European Network of
Transmission System Operators
for Electricity

MEASUREMENT DATA DOCUMENT

UML MODEL AND SCHEMA

2025-05-27
VERSION 1.0

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The force of the following words is modified by the requirement level of the document in which they are used.

- SHALL: This word, or the terms “REQUIRED” or “MUST”, means that the definition is an absolute requirement of the specification.
- SHALL NOT: This phrase, or the phrase “MUST NOT”, means that the definition is an absolute prohibition of the specification.
- SHOULD: This word, or the adjective “RECOMMENDED”, means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- SHOULD NOT: This phrase, or the phrase “NOT RECOMMENDED”, means that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.
- MAY: This word, or the adjective “OPTIONAL”, means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation which does not include a particular option SHALL be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option SHALL be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides.).

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Revision History

Version	Release	Date	Comments
1	0	2025-05-27	First drafting of the document.

1 Objective

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

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

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

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

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

2 MeasurementData_MarketDocument

2.1 Measurement Data contextual model

2.1.1 Overview of the model

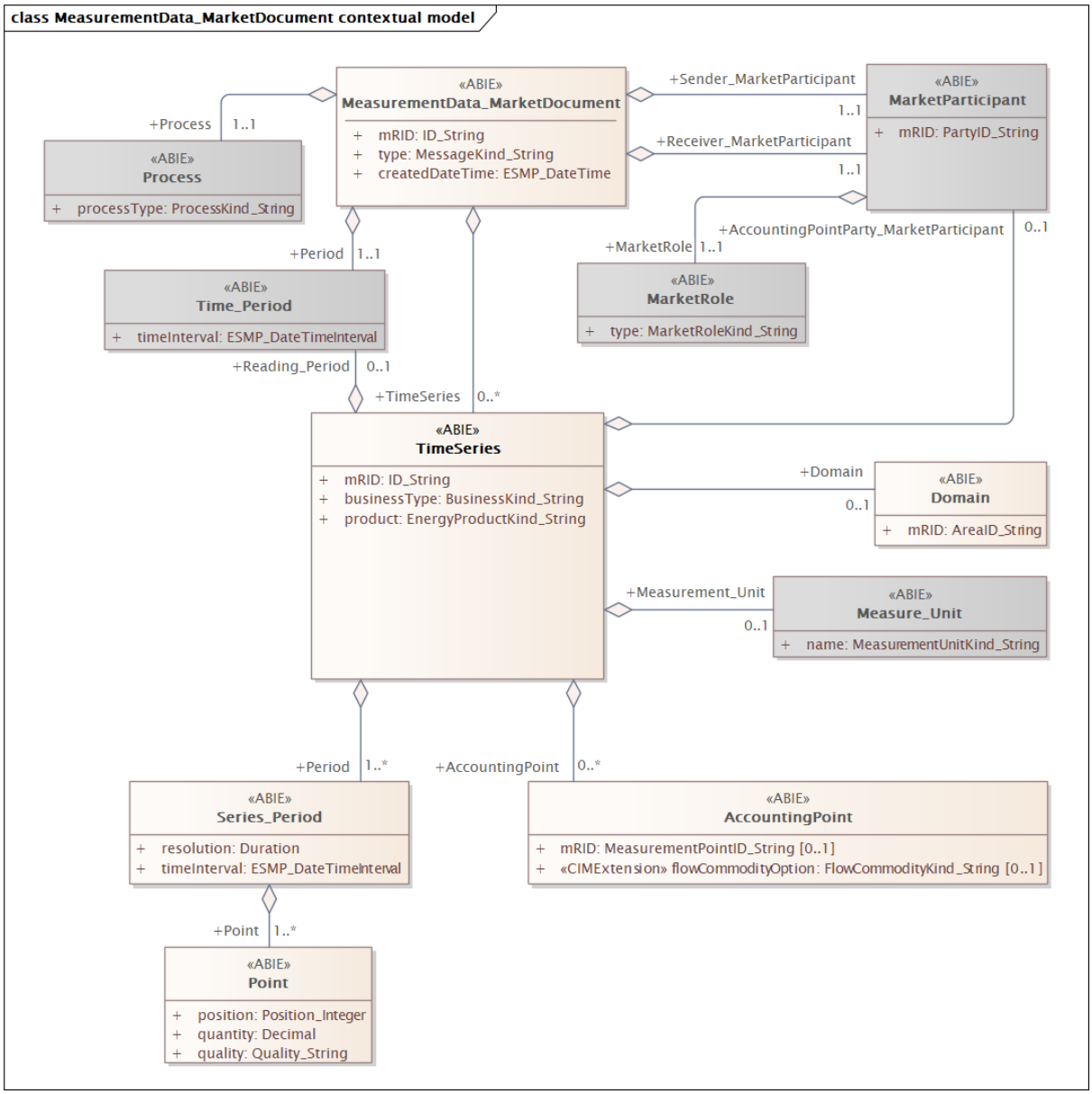

Figure 1 shows the model:

