



European Network of
Transmission System Operators
for Electricity

**PLANNED RESOURCE SCHEDULE
DOCUMENT
UML MODEL AND SCHEMA**

2022-09-06
AGREED DOCUMENT
VERSION 1.3

2

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68

Revision History

Version	Release	Date	Comments
0	1	2019-01-14	First draft of the document.
1	0	2019-02-12	Approved by MC.
1	1	2020-11-04	Updates in Planned Resource Schedule Document version 6.1: <ul style="list-style-type: none"> • A reason class is linked to Timeseries with 0..* cardinality • A MktPSRType class is linked to Timeseries with 0..1 cardinality. Approved by MC.
1	2	2021-09-15	Updates in planned resource schedule document XSD v6.2: An optional curveType attribute was added to Timeseries class. Approved by MC.
1	3	2022-09-06	Updates in planned resource schedule document XSD v6.3: Optional registeredResource.mRID, substituteResourceProvider_MarketRole.type and substituteRegisteredResource.mRID were added in UnavailableReserve_Timeseries. Agreed by CIM EG.

69

70 **1. Objective**

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

73 The schema of the PlannedResourceSchedule_MarketDocument could be used in various
74 business processes.

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

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

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

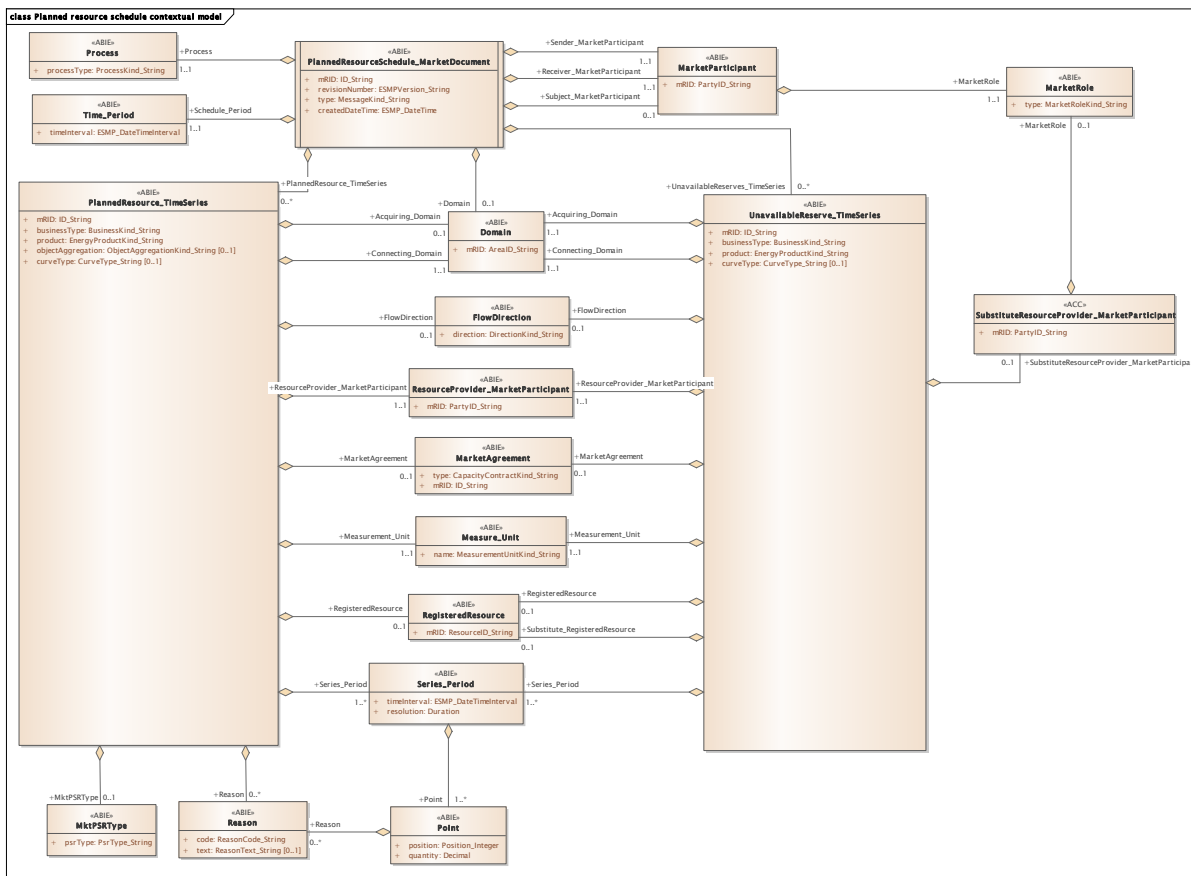
87

