European Network of
Transmission System Operators
for Electricity

CAPACITY DOCUMENT
UML MODEL AND SCHEMA

2022-10-18
AGREED DOCUMENT
VERSION 1.3

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VERSION 1.3

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Revision History

Version	Release	Date	Comments
0	0	2016-12-05	First drafting of the document based on maintenance request from WG EDI.
1	0	2017-01-10	Version to be submitted to Market Committee following WG EDI meeting in January 2017.
1	1	2021-11-09	Updates in schema 'iec62325.351:tc57wg16:451-3:capacitydocument:8:1.xsd': • An optional secondaryQuantity attribute was added into the Point class of Capacity document. • An optional secondary measurement unit was added at Timeseries level. • Measure_Unit was renamed to Measurement_Unit to align the end name with the ESMP one. Approved by MC.
1	2	2022-05-10	Updates in schema 'iec62325.351:tc57wg16:451-3:capacitydocument:8:2.xsd': • Added new optional requesting_MarketParticipant.mRID and requesting_MarketParticipant.marketRole.type at Timeseries. Approved by MC.
1	3	2022-10-18	Updates in schema 'iec62325.351:tc57wg16:451-3:capacitydocument:8:3.xsd': • Added new optional flowDirection.direction attribute at Timeseries. Agreed by CIM EG.

61

1.   Objective

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

The schema of the Capacity_MarketDocument could be used in various business processes related to the transmission capacity. This document could be used to exchange information on net transmission capcity, available transmission capacity, etc.

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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80   **2. Capacity_MarketDocument**

