European Network of
Transmission System Operators
for Electricity

BALANCING DOCUMENT
UML MODEL AND SCHEMA

2019-09-10
APPROVED DOCUMENT
VERSION 2.1

Table of Contents

1 Objective 5
2 Balancing_MarketDocument 6
2.1 Balancing contextual model 6
2.1.1 Overview of the model 6
2.1.2 IsBasedOn relationships from the European style market profile 7
2.2 Balancing assembly model 8
2.2.1 Overview of the model 8
2.2.2 IsBasedOn relationships from the European style market profile 9
2.2.3 Detailed Balancing assembly model 9
2.2.3.1 Balancing_MarketDocument root class 9
2.2.3.2 Financial_Price 10
2.2.3.3 Point 10
2.2.3.4 Series_Period 11
2.2.3.5 TimeSeries 12
2.2.4 Datatypes 13
2.2.5 Balancing_MarketDocument XML schema structure 14
2.2.6 Balancing _MarketDocument XML schema 15

List of figures

Figure 1 - Balancing contextual model 6
Figure 2 - Balancing assembly model 8
Figure 3 - Balancing_MarketDocument schema structure 14

List of tables

Table 1 - IsBasedOn dependency 7
Table 2 - IsBasedOn dependency 9
Table 3 - Attributes of Balancing assembly model::Balancing_MarketDocument 9
Table 4 - Association ends of Balancing assembly model::Balancing_MarketDocument with other classes 10
Table 5 - Attributes of Balancing assembly model::Financial_Price 10
Table 6 - Attributes of Balancing assembly model::Point 10
Table 7 - Association ends of Balancing assembly model::Point with other classes 11
Table 8 - Attributes of Balancing assembly model::Series_Period 11
Table 9 - Association ends of Balancing assembly model::Series_Period with other classes 12
Table 10 - Attributes of Balancing assembly model::TimeSeries 12
Table 11 - Association ends of Balancing assembly model::TimeSeries with other classes 13

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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: • MarketProduct • AllocationDecision • UnavailableQuantity Added two new relations between TimeSeries and MarketProduct
2	1	2019-09-10	XSD version 4.1: • 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.

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1 Objective

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

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

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

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

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

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2 Balancing_MarketDocument

2.1 Balancing contextual model

2.1.1 Overview of the model

Figure 1 shows the model.