88 **2. PlannedResourceSchedule_MarketDocument**

89 **2.1. Planned resource schedule contextual model**

90 **2.1.1. Overview of the model**

91 Figure 1 shows the model.



92

93

Figure 1 - Planned resource schedule contextual model

94

95 **2.1.2. IsBasedOn relationships from the European style market profile**

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

98

Table 1 - IsBasedOn dependency

Name	Complete IsBasedOn Path
Domain	TC57CIM::IEC62325::MarketManagement::Domain
FlowDirection	TC57CIM::IEC62325::MarketManagement::FlowDirection
MarketAgreement	TC57CIM::IEC62325::MarketManagement::MarketAgreement
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MktPSRType	TC57CIM::IEC62325::MarketManagement::MktPSRType
PlannedResource_TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries
PlannedResourceSchedule_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Point	TC57CIM::IEC62325::MarketManagement::Point
Process	TC57CIM::IEC62325::MarketManagement::Process
Reason	TC57CIM::IEC62325::MarketManagement::Reason
RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
ResourceProvider_MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
SubstituteResourceProvider_MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
UnavailableReserve_TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

99

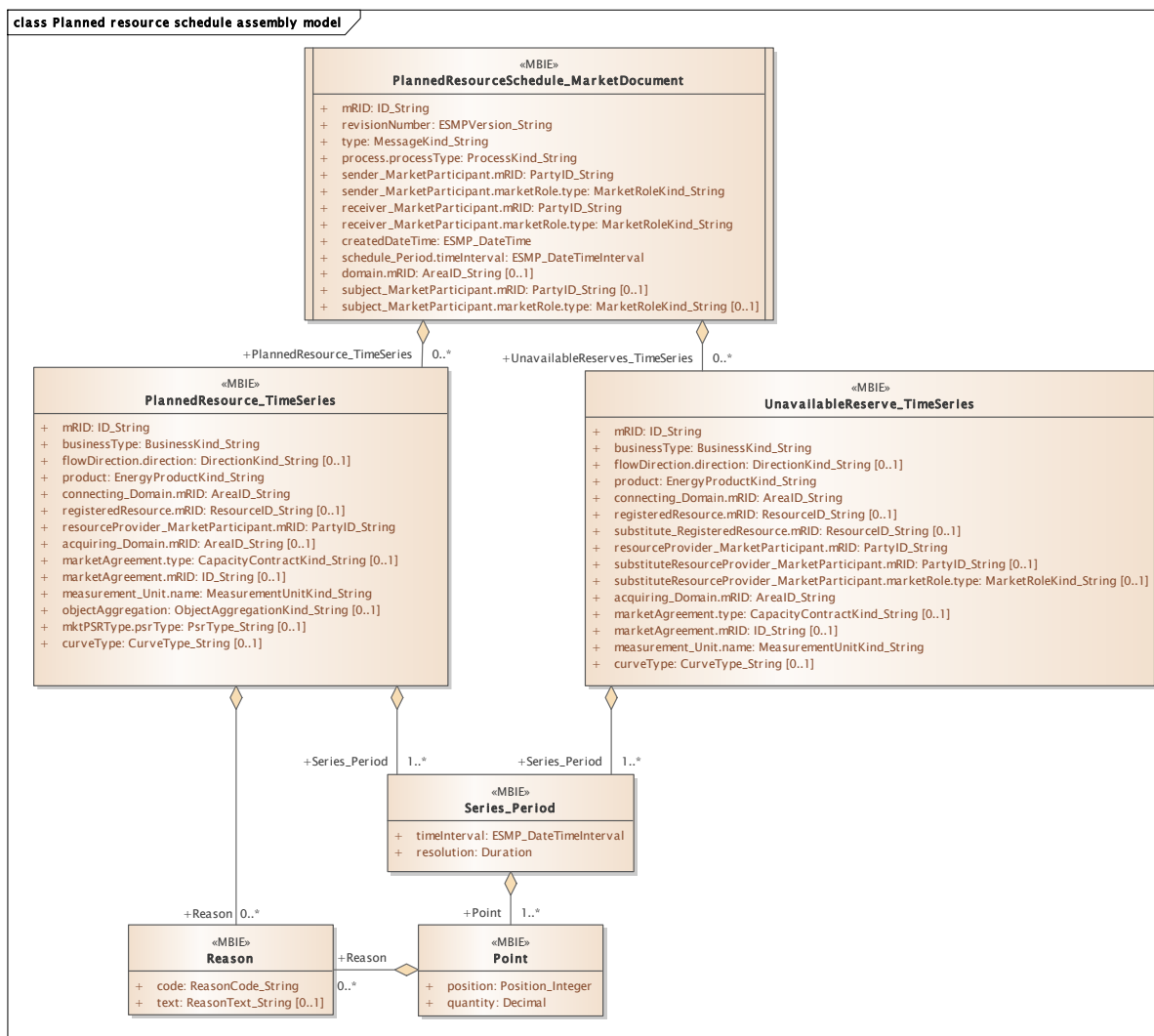
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101

