European Network of
Transmission System Operators
for Electricity

METERING DATA DOCUMENT UML MODEL AND SCHEMA

2022-09-21
APPROVED DOCUMENT
VERSION 1.0

Table of Contents

1. Objective 5
2. MeteringData_MarketDocument 6
2.1 MeteringData contextual model 6
2.1.1 Overview of the model 6
2.1.2 IsBasedOn relationships from the European style market profile 7
2.2 MeteringData assembly model 8
2.2.1 Overview of the model 8
2.2.2 IsBasedOn relationships from the European style market profile 9
2.2.3 Detailed MeteringData assembly model 9
1. MeteringData_MarketDocument root class 9
2. Point 10
3. Series 10
4. Series_Period 12
2.2.4 Datatypes 13
2.2.5 MeteringData_MarketDocument XML schema structure 14
2.2.6 MeteringData_MarketDocument XML schema 15

List of figures

Figure 1 - MeteringData contextual model 6
Figure 2 - MeteringData assembly model 8
Figure 3 - MeteringData_MarketDocument schema structure 14

List of tables

Table 1 - IsBasedOn dependency 7
Table 2 - IsBasedOn dependency 9
Table 3 - Attributes of MeteringData assembly model::MeteringData_MarketDocument 9
Table 4 - Association ends of MeteringData assembly model::MeteringData_MarketDocument with other classes 10
Table 5 - Attributes of MeteringData assembly model::Point 10
Table 6 - Attributes of MeteringData assembly model::Series 11
Table 7 - Association ends of MeteringData assembly model::Series with other classes 12
Table 8 - Attributes of MeteringData assembly model::Series_Period 12
Table 9 - Association ends of MeteringData assembly model::Series_Period with other classes 12

Copyright notice:

Copyright © ENTSO-E. All Rights Reserved.

This document and its whole translations may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, except for literal and whole translation into languages other than English and under all circumstances, the copyright notice or references to ENTSO-E may not be removed.

This document and the information contained herein is provided on an "as is" basis.

ENTSO-E DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Maintenance notice:

This document is maintained by the ENTSO-E CIM EG. Comments or remarks are to be provided at cim@entsoe.eu

55

Revision History

Version	Release	Date	Comments
1	0	2022-09-21	First draft of the document. Approved by SOC.

56

1. Objective

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

The schema of the MeteringData_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. MeteringData_MarketDocument

2.1 MeteringData contextual model

2.1.1 Overview of the model

Figure 1 shows the model.

