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European Network of
Transmission System Operators
for Electricity

ENERGY ACCOUNT DOCUMENT
UML MODEL AND SCHEMA

2022-02-01
APPROVED DOCUMENT
VERSION 1.1

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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.
1	1	2022-02-01	Updates in XSD v4.1: • Measure_Unit replaced by Measurement_Unit to make it ESMP compliant. • mRID of Document, Series and Timeseries (ID_String type) was enlarged from 35 to 60 characters. • Added a curveType attribute at timeSeries level 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 EnergyAccount_MarketDocument.

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

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

70 This document shall only be referenced in an implementation guide of a specific business
71 process. The content of the business process implementation guide shall be as follows:
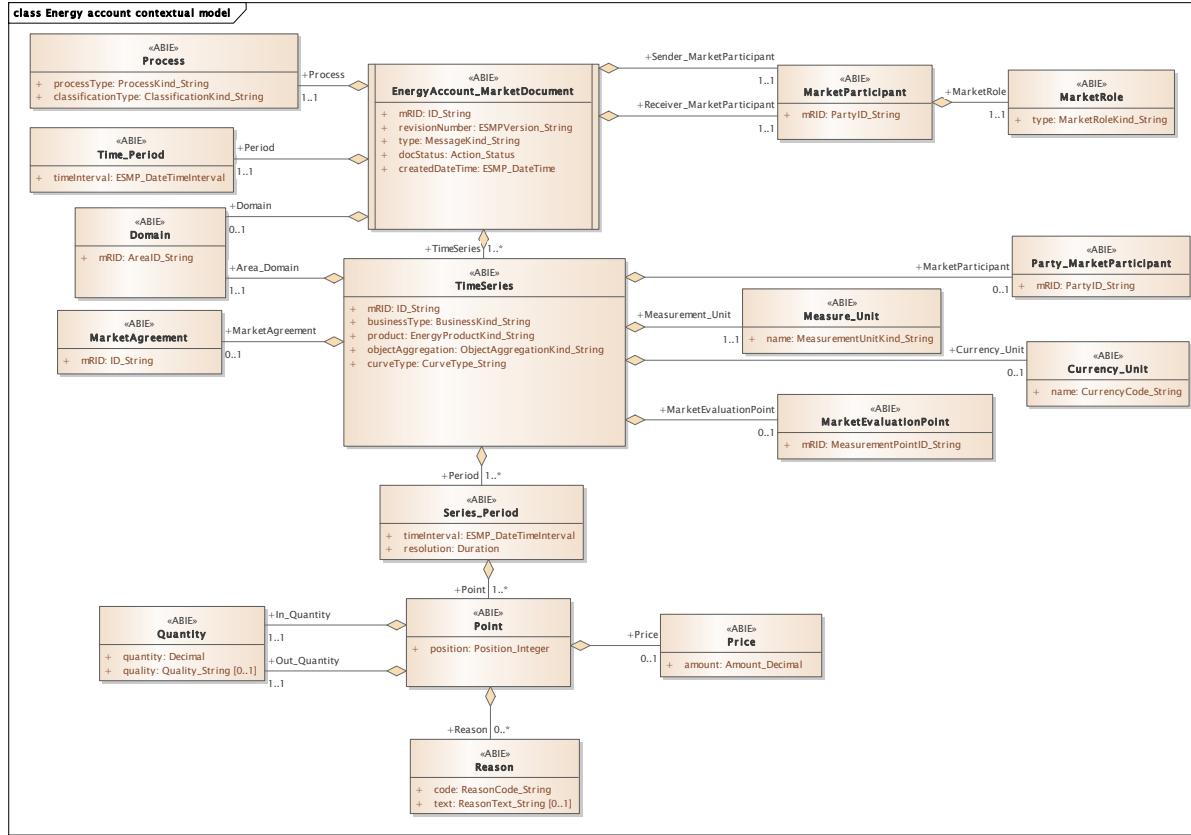
72 • Description of the business process;

73 • Use case of the business process;

74 • Sequence diagrams of the business process;

75 • List of the schema (XSD) to be used in the business process and versions of the
76 schema;

77 • For each schema, dependency tables providing the necessary information for the
78 generation of the XML instances, i.e. when the optional attributes are to be used, which
79 codes from which ENTSO-E codelist are to be used.