102 **2.2. Planned resource schedule assembly model**

103 **2.2.1. Overview of the model**

104 Figure 2 shows the model.



105

106 **Figure 2 - Planned resource schedule assembly model**

107

108

109 **2.2.2. IsBasedOn relationships from the European style market profile**

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

112

Table 2 - IsBasedOn dependency

Name	Complete IsBasedOn Path
PlannedResource_TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries
PlannedResourceSchedule_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Point	TC57CIM::IEC62325::MarketManagement::Point
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
UnavailableReserve_TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

113

114 **2.2.3. Detailed Planned resource schedule assembly model**

115 **2.2.3.1. PlannedResourceSchedule_MarketDocument root class**

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

118 Table 3 shows all attributes of PlannedResourceSchedule_MarketDocument.

119

**Table 3 - Attributes of Planned resource schedule assembly
model::PlannedResourceSchedule_MarketDocument**

120

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. --- The process dealt with in the document.
4	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document owner.
5	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The 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. --- The document recipient.
7	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The 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	[1..1]	schedule_Period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.

Order	mult.	Attribute name / Attribute type	Description
10	[0..1]	domain.mRID AreaID_String	The unique identification of the domain. --- The Domain associated with an electronic document header.
11	[0..1]	subject_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The party that is the subject of the documents time series.
12	[0..1]	subject_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The party that is the subject of the documents time series. --- The role associated with a MarketParticipant.

121

122 Table 4 shows all association ends of PlannedResourceSchedule_MarketDocument with other
123 classes.

124 **Table 4 - Association ends of Planned resource schedule assembly**
125 **model::PlannedResourceSchedule_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
13	[0..*]	PlannedResource_TimeSeries PlannedResource_TimeSeries	The planned resource schedule time series. MXM to be detailed. Association Based On: Planned resource schedule contextual model::PlannedResourceSchedule_MarketDocument.[] ----- Planned resource schedule contextual model::PlannedResource_TimeSeries.PlannedResource_TimeSeries[0..*]
14	[0..*]	UnavailableReserve_TimeSeries UnavailableReserves_TimeSeries	The time series that is associated with an electronic document. mxm TO BE DETAILED Association Based On: Planned resource schedule contextual model::PlannedResourceSchedule_MarketDocument.[] ----- Planned resource schedule contextual model::UnavailableReserve_TimeSeries.UnavailableReserves_TimeSeries[0..*]

126

127 2.2.3.2. PlannedResource_TimeSeries

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

129 Table 5 shows all attributes of PlannedResource_TimeSeries.

130 **Table 5 - Attributes of Planned resource schedule assembly**
131 **model::PlannedResource_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]	flowDirection.direction DirectionKind_String	The coded identification of the direction of energy flow. --- The flow direction associated with a TimeSeries.
3	[1..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.

Order	mult.	Attribute name / Attribute type	Description
4	[1..1]	connecting_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
5	[0..1]	registeredResource.mRID ResourceID_String	The unique identification of a resource. --- The identification of a resource associated with a TimeSeries.
6	[1..1]	resourceProvider_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The identification of a market participant associated with a TimeSeries.
7	[0..1]	acquiring_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
8	[0..1]	marketAgreement.type CapacityContractKind_String	The specification of the kind of the agreement, e.g. long term, daily contract. --- The identification of an agreement associated with a TimeSeries.
9	[0..1]	marketAgreement.mRID ID_String	The unique identification of the agreement. --- The identification of an agreement associated with a TimeSeries.
10	[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 associated with the quantities in a TimeSeries.
11	[0..1]	objectAggregation ObjectAggregationKind_String	The identification of the domain that is the common denominator used to aggregate a time series.
12	[0..1]	mktPSRType.psrType PsrType_String	The coded type of a power system resource. --- The identification of the type of resource associated with a TimeSeries.
13	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.

132

133 Table 6 shows all association ends of PlannedResource_TimeSeries with other classes.

134 **Table 6 - Association ends of Planned resource schedule assembly**
135 **model::PlannedResource_TimeSeries with other classes**

Order	mult.	Class name / Role	Description
14	[1..*]	Series_Period Series_Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: Planned resource schedule contextual model::PlannedResource_TimeSeries.[] ----- Planned resource schedule contextual model::Series_Period.Series_Period[1..*]
15	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: Planned resource schedule contextual model::Reason.Reason[0..*] ----- Planned resource schedule contextual model::PlannedResource_TimeSeries.[]

136

137 **2.2.3.3. Point**

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

139 Table 7 shows all attributes of Point.

140 **Table 7 - Attributes of Planned resource schedule 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.

141

142 Table 8 shows all association ends of Point with other classes.

143 **Table 8 - Association ends of Planned resource schedule assembly model::Point with**
144 **other classes**

Order	mult.	Class name / Role	Description
4	[0..*]	Reason Reason	The Reason information associated with a Point providing motivation information. Association Based On: Planned resource schedule contextual model::Point.[] ----- Planned resource schedule contextual model::Reason.Reason[0..*]

145

146 2.2.3.4. Reason

147 The motivation of an act.

148 Table 9 shows all attributes of Reason.

149 **Table 9 - Attributes of Planned resource schedule 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.