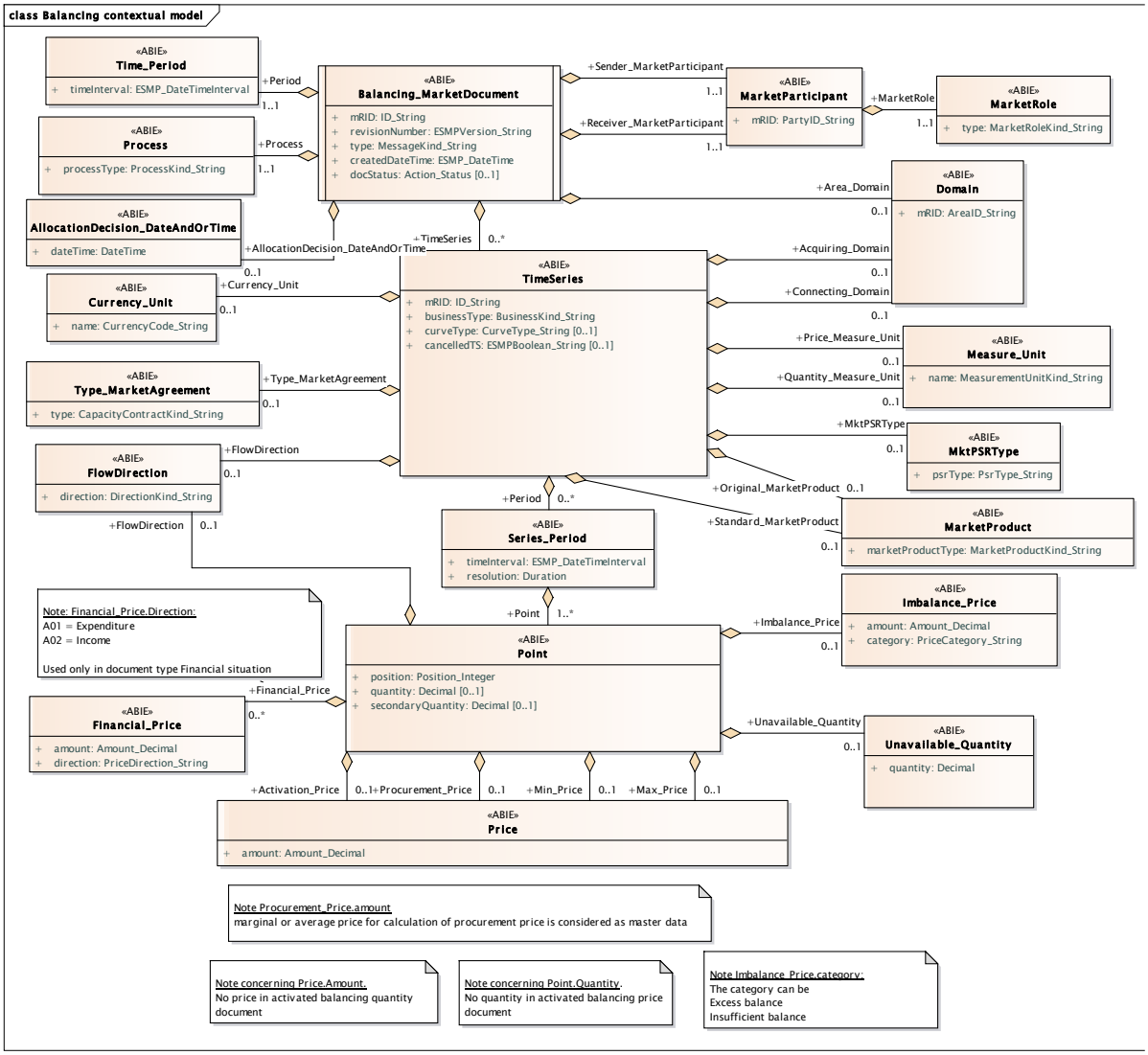

Figure 1 - Balancing contextual model

2.1.2 IsBasedOn relationships from the European style market profile

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

Table 1 - IsBasedOn dependency

Name	Complete IsBasedOn Path
AllocationDecision_DateAndOrTime	TC57CIM::IEC62325::MarketManagement::DateAndOrTime
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

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2.2 Balancing assembly model

2.2.1 Overview of the model

Figure 2 shows the model.