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80   **EnergyAccount_MarketDocument**

81   **2.1   Energy account contextual model**

82   **2.1.1   Overview of the model**

83   Figure 1 shows the model.

84

85   **Figure 1 - Energy account contextual model**

86

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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
Currency_Unit	TC57CIM::IEC62325::MarketManagement::Unit
Domain	TC57CIM::IEC62325::MarketManagement::Domain
EnergyAccount_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
MarketAgreement	TC57CIM::IEC62325::MarketManagement::MarketAgreement
MarketEvaluationPoint	TC57CIM::IEC62325::MarketManagement::MarketEvaluationPoint
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
Party_MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
Point	TC57CIM::IEC62325::MarketManagement::Point
Price	TC57CIM::IEC62325::MarketManagement::Price
Process	TC57CIM::IEC62325::MarketManagement::Process
Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

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93

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94
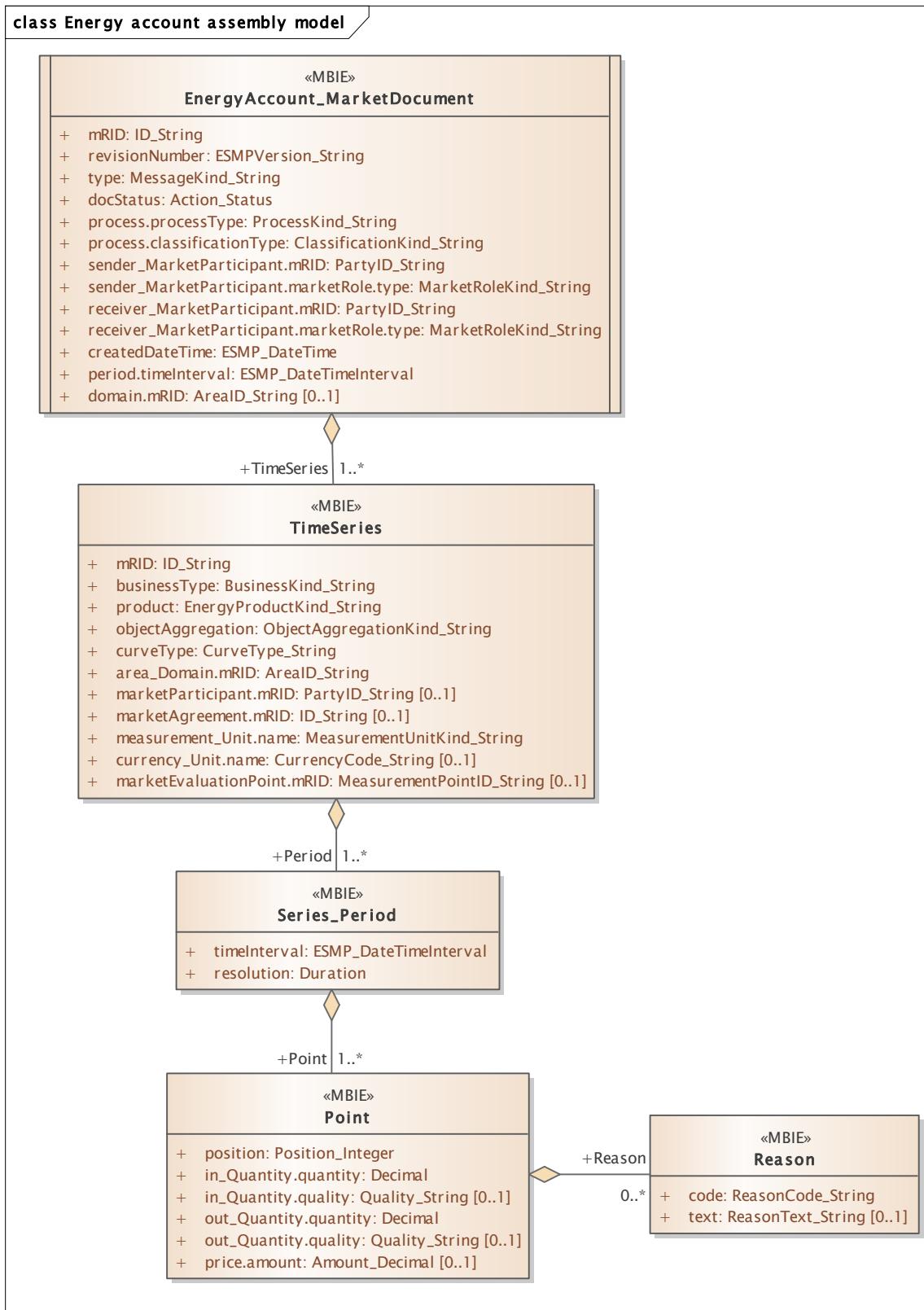
2.2 Energy account assembly model

