1

THE HARMONISED ELECTRICITY MARKET ROLE MODEL

VERSION: 2019-01

entso**e**   **EFET** European Federation of Energy Traders SO YOU CAN RELY ON THE MARKET   eb**IX**

2 **TABLE OF CONTENTS**

16

17 **TABLE OF FIGURES**

22

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41 <u>**REVISION HISTORY**</u>

Version	Date	Change (compared to version 2018-01)
2019-01	2019-06-12	This version of the Harmonised electricity market Role Model (HRM) is based on roles and objects mainly from the new network codes. The revision history is published at ENTSO-E and ebIX® web sites as referenced below.

42 The Harmonised electricity market Role Model and the revision history can be found at:

43   ENTSO-E web site: <u>Harmonised Electricity Role Model</u> or

44   ebIX® web site: <u>Harmonised Electricity Role Model</u>

1 INTRODUCTION

The Harmonised electricity market Role Model (HRM) has been developed in order to facilitate the dialogue between the market participants from different countries through the designation of a common name for each role and related object that are prevalent within the European electricity market information exchange. It focuses essentially to enable a common terminology for IT supported information exchange. The HRM has been developed by ENTSO-E, EFET and ebIX®.

This document describes all the roles that can be played for given objects within the European electricity market. It covers both the wholesale and retail electricity markets. The document covers the roles as identified in current development being carried out in information exchange. It will naturally grow or evolve as this work progresses. The reader is therefore encouraged to ensure that the document is the latest available version.

A role model of this nature shall be the formal means of identifying roles and objects that are used in information exchange. It is important to stress that it is not a model of the electricity market but rather a model of the roles related to information exchange.

The necessity for such a role model arises from the possibility that a single party in the market may assume multiple roles, however in decentralised, competitive market every role can be played by different party. This implies that the roles need to be atomically decomposed where necessary in order to satisfy the information flows for a given process required within the electricity market.

The HRM represents these abstract roles and objects used in information exchange on European electricity market.
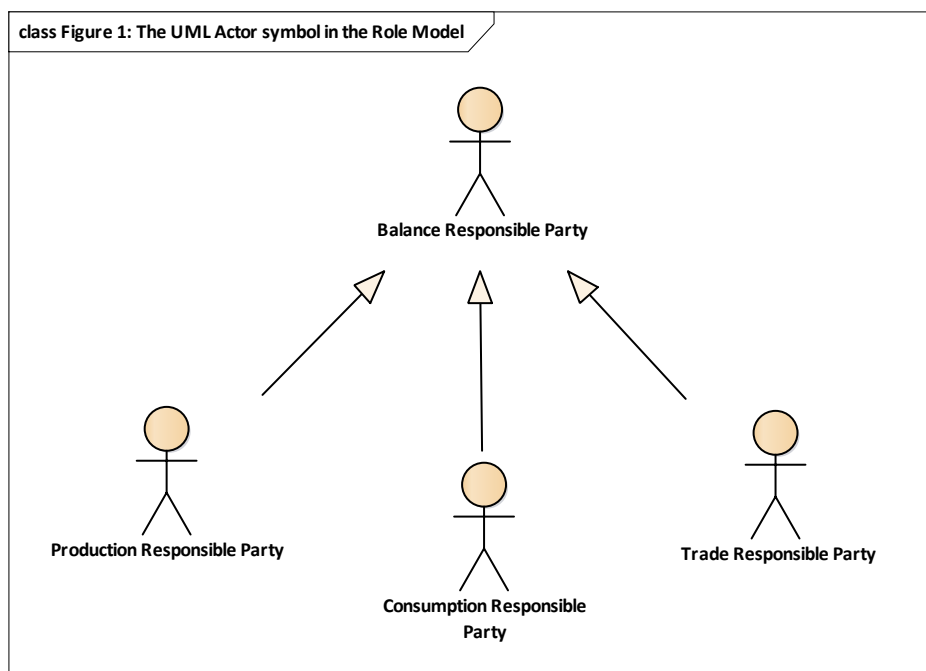
2 ABOUT THE ROLE MODEL

68

69 A party on the market may play several roles; for example a TSO frequently plays the roles
70 of a System Operator, an LFC Operator and the role of an Imbalance Settlement
71 Responsible. A DSO frequently plays the role of a System operator, a Metering Point
72 Administrator and the role of a Grid Access Provider. However, different roles have been
73 defined since these roles are not always played by the same party in every electricity
74 market. Consequently, it is necessary to clearly define the roles in order to be in a position
75 to correctly use them as required.