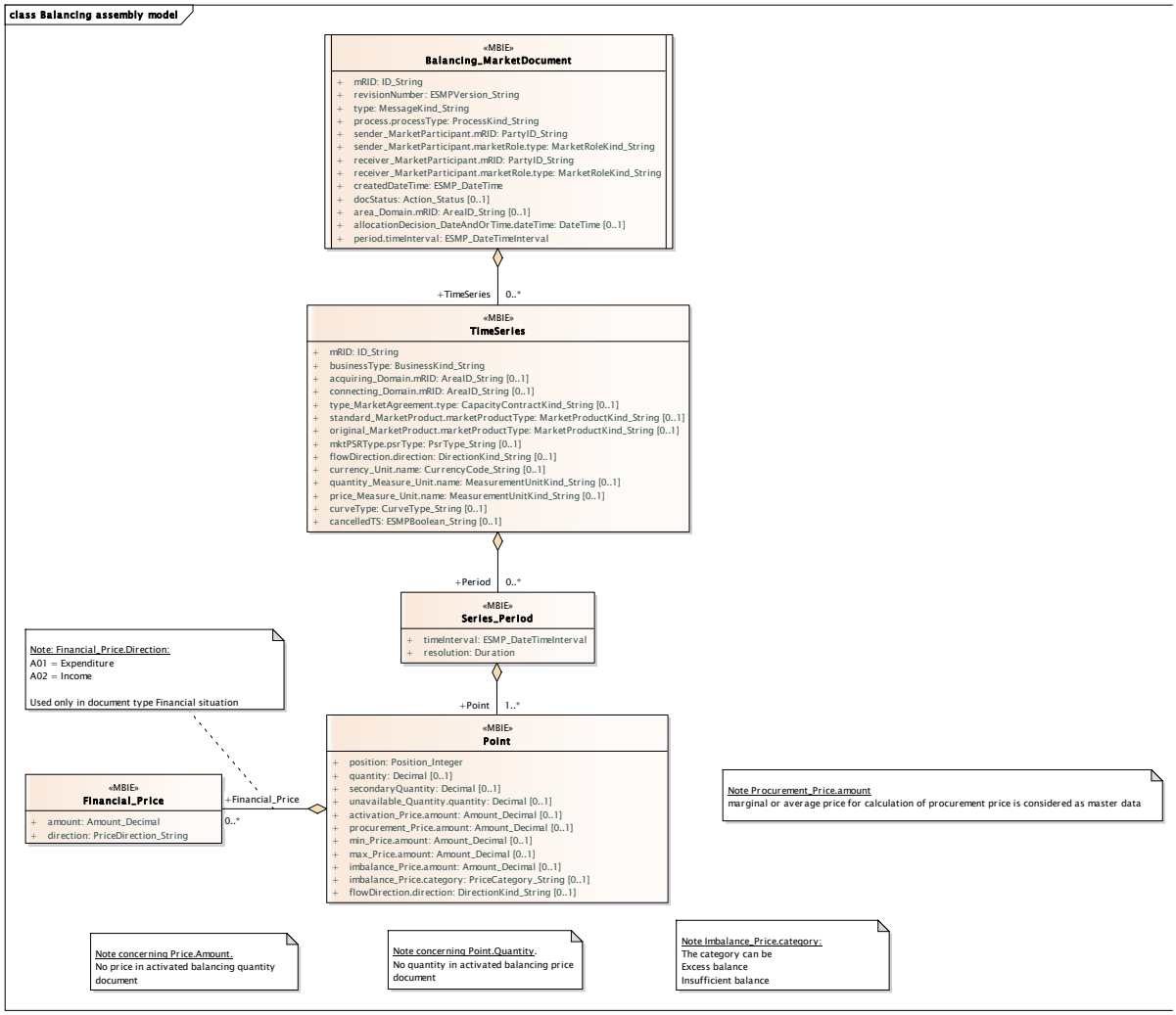

Figure 2 - Balancing assembly model

2.2.2 IsBasedOn relationships from the European style market profile

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

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

2.2.3 Detailed Balancing assembly model

2.2.3.1 Balancing_MarketDocument root class

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

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

Table 3 shows all attributes of Balancing_MarketDocument.

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.
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.

Order	mult.	Attribute name / Attribute type	Description
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.

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

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

2.2.3.2 Financial_Price

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

Table 5 shows all attributes of Financial_Price.

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.

2.2.3.3 Point

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

Table 6 shows all attributes of Point.

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.

Order	mult.	Attribute name / Attribute type	Description
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.

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

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..*]

2.2.3.4 Series_Period

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

Table 8 shows all attributes of Series_Period.

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.

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

130

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

132 **Table 9 - Association ends of Balancing assembly model::Series_Period with other**
133 **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..*]

134

135 **2.2.3.5 TimeSeries**

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

137 Table 10 shows all attributes of TimeSeries.

138 **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.
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.

Order	mult.	Attribute name / Attribute type	Description
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.

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

Table 11 - Association ends of Balancing assembly model::TimeSeries with other classes

Order	mult.	Class name / Role	Description
14	[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..*]

2.2.4 Datatypes

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

- Action_Status compound
- ESMP_DateTimeInterval compound
- Amount_Decimal datatype
- AreaID_String datatype, codelist CodingSchemeTypeList
- BusinessKind_String datatype, codelist BusinessTypeList
- CapacityContractKind_String datatype, codelist ContractTypeList
- CurrencyCode_String datatype, codelist CurrencyTypeList
- CurveType_String datatype, codelist CurveTypeList
- DirectionKind_String datatype, codelist DirectionTypeList
- ESMP_DateTime datatype
- ESMPBoolean_String datatype, codelist IndicatorTypeList
- ESMPVersion_String datatype
- ID_String datatype
- MarketProductKind_String datatype, codelist MarketProductTypeList
- MarketRoleKind_String datatype, codelist RoleTypeList
- MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- MessageKind_String datatype, codelist MessageTypeList
- PartyID_String datatype, codelist CodingSchemeTypeList
- Position_Integer datatype
- PriceCategory_String datatype, codelist PriceCategoryTypeList
- PriceDirection_String datatype, codelist PriceDirectionTypeList
- ProcessKind_String datatype, codelist ProcessTypeList
- PsrType_String datatype, codelist AssetTypeList
- Status_String datatype, codelist StatusTypeList
- YMDHM_DateTime datatype