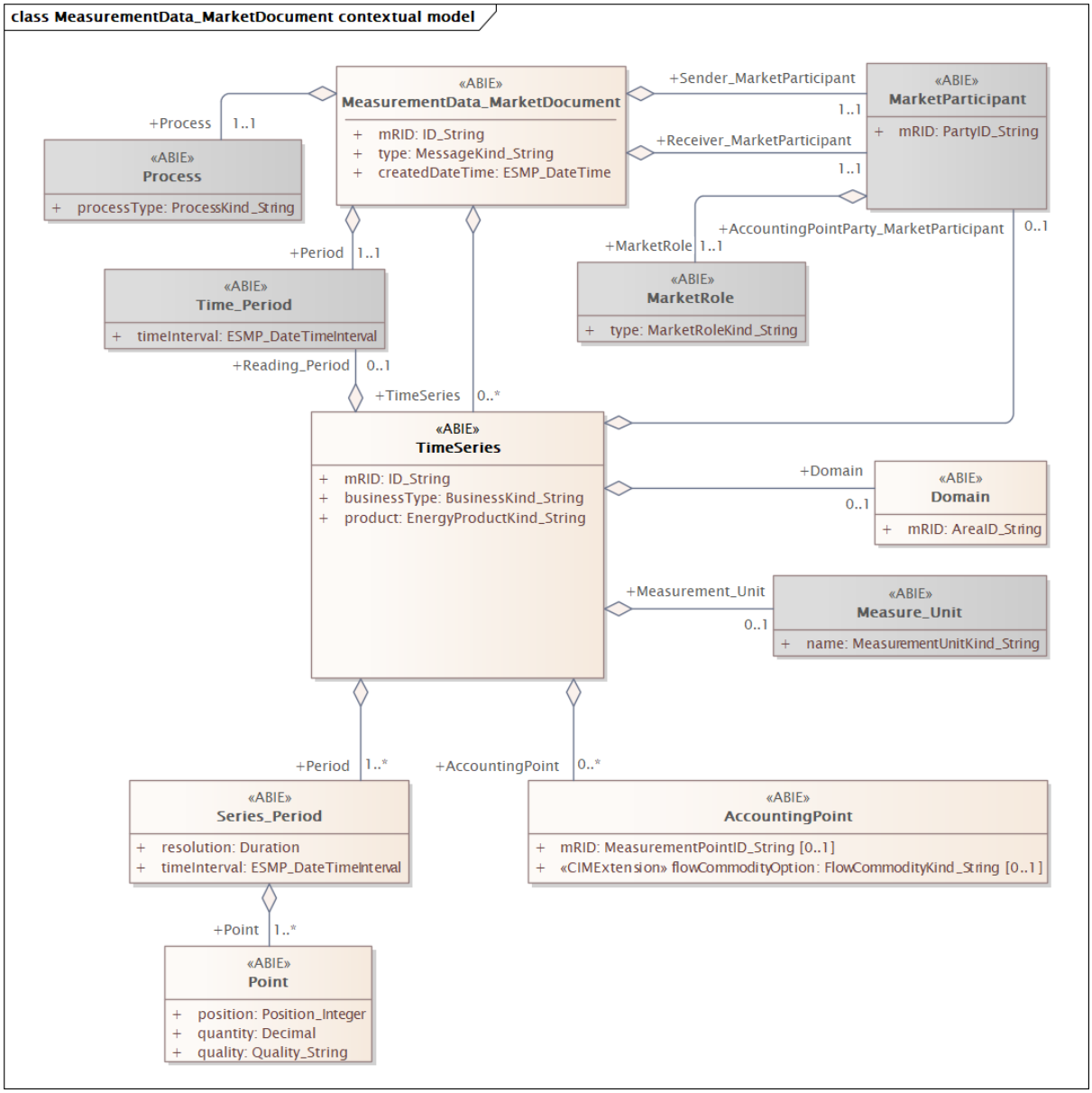

Figure 1 – Measurement contextual model

2.1.2 IsBasedOn relationships from the European style market profile

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

Table 1 - IsBasedOn dependency

Name	Complete IsBasedOn Path
AccountingPoint	CIM::Market::MarketManagement::AccountingPoint
AccountingPoint	CIM::Market::MarketManagement::AccountingPoint
Auction	CIM::Market::MarketManagement::Auction
Domain	CIM::Market::MarketManagement::Domain
MarketParticipant	CIM::Market::MarketCommon::MarketParticipant
MarketRole	CIM::Market::MarketCommon::MarketRole
Measure_Unit	CIM::Market::MarketManagement::Unit
MeasurementData_MarketDocument	CIM::Market::MarketManagement::MarketDocument
MeasurementData_MarketDocument	CIM::Market::MarketManagement::MarketDocument
Point	CIM::Market::MarketManagement::Point
Point	CIM::Market::MarketManagement::Point
Process	CIM::Market::MarketManagement::Process
Series_Period	CIM::Market::MarketManagement::Period
Series_Period	CIM::Market::MarketManagement::Period
Time_Period	CIM::Market::MarketManagement::Period
TimeSeries	CIM::Market::MarketManagement::TimeSeries
TimeSeries	CIM::Market::MarketManagement::TimeSeries