76 It is important to differentiate between the roles that can be found on a given marketplace
77 and the parties that can play such roles. ENTSO-E, EFET and ebIX® have identified a given
78 role whenever it has been found necessary to distinguish it in an information exchange
79 process.

80 The HRM also identifies the different objects, described as UML classes, that are
81 necessary in the electricity market for information exchange. The term *Object* is a generic
82 term covering domains, points, resources, CIM objects and accounts.

83 To build a Role Model diagram the UML class diagramming technique has been used. The
84 diagram makes use of two UML symbols, the "actor" symbol (not to be confused with a
85 party on a marketplace) is used to represent a role and the "class" symbol is used to define
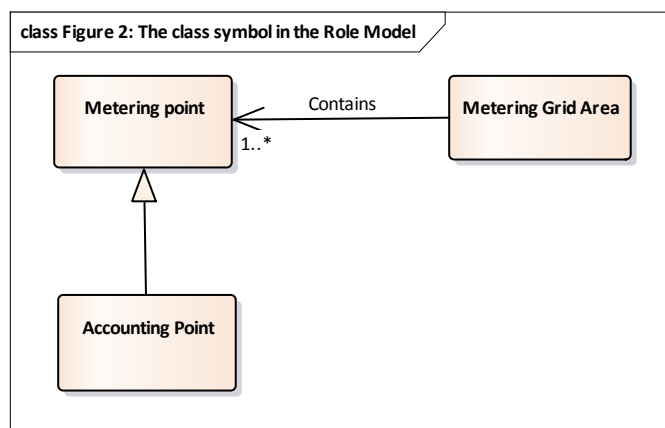86 an object.

87

88
89 *Figure 1: The UML Actor symbol in the Role Model*

90 The Role Model shown in figure 1 shows the actor symbol used to identify roles. It also
91 introduces the concept of a "generalisation" relationship. The generalisation relationships in
92 the figure show that three roles inherit the basic properties of a "Balance Responsible
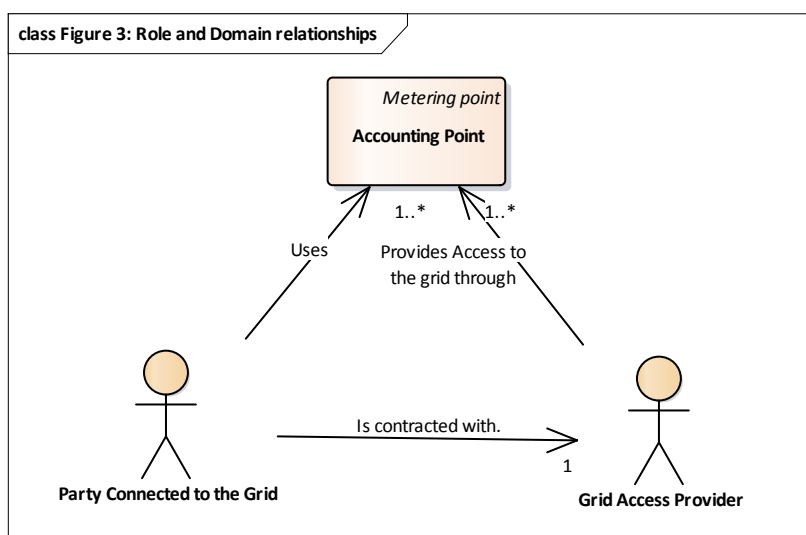93 Party".

94

class Figure 2: The class symbol in the Role Model

Metering point ◁——Contains—— Metering Grid Area
1..*

△
Accounting Point

95

96 *Figure 2: The class symbol in the Role Model*

97 The class symbols outlined in figure 2 show an example of objects and indicate that an
98 Accounting Point is a specialisation of a Metering Point. One also sees that a Metering Grid
99 Area contains one or more (1..*) Metering Points.