2.2.1 Overview of the model

97   Figure 2 shows the model.


98

99   **Figure 2 - Energy account assembly model**

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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
EnergyAccount_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
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 Energy account assembly model**

106 **2.2.3.1   EnergyAccount_MarketDocument root class**

107 An energy account report for a given set of time series and a given accounting period
108 Time_Period class, period.timeInterval attribute) shall have a unique identification assigned by
109 the sender of the document for all transmissions to the receiver.

110 All additions, modifications, or suppressions for the time series and accounting period shall use
111 the same identification.

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

114 Table 3 shows all attributes of EnergyAccount_MarketDocument.

115   **Table 3 - Attributes of Energy account assembly**
116   **model::EnergyAccount_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]	docStatus Action_Status	The identification of the condition or position of the document with regard to its standing.
4	[1..1]	process.processType ProcessKind_String	The identification of the nature of process that the document addresses.
5	[1..1]	process.classificationType ClassificationKind_String	The classification mechanism used to group a set of objects together within a business process. The grouping may be of a detailed or a summary nature.
6	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document owner.
7	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document owner.
8	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document recipient.

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Order	mult.	Attribute name / Attribute type	Description
9	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document recipient.
10	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
11	[1..1]	period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- This information provides the start and end date and time of the accounting period. The receiver shall completely reject documents with any time intervals outside the accounting period.
12	[0..1]	domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the domain that is covered in the energy account report. This will frequently be the market balance area that is the subject of the report. However, other domains may also be used as defined by local market rules to enable the particular balancing markets to be identified.

117

118 Table 4 shows all association ends of EnergyAccount_MarketDocument with other classes.

119 **Table 4 - Association ends of Energy account assembly**
120 **model::EnergyAccount_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
13	[1..*]	TimeSeries TimeSeries	Association Based On: Energy account contextual model::TimeSeries.TimeSeries[1..*] ----- Energy account contextual model::EnergyAccount_MarketDocument.[]

121

122 **2.2.3.2   Point**

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

124 Table 5 shows all attributes of Point.

125 **Table 5 - Attributes of Energy account 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	[1..1]	in_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The quantity that is flowing into the Area_Domain.mRID.
2	[0..1]	in_Quantity.quality Quality_String	The description of the quality of the quantity. --- The quantity that is flowing into the Area_Domain.mRID.
3	[1..1]	out_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The quantity that is going out of the Area_Domain.mRID.
4	[0..1]	out_Quantity.quality Quality_String	The description of the quality of the quantity. --- The quantity that is going out of the Area_Domain.mRID.

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Order	mult.	Attribute name / Attribute type	Description
5	[0..1]	price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The amount due for the account interval in question. This information defines the settlement amount taking into consideration the in and out quantities and the pricing scheme based on local market rules. A negative value indicates that the settlement amount is due by the party in question (party to be debited). If the amount is positive it is due by the imbalance settlement responsible (party to be credited).

126

127   Table 6 shows all association ends of Point with other classes.

128   **Table 6 - Association ends of Energy account assembly model::Point with other classes**

Order	mult.	Class name / Role	Description
6	[0..*]	Reason Reason	Association Based On: Energy account contextual model::Reason.Reason[0..*] ----- Energy account contextual model::Point.[]

129

130   **2.2.3.3   Reason**

131   The motivation of an act.

132   Table 7 shows all attributes of Reason.

133   **Table 7 - Attributes of Energy account 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.

