4.2 European style market package (ESMP) structure

The main package structure described in the European style market profile is provided in Figure 2.

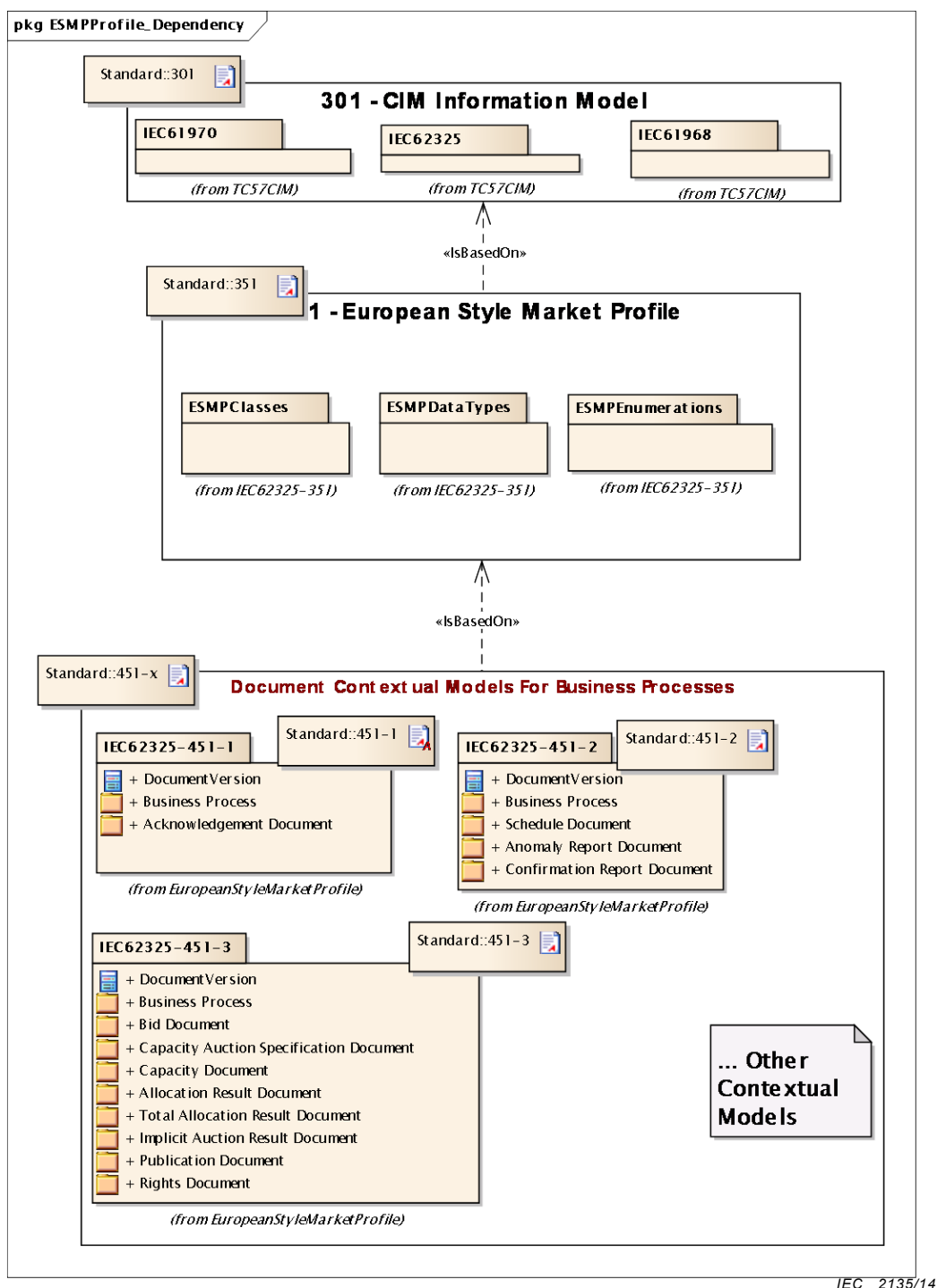


Figure 2 – Overview of European style market profile dependency

For each business process, a business process package is described in an IEC 62325-451-x (x from 1 to n) standard. A business process package contains:

- The document contextual model (ABIE) and the automatically generated message assembly model (MBIE) for each electronic document required to enable the completion of

the business process. Each document is a sub contextual model derived by restriction from the European style market profile.

- The XML schema of the business document that is automatically generated from the message assembly model.

The European style market profile (ESMP), as defined in the IEC 62325-351, provides the core components permitted for use in an IEC 62325-451-x standard as all ABIEs must be “based on” the IEC 62325-351 core components:

- **ESMPClasses:** Defining all the semi-contextual classes of the European style market profile derived by restriction from the CIM model.
- **ESMPDataTypes:** Defining all the core datatypes used within the ESMP classes.

All the core components that are used in every electronic document structure have been harmonized and centralized in the European style market profile. These core components are consequently the basic building blocks from which all electronic document ABIEs are derived.

4.3 From the European style market profile to the document contextual model

The document contextual model for a given business process is constructed by an information analyst who identifies all the information requirements necessary to satisfy the business process.

Once the information requirements have been identified the information analyst identifies the related ACCs that are available in the European style market profile and contextualises them to meet the information requirements. This contextualisation step creates a set of aggregate business information entities (ABIEs).

In a final step the information analyst assembles together into a specific document contextual model package the ABIEs to form a document model satisfying the business requirements.

4.4 From the document contextual model to the message assembly model

Once the document contextual model has been finalised, the message assembly model may be automatically generated.

All document contextual models share the same core components and core datatypes. These are defined in the European style market profile (IEC 62325-351) and are contextualised and refined in all document contextual models (IEC 62325-451-x series) respecting the rules as described in IEC 62325-450.

4.5 From the assembly model to the XML schema

The final modelling step applies a standardized set of criteria in order to generate a uniform XML schema from the assembly model. This transformation process respects the rules defined in IEC 62361-100.

5 The transmission capacity allocation business process

5.1 Overall business context

The business processes described in this standard are related to the transmission capacity auctions and to the market of transmission capacity rights.

No assumption is made on the way the auction are carried out as well as on the allocation mode or the payment terms.

The auctions can be carried out for products such as:

- multi-year,
- annual,
- monthly,
- weekly,
- daily
- intraday.

The allocation mode can be one of the following:

- order by price with pro rata,
- first come first served,
- pro rata,
- etc.

And the payment terms may vary from:

- pay as bid,
- pay as cleared,
- no payment terms,
- etc.

There are two different types of transmission capacity auctioning, explicit or implicit auctions. These are outlined in the use case in Figure 3.

The use case “Establish offered capacity” is common to both explicit and implicit auctions and relates to the identification and publication of the offered capacity that can be allocated. The available transmission capacity has initially to be agreed between the system operators. Once the offered capacity is agreed, it is published with the relevant information that defines the auction, i.e. the transmission capacity auction specification.

The use case “Participate in Explicit auctions” implies the following steps:

- The first step covers the bidding and allocation activity itself. A sub use case of the bidding and allocation activity may be the eventual secondary trade and negotiation of allocated capacity rights between capacity traders or capacity traders and interconnection trade responsible parties. The principle actors are the capacity trader and the transmission capacity allocator.
- The second step concerns nomination, the activity of declaring the long term, daily and intraday capacity rights to be used. This involves the interconnection trade responsible, the nomination validator and the system operator. The nomination validator ensures that all nominations presented are coherent. To carry out this nomination process, the electronic documents defined in IEC 62325-451-2 are to be used.
- The third and final step concerns the validation and final confirmation of all nominations. This step includes cross border matching. The principle actors are the nomination validator and the system operators.

The use case “Participate in Implicit auctions” implies the publication of cross border exchange values with or without prices.