100

class Figure 3: Role and Domain relationships

Metering point
Accounting Point

1..*   1..*

Uses   Provides Access to
            the grid through

Party Connected to the Grid ——Is contracted with.——▶ Grid Access Provider
                                              1

101

102 *Figure 3: Role and Object relationships*

103 Figure 3 shows how roles may interact. The relationship that exists between the roles and
104 objects are shown by the arrows drawn between them. For example, the Party Connected
105 to the Grid uses an Accounting Point and is contracted with a Grid Access Provider, which
106 provides access to an Accounting Point.

107 Naturally enough the role model does not show all the relationships that may exist between
108 the roles and the objects. The relationships in the model are there only to highlight the
109 major relationship that justifies the presence of a role or an object. In other words, not all
110 relationships are present in the role model.

3 PROCEDURES FOR THE USE OF THE ROLE MODEL

3.1 Introduction

An actor represents a party that participates in a business transaction. Within a given business transaction an actor assumes a specific role or a set of roles. An actor is a composition of one or more roles and as such does not appear in the model.

A harmonised role represents the external intended behaviour of an actor. Actors, e.g. DSO, TSO, traders and suppliers carry out their activities by performing roles. A role cannot be split over several actors. Roles are the main scope of the HRM.

A harmonised domain represents abstract objects used in the electricity market necessary for the management of various processes, resources or areas, with the following characteristics:

- A *harmonised domain* is the composition of one or more Metering Points.
- A Metering Grid Area (MGA) consist of a set of Metering points;
- A MGA is the corner stone of defining areas, since the flow out and in of an MGA can be measured;
- Other Areas will normally be composed of one or more MGAs;
- An Area has a set of common characteristics (e.g. same price, no congestion, same rules…) and one responsible role.
- Domains will only be added for clarification and only where the responsibility for the domain is clear.
- There should be only one role responsible for creation, maintenance and deletion of a Domain.

A *harmonised resource* represents a grid asset, a consumption resource or a production resource used in the electricity market, necessary for the management of various processes.

A *harmonised account* represents a business object for aggregated reporting.

A *CIM Object* represents objects defined in IEC/CIM standards.

The objective of decomposing the electricity market model into a set of autonomous roles and objects is to enable the construction of business processes where the relevant role participates to satisfy a specific transaction. Business processes should be designed to satisfy the requirements of the roles and not of the actors.

It is not the intent of the HRM to define the business processes and their transactions. Business processes and their transactions shall be completely defined in a Business Requirements Specification (BRS).

3.2 Role constraints

A role must be able to stand alone within the model. In other words, it must represent a relatively autonomous function. A good guide to determining the validity for the insertion of a role is to determine whether it provides:

1. All the information relevant to interoperability. It must be able to participate in the development of a business process by being a key factor in the construction of the

allowable sequences of information exchanges and satisfy the conditions in which it is allowed to send information. In this respect, it has to be autonomous. That is to say it must have the business responsibility which enables it to:

➢ receive information from another role,

➢ determine the actions to be carried out on the information in question,

➢ terminate, if necessary, prematurely, the exchange with respect to predefined rules,

➢ send information to the role in question or to another role,

➢ manage error conditions.

2. Satisfy the process constraints in which the role participates. Such constraints impose restrictions on how roles may or must react. These constraints will be defined within the business process specification. Such constraints include:

➢ demands on quality of service imposed by the business process requirements for a role, such as network acknowledgement or security features;

➢ constraints on the characteristics of the party that can play the role;

➢ constraints on the preconditions that must be met before a role can be played;

➢ constraints on the ability of a party to assign all or part of a role to another party;

The role shall be generic. The model is intended to be employed throughout the industry. Consequently, roles that are specific or that are particular to only one European context shall not appear in the model.

In essence, this means that a separate role shall be identified when it can be played by a third party (= a party that can carry out the task on behalf of another party or as an independent entity). E.g. the Transmission Capacity Allocator can carry out the capacity allocation on behalf of the System Operator.

