



European Network of
Transmission System Operators
for Electricity

BALANCING DOCUMENT UML MODEL AND SCHEMA

2021-09-15
APPROVED DOCUMENT
VERSION 2.4

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Revision History

Version	Release	Date	Comments
0	0	2017-01-19	First drafting of the document.
1	0	2017-01-30	Version to be submitted to Market Committee following WG EDI meeting in March 2017.
2	0	2018-03-08	Approved by MC. XSD version 4.0: Add new attributes: <ul style="list-style-type: none"> • MarketProduct • AllocationDecision • UnavailableQuantity Added two new relations between TimeSeries and MarketProduct
2	1	2019-09-10	XSD version 4.1: <ul style="list-style-type: none"> • controlArea_Domain.mRID in Balancing_MarketDocument class changed to area_Domain.mRID • mRID of Document, Series and Timeseries (ID_String type) was enlarged from 35 to 60 characters. Approved by MC.
2	2	2020-09-16	XSD version 4.2: Auction mRID attribute has been linked to Timeseries with Cardinality 0..1 Approved by MC.
2	3	2021-05-14	XSD version 4.3: New reason class linked to Balancing_MarketDocument, Timeseries and Point with cardinality 0..*.
2	4	2021-09-15	XSD version 4.4: New priceDescriptor class linked to FinancialPrice class with cardinality 0..1. Approved by MC.

62

63 **Objective**

64 The purpose of this document is to provide the contextual and assembly UML models and the
65 schema of the Balancing_MarketDocument.

66 The schema of the Balancing_MarketDocument could be used in various business processes.

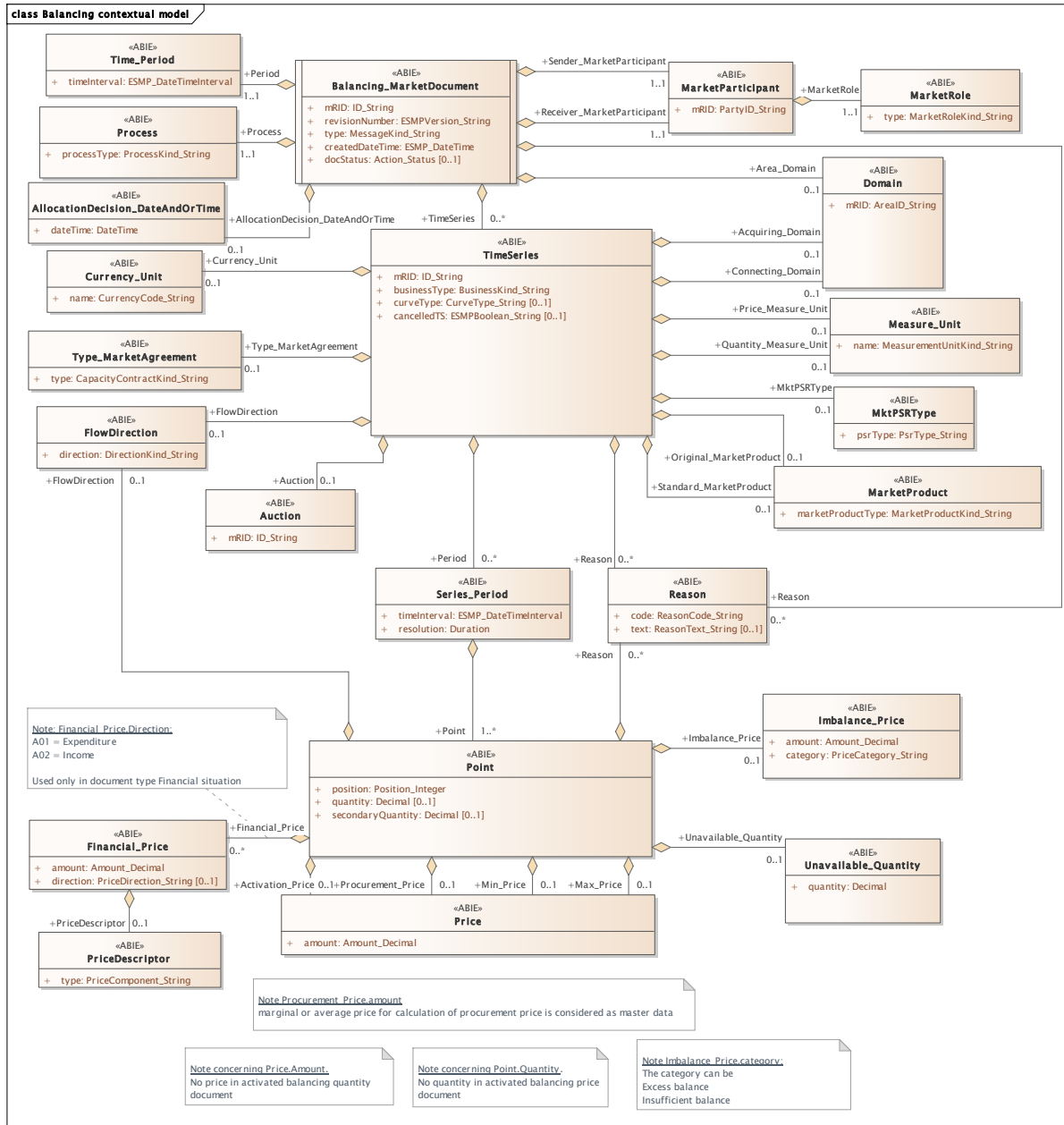
67 It is not the purpose of this document to describe all the use cases, sequence diagrams,
68 business processes, etc. for which this schema is to be used.