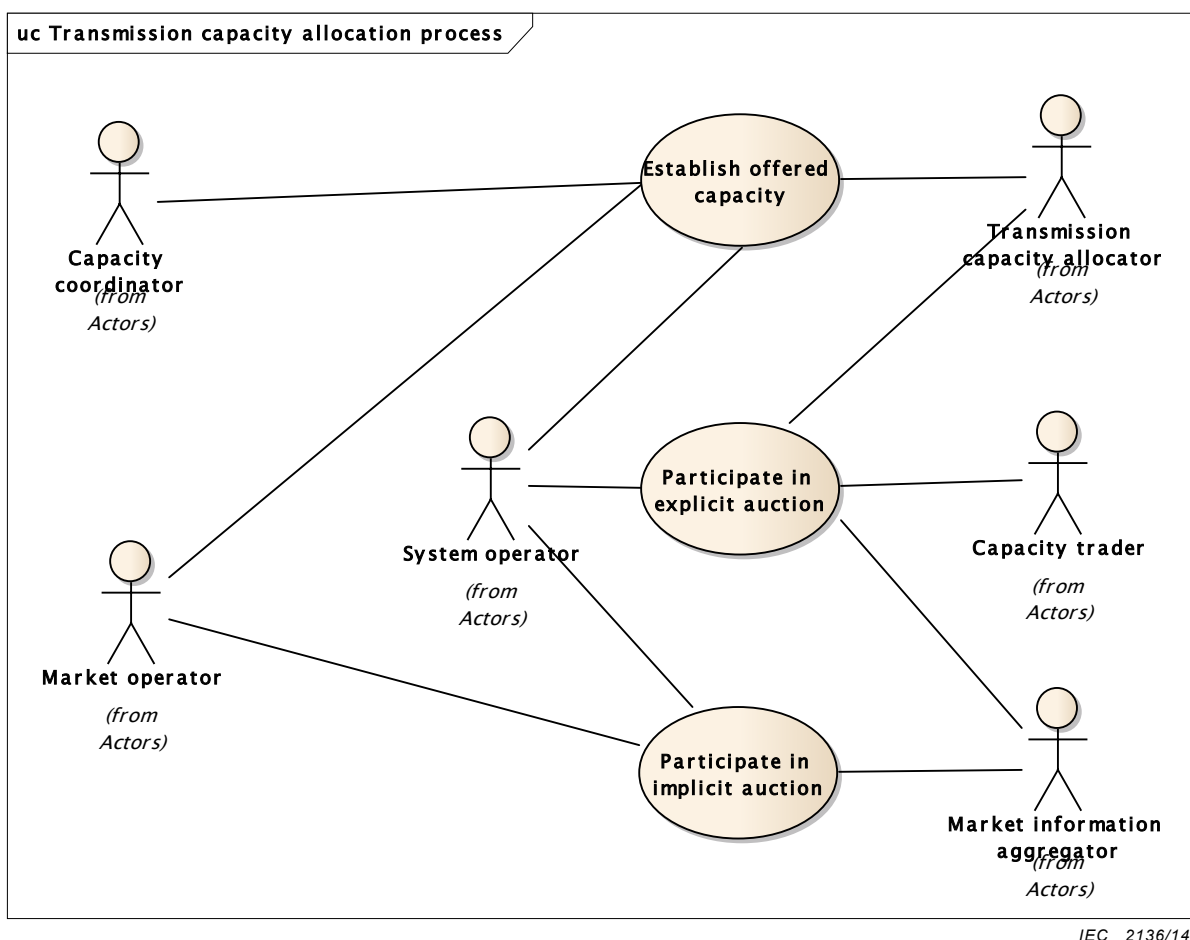


Figure 3 – Use case of the transmission capacity allocation process

5.2 Establish offered capacity process

The process necessary to constitute an auction specification is initiated by the system operators who provide the capacity coordinator with all the information necessary for the establishment of the offered capacity.

This capacity may be increased with additional capacity rights submitted by the capacity traders for resale, for the period being addressed such as resale of annual capacity rights to a monthly auction, etc.

This capacity may be also increased with additional capacity rights not used for nomination, i.e. the annual, monthly, weekly capacity rights that have not been used for the daily nomination, and thus that are released (either as “use it or lose it” or “use it or get paid for it” or “use it or sale it”, etc.) to the daily auction.

The capacity coordinator then determines the initial offered capacity with the information received.

The offered capacity is then sent to the transmission capacity allocator to enable the establishment of the auction specification for the period in question.

Finally, the auction specification is published. A first version of the AuctionSpecification_MarketDocument may be published with only the identification of the auction and the planned date of the auction. Then a new version of document shall be issued with all the relevant information. It is to be noted that this document may be updated to inform the market participant that the auction is cancelled.

This process is described in Figure 4; the documents exchanged within this process are indicated.

The establishment of the offered capacity is common to both explicit and implicit auction process.

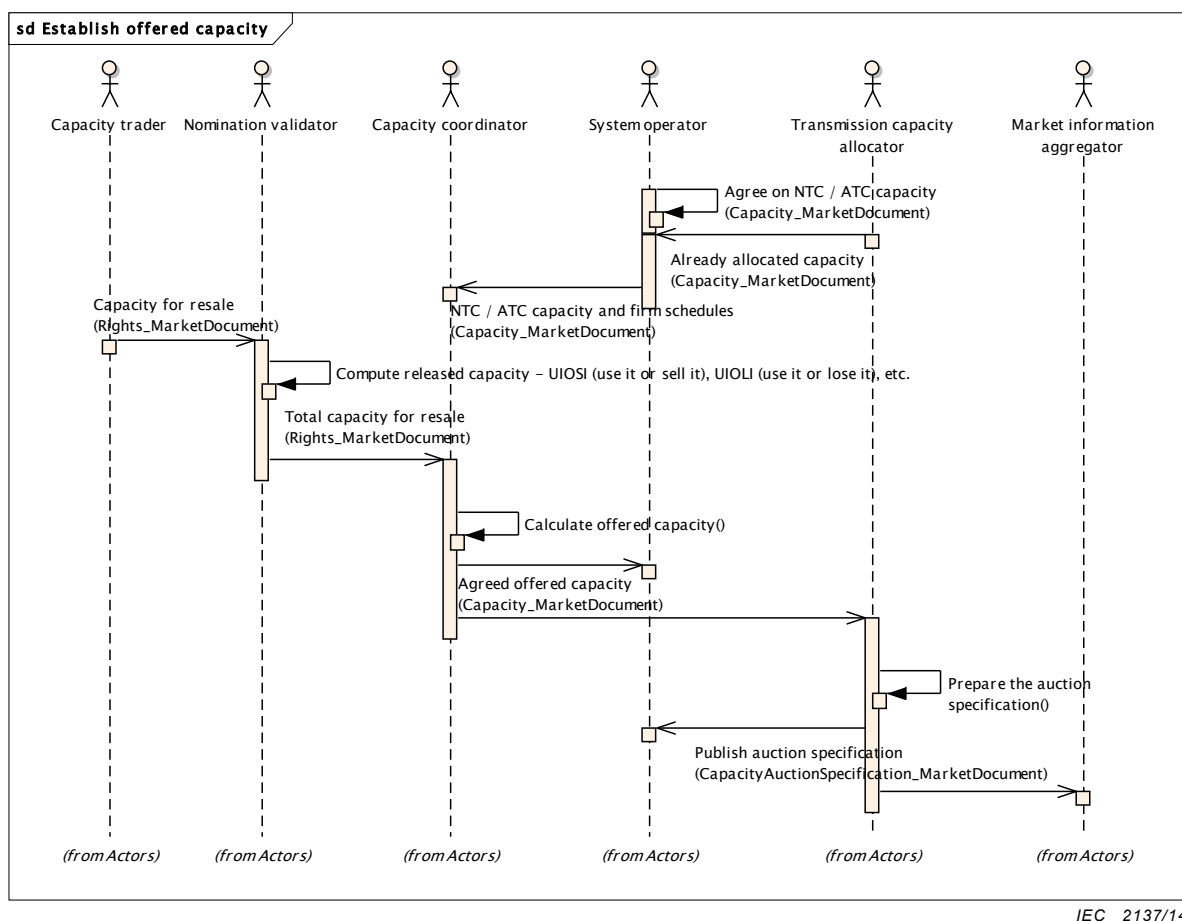


Figure 4 – Establish offered capacity overview

5.3 Explicit auction process

5.3.1 Overview of explicit auction process

The explicit auction process is composed of a number of steps described in the following paragraphs:

- Figure 5 describes the submission of bids, the allocation process of capacity rights and the publication of allocated capacity rights.
- Figure 6 describes the resale of capacity rights and the capacity curtailment process for security reason.
- Figure 7 describes the nomination of capacity rights.

5.3.2 Bid and allocate capacity

The capacity traders submit bids for the transmission rights on a border to the transmission capacity allocator during the bidding period.

During a predefined validation window the transmission capacity allocator will verify the correctness of all bids for the auction in question.

After the bidding phase, the bids in question are allocated transmission rights by the transmission capacity allocator in compliance with the published auction rules.

5.3.3 Publish auction results

In the final step of the capacity allocation process the transmission capacity allocator publishes the auction results which include the auction outcome of all bids and resales.

Involved system operators are informed of the allocated and resold capacity being the outcome of the auction.

Each capacity trader is informed of the outcome of its bid(s) and resales after the bidding period in compliance with auction rules.

The results may be re-transmitted to market information aggregators for general publication.