134

135   **2.2.3.4   Series_Period**

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

137   Table 8 shows all attributes of Series_Period.

138   **Table 8 - Attributes of Energy account 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.

139

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

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141
142 **Table 9 - Association ends of Energy account assembly model::Series_Period with other classes**

Order	mult.	Class name / Role	Description
2	[1..*]	Point Point	Association Based On: Energy account contextual model::Point.Point[1..*] ----- Energy account contextual model::Series_Period.[]

143

144 **2.2.3.5   TimeSeries**

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

146 Table 10 shows all attributes of TimeSeries.

147 **Table 10 - Attributes of Energy account 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	[1..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.
3	[1..1]	objectAggregation ObjectAggregationKind_String	The identification of the domain that is the common denominator used to aggregate a time series.
4	[1..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
5	[1..1]	area_Domain.mRID AreaID_String	The unique identification of the domain. --- The area of concern for the imbalance settlement responsible that the time series addresses.
6	[0..1]	marketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The identification of the party of concern for the time series.
7	[0..1]	marketAgreement.mRID ID_String	The unique identification of the agreement. --- This provides the identification of the agreement, such as a capacity agreement, that is relative to the time series.
8	[1..1]	measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit if measurement is used for the quantities expressed within the time series.
9	[0..1]	currency_Unit.name CurrencyCode_String	The identification of the formal code for a currency (ISO 4217). --- The currency used for the monetary amount expressed within the time series.
10	[0..1]	marketEvaluationPoint.mRID MeasurementPointID_String	A unique identification of the measurement point. --- The identification of the accounting point where the settlement information has been aggregated.

148

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

150
151

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

| Order	mult.	Class name / Role	Description
11	[1..*]	Series_Period Period	The receiver shall completely reject documents with any time intervals outside the accounting period. Association Based On: Energy account contextual model::Series_Period.Period[1..*] ----- Energy account contextual model::TimeSeries.[]