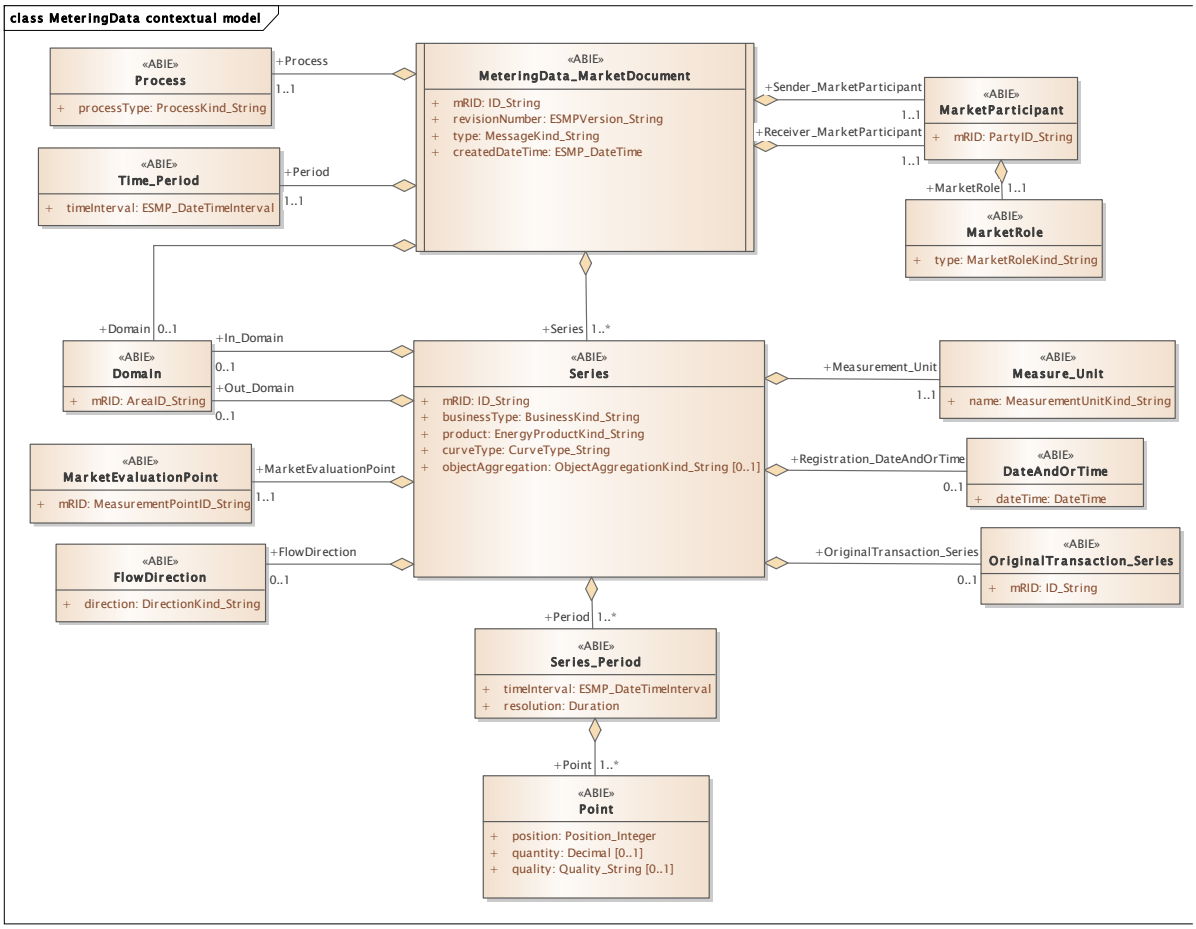

Figure 1 - MeteringData contextual model

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
DateAndOrTime	TC57CIM::IEC62325::MarketManagement::DateAndOrTime
Domain	TC57CIM::IEC62325::MarketManagement::Domain
FlowDirection	TC57CIM::IEC62325::MarketManagement::FlowDirection
MarketEvaluationPoint	TC57CIM::IEC62325::MarketManagement::MarketEvaluationPoint
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MeteringData_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
OriginalTransaction_Series	TC57CIM::IEC62325::MarketManagement::Series
Point	TC57CIM::IEC62325::MarketManagement::Point
Process	TC57CIM::IEC62325::MarketManagement::Process
Series	TC57CIM::IEC62325::MarketManagement::Series
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Time_Period	TC57CIM::IEC62325::MarketManagement::Period

2.2 MeteringData assembly model

2.2.1 Overview of the model

Figure 2 shows the model.