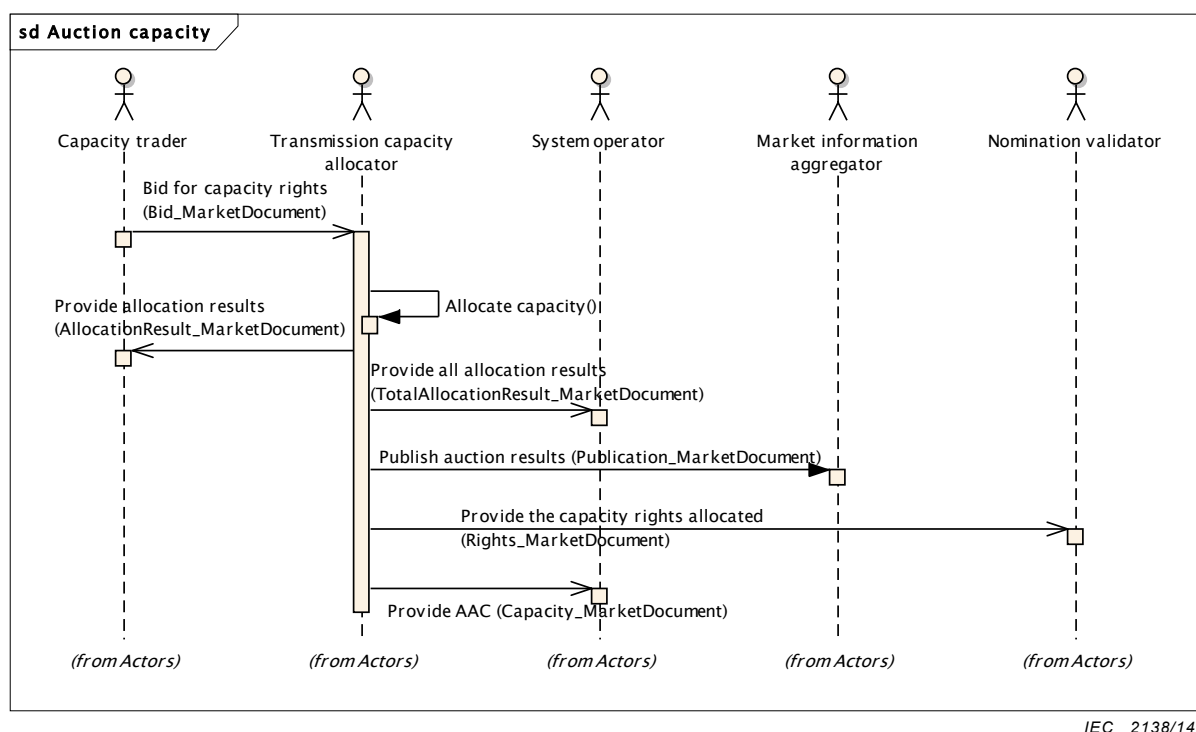


Figure 5 – Auction capacity

5.3.4 Trade and negotiate allocated capacity

In this process capacity traders trade transmission capacity rights between themselves and at the end of the trade inform the transmission capacity allocator of the rights transfer.

This is an “Over The Counter (OTC)” market, i.e. there are no specific rules for the trade, only the rules agreed between the parties involved in the trade. This market is also called “secondary market”.

The transmission capacity allocator approves the transfer through the transmission of a **Rights_MarketDocument** containing the approved transmission rights that have been transferred between both parties. This is sent to both the transferor and the transferee parties.

5.3.5 Capacity rights resale

The capacity trader may, dependent on local rules, release his transmission capacity rights that he has previously acquired prior to an auction. If the capacity is released to the transmission capacity allocator sufficiently in advance the trader can benefit from its resale in the coming auction.

In a “use it or sell it” (UIOSI) model the capacity trader benefits from the resale of the capacity rights in a subsequent auction for the part of the capacity rights that was not nominated beforehand.

In a “use it or lose it” model (UIOLI) capacity not nominated is generally lost by the capacity trader.

5.3.6 Possibility of curtailment of allocated capacity

If, in order to ensure network security, the system operator found it necessary to curtail the transmission capacity rights from a previous auction, the system operator informs the corresponding transmission capacity allocator of the curtailment that will have to be imposed. The transmission capacity allocator informs the capacity traders of the new curtailed transmission capacity rights.

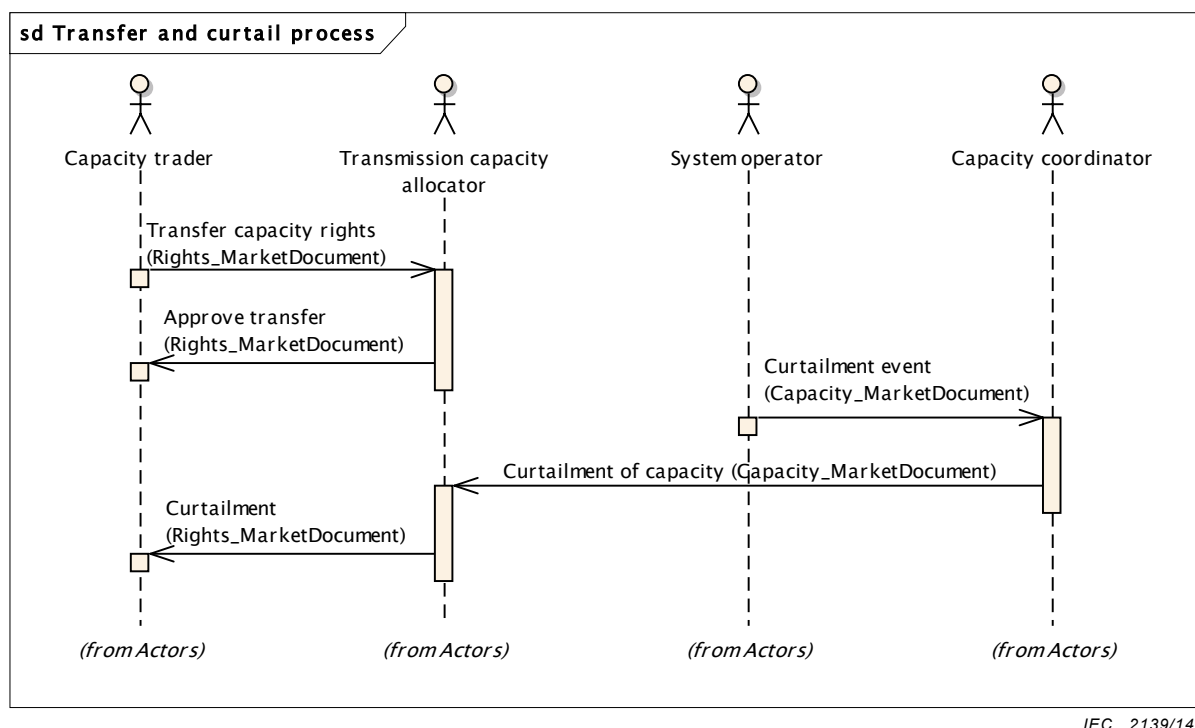


Figure 6 – Transfer and curtailment

5.3.7 Designate interconnection trade responsible for nomination

The capacity trader informs the transmission capacity allocator of the interconnection trade responsible that will carry out the nomination of transmission capacity rights on his behalf.

The designation of the interconnection trade responsible that will nominate the capacity rights is transmitted to the transmission capacity allocation with a Rights_MarketDocument.

5.3.8 Nominate use of border capacity

The nomination validator receives the final allocations (capacity rights) from the transmission capacity allocator, which identifies the interconnection trade responsible parties authorised to nominate the capacity, and sends the authorised nomination capacity to the interconnection trade responsible parties in question.

5.3.9 Validate nominations

The validation process for nominations may take place on one side or both sides of the border.

The nomination validator must check that the nominations from the interconnection trade responsible parties do not exceed the amount of capacity that the transmission capacity allocator has communicated. In the case that the nominations exceeded the amount of the capacity rights the nomination validator applies local market rules.

