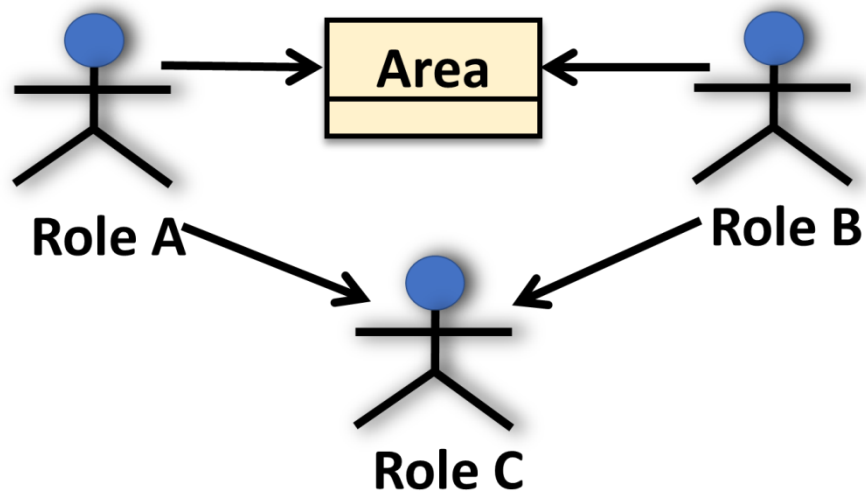

THE HARMONISED ELECTRICITY MARKET ROLE MODEL



VERSION: 2020-01

2

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41

REVISION HISTORY

Version	Date	Change (compared to version 2019-01)
2020-01	2020-05-08	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: [Harmonised Electricity Role Model](#) or

44 eBIX® web site: [Harmonised Electricity Role Model](#)

45 **1 INTRODUCTION**

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

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

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

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

63 The HRM represents these abstract roles and objects used in information exchange on European
64 electricity market.

65

66 2 ABOUT THE ROLE MODEL

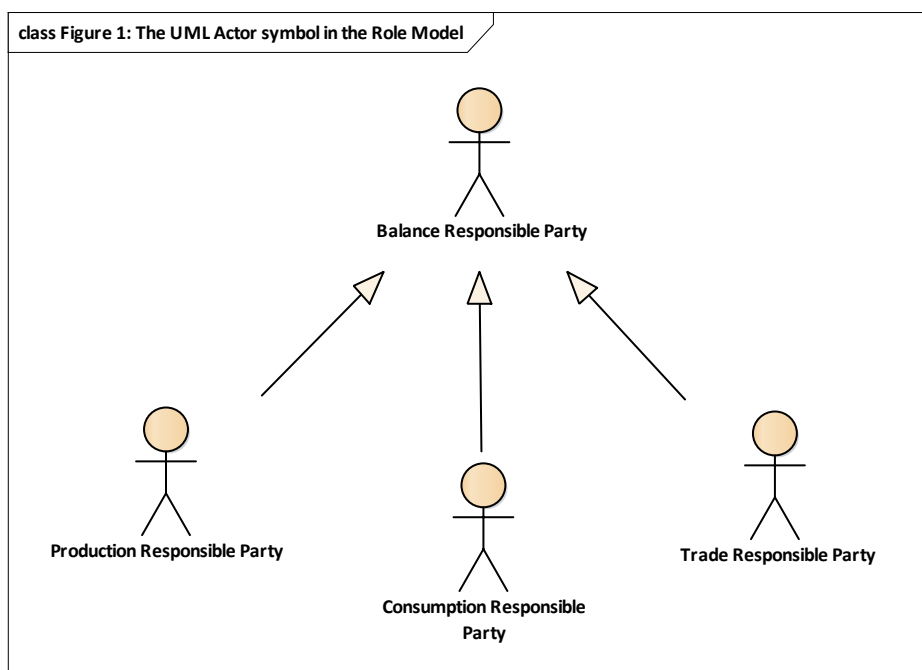
67 A party on the market may play several roles; for example, a TSO frequently plays the roles of a
68 System Operator, an LFC Operator and the role of an Imbalance Settlement Responsible. A DSO
69 frequently plays the role of a System operator, a Metering Point Administrator and the role of a
70 Grid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

73 It is important to differentiate between the roles that can be found on a given marketplace and the
74 parties that can play such roles. ENTSO-E, EFET and eBIX[®] have identified a given role whenever it
75 has been found necessary to distinguish it in an information exchange process.