2.2.5 Balancing_MarketDocument XML schema structure

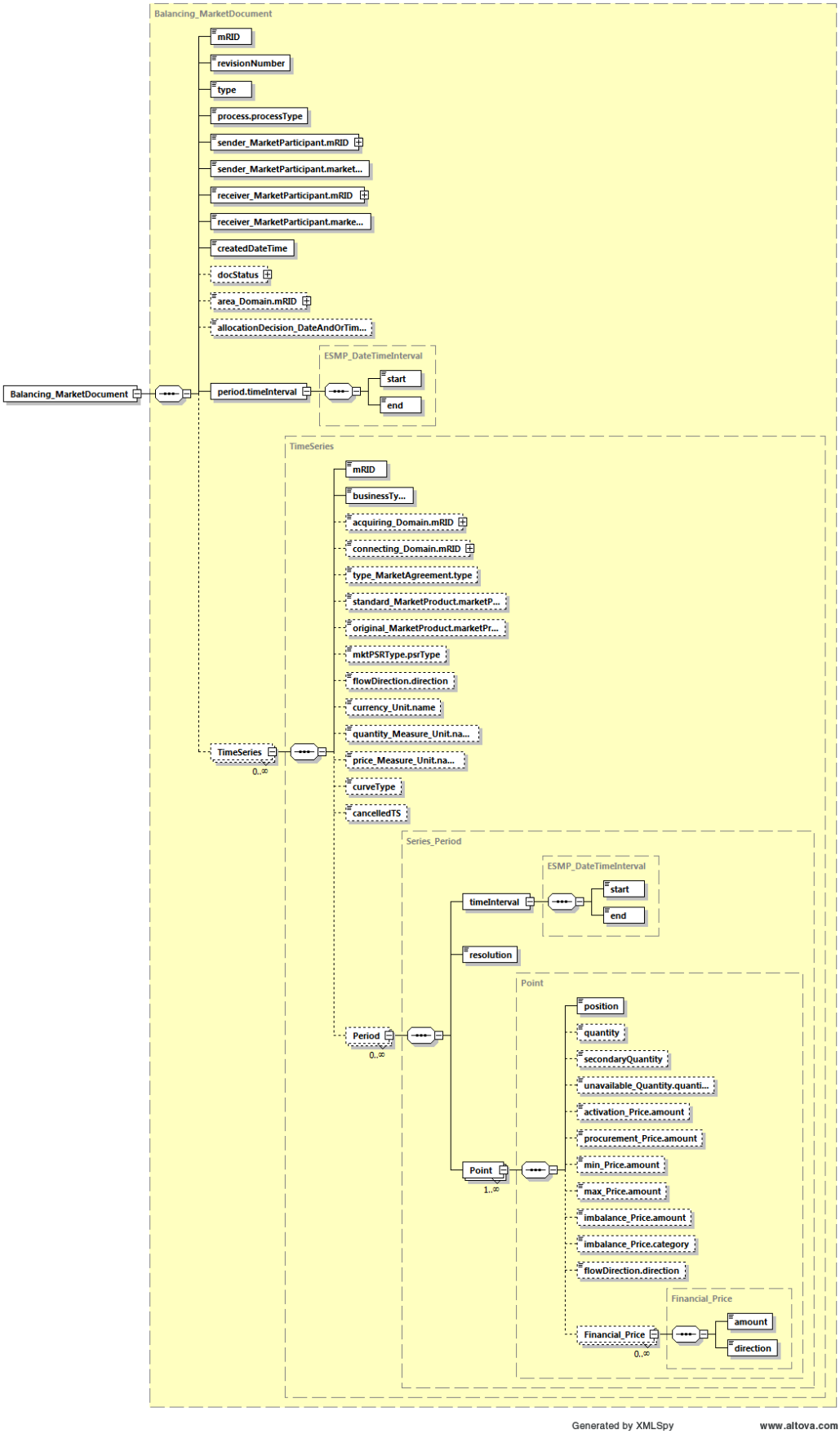

Figure 3 - Balancing_MarketDocument schema structure

2.2.6 Balancing _MarketDocument XML schema

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

urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:1

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:1"
xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
xmlns:cimp="http://www.iec.ch/cimprofile"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:1"
elementFormDefault="qualified" attributeFormDefault="unqualified">
	<xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
entsoe-eu-wgedi-codelists.xsd"/>
	<xs:element name="Balancing_MarketDocument"
type="Balancing_MarketDocument"/>
	<xs:simpleType name="ID_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="xs:string">
			<xs:maxLength value="60"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:simpleType name="ESMPVersion_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="xs:string">
			<xs:pattern value="[1-9]([0-9]){0,2}"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:simpleType name="MessageKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="ecl:MessageTypeList"/>
	</xs:simpleType>
	<xs:simpleType name="ProcessKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="ecl:ProcessTypeList"/>
	</xs:simpleType>
	<xs:simpleType name="PartyID_String-base"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="xs:string">
			<xs:maxLength value="16"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:complexType name="PartyID_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:simpleContent>
			<xs:extension base="PartyID_String-base">
				<xs:attribute name="codingScheme"
type="ecl:CodingSchemeTypeList" use="required"/>
			</xs:extension>
		</xs:simpleContent>
	</xs:complexType>
	<xs:simpleType name="MarketRoleKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="ecl:RoleTypeList"/>
	</xs:simpleType>
	<xs:simpleType name="ESMP_DateTime"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
```

```
232                 <xs:restriction base="xs:dateTime">
233                       <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
234   9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
235   9]|30))T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
236   9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
237   48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
238   0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
239   5][0-9]:[0-5][0-
240   9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