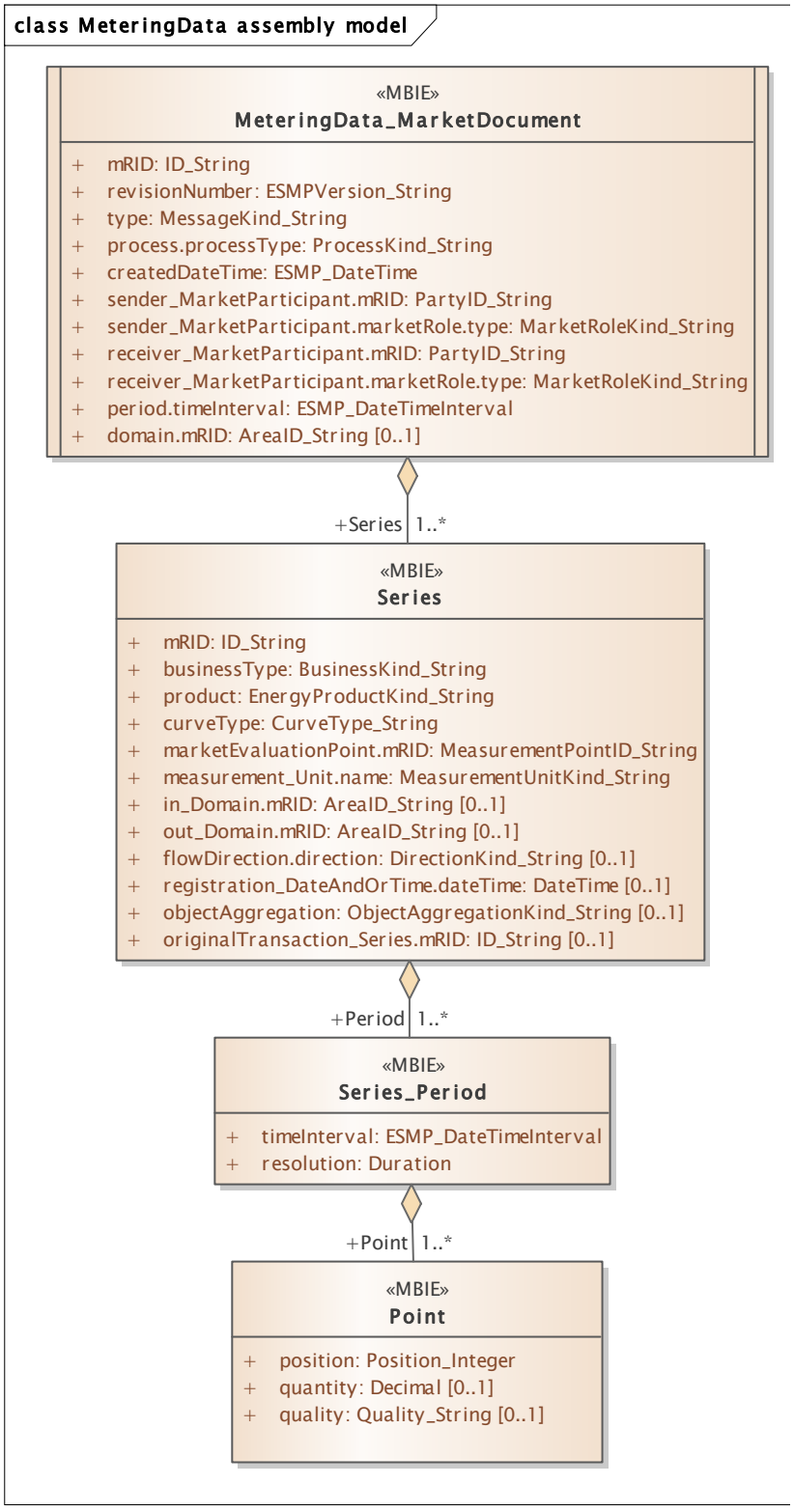

Figure 2 - MeteringData assembly model

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
MeteringData_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Point	TC57CIM::IEC62325::MarketManagement::Point
Series	TC57CIM::IEC62325::MarketManagement::Series
Series_Period	TC57CIM::IEC62325::MarketManagement::Period

2.2.3 Detailed MeteringData assembly model

1. MeteringData_MarketDocument root class

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

Table 3 shows all attributes of MeteringData_MarketDocument.

Table 3 - Attributes of MeteringData assembly model::MeteringData_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. --- The Process associated with an electronic document header that is valid for the whole document.
4	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
5	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document owner.
6	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document owner.
7	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document recipient.
8	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document recipient.
9	[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.

Order	mult.	Attribute name / Attribute type	Description
10	[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. --- The Domain associated with an electronic document header.

105

106 Table 4 shows all association ends of MeteringData_MarketDocument with other classes.

107 **Table 4 - Association ends of MeteringData assembly**
108 **model::MeteringData_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
11	[1..*]	Series Series	The time series that is associated with an electronic document. Association Based On: MeteringData contextual model::Series.Series[1..*] ----- MeteringData contextual model::MeteringData_MarketDocument.[]

109

110 2. Point

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

112 Table 5 shows all attributes of Point.

113 **Table 5 - Attributes of MeteringData 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	[0..1]	quantity Decimal	The principal quantity identified for a point.
2	[0..1]	quality Quality_String	The quality of the information being provided. This quality may be estimated, not available, as provided, etc.