2.2 MeasurementData assembly model

2.2.1 Overview of the

Figure 2 shows the model:

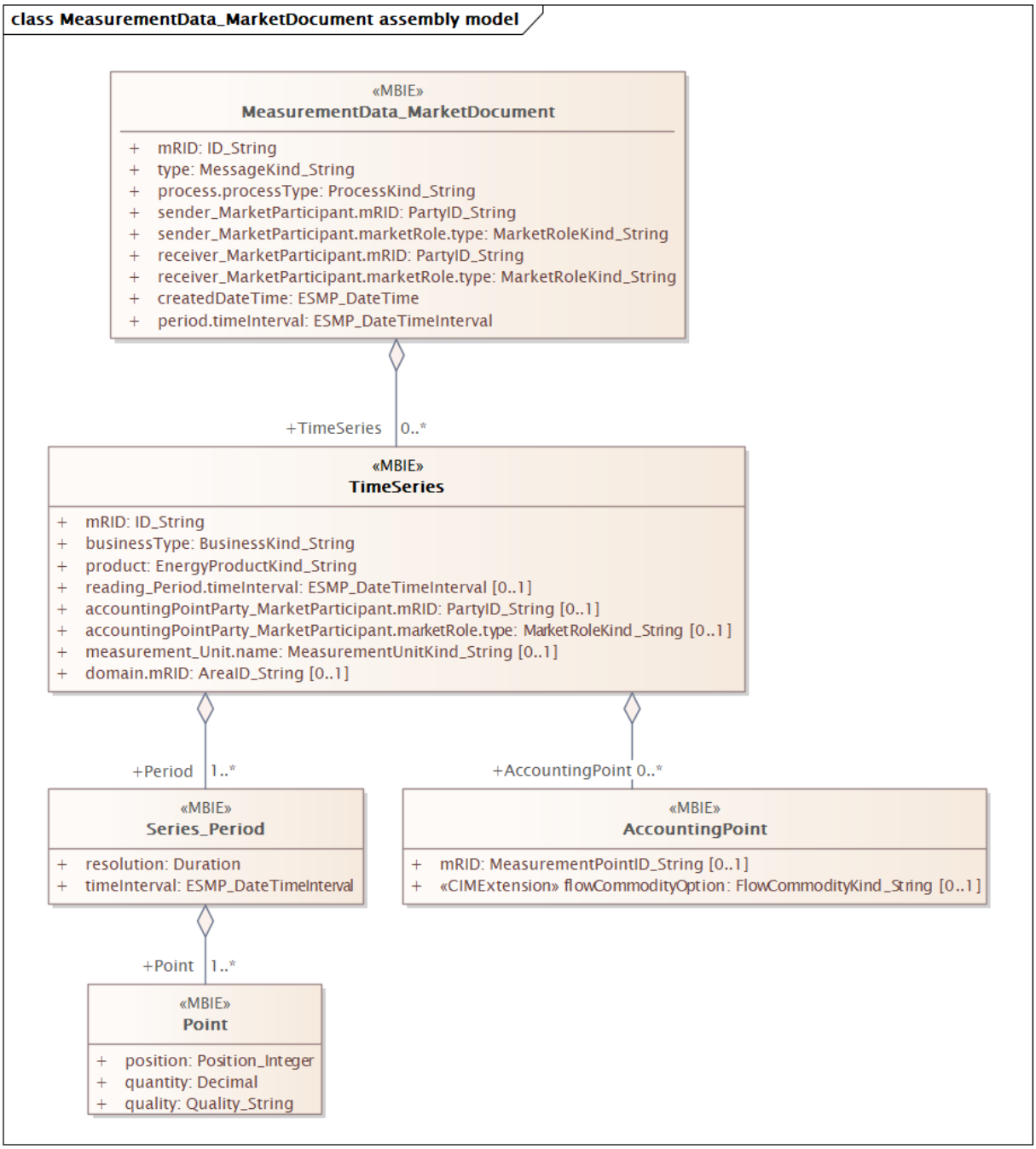

Figure 2 - MeasurementData assembly model

2.2.2 IsBasedOn relationships from the European style market profile

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

Table 2 - IsBasedOn dependency

Name	Complete IsBasedOn Path
AccountingPoint	CIM::Market::MarketManagement::AccountingPoint
AccountingPoint	CIM::Market::MarketManagement::AccountingPoint
Auction	CIM::Market::MarketManagement::Auction
Domain	CIM::Market::MarketManagement::Domain
MarketParticipant	CIM::Market::MarketCommon::MarketParticipant
MarketRole	CIM::Market::MarketCommon::MarketRole
Measure_Unit	CIM::Market::MarketManagement::Unit
MeasurementData_MarketDocument	CIM::Market::MarketManagement::MarketDocument
MeasurementData_MarketDocument	CIM::Market::MarketManagement::MarketDocument
Point	CIM::Market::MarketManagement::Point
Point	CIM::Market::MarketManagement::Point
Process	CIM::Market::MarketManagement::Process
Series_Period	CIM::Market::MarketManagement::Period
Series_Period	CIM::Market::MarketManagement::Period
Time_Period	CIM::Market::MarketManagement::Period
TimeSeries	CIM::Market::MarketManagement::TimeSeries
TimeSeries	CIM::Market::MarketManagement::TimeSeries