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

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

82



83

84

Figure 1: The UML Actor symbol in the Role Model

85 The Role Model shown in figure 1 shows the actor symbol used to identify roles. It also introduces
86 the concept of a “generalisation” relationship. The generalisation relationships in the figure show
87 that three roles inherit the basic properties of a “Balance Responsible Party”.

88

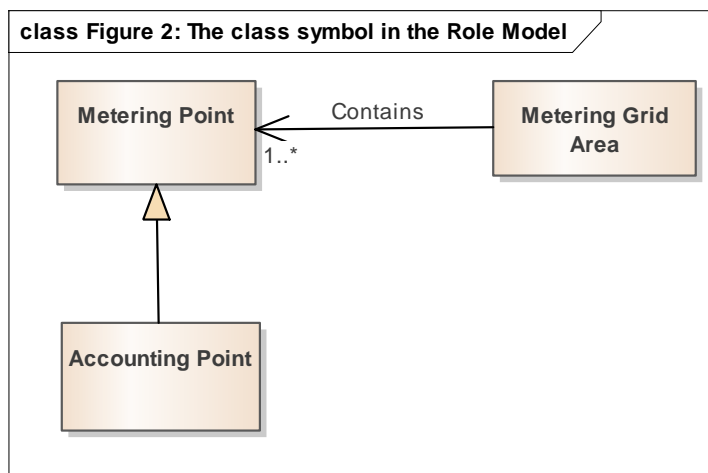


Figure 2: The class symbol in the Role Model

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

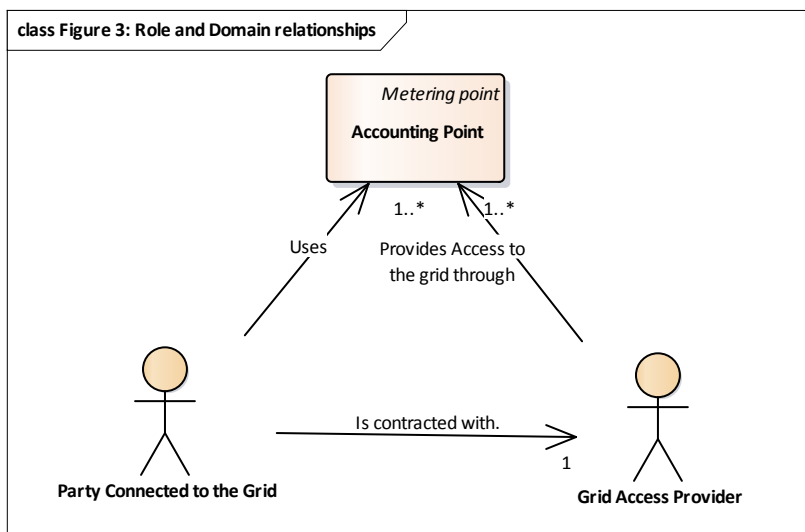


Figure 3: Role and Object relationships

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

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

105 **3 PROCEDURES FOR THE USE OF THE ROLE MODEL**

106 **3.1 Introduction**

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

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

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

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

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

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

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

130

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

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

138 **3.2 Role constraints**

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

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

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

- 147 ➤ receive information from another role,
- 148 ➤ determine the actions to be carried out on the information in question,
- 149 ➤ terminate, if necessary, prematurely, the exchange with respect to predefined rules,
- 150 ➤ send information to the role in question or to another role,
- 151 ➤ manage error conditions.

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

- 155 ➤ demands on quality of service imposed by the business process requirements for a role,
156 such as network acknowledgement or security features;
- 157 ➤ constraints on the characteristics of the party that can play the role;
- 158 ➤ constraints on the preconditions that must be met before a role can be played;
- 159 ➤ constraints on the ability of a party to assign all or part of a role to another party;