114

115 3. Series

116 A set of similar physical or conceptual objects defined for the same period or point of time.

117 Table 6 shows all attributes of Series.

118 **Table 6 - Attributes of MeteringData assembly model::Series**

Order	mult.	Attribute name / Attribute type	Description
0	[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..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]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
4	[1..1]	marketEvaluationPoint.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. --- The identification of a measurement point associated with a TimeSeries.
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 associated with the quantities in a TimeSeries.
6	[0..1]	in_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. --- The domain associated with a TimeSeries.
7	[0..1]	out_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. --- The domain associated with a TimeSeries.
8	[0..1]	flowDirection.direction DirectionKind_String	The coded identification of the direction of energy flow. --- The flow direction associated with a TimeSeries.

Order	mult.	Attribute name / Attribute type	Description
9	[0..1]	registration_DateAndOrTime.dateTime DateTime	Date and time as per ISO 8601 YYYY-MM-DDThh:mm:ss.sssZ. --- A date and/or time associated with a TimeSeries.
10	[0..1]	objectAggregation ObjectAggregationKind_String	The identification of the domain that is the common denominator used to aggregate a time series.
11	[0..1]	originalTransaction_Series.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.

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

Table 7 - Association ends of MeteringData assembly model::Series with other classes

Order	mult.	Class name / Role	Description
12	[1..*]	Series_Period Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: MeteringData contextual model::Series_Period.Period[1..*] ----- MeteringData contextual model::Series.[]

4. Series_Period

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

Table 8 shows all attributes of Series_Period.

Table 8 - Attributes of MeteringData 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.

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

Table 9 - Association ends of MeteringData 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: MeteringData contextual model::Point.Point[1..*] ----- MeteringData contextual model::Series_Period.[]

2.2.4 Datatypes

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

- ESMP_DateTimeInterval compound
- AreaID_String datatype, codelist CodingSchemeTypeList
- BusinessKind_String datatype, codelist BusinessTypeList
- CurveType_String datatype, codelist CurveTypeList
- DirectionKind_String datatype, codelist DirectionTypeList
- EnergyProductKind_String datatype, codelist EnergyProductTypeList
- ESMP_DateTime datatype
- ESMPVersion_String datatype
- ID_String datatype
- MarketRoleKind_String datatype, codelist RoleTypeList
- MeasurementPointID_String datatype, codelist CodingSchemeTypeList
- MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- MessageKind_String datatype, codelist MessageTypeList
- ObjectAggregationKind_String datatype, codelist ObjectAggregationTypeList
- PartyID_String datatype, codelist CodingSchemeTypeList
- Position_Integer datatype
- ProcessKind_String datatype, codelist ProcessTypeList
- Quality_String datatype, codelist QualityTypeList
- YMDHM_DateTime datatype

