



European Network of
Transmission System Operators
for Electricity

BALANCING DOCUMENT UML MODEL AND SCHEMA

2020-09-16
APPROVED DOCUMENT
VERSION 2.2

2

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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.

60

61 1 Objective

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

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

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

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

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

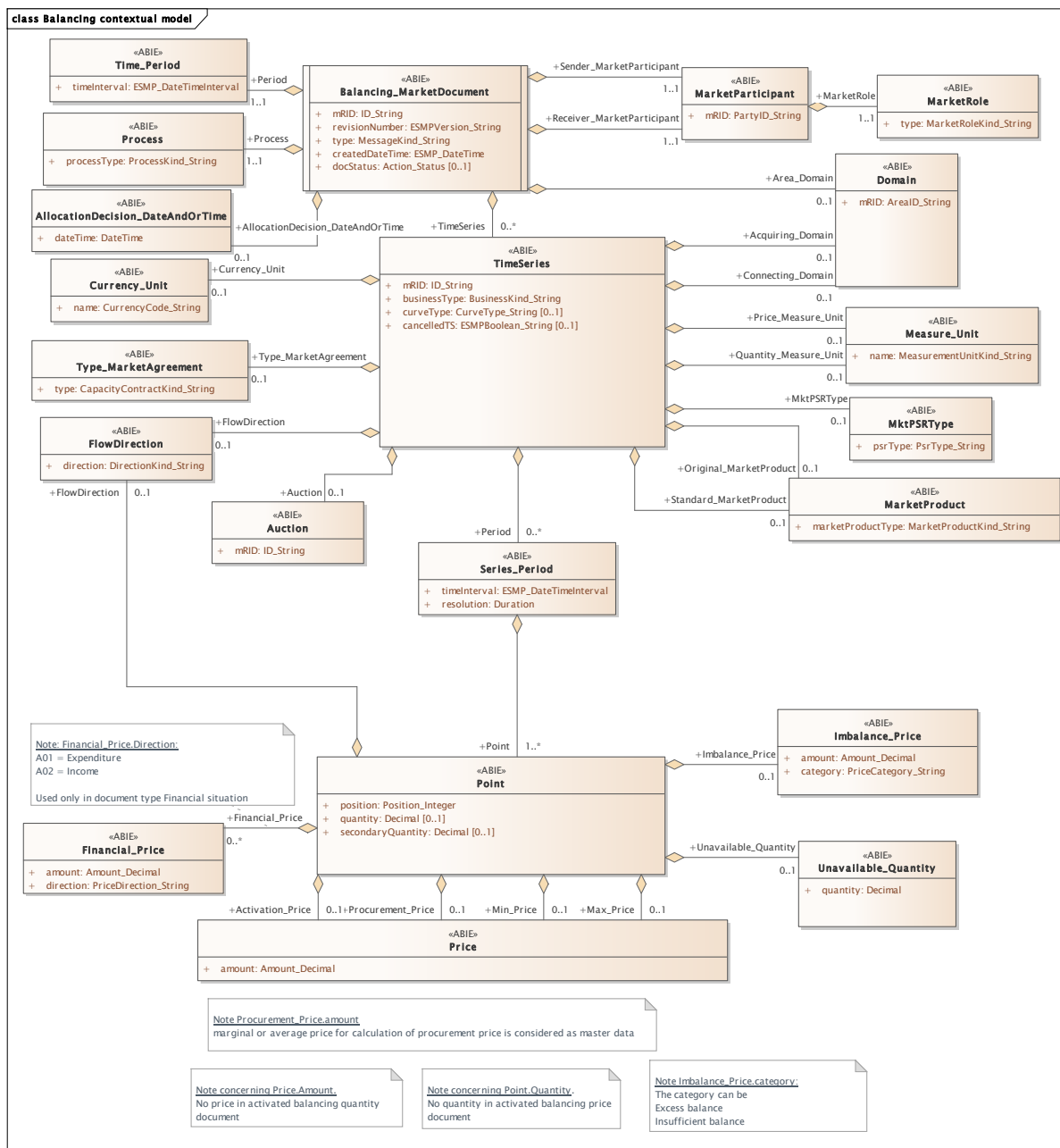
77

78 **2 Balancing_MarketDocument**

79 **2.1 Balancing contextual model**

80 **2.1.1 Overview of the model**

81 Figure 1 shows the model.



82

83

Figure 1 - Balancing contextual model

84

85 **2.1.2 IsBasedOn relationships from the European style market profile**

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

88

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
Process	TC57CIM::IEC62325::MarketManagement::Process
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