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

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

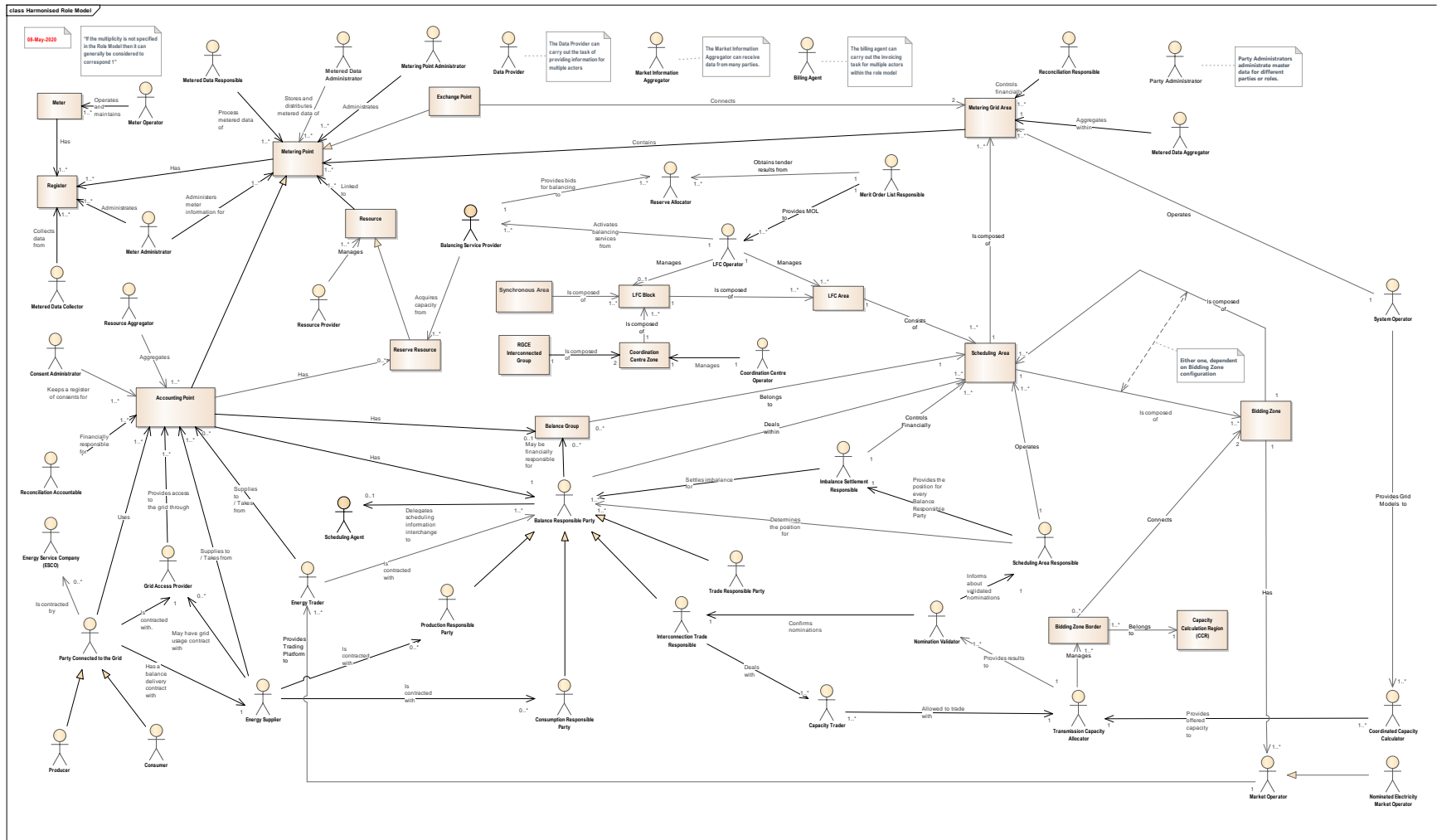
167 **3.3 HRM use**

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

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

173

174 **4 THE ROLE MODEL**



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Figure 4: The Harmonised European Electricity Market Role Model

177 **5 ROLE MODEL DEFINITIONS**

178 **5.1 Roles**

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Balance Responsible Party	<p>A Balance Responsible Party is responsible for its imbalances, meaning the difference between the energy volume physically injected to or withdrawn from the system and the final nominated energy volume, including any imbalance adjustment within a given imbalance settlement period.</p> <p>Note: Based on Electricity Balancing - Art.2 Definitions.</p> <p>Additional information: Responsibility for imbalances (Balance responsibility) requires a contract proving financial security with the Imbalance Settlement Responsible of the Scheduling Area entitling the party to operate in the market.</p>
Role	Balancing Service Provider	<p>A party with reserve-providing units or reserve-providing groups able to provide balancing services to one or more LFC Operators.</p> <p>Additional information: Based on Electricity Balancing - Art.2 Definitions.</p>
Role	Billing Agent	The party responsible for invoicing a concerned party.
Role	Capacity Trader	<p>A party that has a contract to participate in the Capacity Market to acquire capacity through a Transmission Capacity Allocator.</p> <p>Note: The capacity may be acquired on behalf of an Interconnection Trade Responsible or for sale on secondary capacity markets.</p>