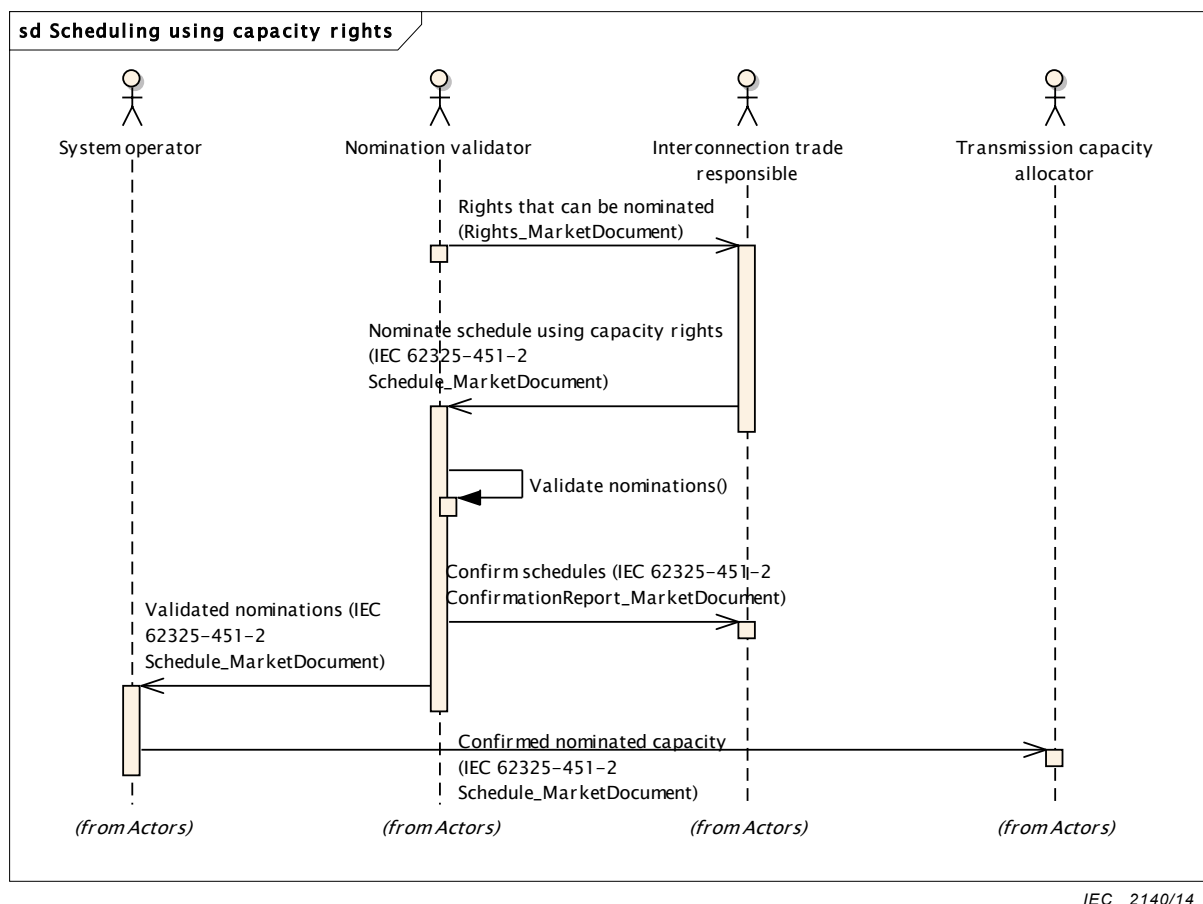


Figure 7 – Nomination of capacity rights

5.4 Implicit auction process

5.4.1 Overview implicit auction process

The implicit auction is characterized by the fact that the trade responsible party bought both energy and transmission capacity at the same time.

Thus the distinction between the role of capacity trader and interconnection trade responsible is not necessary for this business process.

The rules covering the auction mechanism determine the market energy price for the market balance area after applying technical constraints from the system operator.

Figure 8 provides an overview of the implicit auction process and the list of exchanged documents.

5.4.2 Submit bids and offers to local exchange

The trade responsible parties submit to their market operator their offer (sell or buy) of energy. The document to carry out this exchange is not further elaborated in this document.

5.4.3 Implicit auction

The market operator defines, based on agreed market rules, the “market equilibrium point”, i.e. the cross border flows, the energy prices and the trades that are matched.

5.4.4 Publish exchange results

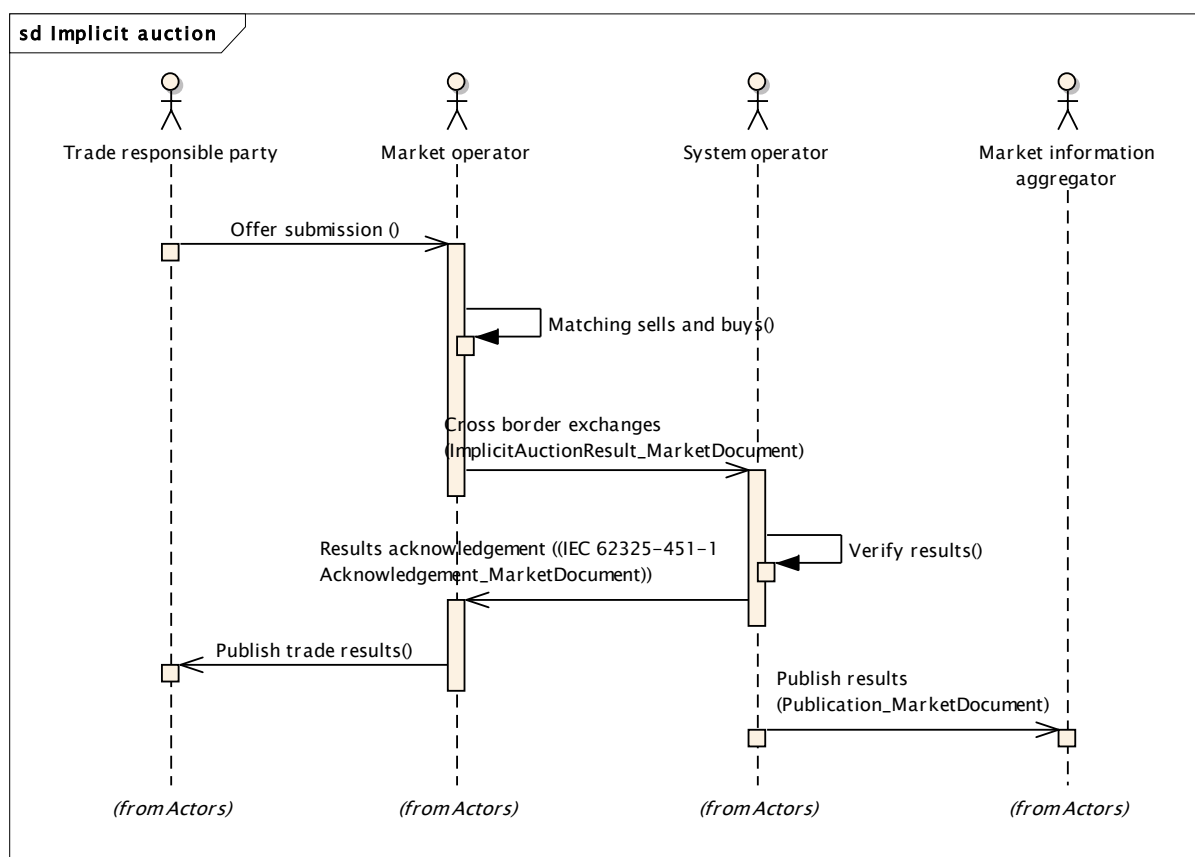
The market operator provides to the involved system operators the result of the matching using the ImplicitAuctionResult_MarketDocument.

The system operators verify the consistency of the results with the constraints provided when defining the offered capacity.

The result are then provided to the market information aggregator using the Publication_MarketDocument.

5.4.5 Publish trade results

The market operator provides to each market participant the results of the market. The document to carry out this exchange is not further elaborated in this document.



IEC 2141/14

Figure 8 – Implicit auction overview

5.5 Business rules for the transmission capacity allocation process

5.5.1 General rules

The generic rules defined in IEC 62325-351 apply to all the documents described in this part. In particular, IEC 62325-351 describes the concept of curve type that is to be used to define the pattern of an auction.

For each electronic data interchange defined in this document, an application acknowledgement is required as defined in IEC 62325-451-1, except for the document sent to the capacity trader or the interconnection trade responsible as receiver_MarketParticipant.marketRole.type.

When a document is received, it shall be checked at the application level to ensure that there are no faults in it that could prevent its normal processing. After this check, an acknowledgement document, as defined in IEC 62325-451-1, shall be generated either accepting in its entirety the document in question or rejecting it.

In the case of explicit auction, nomination of capacity rights shall be made using the schedule document as described in IEC 62325-451-2.

5.5.2 Rules governing the Bid_MarketDocument

The following rules apply to the Bid_MarketDocument:

- A bid document contains a set of bids (a bid is represented by a time series).
- There may be several bids submitted by the sender for the same bid period and subject party (capacity trader).

- To cancel a complete set of bids the bid document is resubmit with a new version number but no time series under it.
- There can only be one sender for a given subject party.
- A bid document can only be for only one subject party.
- A bid document received with the same document identification and document version as an existing bid document shall be rejected.
- The last version of a bid document with the same document identification shall constitute the last valid bid for the document in question.
- Each Bid_TimeSeries within a document is considered a bid within this specification. The bid mRID that the bidder assigns is the unique identification of the bid for a given auction identification (auction.mRID).
- Table 1 provides the dependency concerning the bid indicators:

Table 1 – Bid indicators dependency

	Default case	Other cases			
Divisible (possible values)	YES	NO	NO	YES	YES
Linked Bids Identification (attribute used or not)	Not used	Used	Not used	Not used	Not applicable
Block Bid (possible values)	NO	YES	YES	NO	Not applicable

NOTE “Not used” signifies that the attribute cannot be used. “Not applicable” signifies that the attributes in question do not apply to the dependency case.

For example: a LinkedBidIdentification could only contain an identification where Divisible was “NO” and a BlockedBid was “YES”. In all other cases it could not contain an identification.