241   9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
242   8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
243   9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
244                 </xs:restriction>
245           </xs:simpleType>
246           <xs:simpleType name="AreaID_String-base"
247   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
248                 <xs:restriction base="xs:string">
249                       <xs:maxLength value="18"/>
250                 </xs:restriction>
251           </xs:simpleType>
252           <xs:complexType name="AreaID_String"
253   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
254                 <xs:simpleContent>
255                       <xs:extension base="AreaID_String-base">
256                             <xs:attribute name="codingScheme"
257   type="ecl:CodingSchemeTypeList" use="required"/>
258                       </xs:extension>
259                 </xs:simpleContent>
260           </xs:complexType>
261           <xs:simpleType name="Status_String"
262   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
263                 <xs:restriction base="ecl:StatusTypeList"/>
264           </xs:simpleType>
265           <xs:complexType name="Action_Status"
266   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Status">
267                 <xs:sequence>
268                       <xs:element name="value" type="Status_String" minOccurs="1"
269   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
270   cim16#Status.value"/>
271                 </xs:sequence>
272           </xs:complexType>
273           <xs:simpleType name="YMDHM_DateTime"
274   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
275                 <xs:restriction base="xs:string">
276                       <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
277   9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
278   9]|30))T(([01][0-9]|2[0-3]):[0-5][0-
279   9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
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281   0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
282   5][0-
283   9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
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285   8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
286   9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9])Z)"/>
287                 </xs:restriction>
288           </xs:simpleType>
289           <xs:complexType name="ESMP_DateTimeInterval"
290   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
291                 <xs:sequence>
```