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Consumer	<p>A party that consumes electricity.</p> <p>Additional information: This is a Type of Party Connected to the Grid.</p>
Role	Consumption Responsible Party	<p>A Consumption Responsible Party is responsible for its imbalances, meaning the difference between the energy volume physically withdrawn from the system and the final nominated energy volume, including any imbalance adjustment within a given imbalance settlement period.</p> <p>Additional information: This is a type of Balance Responsible Party.</p>
Role	Consent Administrator	<p>A party responsible for administrating a register of consents for a domain. The Consent Administrator makes this information available on request for entitled parties in the sector.</p>
Role	Coordinated Capacity Calculator	<p>Coordinated Capacity Calculator is the entity or entities with the task of calculating transmission capacity, at regional level or above.</p> <p>Source: Commission Regulation (EU) 2015/1222 (CACM).</p>
Role	Coordination Centre Operator	<p>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.</p>
Role	Data Provider	<p>A party that has a mandate to provide information to other parties in the energy market.</p> <p>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.</p>

ROLES		
TYPE	ROLE NAME	DESCRIPTION
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.
Role	Energy Supplier	An Energy Supplier supplies electricity to or takes electricity from a Party Connected to the Grid at an Accounting Point. Additional information: An Accounting Point can only have one Energy Supplier. When additional suppliers are needed the Energy Supplier delivers/takes the difference between established (e.g. measured or calculated) production/consumption and the (accumulated) contracts with other suppliers.
Role	Energy Trader	A party that is selling or buying energy.
Role	Grid Access Provider	A party responsible for providing access to the grid through an Accounting Point for energy consumption or production by the Party Connected to the Grid. The Grid Access Provider is also responsible for creating and terminating Accounting Points.
Role	Imbalance Settlement Responsible	A party that is responsible for settlement of the difference between the contracted quantities with physical delivery and the established 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 a 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.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	LFC Operator	<p>Responsible for the load frequency control for its LFC Area or LFC Block.</p> <p>Additional information: This role is typically performed by a TSO.</p>
Role	Market Information Aggregator	<p>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.</p> <p>Note: The Market Information Aggregator may receive information from any market participant that is relevant for publication or distribution.</p>
Role	Market Operator	<p>A market operator is a party that provides a service whereby the offers to sell electricity are matched with bids to buy electricity.</p> <p>Additional Information: This usually is an energy/power exchange or platform. The definition is based on Regulation on the internal market for electricity (EU) 2019/943.</p>
Role	Merit Order List Responsible	<p>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.</p>
Role	Meter Administrator	<p>A party responsible for keeping a database of meters.</p>
Role	Meter Operator	<p>A party responsible for installing, maintaining, testing, certifying and decommissioning physical meters.</p>
Role	Metered Data Administrator	<p>A party responsible for storing and distributing validated measured data.</p>
Role	Metered Data Aggregator	<p>A party responsible for the establishment and qualification of measured data from the Metered Data Responsible. This data is aggregated according to a defined set of market rules.</p>
Role	Metered Data Collector	<p>A party responsible for meter reading and quality control of the reading.</p>

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Metered Data Responsible	A party responsible for the establishment and validation of measured 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 administrating and making available the Metering Point characteristics, including registering the parties linked to the Metering Point.
Role	Nominated Electricity Market Operator	<p>An entity designated by the competent authority to perform tasks related to single day-ahead or single intraday coupling.</p> <p>Source: Commission Regulation (EU) 2015/1222 (CACM).</p> <p>Additional Information: A NEMO performs MCO (Market Coupling Operator) and CCP (Central Counter Party) functions. A NEMO runs a power exchange related to day-ahead or intraday market. A NEMO is a type of Market Operator.</p>
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 Administrator	A party responsible for maintaining party characteristics for the energy sector.
Role	Party Connected to the Grid	A party that contracts for the right to consume or produce electricity at an Accounting Point.

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Producer	<p>A party that generates electricity.</p> <p>Additional information: This is a type of Party Connected to the Grid. The definition is based on Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, Article 2 (Definitions).</p>
Role	Production Responsible Party	<p>A Production Responsible Party is responsible for its imbalances, meaning the difference between the energy volume physically injected to the system and the final nominated energy volume, including any imbalance adjustment within a given imbalance settlement period.</p> <p>Additional information: This is a type of Balance Responsible Party.</p>
Role	Reconciliation Accountable	<p>A party that is financially accountable for the reconciled volume of energy products for a profiled Accounting Point.</p>
Role	Reconciliation Responsible	<p>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 measured quantities.</p> <p>Note: The Reconciliation Responsible may delegate the invoicing responsibility to a more generic role such as a Billing Agent.</p>
Role	Reserve Allocator	<p>Informs the market of reserve requirements, receives bids against the requirements and in compliance with the prequalification criteria, determines which bids meet requirements and assigns bids.</p>