2.2.3 Detailed MeasurementData assembly model

2.2.3.1 MeasurementData_MarketDocument root class

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

IsBasedOn: ENTSO-E Market Documents::MeasurementData_MarketDocument- AMCD IG::MeasurementData_MarketDocument contextual model::MeasurementData_MarketDocument

Table 3 shows all attributes of MeasurementData_MarketDocument.

Table 3 - Attributes of MeasurementData_MarketDocument assembly model::MeasurementData_MarketDocument

mult.	Attribute name / type	Description
[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
[1..1]	period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- The time interval that is associated with an electronic document and which is valid for the whole document.
[1..1]	process.processType ProcessKind_String	The identification of the nature of process that the document addresses. --- The process dealt with in the document.
[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The MarketParticipant associated with an electronic document header. --- The role associated with a MarketParticipant.
[1..1]	receiver_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 MarketParticipant associated with an electronic document header.
[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The MarketParticipant associated with an electronic document header. --- The role associated with a MarketParticipant.
[1..1]	sender_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 MarketParticipant associated with an electronic document header.
[1..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.

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

Table 4 - Association ends of MeasurementData_MarketDocument assembly model::MeasurementData_MarketDocument with other classes

mult.	Class name / Role	Description
[0..*]	TimeSeries TimeSeries	The time series that is associated with an electronic document. Association Based On: MeasurementData_MarketDocument contextual model::TimeSeries.TimeSeries[0..*] ----- MeasurementData_MarketDocument contextual model::MeasurementData_MarketDocument.[]

2.2.3.2 TimeSeries

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

In the ESMP profile, the TimeSeries provides not only time-ordered quantities but also time-ordered information.

IsBasedOn: ENTSO-E Market Documents::MeasurementData_MarketDocument - AMCD IG::MeasurementData_MarketDocument contextual model::TimeSeries

Table 5 shows all attributes of TimeSeries.

Table 5 - Attributes of MeasurementData_MarketDocument assembly model::TimeSeries

mult.	Attribute name / type	Description
[0..1]	accountingPointParty_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.
[0..1]	accountingPointParty_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.
[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.

mult.	Attribute name / type	Description
[0..1]	domain.mRID AreaID_String	The unique identification of the domain. 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.
[0..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.
[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid 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.
[1..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.
[0..1]	reading_Period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- The time interval associated with a TimeSeries within an electronic document.

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Table 6 shows all association ends of TimeSeries with other classes.

Table 6 - Association ends of MeasurementData_MarketDocument assembly model::TimeSeries with other classes

mult.	Class name / Role	Description
[0..*]	AccountingPoint AccountingPoint	The identification of a measurement point associated with a TimeSeries. Association Based On: MeasurementData_MarketDocument contextual model::AccountingPoint.AccountingPoint[0..*] ----- MeasurementData_MarketDocument contextual model::TimeSeries.[]
[1..*]	Series_Period Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: MeasurementData_MarketDocument contextual model::Series_Period.Period[1..*] ----- MeasurementData_MarketDocument contextual model::TimeSeries.[]

2.2.3.3 AccountingPoint

An administrative point where Energy Supplier change can take place and for which commercial business processes are defined.

IsBasedOn: ENTSO-E Market Documents::MeasurementData_MarketDocument - AMCD IG::MeasurementData_MarketDocument contextual model::AccountingPoint

Table 7 shows all attributes of Accounting Point.

Table 7 - Attributes of MeasurementData_MarketDocument assembly model::AccountingPoint

mult.	Attribute name / type	Description
[0..1]	flowCommodityOption FlowCommodityKind_String	The option of flow commodity, such as production, consumption, combined or exchange.
[0..1]	mRID MeasurementPointID_String	A unique identification of the measurement point. 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.

2.2.3.4 Series_Period

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

IsBasedOn: ENTSO-E Market Documents::MeasurementData_MarketDocument - AMCD IG::MeasurementData_MarketDocument contextual model::Series_Period

Error! Reference source not found.8 shows all attributes of Series_Period.

Table 8 - Attributes of MeasurementData_MarketDocument assembly model::Series_Period

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

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

Table 9 - Association ends of MeasurementData_MarketDocument assembly model::Series_Period with other classes

mult.	Class name / Role	Description
[1..*]	Point Point	The Point information associated with a given Series_Period.within a TimeSeries. Association Based On: MeasurementData_MarketDocument contextual model::Point.Point[1..*] ----- MeasurementData_MarketDocument contextual model::Series_Period.[]

2.2.3.5 Point

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

IsBasedOn: ENTSO-E Market Documents::MeasurementData_MarketDocument - AMCD IG::MeasurementData_MarketDocument contextual model::Point

Table 10 shows all attributes of Point.