81   **2.1.   Capacity contextual model**

82   **2.1.1.   Overview of the model**

83   Figure 1 shows the model.
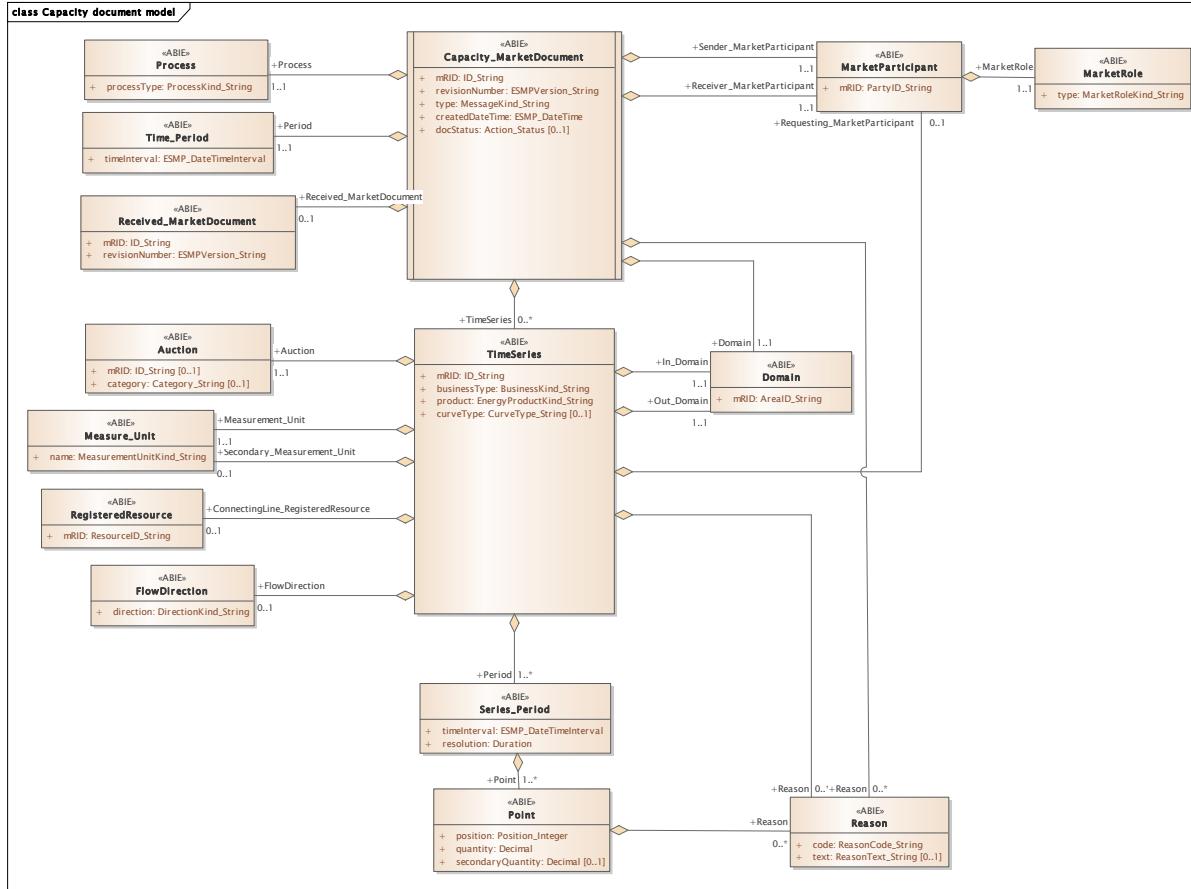
84

85   **Figure 1 - Capacity contextual model**

86

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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
Auction	TC57CIM::IEC62325::MarketManagement::Auction
Capacity_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Domain	TC57CIM::IEC62325::MarketManagement::Domain
FlowDirection	TC57CIM::IEC62325::MarketManagement::FlowDirection
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
Point	TC57CIM::IEC62325::MarketManagement::Point
Process	TC57CIM::IEC62325::MarketManagement::Process
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Received_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