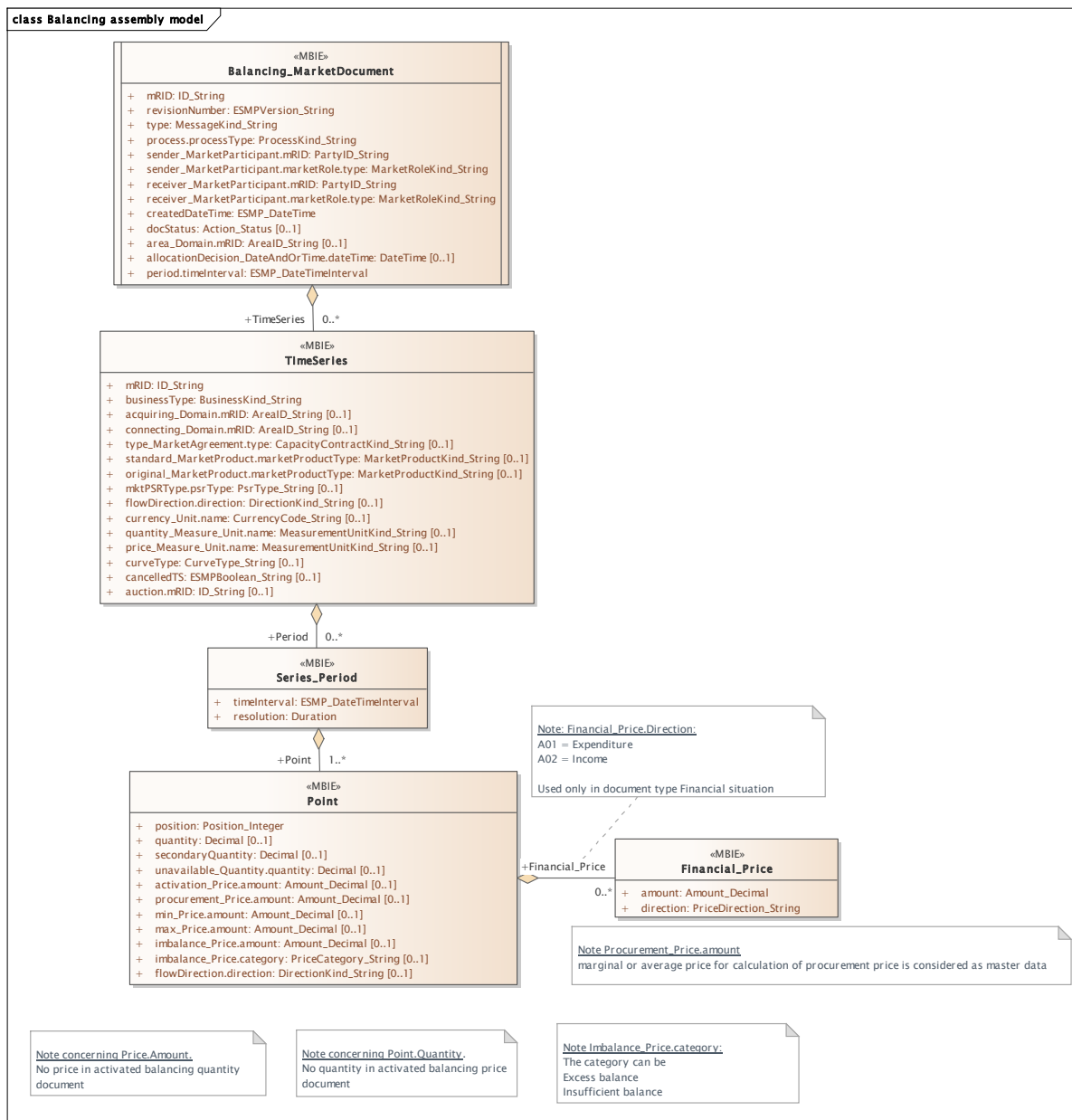
89

90

91 **2.2 Balancing assembly model**

92 **2.2.1 Overview of the model**

93 Figure 2 shows the model.



94

95

Figure 2 - Balancing assembly model

96

97 **2.2.2 IsBasedOn relationships from the European style market profile**

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

100

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
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

101

102 **2.2.3 Detailed Balancing assembly model**

103 **2.2.3.1 Balancing_MarketDocument root class**

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

106 The Balancing_MarketDocument describes a specific situation in the balancing information
107 exchange.

108 Table 3 shows all attributes of Balancing_MarketDocument.

109

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.

110

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

112 **Table 4 - Association ends of Balancing assembly model::Balancing_MarketDocument**
113 **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..*]

114

115 2.2.3.2 Financial_Price

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

117 Table 5 shows all attributes of Financial_Price.

118 **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	[1..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.

119

120 2.2.3.3 Point

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

122 Table 6 shows all attributes of Point.

123

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.

124

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

126 **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..*]

127

128 **2.2.3.4 Series_Period**

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

130 Table 8 shows all attributes of Series_Period.

131

Table 8 - 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.

132

133 Table 9 shows all association ends of Series_Period with other classes.

134 **Table 9 - Association ends of Balancing assembly model::Series_Period with other**
135 **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..*]

136

137 **2.2.3.5 TimeSeries**

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

139 Table 10 shows all attributes of TimeSeries.

140 **Table 10 - 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.

Order	mult.	Attribute name / Attribute type	Description
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.
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. --- The auction characteristics that are associated with a TimeSeries.

141

142 Table 11 shows all association ends of TimeSeries with other classes.

143 **Table 11 - Association ends of Balancing assembly model::TimeSeries with other**
144 **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..*]