Table 10 - Attributes of MeasurementData_MarketDocument assembly model::Point

mult.	Attribute name / type	Description
[1..1]	position Position_Integer	A sequential value representing the relative position within a given time interval.
[1..1]	quality Quality_String	The quality of the information being provided. This quality may be estimated, not available, as provided, etc.
[1..1]	quantity Decimal	The principal quantity identified for a point.

2.2.5 Datatypes

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

- ESMP_DateTimeInterval compound
- AreaID_String datatype, codelist CodingSchemeTypeList
- BusinessKind_String datatype, codelist BusinessTypeList
- EnergyProductKind_String datatype, codelist EnergyProductTypeList
- ESMP_DateTime datatype
- FlowCommodityKind_String datatype
- ID_String datatype
- MarketRoleKind_String datatype, codelist RoleTypeList
- MeasurementPointID_String datatype
- MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- MessageKind_String datatype, codelist MessageTypeList
- PartyID_String datatype, codelist CodingSchemeTypeList
- Position_Integer datatype
- ProcessKind_String datatype, codelist ProcessTypeList
- Quality_String datatype
- YMDHM_DateTime datatype

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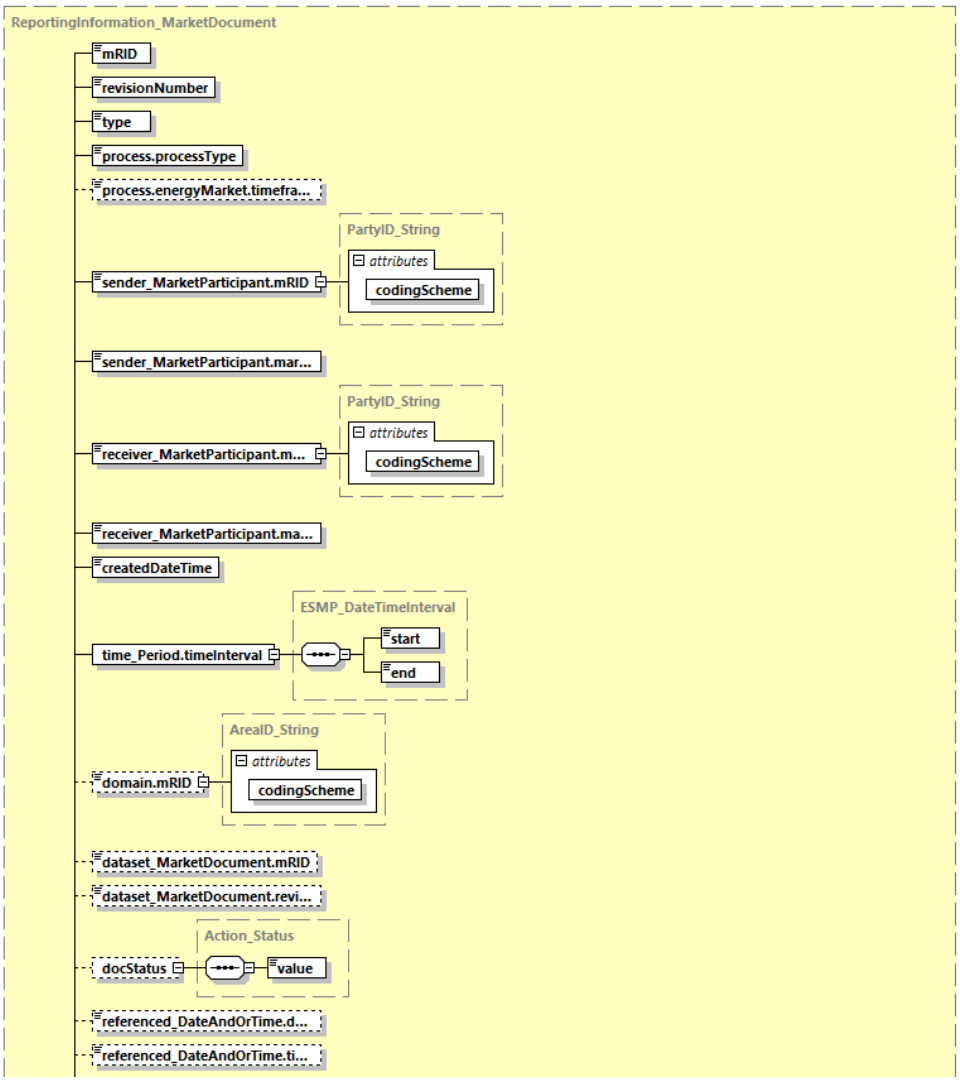
2.2.6 MeasurementData_MarketDocument XML schema structure