92

93

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94

2.2. Capacity assembly model

2.2.1. Overview of the model

97 Figure 2 shows the model.
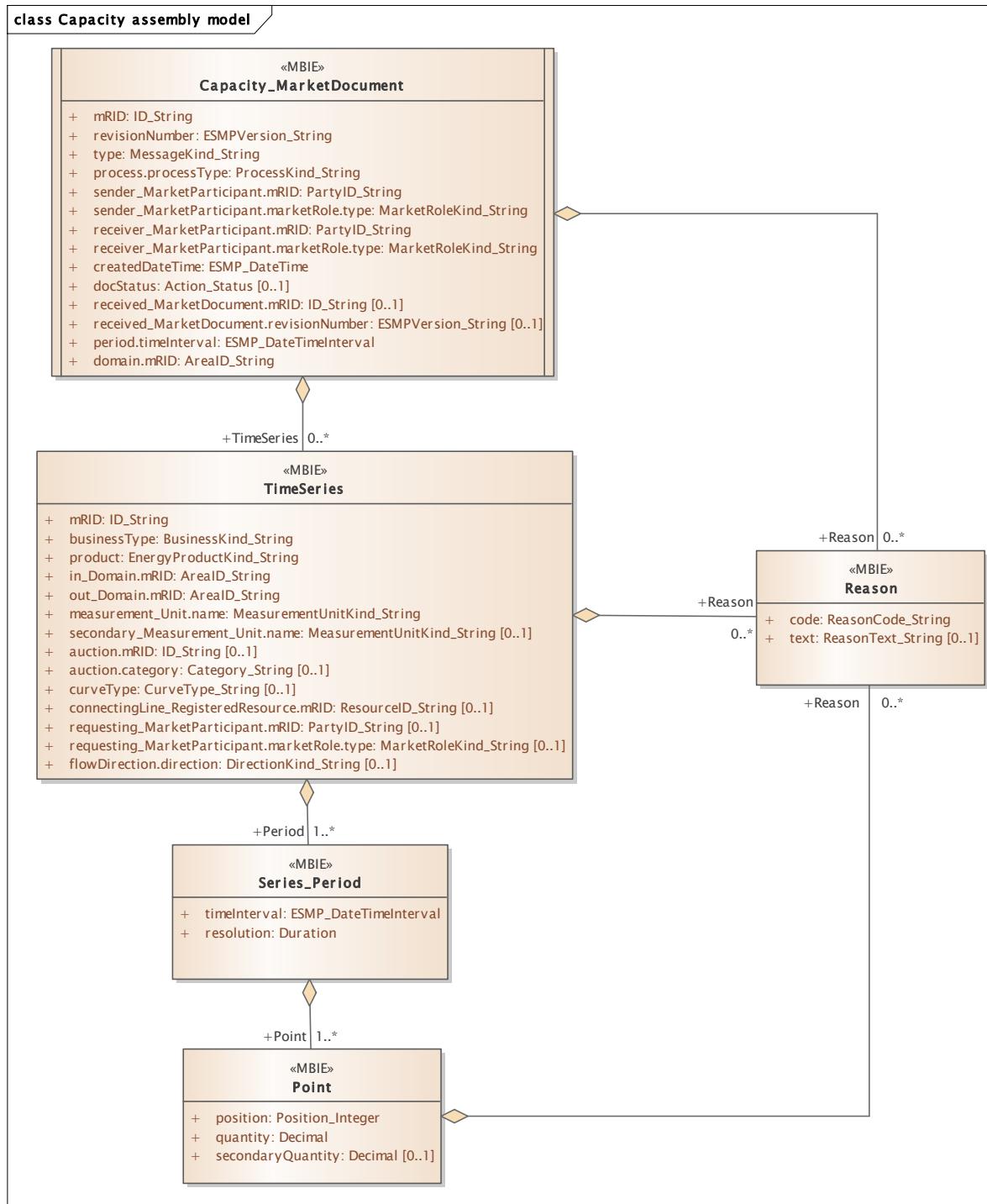
98

99 **Figure 2 - Capacity assembly model**

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.

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103
Table 2 - IsBasedOn dependency

Name	Complete IsBasedOn Path
Capacity_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 Capacity assembly model**

106 **2.2.3.1.   Capacity_MarketDocument root class**

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

109 The Capacity_MaketDocument enables the exchange of information related to transmission
110 capacity. These exchanges could be related to capacity determination or capacity allocation.
111 The values exchanged could be related to NTC, ATC, AAC, released AAC, offered capacity or
112 general capacity information.

113 Table 3 shows all attributes of Capacity_MarketDocument.

114 **Table 3 - Attributes of Capacity assembly model::Capacity_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.
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.
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]	received_MarketDocument.mRID ID_String	The unique identification of the document being exchanged within a business process flow. --- The identification of the received document. The identification of an electronic document that is related to an electronic document header

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Order	mult.	Attribute name / Attribute type	Description
11	[0..1]	received_MarketDocument.revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another. --- The identification of the received document. The identification of an electronic document that is related to an electronic document header
12	[1..1]	period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- The beginning and ending date and time of the period covered by the document.
13	[1..1]	domain.mRID AreaID_String	The unique identification of the domain. --- The domain covered within the Capacity_MarketDocument.

115

116   Table 4 shows all association ends of Capacity_MarketDocument with other classes.

117   **Table 4 - Association ends of Capacity assembly model::Capacity_MarketDocument**
118   **with other classes**

Order	mult.	Class name / Role	Description
14	[0..*]	TimeSeries TimeSeries	Association Based On: Capacity contextual model::TimeSeries.TimeSeries[0..*] ----- Capacity contextual model::Capacity_MarketDocument.[]
15	[0..*]	Reason Reason	Association Based On: Capacity contextual model::Reason.Reason[0..*] ----- Capacity contextual model::Capacity_MarketDocument.[]

119

120   **2.2.3.2.   Point**

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

122   Table 5 shows all attributes of Point.

123   **Table 5 - Attributes of Capacity 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]	quantity Decimal	The principal quantity identified for a point.
2	[0..1]	secondaryQuantity Decimal	The secondary quantity identified for a point.

124

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

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126   **Table 6 - Association ends of Capacity assembly model::Point with other classes**

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

127

128 **2.2.3.3.   Reason**

129 The motivation of an act.

130 Table 7 shows all attributes of Reason.

131   **Table 7 - Attributes of Capacity 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.

132

133 **2.2.3.4.   Series_Period**

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

135 Table 8 shows all attributes of Series_Period.

136   **Table 8 - Attributes of Capacity 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.