3.3   HRM use

The HRM shall be used as the basis for the construction of the information exchange processes that are necessary for the electricity market. The generic nature of the HRM should cover all the roles that can be used in a heterogeneous environment.

If, during the course of the construction of a process, a role is found to be missing from the HRM, a maintenance request should be made requesting its inclusion in the model.
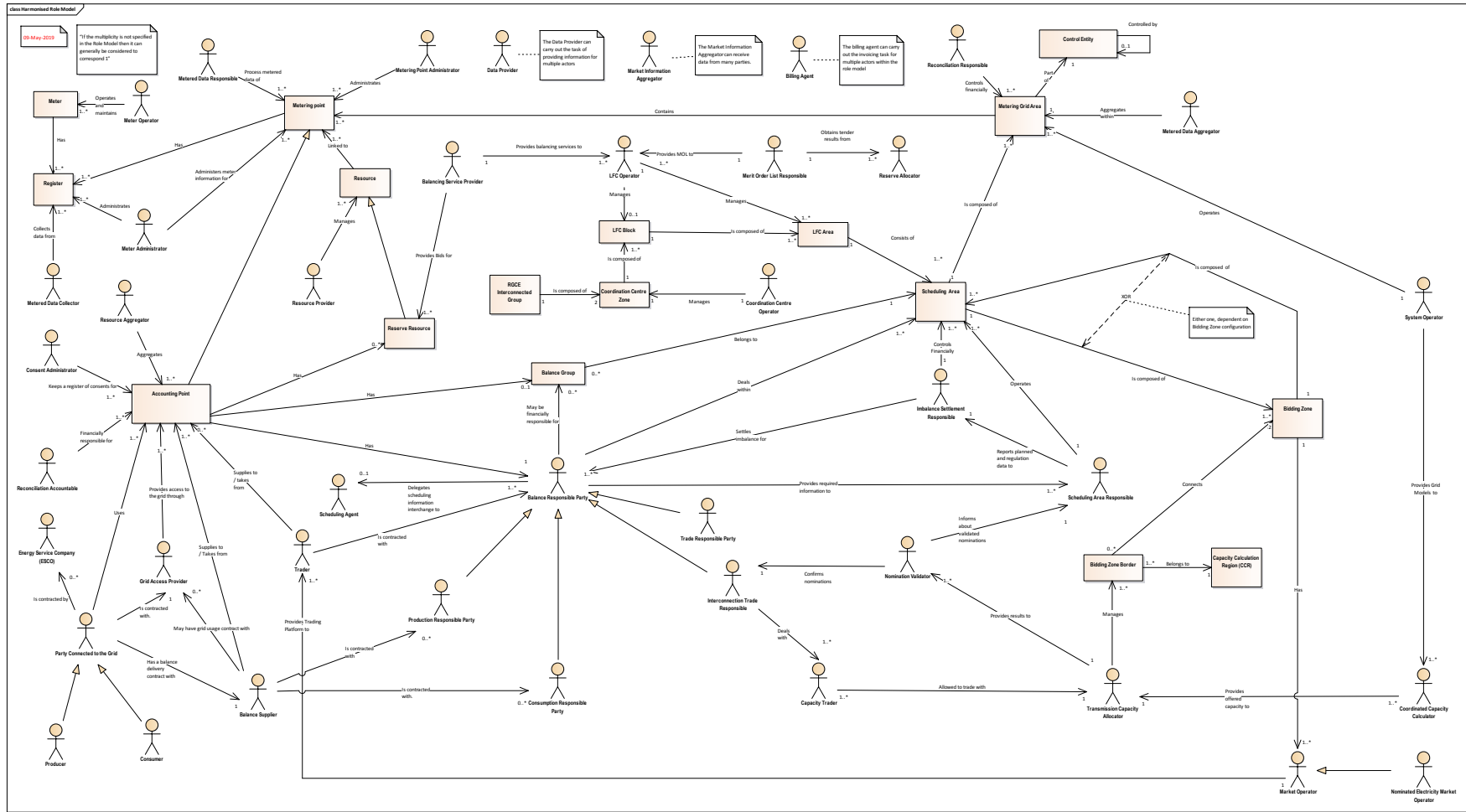
4 THE ROLE MODEL