152
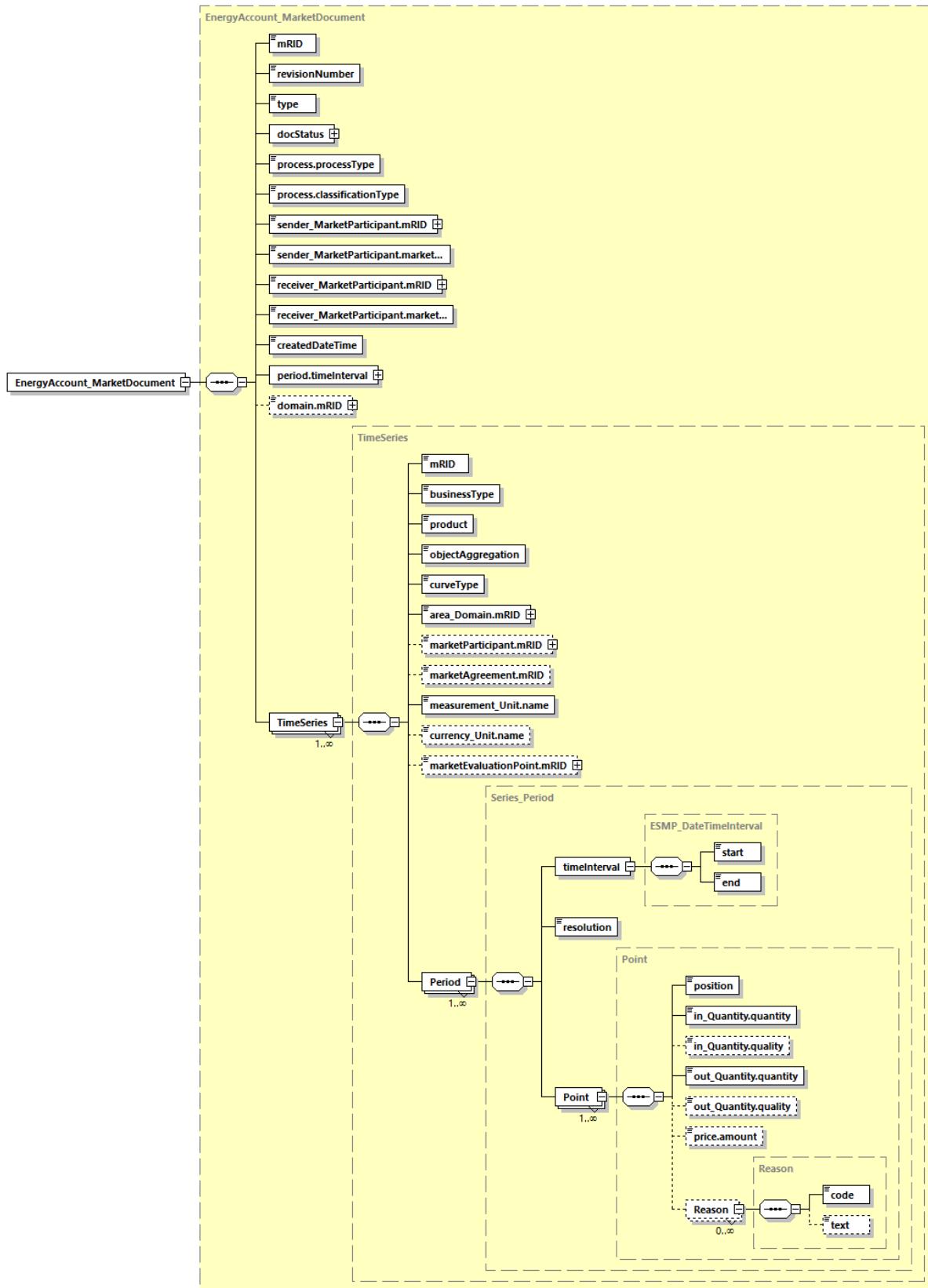
153 **2.2.4   Datatypes**

154 The list of datatypes used for the Energy account assembly model is as follows:

155 • Action_Status compound

156 • ESMP_DateTimeInterval compound

157 • Amount_Decimal datatype

158 • AreaID_String datatype, codelist CodingSchemeTypeList

159 • BusinessKind_String datatype, codelist BusinessTypeList

160 • ClassificationKind_String datatype, codelist ClassificationTypeList

161 • CurrencyCode_String datatype, codelist CurrencyTypeList

162 • CurveType_String datatype, codelist CurveTypeList

163 • EnergyProductKind_String datatype, codelist EnergyProductTypeList

164 • ESMP_DateTime datatype

165 • ESMPVersion_String datatype

166 • ID_String datatype

167 • MarketRoleKind_String datatype, codelist RoleTypeList

168 • MeasurementPointID_String datatype, codelist CodingSchemeTypeList

169 • MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList

170 • MessageKind_String datatype, codelist MessageTypeList

171 • ObjectAggregationKind_String datatype, codelist ObjectAggregationTypeList

172 • PartyID_String datatype, codelist CodingSchemeTypeList

173 • Position_Integer datatype

174 • ProcessKind_String datatype, codelist ProcessTypeList

175 • Quality_String datatype, codelist QualityTypeList

176 • ReasonCode_String datatype, codelist ReasonCodeTypeList

177 • ReasonText_String datatype

178 • Status_String datatype, codelist StatusTypeList

179 • YMDHM_DateTime datatype

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180   **2.2.5   EnergyAccount_MarketDocument XML schema structure**

181   Figure 3 provides the structure of the schema.

182

Generated by XMLSpy   www.altova.com

183   **Figure 3 - EnergyAccount_MarketDocument schema structure**

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2.2.6   EnergyAccount_MarketDocument XML schema

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

urn:iec62325.351:tc57wg16:451-4:energyaccountdocument:4:1

```xml
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
xmlns="urn:iec62325.351:tc57wg16:451-4:energyaccountdocument: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:tc57wg16:451-4:energyaccountdocument:4:1"
elementFormDefault="qualified" attributeFormDefault="unqualified">
        <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
entsoe-eu-wgedi-codelists.xsd"/>
        <xs:element name="EnergyAccount_MarketDocument"
type="EnergyAccount_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="ClassificationKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
                <xs:restriction base="ecl:ClassificationTypeList"/>
        </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">
```