69 This document shall only be referenced in an implementation guide of a specific business
70 process. The content of the business process implementation guide shall be as follows:

- 71 • Description of the business process;
- 72 • Use case of the business process;
- 73 • Sequence diagrams of the business process;
- 74 • List of the schema (XSD) to be used in the business process and versions of the
75 schema;
- 76 • For each schema, dependency tables providing the necessary information for the
77 generation of the XML instances, i.e. when the optional attributes are to be used, which
78 codes from which ENTSO-E codelist are to be used.

79

- 80 **Balancing_MarketDocument**
- 81 **2.1 Balancing contextual model**
- 82 **2.1.1 Overview of the model**
- 83 Figure 1 shows the model.



- 84
- 85
- 86

Figure 1 - Balancing contextual model

87

88 **2.1.2 IsBasedOn relationships from the European style market profile**

89 Table 1 shows the traceability dependency of the classes used in this package towards the
90 upper level.

91

Table 1 - IsBasedOn dependency

Name	Complete IsBasedOn Path
AllocationDecision_DateAndOrTime	TC57CIM::IEC62325::MarketManagement::DateAndOrTime
Auction	TC57CIM::IEC62325::MarketManagement::Auction
Balancing_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Currency_Unit	TC57CIM::IEC62325::MarketManagement::Unit
Domain	TC57CIM::IEC62325::MarketManagement::Domain
Financial_Price	TC57CIM::IEC62325::MarketManagement::Price
FlowDirection	TC57CIM::IEC62325::MarketManagement::FlowDirection
Imbalance_Price	TC57CIM::IEC62325::MarketManagement::Price
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketProduct	TC57CIM::IEC62325::MarketCommon::MarketProduct
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MktPSRType	TC57CIM::IEC62325::MarketManagement::MktPSRType
Point	TC57CIM::IEC62325::MarketManagement::Point
Price	TC57CIM::IEC62325::MarketManagement::Price
PriceDescriptor	TC57CIM::IEC62325::MarketCommon::PriceDescriptor
Process	TC57CIM::IEC62325::MarketManagement::Process
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries
Type_MarketAgreement	TC57CIM::IEC62325::MarketManagement::MarketAgreement
Unavailable_Quantity	TC57CIM::IEC62325::MarketManagement::Quantity