Figure 4: The Harmonised European Electricity Market Role Model

186 # 5 ROLE MODEL DEFINITIONS

187 ## 5.1 Roles

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Balance Responsible Party	A party that has a contract proving financial security and identifying balance responsibility with the Imbalance Settlement Responsible of the Scheduling Area entitling the party to operate in the market. This is the only role allowing a party to nominate energy on a wholesale level. **Additional information:** The meaning of the word "balance" in this context signifies that the quantity contracted to provide or to consume must be equal to the quantity really provided or consumed.
Role	Balance Supplier	A party that markets the difference between actual metered energy consumption and the energy bought with firm energy contracts by the Party Connected to the Grid. In addition, the Balance Supplier markets any difference with the firm energy contract (of the Party Connected to the Grid) and the metered production. **Additional information:** There is only one Balance Supplier for each Accounting Point.
Role	Balancing Service Provider	A party with reserve-providing units or reserve-providing groups able to provide balancing services to one or more LFC Operators. Based on Electricity Balancing - Art.2 Definitions.
Role	Billing Agent	The party responsible for invoicing a concerned party.
Role	Capacity Trader	A party that has a contract to participate in the Capacity Market to acquire capacity through a Transmission Capacity Allocator. **Note:** The capacity may be acquired on behalf of an Interconnection Trade Responsible or for sale on secondary capacity markets.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Consumer	A party that consumes electricity. **Additional information:** This is a Type of Party Connected to the Grid.
Role	Consumption Responsible Party	A party who can be brought to rights, legally and financially, for any imbalance between energy nominated and consumed for all associated Accounting Points. **Additional information:** This is a type of Balance Responsible Party.
Role	Consent Administrator	A party responsible for keeping a register of consents for a domain. The Consent Administrator makes this information available on request for entitled parties in the sector.
Role	Coordinated Capacity Calculator	Coordinated Capacity Calculator is the entity or entities with the task of calculating transmission capacity, at regional level or above. **Source**: Commission Regulation (EU) 2015/1222 (CACM).
Role	Coordination Centre Operator	A party responsible for the coordination of its Coordination Centre Zone in respect of scheduling, load frequency control, time deviation and compensation of unintentional deviation.
Role	Data Provider	A party that has a mandate to provide information to other parties in the energy market. **Note:** For example, due to Article 2 of the European Commission Regulation 543/2013 of the 14th of June 2013, a data provider may be a Transmission System Operator or a third party agreed by a TSO.
Role	Energy Service Company (ESCO)	A party offering energy-related services to the Party Connected to Grid, but not directly active in the energy value chain or the physical infrastructure itself. The ESCO may provide insight services as well as energy management services.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Grid Access Provider	A party responsible for providing access to the grid through a Metering Point for energy consumption or production to the Party Connected to the Grid. The party is also responsible for creating and terminating Metering Points.
Role	Imbalance Settlement Responsible	A party that is responsible for settlement of the difference between the contracted quantities and the realised quantities of energy products for the Balance Responsible Parties in a Scheduling Area. **Note:** The Imbalance Settlement Responsible may delegate the invoicing responsibility to a more generic role such as Billing Agent.
Role	Interconnection Trade Responsible	Is a Balance Responsible Party or depends on one. He is recognised by the Nomination Validator for the nomination of already allocated capacity. **Additional information:** This is a type of Balance Responsible Party.
Role	LFC Operator	Responsible for the load frequency control for its LFC Area or LFC Block. **Additional information:** This role is typically performed by a TSO.
Role	Market Information Aggregator	A party that provides market related information that has been compiled from the figures supplied by different actors in the market. This information may also be published or distributed for general use. **Note:** The Market Information Aggregator may receive information from any market participant that is relevant for publication or distribution.
Role	Market Operator	A market operator is a party that provides a service whereby the offers to sell electricity are matched with bids to buy electricity. **Additional Information:** This usually is an energy/power exchange or platform.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Merit Order List Responsible	Responsible for the management of the available tenders for all Acquiring LFC Operators to establish the order of the reserve capacity that can be activated.