145

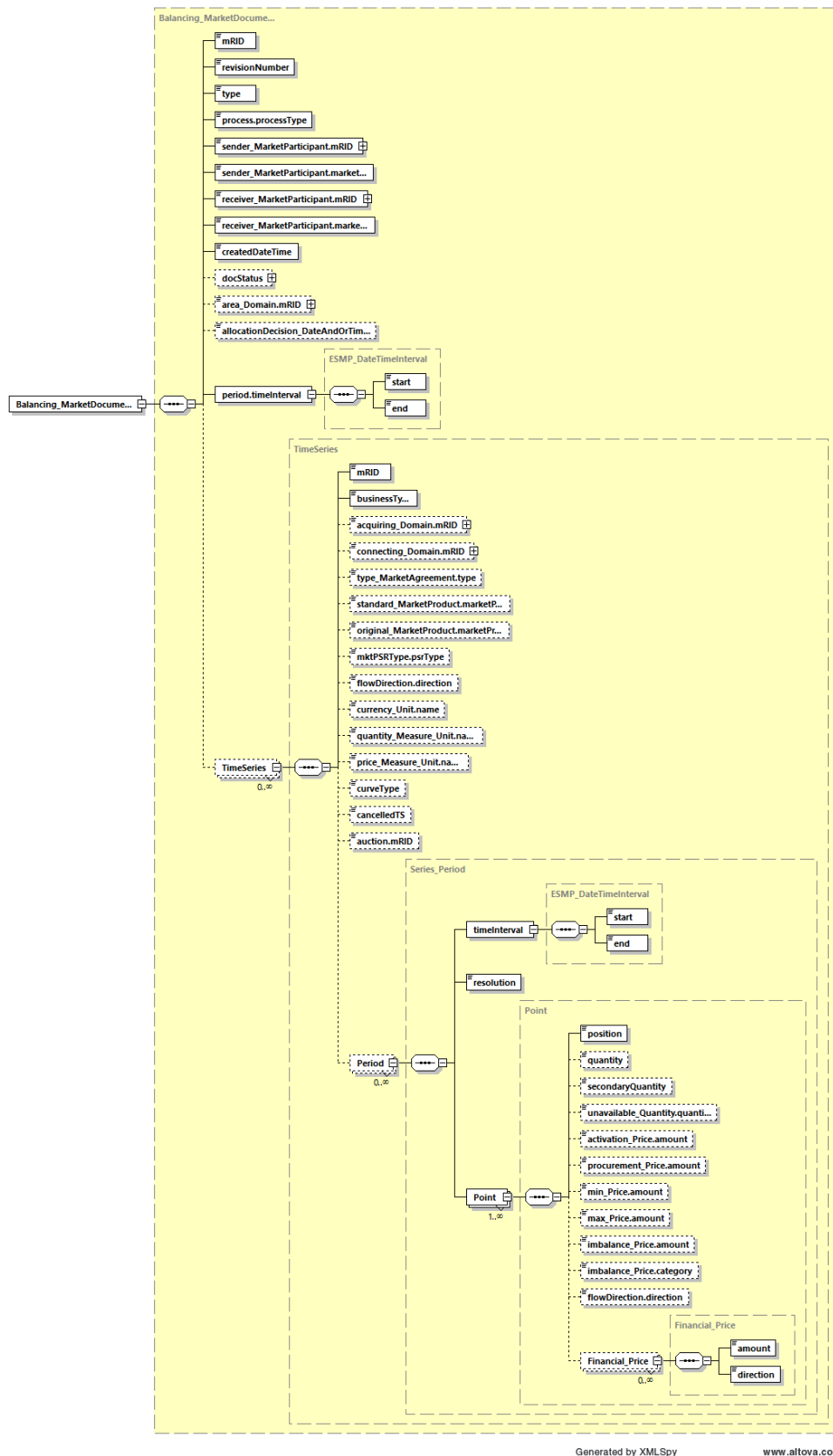
146 2.2.4 Datatypes

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

- 148 • Action_Status compound
- 149 • ESMP_DateTimeInterval compound
- 150 • Amount_Decimal datatype
- 151 • ArealID_String datatype, codelist CodingSchemeTypeList
- 152 • BusinessKind_String datatype, codelist BusinessTypeList
- 153 • CapacityContractKind_String datatype, codelist ContractTypeList
- 154 • CurrencyCode_String datatype, codelist CurrencyTypeList
- 155 • CurveType_String datatype, codelist CurveTypeList
- 156 • DirectionKind_String datatype, codelist DirectionTypeList
- 157 • ESMP_DateTime datatype
- 158 • ESMPBoolean_String datatype, codelist IndicatorTypeList

- 159 • ESMPVersion_String datatype
- 160 • ID_String datatype
- 161 • MarketProductKind_String datatype, codelist MarketProductTypeList
- 162 • MarketRoleKind_String datatype, codelist RoleTypeList
- 163 • MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- 164 • MessageKind_String datatype, codelist MessageTypeList
- 165 • PartyID_String datatype, codelist CodingSchemeTypeList
- 166 • Position_Integer datatype
- 167 • PriceCategory_String datatype, codelist PriceCategoryTypeList
- 168 • PriceDirection_String datatype, codelist PriceDirectionTypeList
- 169 • ProcessKind_String datatype, codelist ProcessTypeList
- 170 • PsrType_String datatype, codelist AssetTypeList
- 171 • Status_String datatype, codelist StatusTypeList
- 172 • YMDHM_DateTime datatype
- 173