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Resource Aggregator	<p>A party that aggregates resources for usage by a service provider for energy market services.</p> <p>Note: In the current version, the only service provider in HRM is the Balancing Service Provider.</p>
Role	Resource Provider	<p>A role that manages a resource and provides production/consumption schedules for it, if required.</p>
Role	Scheduling Agent	<p>The entity or entities with the task of providing schedules.</p> <p>Source: System Operation Guideline, Commission Regulation (EU) 2017/1485.</p> <p>Additional information: A party that is responsible for the schedule information and its exchange on behalf of a Balance Responsible Party.</p>
Role	Scheduling Area Responsible	<p>A party responsible for the coordination of nominated volumes within a scheduling area.</p> <p>Additional information: This role is typically performed by a TSO.</p>
Role	System Operator	<p>A party 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.</p> <p>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).</p>

ROLES		
TYPE	ROLE NAME	DESCRIPTION
Role	Trade Responsible Party	<p>A party who can be brought to rights, legally and financially, for any imbalance between energy nominated and consumed for all associated Accounting Points.</p> <p>Note: A power exchange without any privileged responsibilities acts as a Trade Responsible Party.</p> <p>Additional information: This is a type of Balance Responsible Party.</p>
Role	Transmission Capacity Allocator	<p>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.</p> <p>Additional Information: The single allocation platform established by all TSOs for Forward Capacity Allocation performs the role of a Transmission Capacity Allocator.</p>

179 **5.2 Domains**

DOMAINS		
Type	DOMAIN NAME	DESCRIPTION
Domain	Accounting Point	<p>A domain under balance responsibility where Energy Supplier change can take place and for which commercial business processes are defined.</p> <p>Additional information: This is a type of Metering Point.</p>
Domain	Bidding Zone	<p>The largest geographical area within which market participants are able to exchange energy without capacity allocation.</p> <p>Source: Commission Regulation (EU) 543/2013.</p>
Domain	Bidding Zone Border	<p>Defines the aggregated connection capacity between two Bidding Zones</p> <p>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.</p>
Domain	Capacity Calculation Region	<p>The Capacity Calculation Region is the geographic area in which coordinated capacity calculation is applied.</p> <p>Source: Commission Regulation (EU) 2015/1222 (CACM).</p> <p>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.</p>
Domain	Coordination Centre Zone	<p>The composition of a number of LFC Blocks under the responsibility of the same Coordination Centre Operator.</p>

DOMAINS		
Type	DOMAIN NAME	DESCRIPTION
Domain	Exchange Point	<p>A domain for establishing energy exchange between two Metering Grid Areas.</p> <p>Additional information: This is a type of Metering Point.</p>
Domain	LFC Area	<p>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.</p> <p>Source: System Operation Guideline, Commission Regulation (EU) 2017/1485.</p>
Domain	LFC Block	<p>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.</p> <p>Source: System Operation Guideline, Commission Regulation (EU) 2017/1485.</p>
Domain	Metering Grid Area	<p>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.</p> <p>Additional information: It can be used to establish volumes that cannot be measured such as network losses.</p>
Domain	Metering Point	<p>An entity where energy products are measured or computed.</p>
Domain	RGCE Interconnected Group	<p>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.</p>

DOMAINS		
Type	DOMAIN NAME	DESCRIPTION
Domain	Scheduling Area	<p>An area within which the TSOs' obligations regarding scheduling apply due to operational or organisational needs.</p> <p>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.</p> <p>Source: System Operation Guideline, Commission Regulation (EU) 2017/1485.</p> <p>Additional information: This covers both Imbalance Area and Imbalance Price Area from the Electricity Balancing Guideline (2017/2195).</p>
Domain	Synchronous Area	<p>An area covered by synchronously interconnected LFC blocks.</p> <p>Note: Examples of Synchronous Areas are Continental Europe, Great Britain, Ireland-Northern Ireland, Nordic and the power systems of Lithuania, Latvia and Estonia, together referred to as 'Baltic' which are part of a wider synchronous area (IPS/UPS).</p> <p>Source: Requirements for Generators. Art. 2 - Definitions</p>

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181

182 **5.3 Resources**

RESOURCES		
Type	RESOURCE NAME	DESCRIPTION
Resource	Reserve Resource	<p>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.</p> <p>Additional information: This is a type of Resource.</p>
Resource	Resource	<p>A market representation of an asset or a group of assets related to the energy industry.</p> <p>Additional information: A Resource represents for example grid assets, consumption assets or production assets, such as generating units, consumption units, energy storage units or virtual power plants.</p>

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185 **5.4 Accounts**

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

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188 **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.

189