137

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

139   **Table 9 - Association ends of Capacity assembly model::Series_Period with other**
140   **classes**

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

141

142 **2.2.3.5.   TimeSeries**

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

144 Table 10 shows all attributes of TimeSeries.

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Table 10 - Attributes of Capacity 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]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The area where the energy is to be put.
4	[1..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The area where the energy is coming from.
5	[1..1]	measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure that is applied to the quantities in which the time series is expressed, e.g. MAW.
6	[0..1]	secondary_Measurement_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.
7	[0..1]	auction.mRID ID_String	The unique identification of the auction. --- The identification of a set of specifications created by the auction operator.
8	[0..1]	auction.category Category_String	The product category of an auction. --- The identification of a set of specifications created by the auction operator.
9	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
10	[0..1]	connectingLine_RegisteredResource.mRID ResourceID_String	The unique identification of a resource. --- The identification of a resource associated with a TimeSeries. The identification of a set of lines that connect two areas; the transmission capacity rights are related to this set of lines.
11	[0..1]	requesting_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The identification of a market participant associated with a TimeSeries.
12	[0..1]	requesting_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The identification of a market participant associated with a TimeSeries.
13	[0..1]	flowDirection.direction DirectionKind_String	The coded identification of the direction of energy flow. --- The flow direction associated with a TimeSeries.

146

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

148   **Table 11 - Association ends of Capacity assembly model::TimeSeries with other classes**

Order	mult.	Class name / Role	Description
14	[1..*]	Series_Period Period	Association Based On: Capacity contextual model::Series_Period.Period[1..*] ----- Capacity contextual model::TimeSeries.[]

Order	mult.	Class name / Role	Description
15	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: Capacity contextual model::Reason.Reason[0..*] ----- Capacity contextual model::TimeSeries.[]

149

2.2.4. Datatypes

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

152 • Action_Status compound

153 • ESMP_DateTimeInterval compound

154 • AreaID_String datatype, codelist CodingSchemeTypeList

155 • BusinessKind_String datatype, codelist BusinessTypeList

156 • Category_String datatype, codelist CategoryTypeList

157 • CurveType_String datatype, codelist CurveTypeList

158 • DirectionKind_String datatype, codelist DirectionTypeList

159 • EnergyProductKind_String datatype, codelist EnergyProductTypeList

160 • ESMP_DateTime datatype

161 • ESMPVersion_String datatype

162 • ID_String datatype

163 • MarketRoleKind_String datatype, codelist RoleTypeList

164 • MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList

165 • MessageKind_String datatype, codelist MessageTypeList

166 • PartyID_String datatype, codelist CodingSchemeTypeList

167 • Position_Integer datatype

168 • ProcessKind_String datatype, codelist ProcessTypeList

169 • ReasonCode_String datatype, codelist ReasonCodeTypeList

170 • ReasonText_String datatype

171 • ResourceID_String datatype, codelist CodingSchemeTypeList

172 • Status_String datatype, codelist StatusTypeList

173 • YMDHM_DateTime datatype

174

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175   **2.3.   Capacity_MarketDocument XML schema**