174 2.2.5 Balancing_MarketDocument XML schema structure



175

176

Figure 3 - Balancing_MarketDocument schema structure

177 2.2.6 Balancing_MarketDocument XML schema

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

179 urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:2

180

```

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

```



```

230         <xs:restriction base="ecl:RoleTypeList"/>
231     </xs:simpleType>
232     <xs:simpleType name="ESMP_DateTime"
233 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
234         <xs:restriction base="xs:dateTime">
235             <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
236 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
237 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
238 9])Z)|((([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
239 48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
240 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
241 5][0-9]:[0-5][0-
242 9])Z)|((([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
243 9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
244 8][1235679][2468][1235679]|0[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
245 9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
246         </xs:restriction>
247     </xs:simpleType>
248     <xs:simpleType name="AreaID_String-base"
249 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
250         <xs:restriction base="xs:string">
251             <xs:maxLength value="18"/>
252         </xs:restriction>
253     </xs:simpleType>
254     <xs:complexType name="AreaID_String"
255 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
256         <xs:simpleContent>
257             <xs:extension base="AreaID_String-base">
258                 <xs:attribute name="codingScheme"
259 type="ecl:CodingSchemeTypeList" use="required"/>
260             </xs:extension>
261         </xs:simpleContent>
262     </xs:complexType>
263     <xs:simpleType name="Status_String"
264 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
265         <xs:restriction base="ecl:StatusTypeList"/>
266     </xs:simpleType>
267     <xs:complexType name="Action_Status"
268 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Status">
269         <xs:sequence>
270             <xs:element name="value" type="Status_String" minOccurs="1"
271 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
272 cim16#Status.value"/>
273         </xs:sequence>
274     </xs:complexType>
275     <xs:simpleType name="YMDHM_DateTime"
276 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
277         <xs:restriction base="xs:string">
278             <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
279 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
280 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-
281 9])Z)|((([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
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286 9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
287 8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])(\-(02)(\-(0[1-9]|1[0-
288 9]|2[0-8]))T((([01][0-9]|2[0-3]):[0-5][0-9])Z)"/>
289     </xs:restriction>
290   </xs:simpleType>
291   <xs:complexType name="ESMP_DateTimeInterval"
292 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
293     <xs:sequence>
294       <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
295 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
296 cim16#DateTimeInterval.start"/>
297       <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
298 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
299 cim16#DateTimeInterval.end"/>
300     </xs:sequence>
301   </xs:complexType>
302   <xs:complexType name="Balancing_MarketDocument"
303 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
304     <xs:sequence>
305       <xs:element name="mRID" type="ID_String" minOccurs="1"
306 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
307 cim16#IdentifiedObject.mRID"/>
308       <xs:element name="revisionNumber" type="ESMPVersion_String"
309 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
310 schema-cim16#Document.revisionNumber"/>
311       <xs:element name="type" type="MessageKind_String" minOccurs="1"
312 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
313 cim16#Document.type"/>
314       <xs:element name="process.processType"
315 type="ProcessKind_String" minOccurs="1" maxOccurs="1"
316 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
317 cim16#Process.processType"/>
318       <xs:element name="sender_MarketParticipant.mRID"
319 type="PartyID_String" minOccurs="1" maxOccurs="1"
320 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
321 cim16#IdentifiedObject.mRID"/>
322       <xs:element name="sender_MarketParticipant.marketRole.type"
323 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
324 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
325       <xs:element name="receiver_MarketParticipant.mRID"
326 type="PartyID_String" minOccurs="1" maxOccurs="1"
327 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
328 cim16#IdentifiedObject.mRID"/>
329       <xs:element name="receiver_MarketParticipant.marketRole.type"
330 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