92

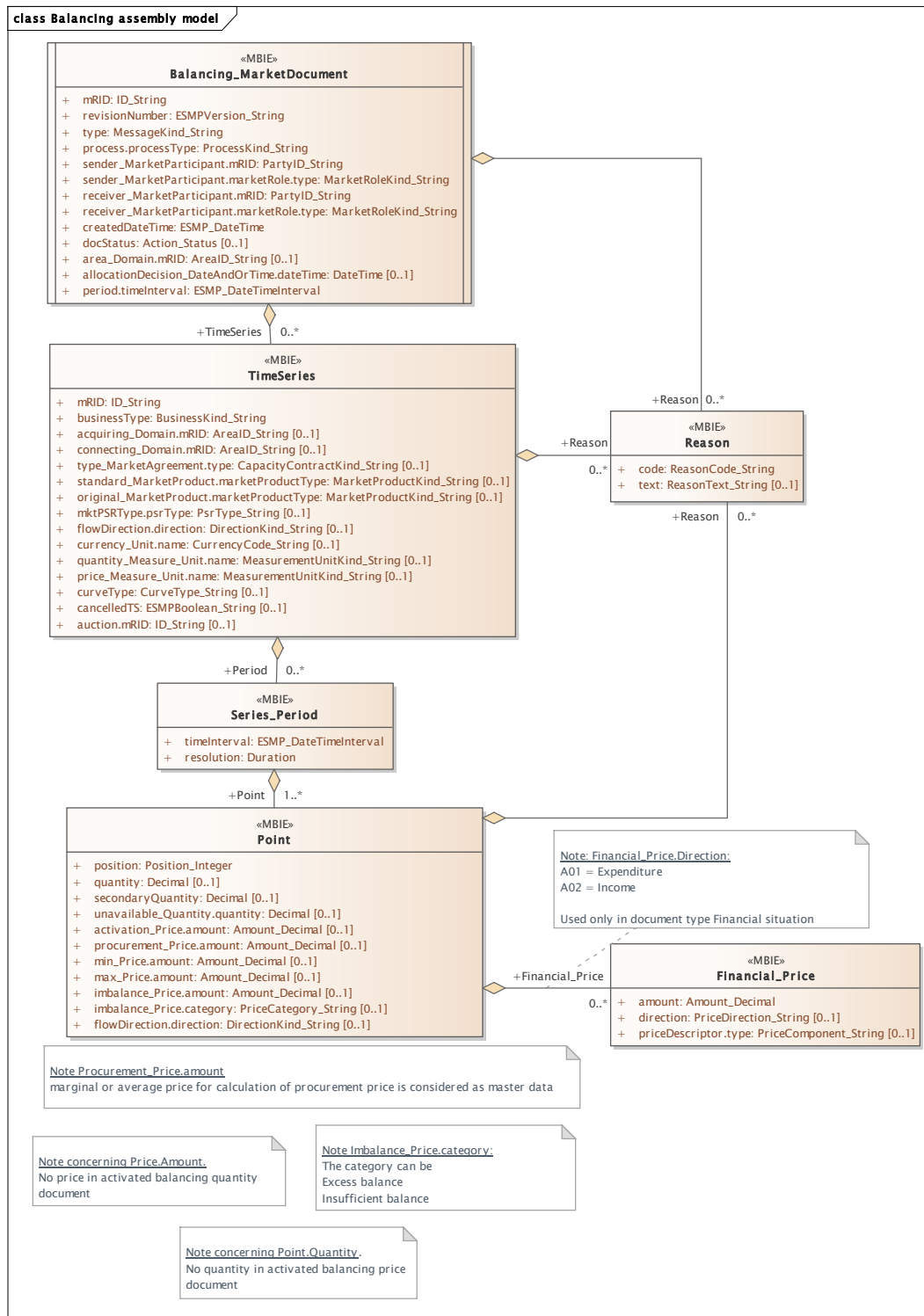
93

94

95 **2.2 Balancing assembly model**

96 **2.2.1 Overview of the model**

97 Figure 2 shows the model.



98

99

Figure 2 - Balancing assembly model

100 **2.2.2 IsBasedOn relationships from the European style market profile**

101 Table 2 shows the traceability dependency of the classes used in this package towards the
102 upper level.

103 **Table 2 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
Balancing_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Financial_Price	TC57CIM::IEC62325::MarketManagement::Price
Point	TC57CIM::IEC62325::MarketManagement::Point
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

104

105 **2.2.3 Detailed Balancing assembly model**

106 **2.2.3.1 Balancing_MarketDocument root class**

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

109 The Balancing_MarketDocument describes a specific situation in the balancing information
110 exchange.

111 Table 3 shows all attributes of Balancing_MarketDocument.

112 **Table 3 - Attributes of Balancing assembly model::Balancing_MarketDocument**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
1	[1..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
2	[1..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.
3	[1..1]	process.processType ProcessKind_String	The identification of the nature of process that the document addresses.
4	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document owner.
5	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document owner. --- The role associated with a MarketParticipant.
6	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document recipient
7	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document recipient --- The role associated with a MarketParticipant.

Order	mult.	Attribute name / Attribute type	Description
8	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
9	[0..1]	docStatus Action_Status	The identification of the condition or position of the document with regard to its standing.
10	[0..1]	area_Domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the control area of the issuer.
11	[0..1]	allocationDecision_DateAndOrTime.dateTime DateTime	Date and time as per ISO 8601 YYYY-MM-DDThh:mm:ss.sssZ. --- Date and time when the decision on allocation was made
12	[1..1]	period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.

113

114 Table 4 shows all association ends of Balancing_MarketDocument with other classes.

115 **Table 4 - Association ends of Balancing assembly model::Balancing_MarketDocument**
116 **with other classes**

Order	mult.	Class name / Role	Description
13	[0..*]	TimeSeries TimeSeries	A time series should exist to describe the specific information associated with balancing reserves, imbalance, financial report or cross-border balancing. Association Based On: Balancing contextual model::Balancing_MarketDocument.[] ----- Balancing contextual model::TimeSeries.TimeSeries[0..*]
14	[0..*]	Reason Reason	The Reason associated with the electronic document header providing different motivations for the creation of the document. Association Based On: Balancing contextual model::Reason.Reason[0..*] ----- Balancing contextual model::Balancing_MarketDocument.[]

117

118 2.2.3.2 Financial_Price

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

120 Table 5 shows all attributes of Financial_Price.

121 **Table 5 - Attributes of Balancing assembly model::Financial_Price**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	amount Amount_Decimal	A number of monetary units specified in a unit of currency.
1	[0..1]	direction PriceDirection_String	The direction of a price payment (i.e. an impacted area system operator pays to internal market parties or inverse). This is to be used only in a document describing the financial situation. The code A01 is to be used for expenditure. The code A02 is to be used for income.

Order	mult.	Attribute name / Attribute type	Description
2	[0..1]	priceDescriptor.type PriceComponent_String	The type of price being described. In general, the priceType will either be "total" to signify that the price is the price paid to buy or sell the commodity, sometimes referred to as an "all-in" price, or one of potentially many components.