5.5.3 Rules governing the Capacity_MarketDocument

The dependencies are listed here after:

- The document type “Agreed capacity” is to be used with the process type “Capacity determination” and the business types “Offered capacity”, “NTC” or “ATC”, the “Reason” could be “Curtailement”;
- The document type “Proposed capacity” is to be used with the process type “Capacity determination” and the business types “Offered capacity”, “NTC” or “ATC”, the “Reason” could be “Curtailement”;
- The document type “Interconnection capacity” is to be used with the process type “Capacity determination” and the business types “AAC” or “Released AAC”;
- The document type “Interconnection capacity” is to be used with the process type “Capacity allocation” and the business type “General capacity information”.

NOTE the Business Type “General Capacity Information” is a generic type for the identification of a time series that provides the total capacity available on a TSO border

5.5.4 Rules governing the AllocationResult_MarketDocument

The following rules apply to the AllocationResult_MarketDocument:

- There is only one contract identification assigned by the transmission capacity allocator per auction identification, bid period and subject party.
- There is only one allocation result document per sender and subject party for a given auction identification and bid time interval.
- Only one of these three possibilities is permitted in a given allocation result document:
 - a) In the case where the allocation result document contains all bids and resales that have been validated for processing in the auction in the latest version of bid and

resales documents received, this shall include bids and resales that have not been satisfied. In this case the quantity and price amount of the bids and resales that have not been satisfied shall be equal to zero.

- b) It is also possible for the allocation result document to contain only the bids that have been allocated capacity transmission rights and resales that have sold capacity transmission rights.
- c) A third possibility exists where only the aggregation of the bids that have capacity transmission rights and the aggregation of transmission rights that have been sold are provided. In this case the bid identification shall not be specified.
- The bid result may mirror the original bid itself in which case the curveType shall not be used, or a profile may be provided as a result in which the curveType shall be used.
- The choice of whether or not to mirror the original bids must be consistent within the whole result document.

5.5.5 Rules governing the TotalAllocationResult_MarketDocument

The following rules apply to the TotalAllocationResult_MarketDocument:

- There is only one contract identification assigned by the transmission capacity allocator per auction identification, bid period and bidding party.
- Only one of these three possibilities is permitted in a given total allocation result document:
 - a) In the case where the total allocation result document contains all bids and resales that have been validated for processing in the auction in the latest version of bid and resales documents received, this shall include bids and resales that have not been satisfied. In this case the quantity and price amount of the bids and resales that have not been satisfied shall be equal to zero.
 - b) It is also possible for the total allocation result document to contain only the bids that have been allocated capacity transmission rights and resales that have sold capacity transmission rights.
 - c) A third possibility exists where only the aggregation of the bids that have capacity transmission rights and the aggregation of transmission rights that have been sold are provided. In this case the bid identification shall not be specified.
- The bid result may mirror the original bid itself in which case the curveType shall not be used, or a profile may be provided as a result in which the curveType shall be used.
- The choice of whether or not to mirror the original bids must be consistent within the whole result document.

5.5.6 Rules governing the Rights_MarketDocument

The following rules apply to the Rights_MarketDocument:

- A Rights_MarketDocument is used in various business contexts. In general it identifies the capacity transmission rights that a capacity trader or an interconnection trade responsible has in his portfolio for a given border.
- Any time a party's capacity transmission rights change for a given period the capacity trader may inform the party of his new portfolio by sending a new version of the rights document to the party in question.
- A rights document may also be used to provide the complete portfolio for a given border.
- In addition, a rights document may be used to provide information on rights compensation such as UIOSI pricing or rights curtailment compensation.
- There can only be one sender for a given subject party.
- A Rights_MarketDocument can only be for only one subject party.
- A Rights_MarketDocument received with the same document identification and document version as an existing Rights_MarketDocument shall be rejected.

- Table 2 provides the dependency concerning the Rights_MarketDocument indicators:

Table 2 – Rights_MarketDocument dependency table

Document type	Business type	Rights holder	Transferee	Previous contract identification	Auction identification
Capacity for resale	Released AAC	Mandatory			Mandatory
	Capacity rights not nominated	Mandatory			
Approved transfer	Capacity transfer notification	Mandatory			
AAC transfer	Capacity transfer notification Interconnection trade responsible designation	Mandatory	Mandatory	Mandatory	
Transmission rights portfolio	Capacity rights	Mandatory			
Allocations	Authorised AAC	Mandatory			
	Minimum authorised AAC	Mandatory			
	Maximum authorised AAC	Mandatory			
Compensation rights	Use it or sell it pricing Resale compensation following cancellation Rights curtailment Use it or sell it compensation Auction cancellation	Mandatory			

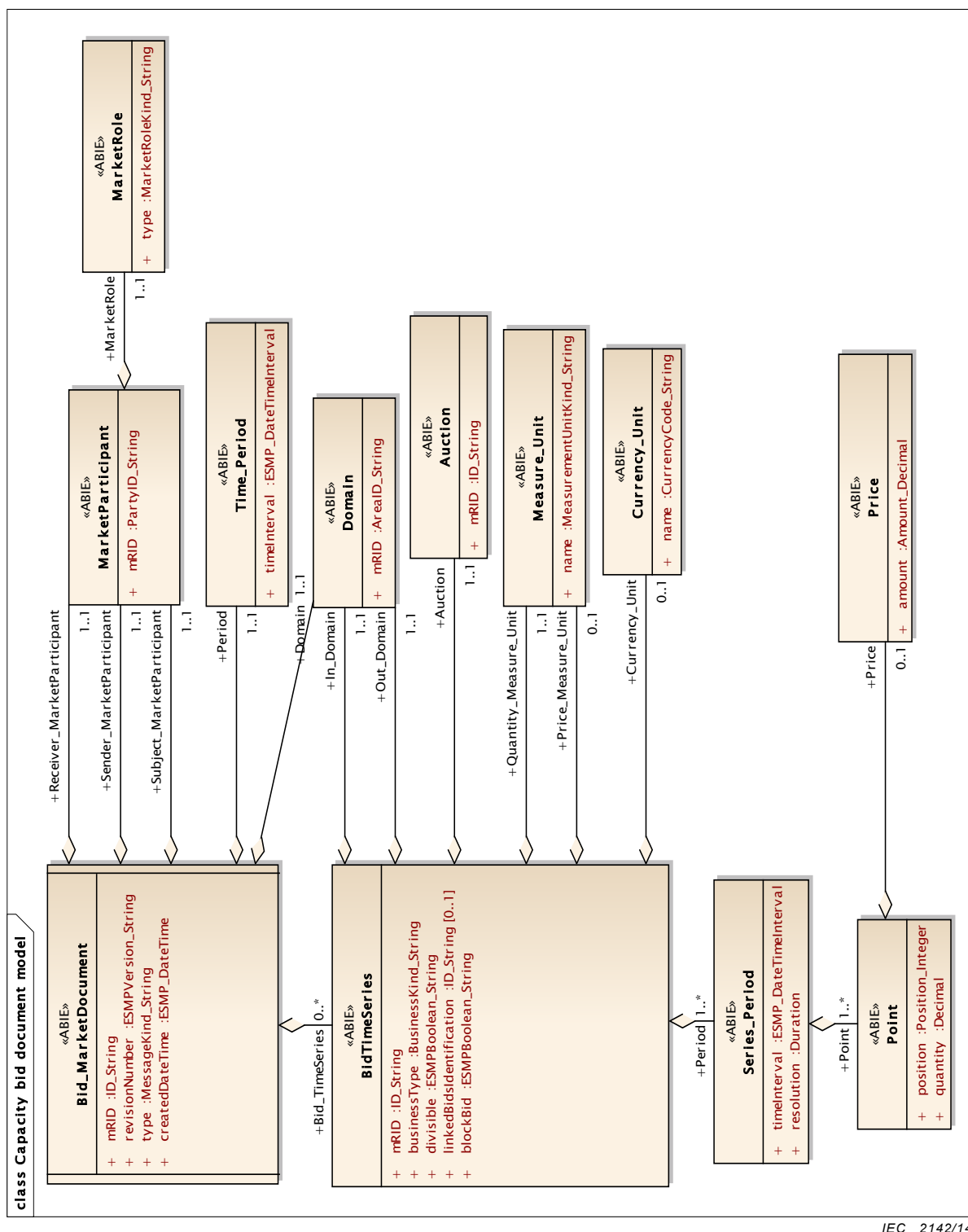
When using the document type “Allocations”, the business type “Authorised AAC” is generally sufficient to provide the maximum amount of AAC available for nomination. However, if the business type “Minimum authorized AAC” is used then the business type “Maximum authorised AAC” shall be used in the place of the business type “Authorised AAC”.

6 Contextual and assembly models

6.1 Bid contextual model

6.1.1 Overview of the model

Figure 9 shows the model.



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Figure 9 – Bid contextual model

6.1.2 IsBasedOn relationships from the European style market profile

Table 3 shows the traceability dependency of the classes used in this package towards the upper level.