331 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
332       <xs:element name="createdDateTime" type="ESMP_DateTime"
333 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
334 schema-cim16#Document.createdDateTime"/>
335       <xs:element name="docStatus" type="Action_Status" minOccurs="0"
336 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
337 cim16#Document.docStatus"/>
338       <xs:element name="area_Domain.mRID" type="AreaID_String"
339 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
340 schema-cim16#IdentifiedObject.mRID"/>

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341         <xs:element name="allocationDecision_DateAndOrTime.dateTime"
342 type="xs:dateTime" minOccurs="0" maxOccurs="1"
343 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
344 cim16#DateAndOrTime.dateTime"/>
345         <xs:element name="period.timeInterval"
346 type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
347 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
348 cim16#Period.timeInterval"/>
349         <xs:element name="TimeSeries" type="TimeSeries" minOccurs="0"
350 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
351 cim16#MarketDocument.TimeSeries"/>
352     </xs:sequence>
353 </xs:complexType>
354 <xs:simpleType name="Amount_Decimal"
355 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Decimal">
356     <xs:restriction base="xs:decimal">
357         <xs:totalDigits value="17"/>
358     </xs:restriction>
359 </xs:simpleType>
360 <xs:simpleType name="PriceDirection_String"
361 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
362     <xs:restriction base="ecl:PriceDirectionTypeList"/>
363 </xs:simpleType>
364 <xs:complexType name="Financial_Price"
365 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price">
366     <xs:sequence>
367         <xs:element name="amount" type="Amount_Decimal" minOccurs="1"
368 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
369 cim16#Price.amount"/>
370         <xs:element name="direction" type="PriceDirection_String"
371 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
372 schema-cim16#Price.direction"/>
373     </xs:sequence>
374 </xs:complexType>
375 <xs:simpleType name="Position_Integer"
376 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
377     <xs:restriction base="xs:integer">
378         <xs:maxInclusive value="999999"/>
379         <xs:minInclusive value="1"/>
380     </xs:restriction>
381 </xs:simpleType>
382 <xs:simpleType name="PriceCategory_String"
383 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
384     <xs:restriction base="ecl:PriceCategoryTypeList"/>
385 </xs:simpleType>
386 <xs:simpleType name="DirectionKind_String"
387 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
388     <xs:restriction base="ecl:DirectionTypeList"/>
389 </xs:simpleType>
390 <xs:complexType name="Point"
391 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
392     <xs:sequence>
393         <xs:element name="position" type="Position_Integer"
394 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
395 schema-cim16#Point.position"/>

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396         <xs:element name="quantity" type="xs:decimal" minOccurs="0"
397 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
398 cim16#Point.quantity"/>
399         <xs:element name="secondaryQuantity" type="xs:decimal"
400 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
401 schema-cim16#Point.secondaryQuantity"/>
402         <xs:element name="unavailable_Quantity.quantity"
403 type="xs:decimal" minOccurs="0" maxOccurs="1"
404 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
405 cim16#Quantity.quantity"/>
406         <xs:element name="activation_Price.amount"
407 type="Amount_Decimal" minOccurs="0" maxOccurs="1"
408 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.amount"/>
409         <xs:element name="procurement_Price.amount"
410 type="Amount_Decimal" minOccurs="0" maxOccurs="1"
411 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.amount"/>
412         <xs:element name="min_Price.amount" type="Amount_Decimal"
413 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
414 schema-cim16#Price.amount"/>
415         <xs:element name="max_Price.amount" type="Amount_Decimal"
416 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
417 schema-cim16#Price.amount"/>
418         <xs:element name="imbalance_Price.amount" type="Amount_Decimal"
419 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
420 schema-cim16#Price.amount"/>
421         <xs:element name="imbalance_Price.category"
422 type="PriceCategory_String" minOccurs="0" maxOccurs="1"
423 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.category"/>
424         <xs:element name="flowDirection.direction"
425 type="DirectionKind_String" minOccurs="0" maxOccurs="1"
426 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
427 cim16#FlowDirection.direction"/>
428         <xs:element name="Financial_Price" type="Financial_Price"
429 minOccurs="0" maxOccurs="unbounded"
430 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
431 cim16#Point.Financial_Price"/>
432     </xs:sequence>
433 </xs:complexType>
434 <xs:complexType name="Series_Period"
435 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
436     <xs:sequence>