```
292                     <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
293   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
294   cim16#DateTimeInterval.start"/>
295                     <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
296   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
297   cim16#DateTimeInterval.end"/>
298               </xs:sequence>
299         </xs:complexType>
300         <xs:complexType name="Balancing_MarketDocument"
301   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
302               <xs:sequence>
303                     <xs:element name="mRID" type="ID_String" minOccurs="1"
304   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
305   cim16#IdentifiedObject.mRID"/>
306                     <xs:element name="revisionNumber" type="ESMPVersion_String"
307   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
308   schema-cim16#Document.revisionNumber"/>
309                     <xs:element name="type" type="MessageKind_String" minOccurs="1"
310   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
311   cim16#Document.type"/>
312                     <xs:element name="process.processType"
313   type="ProcessKind_String" minOccurs="1" maxOccurs="1"
314   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
315   cim16#Process.processType"/>
316                     <xs:element name="sender_MarketParticipant.mRID"
317   type="PartyID_String" minOccurs="1" maxOccurs="1"
318   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
319   cim16#IdentifiedObject.mRID"/>
320                     <xs:element name="sender_MarketParticipant.marketRole.type"
321   type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
322   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
323                     <xs:element name="receiver_MarketParticipant.mRID"
324   type="PartyID_String" minOccurs="1" maxOccurs="1"
325   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
326   cim16#IdentifiedObject.mRID"/>
327                     <xs:element name="receiver_MarketParticipant.marketRole.type"
328   type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
329   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
330                     <xs:element name="createdDateTime" type="ESMP_DateTime"
331   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
332   schema-cim16#Document.createdDateTime"/>
333                     <xs:element name="docStatus" type="Action_Status" minOccurs="0"
334   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
335   cim16#Document.docStatus"/>
336                     <xs:element name="area_Domain.mRID" type="AreaID_String"
337   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
338   schema-cim16#IdentifiedObject.mRID"/>
339                     <xs:element name="allocationDecision_DateAndOrTime.dateTime"
340   type="xs:dateTime" minOccurs="0" maxOccurs="1"
341   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
342   cim16#DateAndOrTime.dateTime"/>
343                     <xs:element name="period.timeInterval"
344   type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
345   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
346   cim16#Period.timeInterval"/>
347                     <xs:element name="TimeSeries" type="TimeSeries" minOccurs="0"
348   maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
349   cim16#MarketDocument.TimeSeries"/>
350               </xs:sequence>
351         </xs:complexType>
```

```
352         <xs:simpleType name="Amount_Decimal"
353   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Decimal">
354               <xs:restriction base="xs:decimal">
355                     <xs:totalDigits value="17"/>
356               </xs:restriction>
357         </xs:simpleType>
358         <xs:simpleType name="PriceDirection_String"
359   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
360               <xs:restriction base="ecl:PriceDirectionTypeList"/>
361         </xs:simpleType>
362         <xs:complexType name="Financial_Price"
363   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price">
364               <xs:sequence>
365                     <xs:element name="amount" type="Amount_Decimal" minOccurs="1"
366   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
367   cim16#Price.amount"/>
368                     <xs:element name="direction" type="PriceDirection_String"
369   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
370   schema-cim16#Price.direction"/>
371               </xs:sequence>
372         </xs:complexType>
373         <xs:simpleType name="Position_Integer"
374   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
375               <xs:restriction base="xs:integer">
376                     <xs:maxInclusive value="999999"/>
377                     <xs:minInclusive value="1"/>
378               </xs:restriction>
379         </xs:simpleType>
380         <xs:simpleType name="PriceCategory_String"
381   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
382               <xs:restriction base="ecl:PriceCategoryTypeList"/>
383         </xs:simpleType>
384         <xs:simpleType name="DirectionKind_String"
385   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
386               <xs:restriction base="ecl:DirectionTypeList"/>
387         </xs:simpleType>
388         <xs:complexType name="Point"
389   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
390               <xs:sequence>
391                     <xs:element name="position" type="Position_Integer"
392   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
393   schema-cim16#Point.position"/>
394                     <xs:element name="quantity" type="xs:decimal" minOccurs="0"
395   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
396   cim16#Point.quantity"/>
397                     <xs:element name="secondaryQuantity" type="xs:decimal"
398   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
399   schema-cim16#Point.secondaryQuantity"/>
400                     <xs:element name="unavailable_Quantity.quantity"
401   type="xs:decimal" minOccurs="0" maxOccurs="1"
402   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
403   cim16#Quantity.quantity"/>
404                     <xs:element name="activation_Price.amount"
405   type="Amount_Decimal" minOccurs="0" maxOccurs="1"
406   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.amount"/>
407                     <xs:element name="procurement_Price.amount"
408   type="Amount_Decimal" minOccurs="0" maxOccurs="1"
409   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.amount"/>
```


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410                     <xs:element name="min_Price.amount" type="Amount_Decimal"
411   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
412   schema-cim16#Price.amount"/>
413                     <xs:element name="max_Price.amount" type="Amount_Decimal"
414   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
415   schema-cim16#Price.amount"/>
416                     <xs:element name="imbalance_Price.amount" type="Amount_Decimal"
417   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
418   schema-cim16#Price.amount"/>
419                     <xs:element name="imbalance_Price.category"
420   type="PriceCategory_String" minOccurs="0" maxOccurs="1"
421   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Price.category"/>
422                     <xs:element name="flowDirection.direction"
423   type="DirectionKind_String" minOccurs="0" maxOccurs="1"
424   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
425   cim16#FlowDirection.direction"/>
426                     <xs:element name="Financial_Price" type="Financial_Price"
427   minOccurs="0" maxOccurs="unbounded"
428   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
429   cim16#Point.Financial_Price"/>
430               </xs:sequence>
431         </xs:complexType>
432         <xs:complexType name="Series_Period"
433   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
434               <xs:sequence>
435                     <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
436   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
437   schema-cim16#Period.timeInterval"/>
438                     <xs:element name="resolution" type="xs:duration" minOccurs="1"
439   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
440   cim16#Period.resolution"/>
441                     <xs:element name="Point" type="Point" minOccurs="1"
442   maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
443   cim16#Period.Point"/>
444               </xs:sequence>
445         </xs:complexType>
446         <xs:simpleType name="BusinessKind_String"
447   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
448               <xs:restriction base="ecl:BusinessTypeList"/>
449         </xs:simpleType>
450         <xs:simpleType name="CapacityContractKind_String"
451   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
452               <xs:restriction base="ecl:ContractTypeList"/>
453         </xs:simpleType>
454         <xs:simpleType name="MarketProductKind_String"
455   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
456               <xs:restriction base="ecl:MarketProductTypeList"/>
457         </xs:simpleType>
458         <xs:simpleType name="PsrType_String"
459   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
460               <xs:restriction base="ecl:AssetTypeList"/>
461         </xs:simpleType>
462         <xs:simpleType name="CurrencyCode_String"
463   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
464               <xs:restriction base="ecl:CurrencyTypeList"/>
465         </xs:simpleType>
466         <xs:simpleType name="MeasurementUnitKind_String"
467   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
468               <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
469         </xs:simpleType>
```