176   **2.3.1.   Capacity_MarketDocument XML schema structure**

177   Figure 3 provides the structure of the schema.
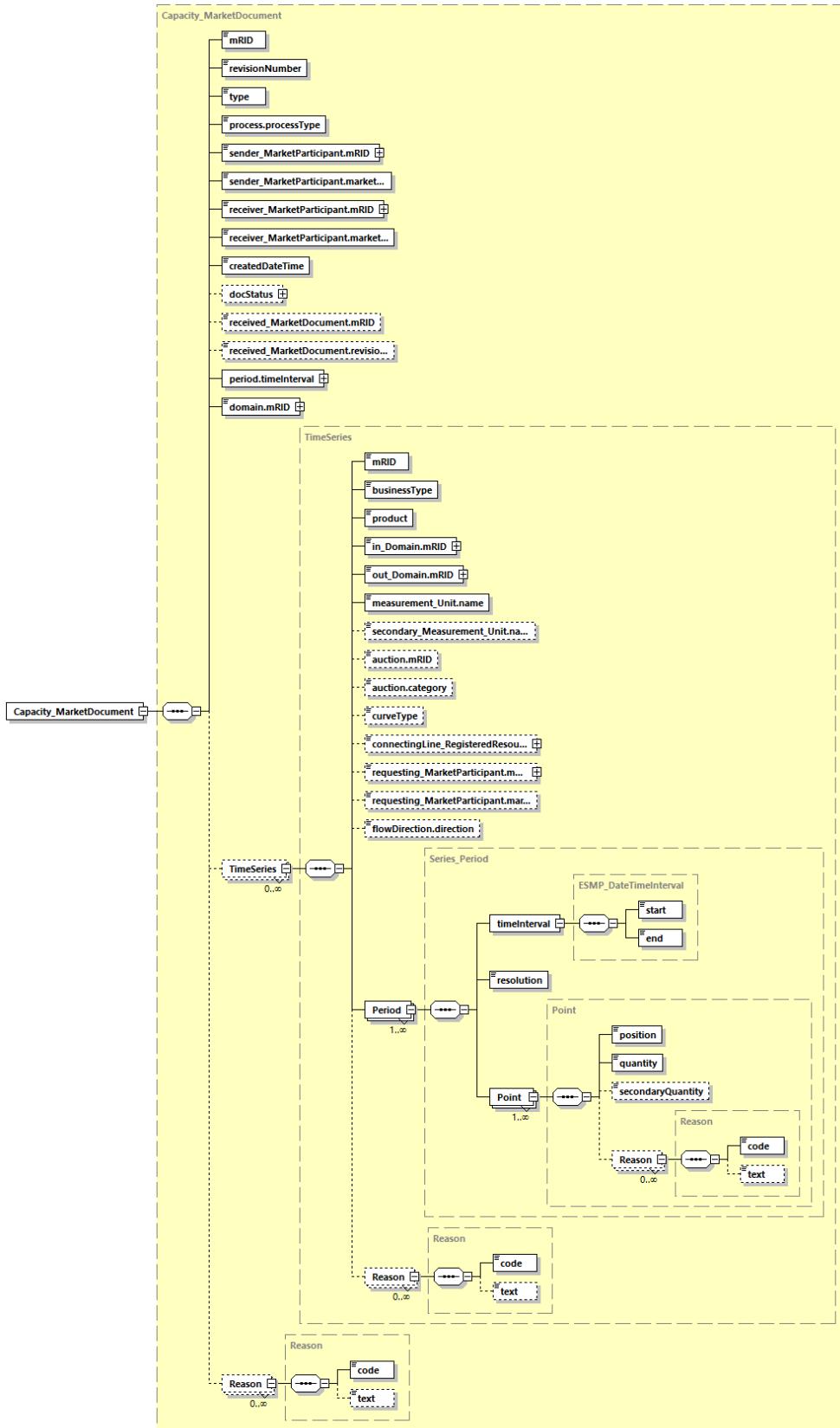
178

Generated by XMLSpy   www.altova.com

179   **Figure 3 - Capacity_MarketDocument schema structure**

180 **2.3.2.   Capacity_MarketDocument XML schema**

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

182 urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:3

```
183 <?xml version="1.0" encoding="utf-8"?>
184 <xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
185 xmlns="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:3"
186 xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
187 xmlns:cimp="http://www.iec.ch/cimprofile"
188 xmlns:xs="http://www.w3.org/2001/XMLSchema"
189 targetNamespace="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:3"
190 elementFormDefault="qualified" attributeFormDefault="unqualified">
191         <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
192 entsoe-eu-wgedi-codelists.xsd"/>
193         <xs:element name="Capacity_MarketDocument" type="Capacity_MarketDocument"/>
194         <xs:simpleType name="ID_String"
195 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
196                 <xs:restriction base="xs:string">
197                         <xs:maxLength value="60"/>
198                 </xs:restriction>
199         </xs:simpleType>
200         <xs:simpleType name="ESMPVersion_String"
201 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
202                 <xs:restriction base="xs:string">
203                         <xs:pattern value="[1-9]([0-9]){0,2}"/>
204                 </xs:restriction>
205         </xs:simpleType>
206         <xs:simpleType name="MessageKind_String"
207 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
208                 <xs:restriction base="ecl:MessageTypeList"/>
209         </xs:simpleType>
210         <xs:simpleType name="ProcessKind_String"
211 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
212                 <xs:restriction base="ecl:ProcessTypeList"/>
213         </xs:simpleType>
214         <xs:simpleType name="PartyID_String-base"
215 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
216                 <xs:restriction base="xs:string">
217                         <xs:maxLength value="16"/>
218                 </xs:restriction>
219         </xs:simpleType>
220         <xs:complexType name="PartyID_String"
221 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
222                 <xs:simpleContent>
223                         <xs:extension base="PartyID_String-base">
224                                 <xs:attribute name="codingScheme"
225 type="ecl:CodingSchemeTypeList" use="required"/>
226                         </xs:extension>
227                 </xs:simpleContent>
228         </xs:complexType>
229         <xs:simpleType name="MarketRoleKind_String"
230 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
231                 <xs:restriction base="ecl:RoleTypeList"/>
232         </xs:simpleType>
233         <xs:simpleType name="ESMP_DateTime"
234 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
235                 <xs:restriction base="xs:dateTime">
236                         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
237 9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
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243  9])Z)|((([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
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245  8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
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252                            <xs:maxLength value="18"/>
253                    </xs:restriction>
254            </xs:simpleType>
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257                    <xs:simpleContent>
258                            <xs:extension base="AreaID_String-base">
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260  type="ecl:CodingSchemeTypeList" use="required"/>
261                            </xs:extension>
262                    </xs:simpleContent>