437         <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
438 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
439 schema-cim16#Period.timeInterval"/>
440         <xs:element name="resolution" type="xs:duration" minOccurs="1"
441 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
442 cim16#Period.resolution"/>
443         <xs:element name="Point" type="Point" minOccurs="1"
444 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
445 cim16#Period.Point"/>
446     </xs:sequence>
447 </xs:complexType>
448 <xs:simpleType name="BusinessKind_String"
449 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
450     <xs:restriction base="ecl:BusinessTypeList"/>
451 </xs:simpleType>

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452     <xs:simpleType name="CapacityContractKind_String"
453 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
454     <xs:restriction base="ecl:ContractTypeList"/>
455     </xs:simpleType>
456     <xs:simpleType name="MarketProductKind_String"
457 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
458     <xs:restriction base="ecl:MarketProductTypeList"/>
459     </xs:simpleType>
460     <xs:simpleType name="PsrType_String"
461 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
462     <xs:restriction base="ecl:AssetTypeList"/>
463     </xs:simpleType>
464     <xs:simpleType name="CurrencyCode_String"
465 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
466     <xs:restriction base="ecl:CurrencyTypeList"/>
467     </xs:simpleType>
468     <xs:simpleType name="MeasurementUnitKind_String"
469 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
470     <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
471     </xs:simpleType>
472     <xs:simpleType name="CurveType_String"
473 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
474     <xs:restriction base="ecl:CurveTypeList"/>
475     </xs:simpleType>
476     <xs:simpleType name="ESMPBoolean_String"
477 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
478     <xs:restriction base="ecl:IndicatorTypeList"/>
479     </xs:simpleType>
480     <xs:complexType name="TimeSeries"
481 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
482     <xs:sequence>
483         <xs:element name="mRID" type="ID_String" minOccurs="1"
484 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
485 cim16#IdentifiedObject.mRID"/>
486         <xs:element name="businessType" type="BusinessKind_String"
487 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
488 schema-cim16#TimeSeries.businessType"/>
489         <xs:element name="acquiring_Domain.mRID" type="AreaID_String"
490 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
491 schema-cim16#IdentifiedObject.mRID"/>
492         <xs:element name="connecting_Domain.mRID" type="AreaID_String"
493 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
494 schema-cim16#IdentifiedObject.mRID"/>
495         <xs:element name="type_MarketAgreement.type"
496 type="CapacityContractKind_String" minOccurs="0" maxOccurs="1"
497 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>
498         <xs:element name="standard_MarketProduct.marketProductType"
499 type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
500 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
501 cim16#MarketProduct.marketProductType"/>
502         <xs:element name="original_MarketProduct.marketProductType"
503 type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
504 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
505 cim16#MarketProduct.marketProductType"/>

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506         <xs:element name="mktPSRType.psrType" type="PsrType_String"
507 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
508 schema-cim16#MktPSRType.psrType"/>
509         <xs:element name="flowDirection.direction"
510 type="DirectionKind_String" minOccurs="0" maxOccurs="1"
511 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
512 cim16#FlowDirection.direction"/>
513         <xs:element name="currency_Unit.name"
514 type="CurrencyCode_String" minOccurs="0" maxOccurs="1"
515 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
516         <xs:element name="quantity_Measure_Unit.name"
517 type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
518 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
519         <xs:element name="price_Measure_Unit.name"
520 type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
521 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
522         <xs:element name="curveType" type="CurveType_String"
523 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
524 schema-cim16#TimeSeries.curveType"/>
525         <xs:element name="cancelledTS" type="ESMPBoolean_String"
526 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
527 schema-cim16#TimeSeries.cancelledTS"/>
528         <xs:element name="auction.mRID" type="ID_String" minOccurs="0"
529 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
530 cim16#IdentifiedObject.mRID"/>
531         <xs:element name="Period" type="Series_Period" minOccurs="0"
532 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
533 cim16#TimeSeries.Period"/>
534     </xs:sequence>
535 </xs:complexType>
536 </xs:schema>

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