2.2.5 MeteringData_MarketDocument XML schema structure

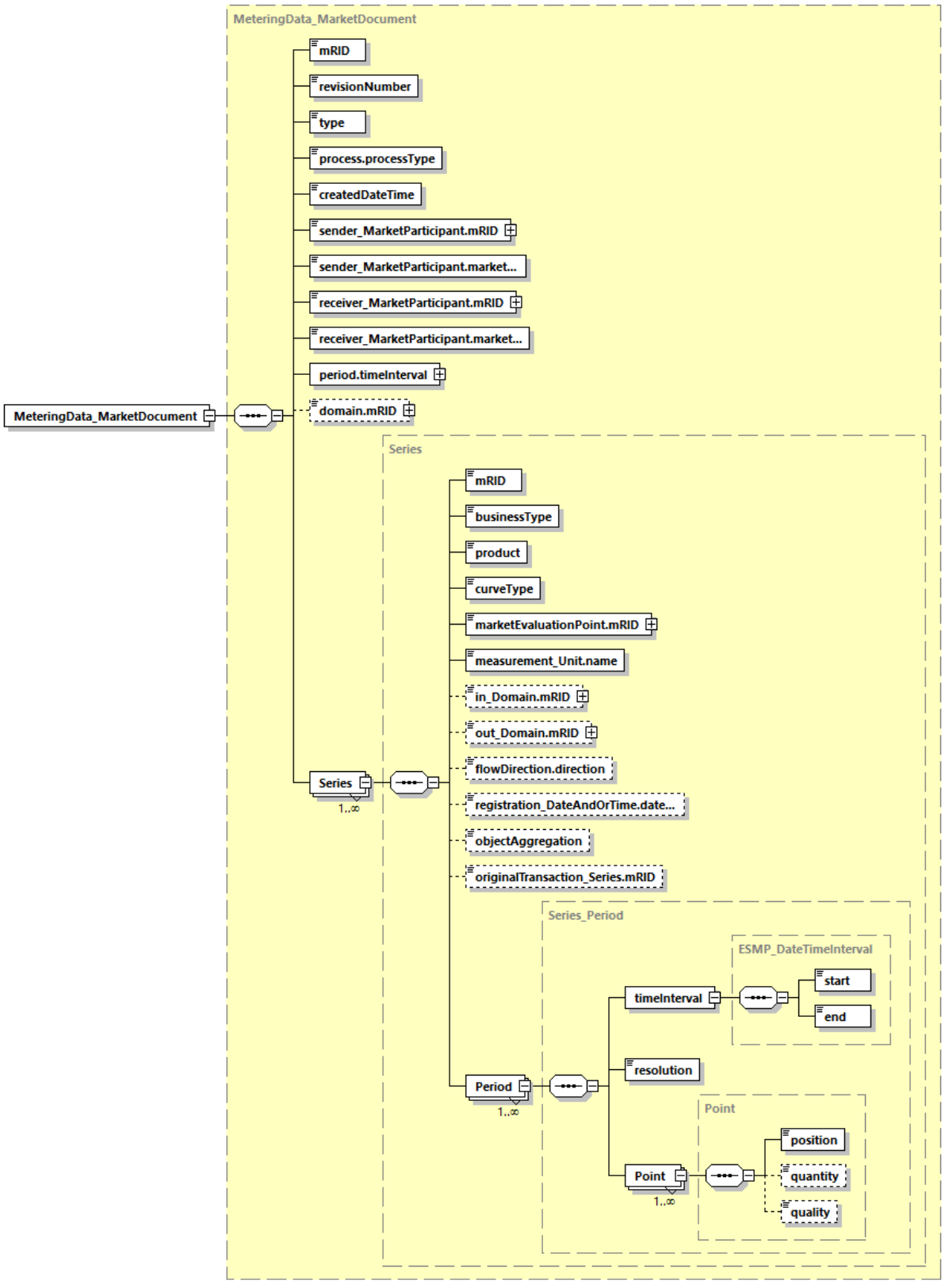

Figure 3 - MeteringData_MarketDocument schema structure

2.2.6 MeteringData_MarketDocument XML schema

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

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

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
xmlns="urn:iec62325.351:tc57wg16:451-n:meteringdatadocument:1:0"
xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
xmlns:cimp="http://www.iec.ch/cimprofile"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="urn:iec62325.351:tc57wg16:451-n:meteringdatadocument:1:0"
elementFormDefault="qualified" attributeFormDefault="unqualified">
	<xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
entsoe-eu-wgedi-codelists.xsd"/>
	<xs:element name="MeteringData_MarketDocument"
type="MeteringData_MarketDocument"/>
	<xs:simpleType name="ID_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="xs:string">
			<xs:maxLength value="60"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:simpleType name="ESMPVersion_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="xs:string">
			<xs:pattern value="[1-9]([0-9]){0,2}"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:simpleType name="MessageKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="ecl:MessageTypeList"/>
	</xs:simpleType>
	<xs:simpleType name="ProcessKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="ecl:ProcessTypeList"/>
	</xs:simpleType>
	<xs:simpleType name="ESMP_DateTime"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
		<xs:restriction base="xs:dateTime">
			<xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
9]|30))T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
5][0-9]:[0-5][0-
9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:simpleType name="PartyID_String-base"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
		<xs:restriction base="xs:string">
			<xs:maxLength value="16"/>
		</xs:restriction>
	</xs:simpleType>
```