122

123 **2.2.3.3 Point**

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

125 Table 6 shows all attributes of Point.

126 **Table 6 - Attributes of Balancing assembly model::Point**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	position Position_Integer	A sequential value representing the relative position within a given time interval.
1	[0..1]	quantity Decimal	The principal quantity or the accepted offer quantity identified for a point.
2	[0..1]	secondaryQuantity Decimal	This information defines the activated quantity or the offered volume for a point.
3	[0..1]	unavailable_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The Quantity of balancing energy unavailable for the activation
4	[0..1]	activation_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The activation pricing information per quantity and interval.
5	[0..1]	procurement_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The procurement pricing information per quantity and interval.
6	[0..1]	min_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The minimum pricing information per quantity and interval.
7	[0..1]	max_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The maximum pricing information per quantity and interval
8	[0..1]	imbalance_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The imbalance pricing information per quantity and interval.
9	[0..1]	imbalance_Price.category PriceCategory_String	The category of a price to be used in a price calculation. Note: the price category is mutually agreed between system operators. --- The imbalance pricing information per quantity and interval.
10	[0..1]	flowDirection.direction DirectionKind_String	The coded identification of the direction of energy flow. --- The flow direction provides the indication if the reserve is activated upward or downward.

127

128 Table 7 shows all association ends of Point with other classes.

129 **Table 7 - Association ends of Balancing assembly model::Point with other classes**

Order	mult.	Class name / Role	Description
11	[0..*]	Financial_Price Financial_Price	The price information associated with a given Point. This identifies the financial amount in relation to a specific direction associated with a transmission system operator for procuring, activating and settling balancing information. Association Based On: Balancing contextual model::Point.[] ----- Balancing contextual model::Financial_Price.Financial_Price[0..*]
12	[0..*]	Reason Reason	The Reason information associated with a Point providing motivation information. Association Based On: Balancing contextual model::Reason.Reason[0..*] ----- Balancing contextual model::Point.[]

130

131 **2.2.3.4 Reason**

132 The motivation of an act.

133 Table 8 shows all attributes of Reason.

134 **Table 8 - Attributes of Balancing assembly model::Reason**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

135

136 **2.2.3.5 Series_Period**

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

138 Table 9 shows all attributes of Series_Period.

139 **Table 9 - Attributes of Balancing assembly model::Series_Period**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end time of the period.
1	[1..1]	resolution Duration	The definition of the number of units of time that compose an individual step within a period.

140

141 Table 10 shows all association ends of Series_Period with other classes.

142 **Table 10 - Association ends of Balancing assembly model::Series_Period with other**
143 **classes**

Order	mult.	Class name / Role	Description
2	[1..*]	Point Point	The Point information associated with a given Series_Period.within a TimeSeries. Association Based On: Balancing contextual model::Series_Period.[] ----- Balancing contextual model::Point.Point[1..*]

144

145 **2.2.3.6 TimeSeries**

146 A set of time-ordered quantities being exchanged in relation to a product.

147 Table 11 shows all attributes of TimeSeries.

148 **Table 11 - Attributes of Balancing assembly model::TimeSeries**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series.
1	[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	acquiring_Domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the acquiring area.
3	[0..1]	connecting_Domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the connecting area
4	[0..1]	type_MarketAgreement.type CapacityContractKind_String	The specification of the kind of the contract, e.g. long term, daily contract. --- The identification of the procurement time unit.
5	[0..1]	standard_MarketProduct.marketProductType MarketProductKind_String	The Type of product on a market view
6	[0..1]	original_MarketProduct.marketProductType MarketProductKind_String	The Type of product on a market view
7	[0..1]	mktPSRType.psrType PsrType_String	The coded type of a power system resource. --- The identification of the source type of the reserve.
8	[0..1]	flowDirection.direction DirectionKind_String	The coded identification of the direction of energy flow. --- The flow direction associated with a TimeSeries for the balance reserve.
9	[0..1]	currency_Unit.name CurrencyCode_String	The identification of the formal code for a currency (ISO 4217). --- The currency associated with a TimeSeries.
10	[0..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 associated with the quantities in a TimeSeries.
11	[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 associated with the prices in a TimeSeries.

Order	mult.	Attribute name / Attribute type	Description
12	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
13	[0..1]	cancelledTS ESMPBoolean_String	An indicator stating that the TimeSeries, identified by the mRID, is cancelled as well as all the values sent in a previous version of the TimeSeries in a previous document.
14	[0..1]	auction.mRID ID_String	The unique identification of the auction. In the ESMP context, the "model authority" is defined as an emitting company that provides an agreed identification unique within a business context such as capacity auction identification, market agreement identification, etc. Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. --- The auction characteristics that are associated with a TimeSeries.

149

150 Table 12 shows all association ends of TimeSeries with other classes.

151 **Table 12 - Association ends of Balancing assembly model::TimeSeries with other**
152 **classes**

Order	mult.	Class name / Role	Description
15	[0..*]	Series_Period Period	The series period class provides the balancing time unit information in respect to the balancing reserve capacity. Association Based On: Balancing contextual model::TimeSeries.[] ----- Balancing contextual model::Series_Period.Period[0..*]
16	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: Balancing contextual model::Reason.Reason[0..*] ----- Balancing contextual model::TimeSeries.[]