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```
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]|[0-9][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
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295    5][0-
296    9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
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>
```

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```
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="EnergyAccount_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="docStatus" type="Action_Status" minOccurs="1"
326    maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
327    cim16#Document.docStatus"/>
328                        <xs:element name="process.processType"
329    type="ProcessKind_String" minOccurs="1" maxOccurs="1"
330    sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
331    cim16#Process.processType"/>
332                        <xs:element name="process.classificationType"
333    type="ClassificationKind_String" minOccurs="1" maxOccurs="1"
334    sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
335    cim16#Process.classificationType"/>
336                        <xs:element name="sender_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="sender_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="receiver_MarketParticipant.mRID"
344    type="PartyID_String" minOccurs="1" maxOccurs="1"
345    sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
346    cim16#IdentifiedObject.mRID"/>
347                        <xs:element name="receiver_MarketParticipant.marketRole.type"
348    type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
349    sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
350                        <xs:element name="createdDateTime" type="ESMP_DateTime"
351    minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
352    schema-cim16#Document.createdDateTime"/>
353                        <xs:element name="period.timeInterval"
354    type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
355    sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
356    cim16#Period.timeInterval"/>
357                        <xs:element name="domain.mRID" type="AreaID_String"
358    minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
359    schema-cim16#IdentifiedObject.mRID"/>
```

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```
360            <xs:element name="TimeSeries" type="TimeSeries" minOccurs="1"
361   maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
362   cim16#MarketDocument.TimeSeries"/>
363         </xs:sequence>
364      </xs:complexType>
365      <xs:simpleType name="Position_Integer"
366   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
367         <xs:restriction base="xs:integer">
368            <xs:maxInclusive value="999999"/>
369            <xs:minInclusive value="1"/>
370         </xs:restriction>
371      </xs:simpleType>
372      <xs:simpleType name="Quality_String"
373   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
374         <xs:restriction base="ecl:QualityTypeList"/>
375      </xs:simpleType>
376      <xs:simpleType name="Amount_Decimal"
377   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Decimal">
378         <xs:restriction base="xs:decimal">
379            <xs:totalDigits value="17"/>
380         </xs:restriction>
381      </xs:simpleType>
382      <xs:complexType name="Point"
383   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
384         <xs:sequence>
385            <xs:element name="position" type="Position_Integer"
386   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
387   schema-cim16#Point.position"/>
388            <xs:element name="in_Quantity.quantity" type="xs:decimal"
389   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
390   schema-cim16#Quantity.quantity"/>
391            <xs:element name="in_Quantity.quality" type="Quality_String"
392   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
393   schema-cim16#Quantity.quality"/>
394            <xs:element name="out_Quantity.quantity" type="xs:decimal"
395   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
396   schema-cim16#Quantity.quantity"/>
397            <xs:element name="out_Quantity.quality" type="Quality_String"
398   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
399   schema-cim16#Quantity.quality"/>
400            <xs:element name="price.amount" type="Amount_Decimal"
401   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
402   schema-cim16#Price.amount"/>
403            <xs:element name="Reason" type="Reason" minOccurs="0"
404   maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
405   cim16#Point.Reason"/>
406         </xs:sequence>
407      </xs:complexType>
408      <xs:simpleType name="ReasonCode_String"
409   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
410         <xs:restriction base="ecl:ReasonCodeTypeList"/>
411      </xs:simpleType>
412      <xs:simpleType name="ReasonText_String"
413   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
414         <xs:restriction base="xs:string">
415            <xs:maxLength value="512"/>
416         </xs:restriction>
417      </xs:simpleType>
418      <xs:complexType name="Reason"
419   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
```

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420                <xs:sequence>
421                        <xs:element name="code" type="ReasonCode_String" minOccurs="1"
422  maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
423  cim16#Reason.code"/>
424                        <xs:element name="text" type="ReasonText_String" minOccurs="0"
425  maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
426  cim16#Reason.text"/>
427                </xs:sequence>
428        </xs:complexType>
429        <xs:complexType name="Series_Period"
430  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
431                <xs:sequence>
432                        <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
433  minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
434  schema-cim16#Period.timeInterval"/>
435                        <xs:element name="resolution" type="xs:duration" minOccurs="1"
436  maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
437  cim16#Period.resolution"/>
438                        <xs:element name="Point" type="Point" minOccurs="1"
439  maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
440  cim16#Period.Point"/>
441                </xs:sequence>
442        </xs:complexType>
443        <xs:simpleType name="BusinessKind_String"
444  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
445                <xs:restriction base="ecl:BusinessTypeList"/>
446        </xs:simpleType>
447        <xs:simpleType name="EnergyProductKind_String"
448  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
449                <xs:restriction base="ecl:EnergyProductTypeList"/>
450        </xs:simpleType>
451        <xs:simpleType name="ObjectAggregationKind_String"
452  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
453                <xs:restriction base="ecl:ObjectAggregationTypeList"/>
454        </xs:simpleType>
455        <xs:simpleType name="CurveType_String"
456  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
457                <xs:restriction base="ecl:CurveTypeList"/>
458        </xs:simpleType>
459        <xs:simpleType name="MeasurementUnitKind_String"
460  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
461                <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
462        </xs:simpleType>
463        <xs:simpleType name="CurrencyCode_String"
464  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
465                <xs:restriction base="ecl:CurrencyTypeList"/>
466        </xs:simpleType>
467        <xs:simpleType name="MeasurementPointID_String-base"
468  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
469                <xs:restriction base="xs:string">
470                        <xs:maxLength value="60"/>
471                </xs:restriction>
472        </xs:simpleType>
473        <xs:complexType name="MeasurementPointID_String"
474  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
475                <xs:simpleContent>
476                        <xs:extension base="MeasurementPointID_String-base">
477                                <xs:attribute name="codingScheme"
478  type="ecl:CodingSchemeTypeList" use="required"/>
479                        </xs:extension>
```