```
214         <xs:complexType name="PartyID_String"
215   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
216                <xs:simpleContent>
217                      <xs:extension base="PartyID_String-base">
218                            <xs:attribute name="codingScheme"
219   type="ecl:CodingSchemeTypeList" use="required"/>
220                      </xs:extension>
221                </xs:simpleContent>
222         </xs:complexType>
223         <xs:simpleType name="MarketRoleKind_String"
224   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
225                <xs:restriction base="ecl:RoleTypeList"/>
226         </xs:simpleType>
227         <xs:simpleType name="AreaID_String-base"
228   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
229                <xs:restriction base="xs:string">
230                      <xs:maxLength value="18"/>
231                </xs:restriction>
232         </xs:simpleType>
233         <xs:complexType name="AreaID_String"
234   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
235                <xs:simpleContent>
236                      <xs:extension base="AreaID_String-base">
237                            <xs:attribute name="codingScheme"
238   type="ecl:CodingSchemeTypeList" use="required"/>
239                      </xs:extension>
240                </xs:simpleContent>
241         </xs:complexType>
242         <xs:simpleType name="YMDHM_DateTime"
243   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
244                <xs:restriction base="xs:string">
245                      <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
246   9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
247   9]|30))T(([01][0-9]|2[0-3]):[0-5][0-
248   9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
249   48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048]|[
250   0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
251   5][0-
252   9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
253   9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
254   8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
255   9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9])Z)"/>
256                </xs:restriction>
257         </xs:simpleType>
258         <xs:complexType name="ESMP_DateTimeInterval"
259   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
260                <xs:sequence>
261                      <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
262   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
263   cim16#DateTimeInterval.start"/>
264                      <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
265   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
266   cim16#DateTimeInterval.end"/>
267                </xs:sequence>
268         </xs:complexType>
269         <xs:complexType name="MeteringData_MarketDocument"
270   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
271                <xs:sequence>
```

```
                    <xs:element name="mRID" type="ID_String" minOccurs="1"
maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#IdentifiedObject.mRID"/>
                    <xs:element name="revisionNumber" type="ESMPVersion_String"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Document.revisionNumber"/>
                    <xs:element name="type" type="MessageKind_String"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Document.type"/>
                    <xs:element name="process.processType"
type="ProcessKind_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#Process.processType"/>
                    <xs:element name="createdDateTime" type="ESMP_DateTime"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Document.createdDateTime"/>
                    <xs:element name="sender_MarketParticipant.mRID"
type="PartyID_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#IdentifiedObject.mRID"/>
                    <xs:element name="sender_MarketParticipant.marketRole.type"
type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
                    <xs:element name="receiver_MarketParticipant.mRID"
type="PartyID_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#IdentifiedObject.mRID"/>
                    <xs:element name="receiver_MarketParticipant.marketRole.type"
type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
                    <xs:element name="period.timeInterval"
type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#Period.timeInterval"/>
                    <xs:element name="domain.mRID" type="AreaID_String"
minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#IdentifiedObject.mRID"/>
                    <xs:element name="Series" type="Series" minOccurs="1"
maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#MarketDocument.Series"/>
                </xs:sequence>
            </xs:complexType>
            <xs:simpleType name="Position_Integer"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
                <xs:restriction base="xs:integer">
                    <xs:maxInclusive value="999999"/>
                    <xs:minInclusive value="1"/>
                </xs:restriction>
            </xs:simpleType>
            <xs:simpleType name="Quality_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
                <xs:restriction base="ecl:QualityTypeList"/>
            </xs:simpleType>
            <xs:complexType name="Point"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
                <xs:sequence>
                    <xs:element name="position" type="Position_Integer"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Point.position"/>
```