153

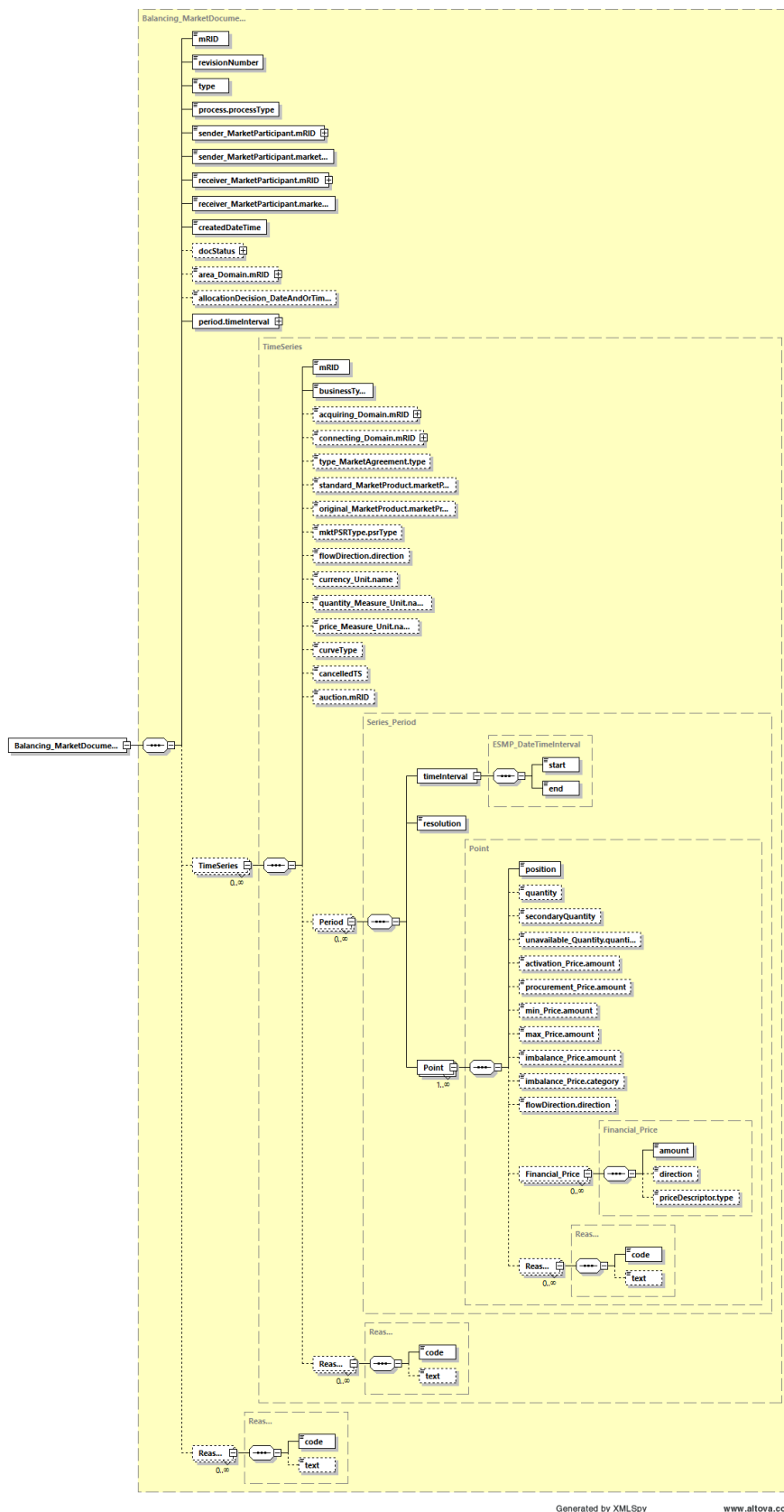
154 2.2.4 Datatypes

155 The list of datatypes used for the Balancing assembly model is as follows:

- 156 • Action_Status compound
- 157 • ESMP_DateTimeInterval compound
- 158 • Amount_Decimal datatype
- 159 • ArealD_String datatype, codelist CodingSchemeTypeList
- 160 • BusinessKind_String datatype, codelist BusinessTypeList
- 161 • CapacityContractKind_String datatype, codelist ContractTypeList
- 162 • CurrencyCode_String datatype, codelist CurrencyTypeList
- 163 • CurveType_String datatype, codelist CurveTypeList
- 164 • DirectionKind_String datatype, codelist DirectionTypeList
- 165 • ESMP_DateTime datatype

- 166 • ESMPBoolean_String datatype, codelist IndicatorTypeList
- 167 • ESMPVersion_String datatype
- 168 • ID_String datatype
- 169 • MarketProductKind_String datatype, codelist MarketProductTypeList
- 170 • MarketRoleKind_String datatype, codelist RoleTypeList
- 171 • MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- 172 • MessageKind_String datatype, codelist MessageTypeList
- 173 • PartyID_String datatype, codelist CodingSchemeTypeList
- 174 • Position_Integer datatype
- 175 • PriceCategory_String datatype, codelist PriceCategoryTypeList
- 176 • PriceComponent_String datatype, codelist PriceComponentTypeList
- 177 • PriceDirection_String datatype, codelist PriceDirectionTypeList
- 178 • ProcessKind_String datatype, codelist ProcessTypeList
- 179 • PsrType_String datatype, codelist AssetTypeList
- 180 • ReasonCode_String datatype, codelist ReasonCodeTypeList
- 181 • ReasonText_String datatype
- 182 • Status_String datatype, codelist StatusTypeList
- 183 • YMDHM_DateTime datatype
- 184