Role	Meter Administrator	A party responsible for keeping a database of meters.
Role	Meter Operator	A party responsible for installing, maintaining, testing, certifying and decommissioning physical meters.
Role	Metered Data Aggregator	A party responsible for the establishment and qualification of metered data from the Metered Data Responsible. This data is aggregated according to a defined set of market rules.
Role	Metered Data Collector	A party responsible for meter reading and quality control of the reading.
Role	Metered Data Responsible	A party responsible for the establishment and validation of metered data based on the collected data received from the Metered Data Collector. The party is responsible for the history of metered data for a Metering Point.
Role	Metering Point Administrator	A party responsible for registering the parties linked to the metering points in a Metering Grid Area. The party is also responsible for registering and making available the Metering Point characteristics.
Role	Nominated Electricity Market Operator	An entity designated by the competent authority to perform tasks related to single day-ahead or single intraday coupling. Source: Commission Regulation (EU) 2015/1222 (CACM). **Additional Information:** A NEMO performs MCO functions. (Market Coupling Operator) A NEMO runs a power exchange related to day-ahead or intraday market. A NEMO is a type of Market Operator.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Nomination Validator	Has the responsibility of ensuring that all capacity nominated is within the allowed limits and confirming all valid nominations to all involved parties. He informs the Interconnection Trade Responsible of the maximum nominated capacity allowed. Depending on market rules for a given interconnection the corresponding System Operators may appoint one Nomination Validator.
Role	Party Connected to the Grid	A party that contracts for the right to consume or produce electricity at an Accounting Point.
Role	Producer	A party that produces electricity. **Additional information:** This is a type of Party Connected to the Grid.
Role	Production Responsible Party	A party who can be brought to rights, legally and financially, for any imbalance between energy nominated and produced for all associated Accounting Points. **Additional information:** This is a type of Balance Responsible Party.
Role	Reconciliation Accountable	A party that is financially accountable for the reconciled volume of energy products for a profiled Accounting Point.
Role	Reconciliation Responsible	A party that is responsible for reconciling, within a Metering Grid Area, the volumes used in the imbalance settlement process for profiled Accounting Points and the actual metered quantities. **Note:** The Reconciliation Responsible may delegate the invoicing responsibility to a more generic role such as a Billing Agent.
Role	Reserve Allocator	Informs the market of reserve requirements, receives tenders against the requirements and in compliance with the prequalification criteria, determines what tenders meet requirements and assigns tenders.
Role	Resource Aggregator	A party that aggregates resources for usage by a service provider for energy market services.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Resource Provider	A role that manages a resource and provides production/consumption schedules for it, if required.
Role	Scheduling Agent	The entity or entities with the task of providing schedules. Source: System Operation Guideline, Commission Regulation (EU) 2017/1485. **Additional information:** A party that is responsible for the schedule information and its exchange on behalf of a Balance Responsible Party.
Role	Scheduling Area Responsible	A party responsible for the coordination of nominated volumes within a scheduling area. **Additional information:** This role is typically performed by a TSO.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	System Operator	System Operator means a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the distribution or transmission of electricity. **Additional information:** The definition is based on DIRECTIVE 2009/72/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, Article 2 (Definitions)
Role	Trade Responsible Party	A party who can be brought to rights, legally and financially, for any imbalance between energy nominated and consumed for all associated Accounting Points. **Note:** A power exchange without any privileged responsibilities acts as a Trade Responsible Party. **Additional information:** This is a type of Balance Responsible Party.
Role	Trader	A party that is selling or buying energy.
Role	Transmission Capacity Allocator	The Transmission Capacity Allocator manages, on behalf of the System Operators, the allocation of available transmission capacity for a Bidding Zone Border. He offers the available transmission capacity to the market, allocates the available transmission capacity to individual Capacity Traders and calculates the billing amount of already allocated capacities to the Capacity Traders. **Additional Information:** The single allocation platform established by all TSOs for Forward Capacity Allocation performs the role of a Transmission Capacity Allocator.