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480                      </xs:simpleContent>
481              </xs:complexType>
482              <xs:complexType name="TimeSeries"
483      sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
484                      <xs:sequence>
485                              <xs:element name="mRID" type="ID_String" minOccurs="1"
486      maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
487      cim16#IdentifiedObject.mRID"/>
488                              <xs:element name="businessType" type="BusinessKind_String"
489      minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
490      schema-cim16#TimeSeries.businessType"/>
491                              <xs:element name="product" type="EnergyProductKind_String"
492      minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
493      schema-cim16#TimeSeries.product"/>
494                              <xs:element name="objectAggregation"
495      type="ObjectAggregationKind_String" minOccurs="1" maxOccurs="1"
496      sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
497      cim16#TimeSeries.objectAggregation"/>
498                              <xs:element name="curveType" type="CurveType_String"
499      minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
500      schema-cim16#TimeSeries.curveType"/>
501                              <xs:element name="area_Domain.mRID" type="AreaID_String"
502      minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
503      schema-cim16#IdentifiedObject.mRID"/>
504                              <xs:element name="marketParticipant.mRID" type="PartyID_String"
505      minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
506      schema-cim16#IdentifiedObject.mRID"/>
507                              <xs:element name="marketAgreement.mRID" type="ID_String"
508      minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
509      schema-cim16#IdentifiedObject.mRID"/>
510                              <xs:element name="measurement_Unit.name"
511      type="MeasurementUnitKind_String" minOccurs="1" maxOccurs="1"
512      sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
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="marketEvaluationPoint.mRID"
517      type="MeasurementPointID_String" minOccurs="0" maxOccurs="1"
518      sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
519      cim16#IdentifiedObject.mRID"/>
520                              <xs:element name="Period" type="Series_Period" minOccurs="1"
521      maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
522      cim16#TimeSeries.Period"/>
523                      </xs:sequence>
524              </xs:complexType>
525      </xs:schema>
526
```