```
331                     <xs:element name="quantity" type="xs:decimal" minOccurs="0"
332   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
333   cim16#Point.quantity"/>
334                     <xs:element name="quality" type="Quality_String" minOccurs="0"
335   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
336   cim16#Point.quality"/>
337               </xs:sequence>
338         </xs:complexType>
339         <xs:simpleType name="BusinessKind_String"
340   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
341               <xs:restriction base="ecl:BusinessTypeList"/>
342         </xs:simpleType>
343         <xs:simpleType name="EnergyProductKind_String"
344   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
345               <xs:restriction base="ecl:EnergyProductTypeList"/>
346         </xs:simpleType>
347         <xs:simpleType name="CurveType_String"
348   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
349               <xs:restriction base="ecl:CurveTypeList"/>
350         </xs:simpleType>
351         <xs:simpleType name="MeasurementPointID_String-base"
352   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
353               <xs:restriction base="xs:string">
354                     <xs:maxLength value="60"/>
355               </xs:restriction>
356         </xs:simpleType>
357         <xs:complexType name="MeasurementPointID_String"
358   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
359               <xs:simpleContent>
360                     <xs:extension base="MeasurementPointID_String-base">
361                           <xs:attribute name="codingScheme"
362   type="ecl:CodingSchemeTypeList" use="required"/>
363                     </xs:extension>
364               </xs:simpleContent>
365         </xs:complexType>
366         <xs:simpleType name="MeasurementUnitKind_String"
367   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
368               <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
369         </xs:simpleType>
370         <xs:simpleType name="DirectionKind_String"
371   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
372               <xs:restriction base="ecl:DirectionTypeList"/>
373         </xs:simpleType>
374         <xs:simpleType name="ObjectAggregationKind_String"
375   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
376               <xs:restriction base="ecl:ObjectAggregationTypeList"/>
377         </xs:simpleType>
378         <xs:complexType name="Series"
379   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Series">
380               <xs:sequence>
381                     <xs:element name="mRID" type="ID_String" minOccurs="1"
382   maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
383   cim16#IdentifiedObject.mRID"/>
384                     <xs:element name="businessType" type="BusinessKind_String"
385   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
386   schema-cim16#TimeSeries.businessType"/>
387                     <xs:element name="product" type="EnergyProductKind_String"
388   minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
389   schema-cim16#TimeSeries.product"/>
```

```
                    <xs:element name="curveType" type="CurveType_String"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#TimeSeries.curveType"/>
                    <xs:element name="marketEvaluationPoint.mRID"
type="MeasurementPointID_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#IdentifiedObject.mRID"/>
                    <xs:element name="measurement_Unit.name"
type="MeasurementUnitKind_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
                    <xs:element name="in_Domain.mRID" type="AreaID_String"
minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#IdentifiedObject.mRID"/>
                    <xs:element name="out_Domain.mRID" type="AreaID_String"
minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#IdentifiedObject.mRID"/>
                    <xs:element name="flowDirection.direction"
type="DirectionKind_String" minOccurs="0" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#FlowDirection.direction"/>
                    <xs:element name="registration_DateAndOrTime.dateTime"
type="xs:dateTime" minOccurs="0" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#DateAndOrTime.dateTime"/>
                    <xs:element name="objectAggregation"
type="ObjectAggregationKind_String" minOccurs="0" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#TimeSeries.objectAggregation"/>
                    <xs:element name="originalTransaction_Series.mRID"
type="ID_String" minOccurs="0" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#IdentifiedObject.mRID"/>
                    <xs:element name="Period" type="Series_Period" minOccurs="1"
maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#Series.Period"/>
                </xs:sequence>
            </xs:complexType>
            <xs:complexType name="Series_Period"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
                <xs:sequence>
                    <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Period.timeInterval"/>
                    <xs:element name="resolution" type="xs:duration" minOccurs="1"
maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#Period.resolution"/>
                    <xs:element name="Point" type="Point" minOccurs="1"
maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#Period.Point"/>
                </xs:sequence>
            </xs:complexType>
</xs:schema>
```