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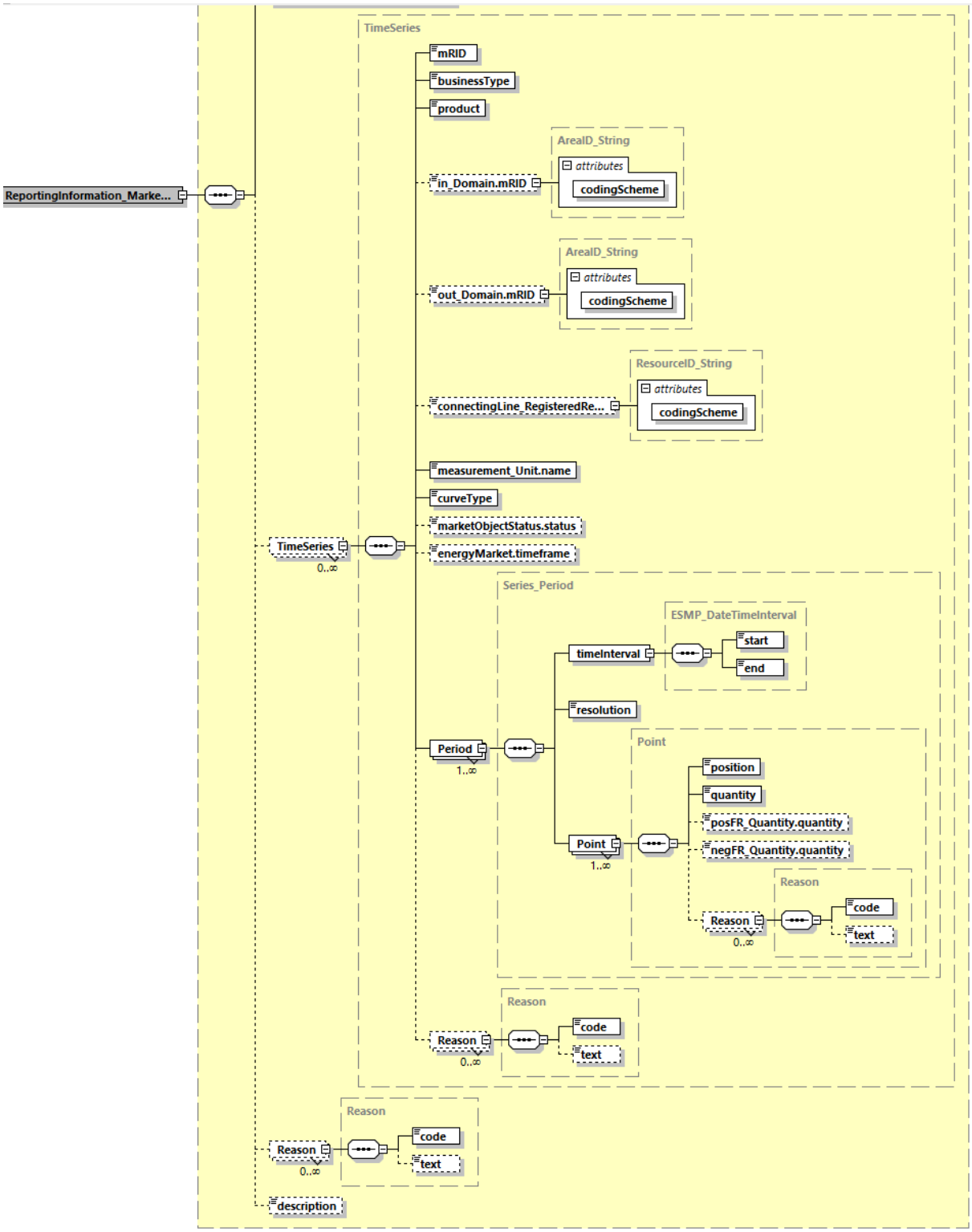
217



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219 Figure 3 – MeasurementData assembly model

2.2.7 MeasurementData_MarketDocument XML schema

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

urn:iec62325.351:tc57wg16:451-n:measurementdatadocument:1:0

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
xmlns:dl="urn:iec62325.351:tc57wg16:451-n:measurementdatadocument:1:0"
xmlns:cimp="http://www.iec.ch/cimprofile" attributeFormDefault="unqualified"
elementFormDefault="qualified" targetNamespace="urn:iec62325.351:tc57wg16:451-
n:measurementdatadocument:1:0" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:import schemaLocation="urn-entsoe-eu-wgedi-codelists.xsd"
namespace="urn:entsoe.eu:wgedi:codelists" />
  <xs:element name="MeasurementData_MarketDocument"
type="dl:MeasurementData_MarketDocument" />
  <xs:simpleType name="MeasurementPointID_String-base"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
    <xs:restriction base="xs:string">
      <xs:maxLength value="60" />
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="MeasurementPointID_String"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
    <xs:simpleContent>
      <xs:extension base="dl:MeasurementPointID_String-base">
        <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"
use="required" />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
  <xs:simpleType name="FlowCommodityKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
    <xs:restriction base="ecl:FlowCommodityTypeList" />
  </xs:simpleType>
  <xs:complexType name="AccountingPoint"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#AccountingPoint">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="mRID"
type="dl:MeasurementPointID_String"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
cim15#IdentifiedObject.mRID">
      </xs:element>
      <xs:element minOccurs="0" maxOccurs="1" name="flowCommodityOption"
type="dl:FlowCommodityKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
cim15#Ext_acc_MarketEvaluationPoint.flowCommodityOption">
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:simpleType name="ID_String"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
    <xs:restriction base="xs:string">
      <xs:maxLength value="60" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="MessageKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
    <xs:restriction base="ecl:MessageTypeList" />
```