263            </xs:complexType>
264            <xs:simpleType name="Status_String"
265  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
266                    <xs:restriction base="ecl:StatusTypeList"/>
267            </xs:simpleType>
268            <xs:complexType name="Action_Status"
269  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Status">
270                    <xs:sequence>
271                            <xs:element name="value" type="Status_String" minOccurs="1"
272  maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
273  cim16#Status.value"/>
274                    </xs:sequence>
275            </xs:complexType>
276            <xs:simpleType name="YMDHM_DateTime"
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278                    <xs:restriction base="xs:string">
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290                    </xs:restriction>
291            </xs:simpleType>
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293  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
294                    <xs:sequence>
295                            <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
296  maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
297  cim16#DateTimeInterval.start"/>
```

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

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357     <xs:element name="Reason" type="Reason" minOccurs="0"
358 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
359 cim16#MarketDocument.Reason"/>
360         </xs:sequence>
361     </xs:complexType>
362     <xs:simpleType name="Position_Integer"
363 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
364         <xs:restriction base="xs:integer">
365             <xs:maxInclusive value="999999"/>
366             <xs:minInclusive value="1"/>
367         </xs:restriction>
368     </xs:simpleType>
369     <xs:complexType name="Point"
370 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
371         <xs:sequence>
372             <xs:element name="position" type="Position_Integer"
373 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
374 schema-cim16#Point.position"/>
375             <xs:element name="quantity" type="xs:decimal" minOccurs="1"
376 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
377 cim16#Point.quantity"/>
378             <xs:element name="secondaryQuantity" type="xs:decimal"
379 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
380 schema-cim16#Point.secondaryQuantity"/>
381             <xs:element name="Reason" type="Reason" minOccurs="0"
382 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
383 cim16#Point.Reason"/>
384         </xs:sequence>
385     </xs:complexType>
386     <xs:simpleType name="ReasonCode_String"
387 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
388         <xs:restriction base="ecl:ReasonCodeTypeList"/>
389     </xs:simpleType>
390     <xs:simpleType name="ReasonText_String"
391 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
392         <xs:restriction base="xs:string">
393             <xs:maxLength value="512"/>
394         </xs:restriction>
395     </xs:simpleType>
396     <xs:complexType name="Reason"
397 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
398         <xs:sequence>
399             <xs:element name="code" type="ReasonCode_String" minOccurs="1"
400 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
401 cim16#Reason.code"/>
402             <xs:element name="text" type="ReasonText_String" minOccurs="0"
403 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
404 cim16#Reason.text"/>
405         </xs:sequence>
406     </xs:complexType>
407     <xs:complexType name="Series_Period"
408 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
409         <xs:sequence>
410             <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
411 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
412 schema-cim16#Period.timeInterval"/>
413             <xs:element name="resolution" type="xs:duration" minOccurs="1"
414 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
415 cim16#Period.resolution"/>
```