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470         <xs:simpleType name="CurveType_String"
471   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
472               <xs:restriction base="ecl:CurveTypeList"/>
473         </xs:simpleType>
474         <xs:simpleType name="ESMPBoolean_String"
475   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
476               <xs:restriction base="ecl:IndicatorTypeList"/>
477         </xs:simpleType>
478         <xs:complexType name="TimeSeries"
479   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
480               <xs:sequence>
481                     <xs:element name="mRID" type="ID_String" minOccurs="1"
482   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
483   cim16#IdentifiedObject.mRID"/>
484                     <xs:element name="businessType" type="BusinessKind_String"
485   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
486   schema-cim16#TimeSeries.businessType"/>
487                     <xs:element name="acquiring_Domain.mRID" type="AreaID_String"
488   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
489   schema-cim16#IdentifiedObject.mRID"/>
490                     <xs:element name="connecting_Domain.mRID" type="AreaID_String"
491   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
492   schema-cim16#IdentifiedObject.mRID"/>
493                     <xs:element name="type_MarketAgreement.type"
494   type="CapacityContractKind_String" minOccurs="0" maxOccurs="1"
495   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>
496                     <xs:element name="standard_MarketProduct.marketProductType"
497   type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
498   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
499   cim16#MarketProduct.marketProductType"/>
500                     <xs:element name="original_MarketProduct.marketProductType"
501   type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
502   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
503   cim16#MarketProduct.marketProductType"/>
504                     <xs:element name="mktPSRType.psrType" type="PsrType_String"
505   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
506   schema-cim16#MktPSRType.psrType"/>
507                     <xs:element name="flowDirection.direction"
508   type="DirectionKind_String" minOccurs="0" maxOccurs="1"
509   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
510   cim16#FlowDirection.direction"/>
511                     <xs:element name="currency_Unit.name"
512   type="CurrencyCode_String" minOccurs="0" maxOccurs="1"
513   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
514                     <xs:element name="quantity_Measure_Unit.name"
515   type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
516   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
517                     <xs:element name="price_Measure_Unit.name"
518   type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
519   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
520                     <xs:element name="curveType" type="CurveType_String"
521   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
522   schema-cim16#TimeSeries.curveType"/>
523                     <xs:element name="cancelledTS" type="ESMPBoolean_String"
524   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
525   schema-cim16#TimeSeries.cancelledTS"/>
526                     <xs:element name="Period" type="Series_Period" minOccurs="0"
527   maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
528   cim16#TimeSeries.Period"/>
529               </xs:sequence>
```

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530             </xs:complexType>
531     </xs:schema>
```


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