```
279       </xs:simpleType>
280     <xs:simpleType name="ProcessKind_String"
281   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
282       <xs:restriction base="ecl:ProcessTypeList" />
283     </xs:simpleType>
284     <xs:simpleType name="PartyID_String-base"
285   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
286       <xs:restriction base="xs:string">
287         <xs:maxLength value="16" />
288       </xs:restriction>
289     </xs:simpleType>
290     <xs:complexType name="PartyID_String"
291   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
292       <xs:simpleContent>
293         <xs:extension base="dl:PartyID_String-base">
294           <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"
295   use="required" />
296         </xs:extension>
297       </xs:simpleContent>
298     </xs:complexType>
299     <xs:simpleType name="MarketRoleKind_String"
300   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
301       <xs:restriction base="ecl:RoleTypeList" />
302     </xs:simpleType>
303     <xs:simpleType name="ESMP_DateTime"
304   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#DateTime">
305       <xs:restriction base="xs:dateTime">
306         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-9]|[12][0-
307   9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-9]|30))T(([01][0-9]|2[0-
308   3]):[0-5][0-9]:[0-5][0-
309   9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
310   48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
311   0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
312   5][0-9]:[0-5][0-
313   9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
314   9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
315   8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
316   9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)" />
317       </xs:restriction>
318     </xs:simpleType>
319     <xs:simpleType name="YMDHM_DateTime"
320   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#DateTime">
321       <xs:restriction base="xs:string">
322         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-9]|[12][0-
323   9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-9]|30))T(([01][0-9]|2[0-
324   3]):[0-5][0-
325   9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
326   48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
327   0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
328   5][0-
329   9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
330   9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
331   8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
332   9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9])Z)" />
333       </xs:restriction>
334     </xs:simpleType>
335     <xs:complexType name="ESMP_DateTimeInterval"
336   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#DateTimeInterval">
337       <xs:sequence>
```