150

151 2.2.3.5. Series_Period

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

153 Table 10 shows all attributes of Series_Period.

154 **Table 10 - Attributes of Planned resource schedule 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.

155

156 Table 11 shows all association ends of Series_Period with other classes.

157
158

**Table 11 - Association ends of Planned resource schedule assembly
model::Series_Period with other 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: Planned resource schedule contextual model::Series_Period.[] ----- Planned resource schedule contextual model::Point.Point[1..*]

159

160 **2.2.3.6. UnavailableReserve_TimeSeries**

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

162 Table 12 shows all attributes of UnavailableReserve_TimeSeries.

163 **Table 12 - Attributes of Planned resource schedule assembly**
164 **model::UnavailableReserve_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]	flowDirection.direction DirectionKind_String	The coded identification of the direction of energy flow. --- The flow direction associated with a TimeSeries.
3	[1..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.
4	[1..1]	connecting_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
5	[0..1]	registeredResource.mRID ResourceID_String	The unique identification of a resource. --- The identification of a resource associated with a TimeSeries.
6	[0..1]	substitute_RegisteredResource.mRID ResourceID_String	The unique identification of a resource. --- The identification of a resource associated with a TimeSeries.
7	[1..1]	resourceProvider_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The identification of a market participant associated with a TimeSeries.

Order	mult.	Attribute name / Attribute type	Description
8	[0..1]	substituteResourceProvider_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. --- The identification of a market participant associated with a TimeSeries.
9	[0..1]	substituteResourceProvider_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. --- The role associated with a MarketParticipant.
10	[1..1]	acquiring_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
11	[0..1]	marketAgreement.type CapacityContractKind_String	The specification of the kind of the agreement, e.g. long term, daily contract. --- The identification of an agreement associated with a TimeSeries.
12	[0..1]	marketAgreement.mRID ID_String	The unique identification of the agreement. --- The identification of an agreement associated with a TimeSeries.
13	[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 associated with the quantities in a TimeSeries.
14	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.

165

166 Table 13 shows all association ends of UnavailableReserve_TimeSeries with other classes.

167 **Table 13 - Association ends of Planned resource schedule assembly**
168 **model::UnavailableReserve_TimeSeries with other classes**

Order	mult.	Class name / Role	Description
15	[1..*]	Series_Period Series_Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: Planned resource schedule contextual model::UnavailableReserve_TimeSeries.[] ----- Planned resource schedule contextual model::Series_Period.Series_Period[1..*]