188 ## 5.2 Domains

DOMAINS		
Type	DOMAIN NAME	DESCRIPTION
Domain	Accounting Point	A domain under balance responsibility where balance supplier change can take place and for which commercial business processes are defined. **Additional information:** These domains are usually defined in a contract. Typical business processes where this would be used may be "compensation management", "settlement", "calculation of energy volumes", etc This is a type of Metering Point.
Domain	Bidding Zone	The largest geographical area within which market participants are able to exchange energy without capacity allocation. Source: Commission Regulation (EU) 543/2013.
Domain	Bidding Zone Border	Defines the aggregated connection capacity between two Bidding Zones A market area (Which defines the aggregated connection capacity between two Bidding Zones) where the transmission capacity between the Bidding Zones is given to the Balance Responsible Parties according to rules carried out by a Transmission Capacity Allocator. Trade between Bidding Zones is carried out on a bilateral or unilateral basis.
Domain	Capacity Calculation Region	The Capacity Calculation Region is the geographic area in which coordinated capacity calculation is applied. Source: Commission Regulation (EU) 2015/1222 (CACM). **Additional information:** The transmission capacity between Bidding Zones, included in the Capacity Calculation Region, is given to the Balance Responsible Parties through an implicit capacity allocation process or through an explicit allocation auction.
Domain	Control Entity	A geographic area consisting of one or more Metering Grid Areas with an energy delivery responsibility. Each area is synchronously connected

DOMAINS		
Type	DOMAIN NAME	DESCRIPTION
		to another area. In most cases such areas have a load frequency responsibility and therefore may have to report to a higher level control entity.
Domain	Coordination Centre Zone	The composition of a number of LFC Blocks under the responsibility of the same Coordination Centre Operator.
Domain	LFC Area	A part of a synchronous area or an entire synchronous area, physically demarcated by points of measurement at interconnectors to other LFC Areas, operated by one or more TSOs fulfilling the obligations of load-frequency control. Source: System Operation Guideline, Commission Regulation (EU) 2017/1485.
Domain	LFC Block	A part of a synchronous area or an entire synchronous area, physically demarcated by points of measurement at interconnectors to other LFC Blocks, consisting of one or more LFC Areas, operated by one or more TSOs fulfilling the obligations of load-frequency control. Source: System Operation Guideline, Commission Regulation (EU) 2017/1485.
Domain	Metering Grid Area	A Metering Grid Area is a physical area where consumption, production and exchange can be measured. It is delimited by the placement of meters for continuous measurement for input to, and withdrawal from the area. **Additional information:** It can be used to establish volumes that cannot be measured such as network losses.
Domain	Metering Point	An entity where energy products are measured or computed.
Domain	RGCE Interconnected Group	The composition of a number of coordination centre zones, operating under RGCE (Regional Group Continental Europe) rules, where the exchange and compensation programmes within the zone must sum up to zero.

DOMAINS		
Type	DOMAIN NAME	DESCRIPTION
Domain	Scheduling Area	An area within which the TSOs' obligations regarding scheduling apply due to operational or organisational needs. This area consists of one or more Metering Grid Areas with common market rules for which the settlement responsible party carries out an imbalance settlement and which has the same price for imbalance. Source: System Operation Guideline, Commission Regulation (EU) 2017/1485. **Additional information:** This covers both Imbalance Area and Imbalance Price Area from the Electricity Balancing Guideline (2017/2195).

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5.3 Resources

RESOURCES		
Type	RESOURCE NAME	DESCRIPTION
Resource	Reserve Resource	A resource technically pre-qualified using a uniform set of standards to supply reserve capabilities to a System Operator and is associated with one or more tele-measuring devices. **Additional information:** This is a type of Resource.
Resource	Resource	An object that represents a grid asset, a consumption resource or a production resource related to the energy industry. **Additional information:** A Resource can represent for example a generating unit, a consumption unit or a virtual power plant defined in a contract.

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192 ## 5.4 Accounts

ACCOUNTS		
Type	ACCOUNT NAME	DESCRIPTION
Account	Balance Group	An energy account under responsibility of a Balance Responsible Party used to determine imbalance considering predefined inputs and outputs within a specific Scheduling Area.

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195 ## 5.5 CIM Objects

CIM OBJECTS		
Type	CIM OBJECT NAME	DESCRIPTION
CIM Object	Meter	A physical device containing one or more registers.
CIM Object	Register	A physical or logical counter measuring energy products.

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