```
338          <xs:element minOccurs="1"
339    maxOccurs="1" name="start" type="dl:YMDHM_DateTime"
340    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
341    cim15#DateTimeInterval.start">
342          </xs:element>
343          <xs:element minOccurs="1" maxOccurs="1" name="end" type="dl:YMDHM_DateTime"
344    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
345    cim15#DateTimeInterval.end">
346          </xs:element>
347        </xs:sequence>
348      </xs:complexType>
349      <xs:complexType name="MeasurementData_MarketDocument"
350    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#MarketDocument">
351        <xs:sequence>
352          <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="dl:ID_String"
353    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
354    cim15#IdentifiedObject.mRID">
355          </xs:element>
356          <xs:element minOccurs="1" maxOccurs="1" name="type"
357    type="dl:MessageKind_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
358    schema-cim15#Document.type">
359          </xs:element>
360          <xs:element minOccurs="1" maxOccurs="1" name="process.processType"
361    type="dl:ProcessKind_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
362    schema-cim15#Process.processType">
363          </xs:element>
364          <xs:element minOccurs="1" maxOccurs="1" name="sender_MarketParticipant.mRID"
365    type="dl:PartyID_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
366    schema-cim15#IdentifiedObject.mRID">
367          </xs:element>
368          <xs:element minOccurs="1" maxOccurs="1"
369    name="sender_MarketParticipant.marketRole.type" type="dl:MarketRoleKind_String"
370    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#MarketRole.type">
371          </xs:element>
372          <xs:element minOccurs="1" maxOccurs="1"
373    name="receiver_MarketParticipant.mRID" type="dl:PartyID_String"
374    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
375    cim15#IdentifiedObject.mRID">
376          </xs:element>
377          <xs:element minOccurs="1" maxOccurs="1"
378    name="receiver_MarketParticipant.marketRole.type" type="dl:MarketRoleKind_String"
379    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#MarketRole.type">
380          </xs:element>
381          <xs:element minOccurs="1" maxOccurs="1" name="createdDateTime"
382    type="dl:ESMP_DateTime" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
383    cim15#Document.createdDateTime">
384          </xs:element>
385          <xs:element minOccurs="1" maxOccurs="1" name="period.timeInterval"
386    type="dl:ESMP_DateTimeInterval"
387    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
388    cim15#Period.timeInterval">
389          </xs:element>
390          <xs:element minOccurs="0" maxOccurs="unbounded" name="TimeSeries"
391    type="dl:TimeSeries" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
392    cim15#MarketDocument.TimeSeries">
393          </xs:element>
394        </xs:sequence>
395      </xs:complexType>
396      <xs:simpleType name="Position_Integer"
397    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#Integer">
398        <xs:restriction base="xs:integer">
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399          <xs:maxInclusive
400    value="999999" />
401          <xs:minInclusive value="1" />
402        </xs:restriction>
403      </xs:simpleType>
404      <xs:simpleType name="Quality_String"
405    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
406        <xs:restriction base="ecl:QualityTypeList" />
407      </xs:simpleType>
408      <xs:complexType name="Point" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
409    schema-cim15#Point">
410        <xs:sequence>
411          <xs:element minOccurs="1" maxOccurs="1" name="position"
412    type="dl:Position_Integer" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
413    schema-cim15#Point.position">
414          </xs:element>
415          <xs:element minOccurs="1" maxOccurs="1" name="quantity" type="xs:decimal"
416    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#Point.quantity">
417          </xs:element>
418          <xs:element minOccurs="1" maxOccurs="1" name="quality"
419    type="dl:Quality_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
420    schema-cim15#Point.quality">
421          </xs:element>
422        </xs:sequence>
423      </xs:complexType>
424      <xs:complexType name="Series_Period"
425    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#Period">
426        <xs:sequence>
427          <xs:element minOccurs="1" maxOccurs="1" name="resolution" type="xs:duration"
428    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
429    cim15#Period.resolution">
430          </xs:element>
431          <xs:element minOccurs="1" maxOccurs="1" name="timeInterval"
432    type="dl:ESMP_DateTimeInterval"
433    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
434    cim15#Period.timeInterval">
435          </xs:element>
436          <xs:element minOccurs="1" maxOccurs="unbounded" name="Point" type="dl:Point"
437    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#Period.Point">
438          </xs:element>
439        </xs:sequence>
440      </xs:complexType>
441      <xs:simpleType name="BusinessKind_String"
442    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
443        <xs:restriction base="ecl:BusinessTypeList" />
444      </xs:simpleType>
445      <xs:simpleType name="EnergyProductKind_String"
446    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
447        <xs:restriction base="ecl:EnergyProductTypeList" />
448      </xs:simpleType>
449      <xs:simpleType name="MeasurementUnitKind_String"
450    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
451        <xs:restriction base="ecl:UnitOfMeasureTypeList" />
452      </xs:simpleType>
453      <xs:simpleType name="AreaID_String-base"
454    sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#String">
455        <xs:restriction base="xs:string">
456          <xs:maxLength value="18" />
457        </xs:restriction>
458      </xs:simpleType>
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459      <xs:complexType
460   name="AreaID_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
461   cim15#String">
462       <xs:simpleContent>
463         <xs:extension base="dl:AreaID_String-base">
464           <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"
465   use="required" />
466         </xs:extension>
467       </xs:simpleContent>
468     </xs:complexType>
469     <xs:complexType name="TimeSeries"
470   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#TimeSeries">
471       <xs:sequence>
472         <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="dl:ID_String"
473   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
474   cim15#IdentifiedObject.mRID">
475         </xs:element>
476         <xs:element minOccurs="1" maxOccurs="1" name="businessType"
477   type="dl:BusinessKind_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
478   schema-cim15#TimeSeries.businessType">
479         </xs:element>
480         <xs:element minOccurs="1" maxOccurs="1" name="product"
481   type="dl:EnergyProductKind_String"
482   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
483   cim15#TimeSeries.product">
484         </xs:element>
485         <xs:element minOccurs="0" maxOccurs="1" name="reading_Period.timeInterval"
486   type="dl:ESMP_DateTimeInterval"
487   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
488   cim15#Period.timeInterval">
489         </xs:element>
490         <xs:element minOccurs="0" maxOccurs="1"
491   name="accountingPointParty_MarketParticipant.mRID" type="dl:PartyID_String"
492   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
493   cim15#IdentifiedObject.mRID">
494         </xs:element>
495         <xs:element minOccurs="0" maxOccurs="1"
496   name="accountingPointParty_MarketParticipant.marketRole.type"
497   type="dl:MarketRoleKind_String"
498   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#MarketRole.type">
499         </xs:element>
500         <xs:element minOccurs="0" maxOccurs="1" name="measurement_Unit.name"
501   type="dl:MeasurementUnitKind_String"
502   sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-cim15#Unit.name">
503         </xs:element>
504         <xs:element minOccurs="0" maxOccurs="unbounded" name="AccountingPoint"
505   type="dl:AccountingPoint" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-
506   schema-cim15#TimeSeries.AccountingPoint">
507         </xs:element>
508         <xs:element minOccurs="0" maxOccurs="1" name="domain.mRID"
509   type="dl:AreaID_String" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
510   cim15#IdentifiedObject.mRID">
511         </xs:element>
512         <xs:element minOccurs="1" maxOccurs="unbounded" name="Period"
513   type="dl:Series_Period" sawsdl:modelReference="http://iec.ch/TC57/2010/CIM-schema-
514   cim15#TimeSeries.Period">
515         </xs:element>
516       </xs:sequence>
517     </xs:complexType>
518   </xs:schema>
```