Table 3 – IsBasedOn dependency

Name	Is BasedOn Class	Complete IsBasedOn Path
Auction	ESMPClasses::Auction	IEC62325-351\ESMPClasses
Bid_MarketDocument	ESMPClasses::MarketDocument	IEC62325-351\ESMPClasses
BidTimeSeries	ESMPClasses::BidTimeSeries	IEC62325-351\ESMPClasses
Currency_Unit	ESMPClasses::Currency_Unit	IEC62325-351\ESMPClasses
Domain	ESMPClasses::Domain	IEC62325-351\ESMPClasses
MarketParticipant	ESMPClasses::MarketParticipant	IEC62325-351\ESMPClasses
MarketRole	ESMPClasses::MarketRole	IEC62325-351\ESMPClasses
Measure_Unit	ESMPClasses::Measure_Unit	IEC62325-351\ESMPClasses
Point	ESMPClasses::Point	IEC62325-351\ESMPClasses
Price	ESMPClasses::Price	IEC62325-351\ESMPClasses
Series_Period	ESMPClasses::Series_Period	IEC62325-351\ESMPClasses
Time_Period	ESMPClasses::Time_Period	IEC62325-351\ESMPClasses

6.1.3 Detailed Bid contextual model

6.1.3.1 Bid_MarketDocument root class

A bid document contains a set of bids (a bid is represented by a time series). There may be several bids submitted by the sender for the same bid period and subject party.

An electronic document containing the information necessary to satisfy the requirements of a given business process.

IsBasedOn: ESMPClasses::MarketDocument

Table 4 shows all attributes of Bid_MarketDocument.

Table 4 – Attributes of Bid contextual model::Bid_MarketDocument

mult.	Attribute name	Attribute type	Description
[1..1]	createdDateTime	ESMP_DateTime	The date and time of the creation of the document.
[1..1]	mRID	ID_String	The unique identification of the document being exchanged within a business process flow.
[1..1]	revisionNumber	ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
[1..1]	type	MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.

Table 5 shows all association ends of Bid_MarketDocument with other classes.

**Table 5 – Association ends of Bid contextual model::
Bid_MarketDocument with other classes**

mult.	Role	Class type name	Description
[0..*]	Bid_TimeSeries	BidTimeSeries	The timeseries contains the bids that are submitted to the auction. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::TimeSeries.TimeSeries[0..*]
[1..1]	Domain	Domain	The domain covered within the bid document, i.e. the border for which auction is done. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Domain.Domain[0..1]
[1..1]	Period	Time_Period	The beginning and ending date and time of the period covered by the document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Time_Period.Period[0..*]
[1..1]	Receiver_MarketParticipant	MarketParticipant	Document recipient. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
[1..1]	Sender_MarketParticipant	MarketParticipant	Document owner. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
[1..1]	Subject_MarketParticipant	MarketParticipant	The party for whom the bid is being submitted. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]

6.1.3.2 Auction

The identification of a formal specification of an energy product that is offered for sale.

IsBasedOn: ESMPClasses::Auction

Table 6 shows all attributes of Auction.

Table 6 – Attributes of Bid contextual model::Auction

mult.	Attribute name	Attribute type	Description
[1..1]	mRID	ID_String	The unique identification of the auction.

6.1.3.3 BidTimeSeries

The formal specification of specific characteristics related to a bid.

IsBasedOn: ESMPClasses::BidTimeSeries

Table 7 shows all attributes of BidTimeSeries.

Table 7 – Attributes of Bid contextual model::BidTimeSeries

mult.	Attribute name	Attribute type	Description
[1..1]	blockBid	ESMPBoolean_String	The indication that the values in the period are considered as a whole. They cannot be changed or subdivided.
[1..1]	businessType	BusinessKind_String	The identification of the nature of the time series.
[1..1]	divisible	ESMPBoolean_String	An indication whether or not each element of the bid may be partially accepted or not.
[0..1]	linkedBidsIdentification	ID_String	The unique identification used to identify associated bids with each other.
[1..1]	mRID	ID_String	A unique identification of the time series.

Table 8 shows all association ends of BidTimeSeries with other classes.

Table 8 – Association ends of Bid contextual model::BidTimeSeries with other classes

mult.	Role	Class type name	Description
[1..1]	Auction	Auction	The identification linking the bid to a set of specifications created by the auction operator. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Auction.Auction[0..*]
[0..1]	Currency_Unit	Currency_Unit	The currency in which the monetary amount is expressed. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Currency_Unit.Currency_Unit[0..1]
[1..1]	In_Domain	Domain	The area where the energy is to be put. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Domain.Domain[0..*]
[1..1]	Out_Domain	Domain	The area where the energy is coming from. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Domain.Domain[0..*]
[1..*]	Period	Series_Period	Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Series_Period.Period[0..*]
[0..1]	Price_Measure_Unit	Measure_Unit	The unit of measure in which the price in the time series is expressed (MW, MWh, etc.). Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Measure_Unit.Measurement_Unit[0..*]
[1..1]	Quantity_Measure_Unit	Measure_Unit	The unit of measure in which the quantities in the time series are expressed, e.g. MAW. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Measure_Unit.Measurement_Unit[0..*]

6.1.3.4 Currency_Unit

The code specifying a monetary unit.

IsBasedOn: ESMPClasses::Currency_Unit

Table 9 shows all attributes of Currency_Unit.

Table 9 – Attributes of Bid contextual model::Currency_Unit

mult.	Attribute name	Attribute type	Description
[1..1]	name	CurrencyCode_String	The identification of the formal code for a currency (ISO 4217).

6.1.3.5 Domain

A domain covering a number of related objects, such as market balance area, grid area, borders etc.

IsBasedOn: ESMPClasses::Domain

Table 10 shows all attributes of Domain.

Table 10 – Attributes of Bid contextual model::Domain

mult.	Attribute name	Attribute type	Description
[1..1]	mRID	AreaID_String	The unique identification of the domain.

6.1.3.6 MarketParticipant

The identification of the party participating in energy market business processes.

IsBasedOn: ESMPClasses::MarketParticipant

Table 11 shows all attributes of MarketParticipant.

Table 11 – Attributes of Bid contextual model::MarketParticipant

mult.	Attribute name	Attribute type	Description
[1..1]	mRID	PartyID_String	The identification of a party in the energy market.

Table 12 shows all association ends of MarketParticipant with other classes.

Table 12 – Association ends of Bid contextual model::MarketParticipant with other classes

mult.	Role	Class type name	Description
[1..1]	MarketRole	MarketRole	Association Based On: ESMPClasses::MarketParticipant.[] ----- ESMPClasses::MarketRole.MarketRole[0..1]

6.1.3.7 MarketRole

The identification of the intended behaviour of a market participant played within a given business process.

IsBasedOn: ESMPClasses::MarketRole

Table 13 shows all attributes of MarketRole.

Table 13 – Attributes of Bid contextual model::MarketRole

mult.	Attribute name	Attribute type	Description
[1..1]	type	MarketRoleKind_String	The identification of the role played by a market player.

6.1.3.8 Measure_Unit

A particular quantity, defined and adopted by convention, with which other quantities of the same kind are compared in order to express their magnitudes relative to that quantity.

IsBasedOn: ESMPClasses::Measure_Unit

Table 14 shows all attributes of Measure_Unit.

Table 14 – Attributes of Bid contextual model::Measure_Unit

mult.	Attribute name	Attribute type	Description
[1..1]	name	MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20).

6.1.3.9 Point

The quantity that is bid for the interval in question.

The identification of the values being addressed within a specific interval of time.

IsBasedOn: ESMPClasses::Point

Table 15 shows all attributes of Point.

Table 15 – Attributes of Bid contextual model::Point

mult.	Attribute name	Attribute type	Description
[1..1]	position	Position_Integer	A sequential value representing the relative position within a given time interval.
[1..1]	quantity	Decimal	The principal quantity identified for a point.

Table 16 shows all association ends of Point with other classes.

Table 16 – Association ends of Bid contextual model::Point with other classes

mult.	Role	Class type name	Description
[0..1]	Price	Price	The price expressed for each unit of quantity. The price amount is mandatory in the case of capacity auctions and shall not be provided in the case of rule based allocations depending on local market rules (for example "first come first serve"). Association Based On: ESMPClasses::Point.[] ----- ESMPClasses::Price.Price[0..*]

6.1.3.10 Price

The cost corresponding to a specific entity expressed in a currency.

IsBasedOn: ESMPClasses::Price

Table 17 shows all attributes of Price.

Table 17 – Attributes of Bid contextual model::Price

mult.	Attribute name	Attribute type	Description
[1..1]	amount	Amount_Decimal	A number of monetary units specified in a unit of currency.

6.1.3.11 Series_Period

The identification of the period of time corresponding to a given time interval and resolution.

IsBasedOn: ESMPClasses::Series_Period

Table 18 shows all attributes of Series_Period.