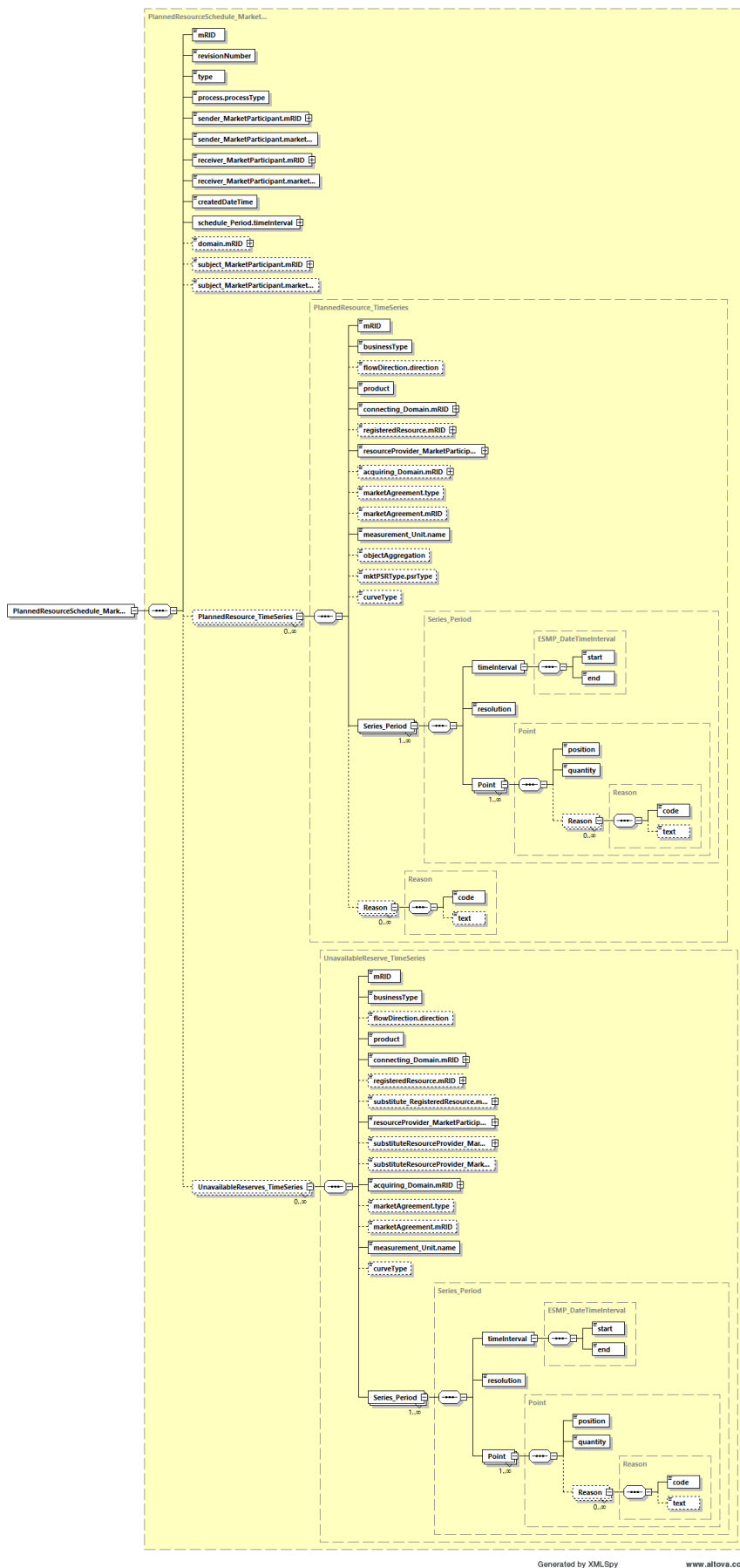
169

170 **2.2.4. Datatypes**

171 The list of datatypes used for the Planned resource schedule assembly model is as follows:

- 172 • ESMP_DateTimeInterval compound
- 173 • AreaID_String datatype, codelist CodingSchemeTypeList
- 174 • BusinessKind_String datatype, codelist BusinessTypeList
- 175 • CapacityContractKind_String datatype, codelist ContractTypeList
- 176 • CurveType_String datatype, codelist CurveTypeList
- 177 • DirectionKind_String datatype, codelist DirectionTypeList
- 178 • EnergyProductKind_String datatype, codelist EnergyProductTypeList
- 179 • ESMP_DateTime datatype
- 180 • ESMPVersion_String datatype
- 181 • ID_String datatype
- 182 • MarketRoleKind_String datatype, codelist RoleTypeList
- 183 • MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- 184 • MessageKind_String datatype, codelist MessageTypeList
- 185 • ObjectAggregationKind_String datatype, codelist ObjectAggregationTypeList
- 186 • PartyID_String datatype, codelist CodingSchemeTypeList
- 187 • Position_Integer datatype
- 188 • ProcessKind_String datatype, codelist ProcessTypeList
- 189 • PsrType_String datatype, codelist AssetTypeList
- 190 • ReasonCode_String datatype, codelist ReasonCodeTypeList
- 191 • ReasonText_String datatype
- 192 • ResourceID_String datatype, codelist CodingSchemeTypeList
- 193 • YMDHM_DateTime datatype
- 194