185 2.2.5 Balancing_MarketDocument XML schema structure



186

187

Figure 3 - Balancing_MarketDocument schema structure

188 2.2.6 Balancing_MarketDocument XML schema

189 The schema to be used to validate XML instances is to be identified by:

190 urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:4

191

```

192 <?xml version="1.0" encoding="utf-8"?>
193 <xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
194 xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:4"
195 xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
196 xmlns:cimp="http://www.iec.ch/cimprofile"
197 xmlns:xs="http://www.w3.org/2001/XMLSchema"
198 targetNamespace="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:4"
199 elementFormDefault="qualified" attributeFormDefault="unqualified">
200   <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
201 entsoe-eu-wgedi-codelists.xsd"/>
202   <xs:element name="Balancing_MarketDocument"
203 type="Balancing_MarketDocument"/>
204   <xs:simpleType name="ID_String"
205 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
206     <xs:restriction base="xs:string">
207       <xs:maxLength value="60"/>
208     </xs:restriction>
209   </xs:simpleType>
210   <xs:simpleType name="ESMPVersion_String"
211 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
212     <xs:restriction base="xs:string">
213       <xs:pattern value="[1-9]([0-9]){0,2}"/>
214     </xs:restriction>
215   </xs:simpleType>
216   <xs:simpleType name="MessageKind_String"
217 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
218     <xs:restriction base="ecl:MessageTypeList"/>
219   </xs:simpleType>
220   <xs:simpleType name="ProcessKind_String"
221 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
222     <xs:restriction base="ecl:ProcessTypeList"/>
223   </xs:simpleType>
224   <xs:simpleType name="PartyID_String-base"
225 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
226     <xs:restriction base="xs:string">
227       <xs:maxLength value="16"/>
228     </xs:restriction>
229   </xs:simpleType>
230   <xs:complexType name="PartyID_String"
231 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
232     <xs:simpleContent>
233       <xs:extension base="PartyID_String-base">
234         <xs:attribute name="codingScheme"
235 type="ecl:CodingSchemeTypeList" use="required"/>
236       </xs:extension>
237     </xs:simpleContent>
238   </xs:complexType>
239   <xs:simpleType name="MarketRoleKind_String"
240 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">