Table 18 – Attributes of Bid contextual model::Series_Period

mult.	Attribute name	Attribute type	Description
[1..1]	resolution	Duration	The definition of the number of units of time that compose an individual step within a period.
[1..1]	timeInterval	ESMP_DateTimeInterval	The start and end time of the period.

Table 19 shows all association ends of Series_Period with other classes.

Table 19 – Association ends of Bid contextual model::Series_Period with other classes

mult.	Role	Class type name	Description
[1..*]	Point	Point	Association Based On: ESMPClasses::Series_Period.[] ----- ESMPClasses::Point.Point[1..*]

6.1.3.12 Time_Period

The identification of a time interval.

IsBasedOn: ESMPClasses::Time_Period

Table 20 shows all attributes of Time_Period.

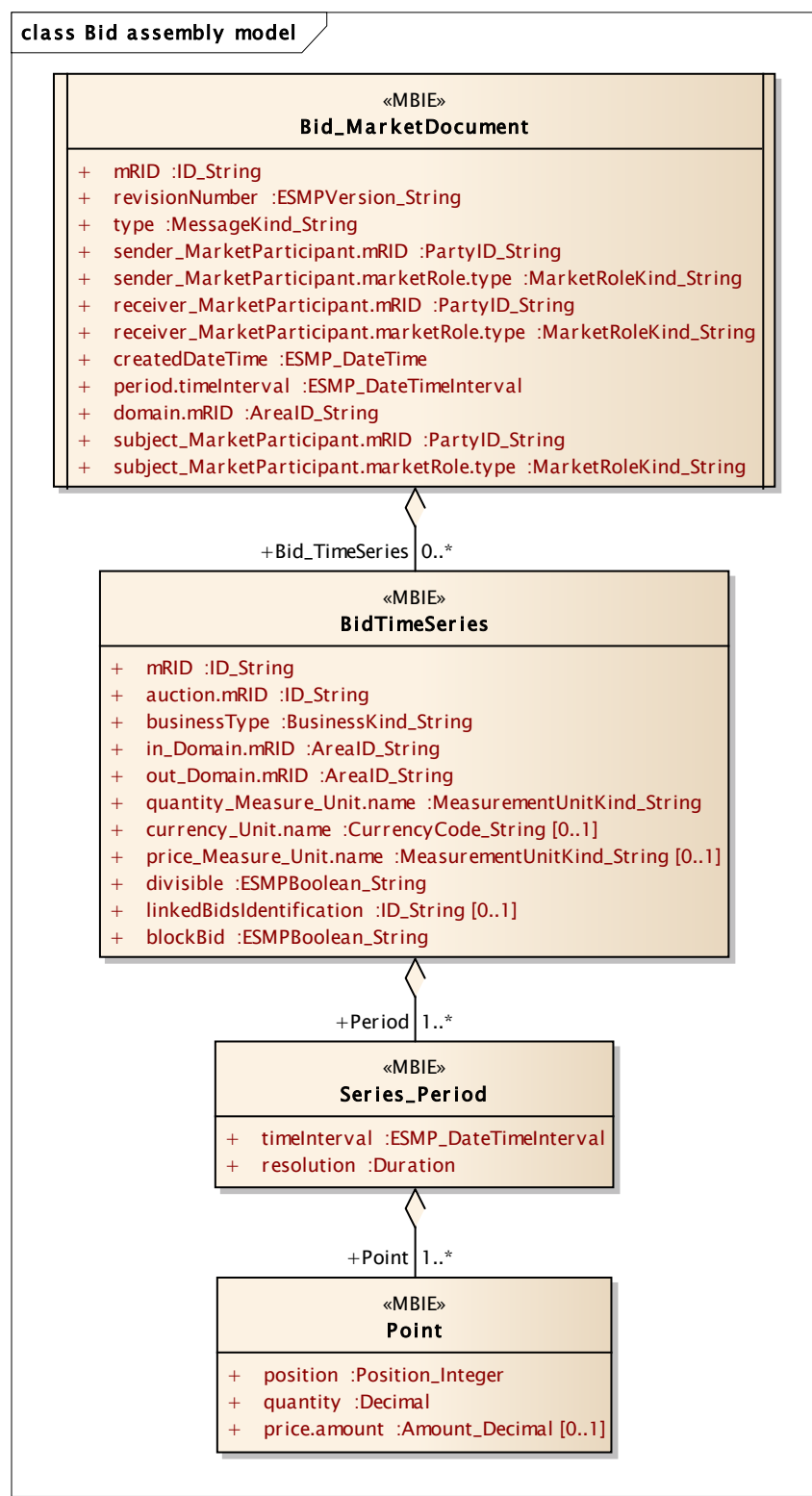
Table 20 – Attributes of Bid contextual model::Time_Period

mult.	Attribute name	Attribute type	Description
[1..1]	timeInterval	ESMP_DateTimeInterval	The start and end date and time for a given interval.

6.2 Bid assembly model

6.2.1 Overview of the model

Figure 10 shows the model.



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Figure 10 – Bid assembly model

6.2.2 IsBasedOn relationships from the European style market profile

Table 21 shows the traceability dependency of the classes used in this package towards the upper level.

Table 21 – IsBasedOn dependency

Name	Is BasedOn Class	Complete IsBasedOn Path
Bid_MarketDocument	Bid contextual model::Bid_MarketDocument	Bid Document\Bid contextual model
BidTimeSeries	Bid contextual model::BidTimeSeries	Bid Document\Bid contextual model
Point	Bid contextual model::Point	Bid Document\Bid contextual model
Series_Period	Bid contextual model::Series_Period	Bid Document\Bid contextual model

6.2.3 Detailed Bid assembly model

6.2.3.1 Bid_MarketDocument root class

A bid document contains a set of bids (a bid is represented by a time series). There may be several bids submitted by the sender for the same bid period and subject party.

An electronic document containing the information necessary to satisfy the requirements of a given business process.

IsBasedOn: Bid contextual model::Bid_MarketDocument

Table 22 shows all attributes of Bid_MarketDocument.

Table 22 – Attributes of Bid assembly model::Bid_MarketDocument

mult.	Attribute name	Attribute type	Description
[1..1]	createdDateTime	ESMP_DateTime	The date and time of the creation of the document.
[1..1]	domain.mRID	AreaID_String	The unique identification of the domain. --- The domain covered within the bid document, i.e. the border for which auction is done.
[1..1]	mRID	ID_String	The unique identification of the document being exchanged within a business process flow.
[1..1]	period.timeInterval	ESMP_DateTimeInterval	The start and end date and time for a given interval. --- The beginning and ending date and time of the period covered by the document.
[1..1]	receiver_MarketParticipant.marketRole.type	MarketRoleKind_String	The identification of the role played by a market player. --- Document recipient.
[1..1]	receiver_MarketParticipant.mRID	PartyID_String	The identification of a party in the energy market. --- Document recipient.
[1..1]	revisionNumber	ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
[1..1]	sender_MarketParticipant.marketRole.type	MarketRoleKind_String	The identification of the role played by a market player. --- Document owner.
[1..1]	sender_MarketParticipant.mRID	PartyID_String	The identification of a party in the energy market. --- Document owner.
[1..1]	subject_MarketParticipant.marketRole.type	MarketRoleKind_String	The identification of the role played by a market player. --- The party for whom the bid is being submitted.
[1..1]	subject_MarketParticipant.mRID	PartyID_String	The identification of a party in the energy market. --- The party for whom the bid is being submitted.
[1..1]	type	MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.

Table 23 shows all association ends of Bid_MarketDocument with other classes.

Table 23 – Association ends of Bid assembly model::Bid_MarketDocument with other classes

mult.	Role	Class type name	Description
[0..*]	Bid_TimeSeries	BidTimeSeries	The timeseries contains the bids that are submitted to the auction. Association Based On: Bid contextual model::BidTimeSeries.Bid_TimeSeries[0..*] ----- Bid contextual model::Bid_MarketDocument.[]

6.2.3.2 BidTimeSeries

The formal specification of specific characteristics related to a bid.

IsBasedOn: Bid contextual model::BidTimeSeries

Table 24 shows all attributes of BidTimeSeries.

Table 24 – Attributes of Bid assembly model::BidTimeSeries

mult.	Attribute name	Attribute type	Description
[1..1]	auction.mRID	ID_String	The unique identification of the auction. --- The identification linking the bid to a set of specifications created by the auction operator.
[1..1]	blockBid	ESMPBoolean_String	The indication that the values in the period are considered as a whole. They cannot be changed or subdivided.
[1..1]	businessType	BusinessKind_String	The identification of the nature of the time series.
[0..1]	currency_Unit.name	CurrencyCode_String	The identification of the formal code for a currency (ISO 4217). --- The currency in which the monetary amount is expressed.
[1..1]	divisible	ESMPBoolean_String	An indication whether or not each element of the bid may be partially accepted or not.
[1..1]	in_Domain.mRID	AreaID_String	The unique identification of the domain. --- The area where the energy is to be put.
[0..1]	linkedBidsIdentification	ID_String	The unique identification used to identify associated bids with each other.
[1..1]	mRID	ID_String	A unique identification of the time series.
[1..1]	out_Domain.mRID	AreaID_String	The unique identification of the domain. --- The area where the energy is coming from.
[0..1]	price_Measure_Unit.name	MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure in which the price in the time series is expressed (MW, MWh, etc.).
[1..1]	quantity_Measure_Unit.name	MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure in which the quantities in the time series are expressed, e.g. MAW.