```
416                    <xs:element name="Point" type="Point" minOccurs="1"
417  maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
418  cim16#Period.Point"/>
419                </xs:sequence>
420            </xs:complexType>
421            <xs:simpleType name="BusinessKind_String"
422  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
423                <xs:restriction base="ecl:BusinessTypeList"/>
424            </xs:simpleType>
425            <xs:simpleType name="EnergyProductKind_String"
426  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
427                <xs:restriction base="ecl:EnergyProductTypeList"/>
428            </xs:simpleType>
429            <xs:simpleType name="MeasurementUnitKind_String"
430  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
431                <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
432            </xs:simpleType>
433            <xs:simpleType name="Category_String"
434  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
435                <xs:restriction base="ecl:CategoryTypeList"/>
436            </xs:simpleType>
437            <xs:simpleType name="CurveType_String"
438  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
439                <xs:restriction base="ecl:CurveTypeList"/>
440            </xs:simpleType>
441            <xs:simpleType name="ResourceID_String-base"
442  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
443                <xs:restriction base="xs:string">
444                    <xs:maxLength value="60"/>
445                </xs:restriction>
446            </xs:simpleType>
447            <xs:complexType name="ResourceID_String"
448  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
449                <xs:simpleContent>
450                    <xs:extension base="ResourceID_String-base">
451                        <xs:attribute name="codingScheme"
452  type="ecl:CodingSchemeTypeList" use="required"/>
453                    </xs:extension>
454                </xs:simpleContent>
455            </xs:complexType>
456            <xs:simpleType name="DirectionKind_String"
457  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
458                <xs:restriction base="ecl:DirectionTypeList"/>
459            </xs:simpleType>
460            <xs:complexType name="TimeSeries"
461  sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
462                <xs:sequence>
463                    <xs:element name="mRID" type="ID_String" minOccurs="1"
464  maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
465  cim16#IdentifiedObject.mRID"/>
466                    <xs:element name="businessType" type="BusinessKind_String"
467  minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
468  schema-cim16#TimeSeries.businessType"/>
469                    <xs:element name="product" type="EnergyProductKind_String"
470  minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
471  schema-cim16#TimeSeries.product"/>
472                    <xs:element name="in_Domain.mRID" type="AreaID_String"
473  minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
474  schema-cim16#IdentifiedObject.mRID"/>
```

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475                         <xs:element name="out_Domain.mRID" type="AreaID_String"
476     minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
477     schema-cim16#IdentifiedObject.mRID"/>
478                         <xs:element name="measurement_Unit.name"
479     type="MeasurementUnitKind_String" minOccurs="1" maxOccurs="1"
480     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
481                         <xs:element name="secondary_Measurement_Unit.name"
482     type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"
483     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
484                         <xs:element name="auction.mRID" type="ID_String" minOccurs="0"
485     maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
486     cim16#IdentifiedObject.mRID"/>
487                         <xs:element name="auction.category" type="Category_String"
488     minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
489     schema-cim16#Auction.category"/>
490                         <xs:element name="curveType" type="CurveType_String"
491     minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
492     schema-cim16#TimeSeries.curveType"/>
493                         <xs:element name="connectingLine_RegisteredResource.mRID"
494     type="ResourceID_String" minOccurs="0" maxOccurs="1"
495     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
496     cim16#IdentifiedObject.mRID"/>
497                         <xs:element name="requesting_MarketParticipant.mRID"
498     type="PartyID_String" minOccurs="0" maxOccurs="1"
499     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
500     cim16#IdentifiedObject.mRID"/>
501                         <xs:element name="requesting_MarketParticipant.marketRole.type"
502     type="MarketRoleKind_String" minOccurs="0" maxOccurs="1"
503     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
504                         <xs:element name="flowDirection.direction"
505     type="DirectionKind_String" minOccurs="0" maxOccurs="1"
506     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
507     cim16#FlowDirection.direction"/>
508                         <xs:element name="Period" type="Series_Period" minOccurs="1"
509     maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
510     cim16#TimeSeries.Period"/>
511                         <xs:element name="Reason" type="Reason" minOccurs="0"
512     maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
513     cim16#TimeSeries.Reason"/>
514                 </xs:sequence>
515         </xs:complexType>
516     </xs:schema>
517
```