```

```

241         <xs:restriction base="ecl:RoleTypeList"/>
242     </xs:simpleType>
243     <xs:simpleType name="ESMP_DateTime"
244 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
245         <xs:restriction base="xs:dateTime">
246             <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
247 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
248 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
249 9])Z)|((([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
250 48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
251 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
252 5][0-9]:[0-5][0-
253 9])Z)|((([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
254 9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
255 8][1235679][2468][1235679]|0[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
256 9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
257         </xs:restriction>
258     </xs:simpleType>
259     <xs:simpleType name="AreaID_String-base"
260 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
261         <xs:restriction base="xs:string">
262             <xs:maxLength value="18"/>
263         </xs:restriction>
264     </xs:simpleType>
265     <xs:complexType name="AreaID_String"
266 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
267         <xs:simpleContent>
268             <xs:extension base="AreaID_String-base">
269                 <xs:attribute name="codingScheme"
270 type="ecl:CodingSchemeTypeList" use="required"/>
271             </xs:extension>
272         </xs:simpleContent>
273     </xs:complexType>
274     <xs:simpleType name="Status_String"
275 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
276         <xs:restriction base="ecl:StatusTypeList"/>
277     </xs:simpleType>
278     <xs:complexType name="Action_Status"
279 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Status">
280         <xs:sequence>
281             <xs:element name="value" type="Status_String" minOccurs="1"
282 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
283 cim16#Status.value"/>
284         </xs:sequence>
285     </xs:complexType>
286     <xs:simpleType name="YMDHM_DateTime"
287 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
288         <xs:restriction base="xs:string">
289             <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
290 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
291 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-
292 9])Z)|((([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
293 48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
294 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
295 5][0-
296 9])Z)|((([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578

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297 9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
298 8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])(\-(02)(\-(0[1-9]|1[0-
299 9]|2[0-8]))T((([01][0-9]|2[0-3]):[0-5][0-9])Z)"/>
300     </xs:restriction>
301   </xs:simpleType>
302   <xs:complexType name="ESMP_DateTimeInterval"
303 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
304     <xs:sequence>
305       <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
306 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
307 cim16#DateTimeInterval.start"/>
308       <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
309 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
310 cim16#DateTimeInterval.end"/>
311     </xs:sequence>
312   </xs:complexType>
313   <xs:complexType name="Balancing_MarketDocument"
314 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
315     <xs:sequence>
316       <xs:element name="mRID" type="ID_String" minOccurs="1"
317 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
318 cim16#IdentifiedObject.mRID"/>
319       <xs:element name="revisionNumber" type="ESMPVersion_String"
320 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
321 schema-cim16#Document.revisionNumber"/>
322       <xs:element name="type" type="MessageKind_String" minOccurs="1"
323 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
324 cim16#Document.type"/>
325       <xs:element name="process.processType"
326 type="ProcessKind_String" minOccurs="1" maxOccurs="1"
327 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
328 cim16#Process.processType"/>
329       <xs:element name="sender_MarketParticipant.mRID"
330 type="PartyID_String" minOccurs="1" maxOccurs="1"
331 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
332 cim16#IdentifiedObject.mRID"/>
333       <xs:element name="sender_MarketParticipant.marketRole.type"
334 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
335 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
336       <xs:element name="receiver_MarketParticipant.mRID"
337 type="PartyID_String" minOccurs="1" maxOccurs="1"
338 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
339 cim16#IdentifiedObject.mRID"/>
340       <xs:element name="receiver_MarketParticipant.marketRole.type"
341 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
342 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
343       <xs:element name="createdDateTime" type="ESMP_DateTime"
344 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
345 schema-cim16#Document.createdDateTime"/>
346       <xs:element name="docStatus" type="Action_Status" minOccurs="0"
347 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
348 cim16#Document.docStatus"/>
349       <xs:element name="area_Domain.mRID" type="AreaID_String"
350 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
351 schema-cim16#IdentifiedObject.mRID"/>

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352         <xs:element name="allocationDecision_DateAndOrTime.dateTime"
353 type="xs:dateTime" minOccurs="0" maxOccurs="1"
354 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
355 cim16#DateAndOrTime.dateTime"/>
356         <xs:element name="period.timeInterval"
357 type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
358 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
359 cim16#Period.timeInterval"/>
360         <xs:element name="TimeSeries" type="TimeSeries" minOccurs="0"
361 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
362 cim16#MarketDocument.TimeSeries"/>
363         <xs:element name="Reason" type="Reason" minOccurs="0"
364 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
365 cim16#MarketDocument.Reason"/>
366     </xs:sequence>
367 </xs:complexType>
368 <xs:simpleType name="Amount_Decimal"
369 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Decimal">
370     <xs:restriction base="xs:decimal">
371         <xs:totalDigits value="17"/>
372     </xs:restriction>
373 </xs:simpleType>
374 <xs:simpleType name="PriceDirection_String"
375 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
376     <xs:restriction base="ecl:PriceDirectionTypeList"/>
377 </xs:simpleType>
378 <xs:simpleType name="PriceComponent_String"
379 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
380 cim16#PriceComponent_String">
381     <xs:restriction base="ecl:PriceComponentTypeList"/>
382 </xs:simpleType>
383 <xs:complexType name="Financial_Price"
384 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price">
385     <xs:sequence>
386         <xs:element name="amount" type="Amount_Decimal" minOccurs="1"
387 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
388 cim16#Price.amount"/>
389         <xs:element name="direction" type="PriceDirection_String"
390 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
391 schema-cim16#Price.direction"/>
392         <xs:element name="priceDescriptor.type"
393 type="PriceComponent_String" minOccurs="0" maxOccurs="1"
394 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
395 cim16#PriceDescriptor.type"/>
396     </xs:sequence>
397 </xs:complexType>
398 <xs:simpleType name="Position_Integer"
399 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
400     <xs:restriction base="xs:integer">
401         <xs:maxInclusive value="999999"/>
402         <xs:minInclusive value="1"/>
403     </xs:restriction>
404 </xs:simpleType>
405 <xs:simpleType name="PriceCategory_String"
406 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
407     <xs:restriction base="ecl:PriceCategoryTypeList"/>

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408     </xs:simpleType>
409     <xs:simpleType name="DirectionKind_String"
410 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
411         <xs:restriction base="ecl:DirectionTypeList"/>
412     </xs:simpleType>
413     <xs:complexType name="Point"
414 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
415         <xs:sequence>
416             <xs:element name="position" type="Position_Integer"