195 2.2.5. PlannedResourceSchedule_MarketDocument XML schema structure



196
 197

Figure 3 - PlannedResourceSchedule_MarketDocument schema structure

198 2.2.6. PlannedResourceSchedule_MarketDocument XML schema

199

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

201 urn:iec62325.351:tc57wg16:451-7:plannedresourcescheduledocument:6:3

```
202 <?xml version="1.0" encoding="utf-8"?>
203 <xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
204 xmlns="urn:iec62325.351:tc57wg16:451-7:plannedresourcescheduledocument:6:3"
205 xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
206 xmlns:cimp="http://www.iec.ch/cimprofile"
207 xmlns:xs="http://www.w3.org/2001/XMLSchema"
208 targetNamespace="urn:iec62325.351:tc57wg16:451-
209 7:plannedresourcescheduledocument:6:3" elementFormDefault="qualified"
210 attributeFormDefault="unqualified">
211   <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
212 entsoe-eu-wgedi-codelists.xsd"/>
213   <xs:element name="PlannedResourceSchedule_MarketDocument"
214 type="PlannedResourceSchedule_MarketDocument"/>
215   <xs:simpleType name="ID_String"
216 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
217     <xs:restriction base="xs:string">
218       <xs:maxLength value="60"/>
219     </xs:restriction>
220   </xs:simpleType>
221   <xs:simpleType name="BusinessKind_String"
222 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
223     <xs:restriction base="ecl:BusinessTypeList"/>
224   </xs:simpleType>
225   <xs:simpleType name="DirectionKind_String"
226 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
227     <xs:restriction base="ecl:DirectionTypeList"/>
228   </xs:simpleType>
229   <xs:simpleType name="EnergyProductKind_String"
230 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
231     <xs:restriction base="ecl:EnergyProductTypeList"/>
232   </xs:simpleType>
233   <xs:simpleType name="AreaID_String-base"
234 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
235     <xs:restriction base="xs:string">
236       <xs:maxLength value="18"/>
237     </xs:restriction>
238   </xs:simpleType>
239   <xs:complexType name="AreaID_String"
240 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
241     <xs:simpleContent>
242       <xs:extension base="AreaID_String-base">
243         <xs:attribute name="codingScheme"
244 type="ecl:CodingSchemeTypeList" use="required"/>
245       </xs:extension>
246     </xs:simpleContent>
247   </xs:complexType>
248   <xs:simpleType name="ResourceID_String-base"
249 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
250     <xs:restriction base="xs:string">
251       <xs:maxLength value="60"/>
252     </xs:restriction>
253   </xs:simpleType>
```

```
254     <xs:complexType name="ResourceID_String"
255 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
256     <xs:simpleContent>
257         <xs:extension base="ResourceID_String-base">
258             <xs:attribute name="codingScheme"
259 type="ecl:CodingSchemeTypeList" use="required"/>
260         </xs:extension>
261     </xs:simpleContent>
262 </xs:complexType>
263 <xs:simpleType name="PartyID_String-base"
264 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
265     <xs:restriction base="xs:string">
266         <xs:maxLength value="16"/>
267     </xs:restriction>
268 </xs:simpleType>
269 <xs:complexType name="PartyID_String"
270 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
271     <xs:simpleContent>
272         <xs:extension base="PartyID_String-base">
273             <xs:attribute name="codingScheme"
274 type="ecl:CodingSchemeTypeList" use="required"/>
275         </xs:extension>
276     </xs:simpleContent>
277 </xs:complexType>
278 <xs:simpleType name="CapacityContractKind_String"
279 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
280     <xs:restriction base="ecl:ContractTypeList"/>
281 </xs:simpleType>
282 <xs:simpleType name="MeasurementUnitKind_String"
283 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
284     <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
285 </xs:simpleType>
286 <xs:simpleType name="ObjectAggregationKind_String"
287 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
288     <xs:restriction base="ecl:ObjectAggregationTypeList"/>
289 </xs:simpleType>
290 <xs:simpleType name="PsrType_String"
291 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
292     <xs:restriction base="ecl:AssetTypeList"/>
293 </xs:simpleType>
294 <xs:simpleType name="CurveType_String"
295 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
296     <xs:restriction base="ecl:CurveTypeList"/>
297 </xs:simpleType>
298 <xs:complexType name="PlannedResource_TimeSeries"
299 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
300     <xs:sequence>
301         <xs:element name="mRID" type="ID_String" minOccurs="1"
302 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
303 cim16#IdentifiedObject.mRID"/>
304         <xs:element name="businessType" type="BusinessKind_String"
305 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
306 schema-cim16#TimeSeries.businessType"/>
307         <xs:element name="flowDirection.direction"
308 type="DirectionKind_String" minOccurs="0" maxOccurs="1"
309 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
310 cim16#FlowDirection.direction"/>
311         <xs:element name="product" type="EnergyProductKind_String"
312 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
313 schema-cim16#TimeSeries.product"/>
```

```
314         <xs:element name="connecting_Domain.mRID" type="AreaID_String"
315 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
316 schema-cim16#IdentifiedObject.mRID"/>
317         <xs:element name="registeredResource.mRID"
318 type="ResourceID_String" minOccurs="0" maxOccurs="1"
319 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
320 cim16#IdentifiedObject.mRID"/>
321         <xs:element name="resourceProvider_MarketParticipant.mRID"
322 type="PartyID_String" minOccurs="1" maxOccurs="1"
323 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
324 cim16#IdentifiedObject.mRID"/>
325         <xs:element name="acquiring_Domain.mRID" type="AreaID_String"
326 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
327 schema-cim16#IdentifiedObject.mRID"/>
328         <xs:element name="marketAgreement.type"
329 type="CapacityContractKind_String" minOccurs="0" maxOccurs="1"
330 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>
331         <xs:element name="marketAgreement.mRID" type="ID_String"
332 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
333 schema-cim16#IdentifiedObject.mRID"/>
334         <xs:element name="measurement_Unit.name"
335 type="MeasurementUnitKind_String" minOccurs="1" maxOccurs="1"
336 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
337         <xs:element name="objectAggregation"
338 type="ObjectAggregationKind_String" minOccurs="0" maxOccurs="1"
339 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
340 cim16#TimeSeries.objectAggregation"/>
341         <xs:element name="mktPSRType.psrType" type="PsrType_String"
342 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
343 schema-cim16#MktPSRType.psrType"/>
344         <xs:element name="curveType" type="CurveType_String"
345 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
346 schema-cim16#TimeSeries.curveType"/>
347         <xs:element name="Series_Period" type="Series_Period"
348 minOccurs="1" maxOccurs="unbounded"
349 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
350 cim16#TimeSeries.Series_Period"/>
351         <xs:element name="Reason" type="Reason" minOccurs="0"
352 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
353 cim16#TimeSeries.Reason"/>
354     </xs:sequence>
355 </xs:complexType>
356 <xs:simpleType name="ESMPVersion_String"
357 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
358     <xs:restriction base="xs:string">
359         <xs:pattern value="[1-9]([0-9]){0,2}"/>
360     </xs:restriction>
361 </xs:simpleType>
362 <xs:simpleType name="MessageKind_String"
363 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
364     <xs:restriction base="ecl:MessageTypeList"/>
365 </xs:simpleType>
366 <xs:simpleType name="ProcessKind_String"
367 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
368     <xs:restriction base="ecl:ProcessTypeList"/>
369 </xs:simpleType>
370 <xs:simpleType name="MarketRoleKind_String"
371 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
372     <xs:restriction base="ecl:RoleTypeList"/>
373 </xs:simpleType>
```