Table 25 shows all association ends of BidTimeSeries with other classes.

Table 25 – Association ends of Bid assembly model::BidTimeSeries with other classes

mult.	Role	Class type name	Description
[1..*]	Period	Series_Period	Association Based On: Bid contextual model::Series_Period.Period[1..*] ----- Bid contextual model::BidTimeSeries.[]

6.2.3.3 Point

The quantity that is bid for the interval in question.

The identification of the values being addressed within a specific interval of time.

IsBasedOn: Bid contextual model::Point

Table 26 shows all attributes of Point.

Table 26 – Attributes of Bid assembly model::Point

mult.	Attribute name	Attribute type	Description
[1..1]	position	Position_Integer	A sequential value representing the relative position within a given time interval.
[0..1]	price.amount	Amount_Decimal	A number of monetary units specified in a unit of currency. --- The price expressed for each unit of quantity. The price amount is mandatory in the case of capacity auctions and shall not be provided in the case of rule based allocations depending on local market rules (for example "first come first serve").
[1..1]	quantity	Decimal	The principal quantity identified for a point.

6.2.3.4 Series_Period

The identification of the period of time corresponding to a given time interval and resolution.

IsBasedOn: Bid contextual model::Series_Period

Table 27 shows all attributes of Series_Period.

Table 27 – Attributes of Bid assembly model::Series_Period

mult.	Attribute name	Attribute type	Description
[1..1]	resolution	Duration	The definition of the number of units of time that compose an individual step within a period.
[1..1]	timeInterval	ESMP_DateTimeInterval	The start and end time of the period.

Table 28 shows all association ends of Series_Period with other classes.

Table 28 – Association ends of Bid assembly model::Series_Period with other classes

mult.	Role	Class type name	Description
[1..*]	Point	Point	Association Based On: Bid contextual model::Point.Point[1..*] ----- Bid contextual model::Series_Period.[]

6.3.1 Overview of the model

class Capacity auction specification contextual model

```

classDiagram
    class CapacityAuctionSpecification_MarketDocument {
        «ABIE»
        + nRID :ID_String
        + revisionNumber :ESMPVersion_String
        + type :MessageKind_String
        + createdDateTime :ESMP_DateTime
    }
    class Time_Period {
        «ABIE»
        + timeInterval :ESMP_DateTimeInterval
    }
    class Domain {
        «ABIE»
        + nRID :AreaID_String
    }
    class Action {
        «ABIE»
        + category :Category_String
        + type :ActionKind_String
        + allocationMode :AllocationMode_String
        + paymentTerms :PaymentTerms_String
        + cancelled :ESMPBoolean_String [0..1]
    }
    class Currency_Unit {
        «ABIE»
        + name :CurrencyCode_String
    }
    class Series_Period {
        «ABIE»
        + timeInterval :ESMP_DateTimeInterval
        + resolution :Duration
    }
    class RightsCharacteristics_Auction {
        «ABIE»
        + rights :RightsKind_String
    }
    class Reason {
        «ABIE»
        + code :ReasonCode_String
        + text :ReasonText_String [0..1]
    }
    class Point {
        «ABIE»
        + position :Position_Integer
        + quantity :Decimal
    }
    class AttributInstanceComponent {
        «ABIE»
        + position :Integer
        + attribute :String
    }
    class CapacityAuctionSpecification_MarketDocument {
        + Sender :MarketParticipant
        + Receiver :MarketParticipant
    }
    class Time_Period {
        + Delivery_Period
        + Bidding_Period
    }
    class Domain {
        + In_Domain
        + Out_Domain
    }
    class Action {
        + Auction
    }
    class Currency_Unit {
        + Currency_Unit
    }
    class Series_Period {
        + Period [0..*]
    }
    class RightsCharacteristics_Auction {
        + RightsCharacteristics_Auction [0..*]
    }
    class Reason {
        + Reason [0..*]
    }
    class Point {
        + Point [1..*]
    }
    class AttributInstanceComponent {
        + AuctionDescription_AttributInstanceComponent [0..*]
    }
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Time_Period
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Domain
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Action
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Currency_Unit
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Series_Period
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" RightsCharacteristics_Auction
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Reason
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" Point
    CapacityAuctionSpecification_MarketDocument "1" -- "0..1" AttributInstanceComponent
    Time_Period "1" -- "1..1" Domain
    Time_Period "1" -- "1..1" Action
    Time_Period "1" -- "1..1" Currency_Unit
    Time_Period "1" -- "1..1" Series_Period
    Time_Period "1" -- "1..1" RightsCharacteristics_Auction
    Time_Period "1" -- "1..1" Reason
    Time_Period "1" -- "1..1" Point
    Time_Period "1" -- "1..1" AttributInstanceComponent
    Domain "1" -- "1..1" Action
    Domain "1" -- "1..1" Currency_Unit
    Domain "1" -- "1..1" Series_Period
    Domain "1" -- "1..1" RightsCharacteristics_Auction
    Domain "1" -- "1..1" Reason
    Domain "1" -- "1..1" Point
    Domain "1" -- "1..1" AttributInstanceComponent
    Action "1" -- "1..1" Currency_Unit
    Action "1" -- "1..1" Series_Period
    Action "1" -- "1..1" RightsCharacteristics_Auction
    Action "1" -- "1..1" Reason
    Action "1" -- "1..1" Point
    Action "1" -- "1..1" AttributInstanceComponent
    Currency_Unit "1" -- "1..1" Series_Period
    Currency_Unit "1" -- "1..1" RightsCharacteristics_Auction
    Currency_Unit "1" -- "1..1" Reason
    Currency_Unit "1" -- "1..1" Point
    Currency_Unit "1" -- "1..1" AttributInstanceComponent
    Series_Period "1" -- "1..1" RightsCharacteristics_Auction
    Series_Period "1" -- "1..1" Reason
    Series_Period "1" -- "1..1" Point
    Series_Period "1" -- "1..1" AttributInstanceComponent
    RightsCharacteristics_Auction "1" -- "1..1" Reason
    RightsCharacteristics_Auction "1" -- "1..1" Point
    RightsCharacteristics_Auction "1" -- "1..1" AttributInstanceComponent
    Reason "1" -- "1..1" Point
    Reason "1" -- "1..1" AttributInstanceComponent
    Point "1" -- "1..1" AttributInstanceComponent
    AttributInstanceComponent "1" -- "1..1" AttributInstanceComponent
  
```

The diagram illustrates the class structure for the Capacity auction specification contextual model. The central class is **CapacityAuctionSpecification_MarketDocument** (ABIE), which contains attributes: `nRID :ID_String`, `revisionNumber :ESMPVersion_String`, `type :MessageKind_String`, and `createdDateTime :ESMP_DateTime`. It has associations with several other classes: **Time_Period** (ABIE), **Domain** (ABIE), **Action** (ABIE), **Currency_Unit** (ABIE), **Series_Period** (ABIE), **RightsCharacteristics_Auction** (ABIE), **Reason** (ABIE), **Point** (ABIE), and **AttributInstanceComponent** (ABIE). The **Time_Period** class has attributes `timeInterval :ESMP_DateTimeInterval` and `Delivery_Period`, `Bidding_Period`. The **Domain** class has attributes `nRID :AreaID_String`, `In_Domain`, and `Out_Domain`. The **Action** class has attributes `category :Category_String`, `type :ActionKind_String`, `allocationMode :AllocationMode_String`, `paymentTerms :PaymentTerms_String`, and `cancelled :ESMPBoolean_String [0..1]`. The **Currency_Unit** class has attributes `name :CurrencyCode_String`. The **Series_Period** class has attributes `timeInterval :ESMP_DateTimeInterval` and `resolution :Duration`. The **RightsCharacteristics_Auction** class has attribute `rights :RightsKind_String`. The **Reason** class has attributes `code :ReasonCode_String` and `text :ReasonText_String [0..1]`. The **Point** class has attributes `position :Position_Integer` and `quantity :Decimal`. The **AttributInstanceComponent** class has attributes `position :Integer` and `attribute :String`. The **CapacityAuctionSpecification_MarketDocument** class also has associations with **MarketParticipant** (ABIE) and **MarketRole** (ABIE) classes, which have attributes `nRID :PartyID_String` and `type :MarketRoleKind_String` respectively.

Figure 11 – Capacity auction specification contextual model