417 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
418 schema-cim16#Point.position"/>
419             <xs:element name="quantity" type="xs:decimal" minOccurs="0"
420 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
421 cim16#Point.quantity"/>
422             <xs:element name="secondaryQuantity" type="xs:decimal"
423 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
424 schema-cim16#Point.secondaryQuantity"/>
425             <xs:element name="unavailable_Quantity.quantity"
426 type="xs:decimal" minOccurs="0" maxOccurs="1"
427 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
428 cim16#Quantity.quantity"/>
429             <xs:element name="activation_Price.amount"
430 type="Amount_Decimal" minOccurs="0" maxOccurs="1"
431 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.amount"/>
432             <xs:element name="procurement_Price.amount"
433 type="Amount_Decimal" minOccurs="0" maxOccurs="1"
434 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.amount"/>
435             <xs:element name="min_Price.amount" type="Amount_Decimal"
436 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
437 schema-cim16#Price.amount"/>
438             <xs:element name="max_Price.amount" type="Amount_Decimal"
439 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
440 schema-cim16#Price.amount"/>
441             <xs:element name="imbalance_Price.amount" type="Amount_Decimal"
442 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
443 schema-cim16#Price.amount"/>
444             <xs:element name="imbalance_Price.category"
445 type="PriceCategory_String" minOccurs="0" maxOccurs="1"
446 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.category"/>
447             <xs:element name="flowDirection.direction"
448 type="DirectionKind_String" minOccurs="0" maxOccurs="1"
449 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
450 cim16#FlowDirection.direction"/>
451             <xs:element name="Financial_Price" type="Financial_Price"
452 minOccurs="0" maxOccurs="unbounded"
453 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
454 cim16#Point.Financial_Price"/>
455             <xs:element name="Reason" type="Reason" minOccurs="0"
456 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
457 cim16#Point.Reason"/>
458         </xs:sequence>
459     </xs:complexType>
460     <xs:simpleType name="ReasonCode_String"
461 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
462         <xs:restriction base="ecl:ReasonCodeTypeList"/>
463     </xs:simpleType>

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464     <xs:simpleType name="ReasonText_String"
465 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
466     <xs:restriction base="xs:string">
467         <xs:maxLength value="512"/>
468     </xs:restriction>
469 </xs:simpleType>
470 <xs:complexType name="Reason"
471 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
472     <xs:sequence>
473         <xs:element name="code" type="ReasonCode_String" minOccurs="1"
474 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
475 cim16#Reason.code"/>
476         <xs:element name="text" type="ReasonText_String" minOccurs="0"
477 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
478 cim16#Reason.text"/>
479     </xs:sequence>
480 </xs:complexType>
481 <xs:complexType name="Series_Period"
482 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
483     <xs:sequence>
484         <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
485 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
486 schema-cim16#Period.timeInterval"/>
487         <xs:element name="resolution" type="xs:duration" minOccurs="1"
488 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
489 cim16#Period.resolution"/>
490         <xs:element name="Point" type="Point" minOccurs="1"
491 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
492 cim16#Period.Point"/>
493     </xs:sequence>
494 </xs:complexType>
495 <xs:simpleType name="BusinessKind_String"
496 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
497     <xs:restriction base="ecl:BusinessTypeList"/>
498 </xs:simpleType>
499 <xs:simpleType name="CapacityContractKind_String"
500 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
501     <xs:restriction base="ecl:ContractTypeList"/>
502 </xs:simpleType>
503 <xs:simpleType name="MarketProductKind_String"
504 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
505     <xs:restriction base="ecl:MarketProductTypeList"/>
506 </xs:simpleType>
507 <xs:simpleType name="PsrType_String"
508 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
509     <xs:restriction base="ecl:AssetTypeList"/>
510 </xs:simpleType>
511 <xs:simpleType name="CurrencyCode_String"
512 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
513     <xs:restriction base="ecl:CurrencyTypeList"/>
514 </xs:simpleType>
515 <xs:simpleType name="MeasurementUnitKind_String"
516 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
517     <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
518 </xs:simpleType>

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519     <xs:simpleType name="CurveType_String"
520 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
521     <xs:restriction base="ecl:CurveTypeList"/>
522 </xs:simpleType>
523     <xs:simpleType name="ESMPBoolean_String"
524 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
525     <xs:restriction base="ecl:IndicatorTypeList"/>
526 </xs:simpleType>
527     <xs:complexType name="TimeSeries"
528 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
529     <xs:sequence>
530     <xs:element name="mRID" type="ID_String" minOccurs="1"
531 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
532 cim16#IdentifiedObject.mRID"/>
533     <xs:element name="businessType" type="BusinessKind_String"
534 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
535 schema-cim16#TimeSeries.businessType"/>
536     <xs:element name="acquiring_Domain.mRID" type="AreaID_String"
537 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
538 schema-cim16#IdentifiedObject.mRID"/>
539     <xs:element name="connecting_Domain.mRID" type="AreaID_String"
540 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
541 schema-cim16#IdentifiedObject.mRID"/>
542     <xs:element name="type_MarketAgreement.type"
543 type="CapacityContractKind_String" minOccurs="0" maxOccurs="1"
544 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>
545     <xs:element name="standard_MarketProduct.marketProductType"
546 type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
547 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
548 cim16#MarketProduct.marketProductType"/>
549     <xs:element name="original_MarketProduct.marketProductType"
550 type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
551 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
552 cim16#MarketProduct.marketProductType"/>
553     <xs:element name="mktPSRType.psrType" type="PsrType_String"
554 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
555 schema-cim16#MktPSRType.psrType"/>
556     <xs:element name="flowDirection.direction"
557 type="DirectionKind_String" minOccurs="0" maxOccurs="1"
558 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
559 cim16#FlowDirection.direction"/>
560     <xs:element name="currency_Unit.name"
561 type="CurrencyCode_String" minOccurs="0" maxOccurs="1"
562 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
563     <xs:element name="quantity_Measure_Unit.name"
564 type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
565 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
566     <xs:element name="price_Measure_Unit.name"
567 type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
568 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
569     <xs:element name="curveType" type="CurveType_String"
570 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
571 schema-cim16#TimeSeries.curveType"/>
572     <xs:element name="cancelledTS" type="ESMPBoolean_String"
573 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
574 schema-cim16#TimeSeries.cancelledTS"/>

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575         <xs:element name="auction.mRID" type="ID_String" minOccurs="0"  
576 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
577 cim16#IdentifiedObject.mRID"/>  
578         <xs:element name="Period" type="Series_Period" minOccurs="0"  
579 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
580 cim16#TimeSeries.Period"/>  
581         <xs:element name="Reason" type="Reason" minOccurs="0"  
582 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
583 cim16#TimeSeries.Reason"/>  
584     </xs:sequence>  
585 </xs:complexType>  
586 </xs:schema>  
587
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