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374     <xs:simpleType name="ESMP_DateTime"
375 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
376     <xs:restriction base="xs:dateTime">
377         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
378 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
379 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
380 9])Z)|(((13579)[26][02468][048]|13579[01345789](0)[48]|13579[01345789][2468][0
381 48]|02468[048][02468][048]|02468[1235679](0)[48]|02468[1235679][2468][048]|[
382 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
383 5][0-9]:[0-5][0-
384 9])Z)|(((13579)[26][02468][1235679]|13579[01345789](0)[01235679]|13579[0134578
385 9][2468][1235679]|02468[048][02468][1235679]|02468[1235679](0)[01235679]|0246
386 8[1235679][2468][1235679]|0-9[0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
387 9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
388     </xs:restriction>
389     </xs:simpleType>
390     <xs:simpleType name="YMDHM_DateTime"
391 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
392     <xs:restriction base="xs:string">
393         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
394 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
395 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-
396 9])Z)|(((13579)[26][02468][048]|13579[01345789](0)[48]|13579[01345789][2468][0
397 48]|02468[048][02468][048]|02468[1235679](0)[48]|02468[1235679][2468][048]|[
398 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
399 5][0-
400 9])Z)|(((13579)[26][02468][1235679]|13579[01345789](0)[01235679]|13579[0134578
401 9][2468][1235679]|02468[048][02468][1235679]|02468[1235679](0)[01235679]|0246
402 8[1235679][2468][1235679]|0-9[0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
403 9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9])Z)"/>
404     </xs:restriction>
405     </xs:simpleType>
406     <xs:complexType name="ESMP_DateTimeInterval"
407 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
408     <xs:sequence>
409         <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
410 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
411 cim16#DateTimeInterval.start"/>
412         <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
413 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
414 cim16#DateTimeInterval.end"/>
415     </xs:sequence>
416     </xs:complexType>
417     <xs:complexType name="PlannedResourceSchedule_MarketDocument"
418 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
419     <xs:sequence>
420         <xs:element name="mRID" type="ID_String" minOccurs="1"
421 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
422 cim16#IdentifiedObject.mRID"/>
423         <xs:element name="revisionNumber" type="ESMPVersion_String"
424 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
425 schema-cim16#Document.revisionNumber"/>
426         <xs:element name="type" type="MessageKind_String" minOccurs="1"
427 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
428 cim16#Document.type"/>
429         <xs:element name="process.processType"
430 type="ProcessKind_String" minOccurs="1" maxOccurs="1"
431 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
432 cim16#Process.processType"/>

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433         <xs:element name="sender_MarketParticipant.mRID"
434 type="PartyID_String" minOccurs="1" maxOccurs="1"
435 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
436 cim16#IdentifiedObject.mRID"/>
437         <xs:element name="sender_MarketParticipant.marketRole.type"
438 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
439 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
440         <xs:element name="receiver_MarketParticipant.mRID"
441 type="PartyID_String" minOccurs="1" maxOccurs="1"
442 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
443 cim16#IdentifiedObject.mRID"/>
444         <xs:element name="receiver_MarketParticipant.marketRole.type"
445 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
446 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
447         <xs:element name="createdDateTime" type="ESMP_DateTime"
448 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
449 schema-cim16#Document.createdDateTime"/>
450         <xs:element name="schedule_Period.timeInterval"
451 type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
452 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
453 cim16#Period.timeInterval"/>
454         <xs:element name="domain.mRID" type="AreaID_String"
455 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
456 schema-cim16#IdentifiedObject.mRID"/>
457         <xs:element name="subject_MarketParticipant.mRID"
458 type="PartyID_String" minOccurs="0" maxOccurs="1"
459 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
460 cim16#IdentifiedObject.mRID"/>
461         <xs:element name="subject_MarketParticipant.marketRole.type"
462 type="MarketRoleKind_String" minOccurs="0" maxOccurs="1"
463 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
464         <xs:element name="PlannedResource_TimeSeries"
465 type="PlannedResource_TimeSeries" minOccurs="0" maxOccurs="unbounded"
466 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
467 cim16#MarketDocument.PlannedResource_TimeSeries"/>
468         <xs:element name="UnavailableReserves_TimeSeries"
469 type="UnavailableReserve_TimeSeries" minOccurs="0" maxOccurs="unbounded"
470 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
471 cim16#MarketDocument.UnavailableReserves_TimeSeries"/>
472     </xs:sequence>
473 </xs:complexType>
474 <xs:simpleType name="Position_Integer"
475 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
476     <xs:restriction base="xs:integer">
477         <xs:maxInclusive value="999999"/>
478         <xs:minInclusive value="1"/>
479     </xs:restriction>
480 </xs:simpleType>
481 <xs:complexType name="Point"
482 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
483     <xs:sequence>
484         <xs:element name="position" type="Position_Integer"
485 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
486 schema-cim16#Point.position"/>
487         <xs:element name="quantity" type="xs:decimal" minOccurs="1"
488 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
489 cim16#Point.quantity"/>
490         <xs:element name="Reason" type="Reason" minOccurs="0"
491 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
492 cim16#Point.Reason"/>

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493         </xs:sequence>
494     </xs:complexType>
495     <xs:simpleType name="ReasonCode_String"
496 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
497         <xs:restriction base="ecl:ReasonCodeTypeList"/>
498     </xs:simpleType>
499     <xs:simpleType name="ReasonText_String"
500 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
501         <xs:restriction base="xs:string">
502             <xs:maxLength value="512"/>
503         </xs:restriction>
504     </xs:simpleType>
505     <xs:complexType name="Reason"
506 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
507         <xs:sequence>
508             <xs:element name="code" type="ReasonCode_String" minOccurs="1"
509 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
510 cim16#Reason.code"/>
511             <xs:element name="text" type="ReasonText_String" minOccurs="0"
512 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
513 cim16#Reason.text"/>
514         </xs:sequence>
515     </xs:complexType>
516     <xs:complexType name="Series_Period"
517 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
518         <xs:sequence>
519             <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
520 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
521 schema-cim16#Period.timeInterval"/>
522             <xs:element name="resolution" type="xs:duration" minOccurs="1"
523 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
524 cim16#Period.resolution"/>
525             <xs:element name="Point" type="Point" minOccurs="1"
526 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
527 cim16#Period.Point"/>
528         </xs:sequence>
529     </xs:complexType>
530     <xs:complexType name="UnavailableReserve_TimeSeries"
531 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
532         <xs:sequence>
533             <xs:element name="mRID" type="ID_String" minOccurs="1"
534 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
535 cim16#IdentifiedObject.mRID"/>
536             <xs:element name="businessType" type="BusinessKind_String"
537 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
538 schema-cim16#TimeSeries.businessType"/>
539             <xs:element name="flowDirection.direction"
540 type="DirectionKind_String" minOccurs="0" maxOccurs="1"
541 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
542 cim16#FlowDirection.direction"/>
543             <xs:element name="product" type="EnergyProductKind_String"
544 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
545 schema-cim16#TimeSeries.product"/>
546             <xs:element name="connecting_Domain.mRID" type="AreaID_String"
547 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
548 schema-cim16#IdentifiedObject.mRID"/>
549             <xs:element name="registeredResource.mRID"
550 type="ResourceID_String" minOccurs="0" maxOccurs="1"
551 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
552 cim16#IdentifiedObject.mRID"/>
```

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553         <xs:element name="substitute_RegisteredResource.mRID"  
554 type="ResourceID_String" minOccurs="0" maxOccurs="1"  
555 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
556 cim16#IdentifiedObject.mRID"/>  
557         <xs:element name="resourceProvider_MarketParticipant.mRID"  
558 type="PartyID_String" minOccurs="1" maxOccurs="1"  
559 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
560 cim16#IdentifiedObject.mRID"/>  
561         <xs:element  
562 name="substituteResourceProvider_MarketParticipant.mRID" type="PartyID_String"  
563 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-  
564 schema-cim16#IdentifiedObject.mRID"/>  
565         <xs:element  
566 name="substituteResourceProvider_MarketParticipant.marketRole.type"  
567 type="MarketRoleKind_String" minOccurs="0" maxOccurs="1"  
568 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>  
569         <xs:element name="acquiring_Domain.mRID" type="AreaID_String"  
570 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-  
571 schema-cim16#IdentifiedObject.mRID"/>  
572         <xs:element name="marketAgreement.type"  
573 type="CapacityContractKind_String" minOccurs="0" maxOccurs="1"  
574 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>  
575         <xs:element name="marketAgreement.mRID" type="ID_String"  
576 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-  
577 schema-cim16#IdentifiedObject.mRID"/>  
578         <xs:element name="measurement_Unit.name"  
579 type="MeasurementUnitKind_String" minOccurs="1" maxOccurs="1"  
580 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>  
581         <xs:element name="curveType" type="CurveType_String"  
582 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-  
583 schema-cim16#TimeSeries.curveType"/>  
584         <xs:element name="Series_Period" type="Series_Period"  
585 minOccurs="1" maxOccurs="unbounded"  
586 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
587 cim16#TimeSeries.Series_Period"/>  
588     </xs:sequence>  
589 </xs:complexType>  
590 </xs:schema>  
591
```