European Network of
Transmission System Operators
for Electricity

REMEDIAL ACTION SETTLEMENT DOCUMENT
UML MODEL AND SCHEMA

2023-04-18
AGREED DOCUMENT
VERSION 1.2

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Revision History

Version	Release	Date	Comments
1	0	2022-09-21	Approved by SOC
1	1	2022-10-18	Updates in schema 'urn:iec62325.351:tc57wg16:451-n:rasettlementdocument:1:1': price.amount attribute is split in two mandatory attributes. One for credit price amount and another one for debit price amount. Agreed by CIM EG.
1	2	2023-04-18	Updates in schema 'urn:iec62325.351:tc57wg16:451-n:rasettlementdocument:1:2': New optional marketProduct.marketProductType attribute in the TimeSeries class. Agreed by CIM WG.

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1. Objective

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

The schema of the RASettlement_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. RASettlement_MarketDocument

2.1. RASettlement contextual model

2.1.1. Overview of the model

Figure 1 shows the model.

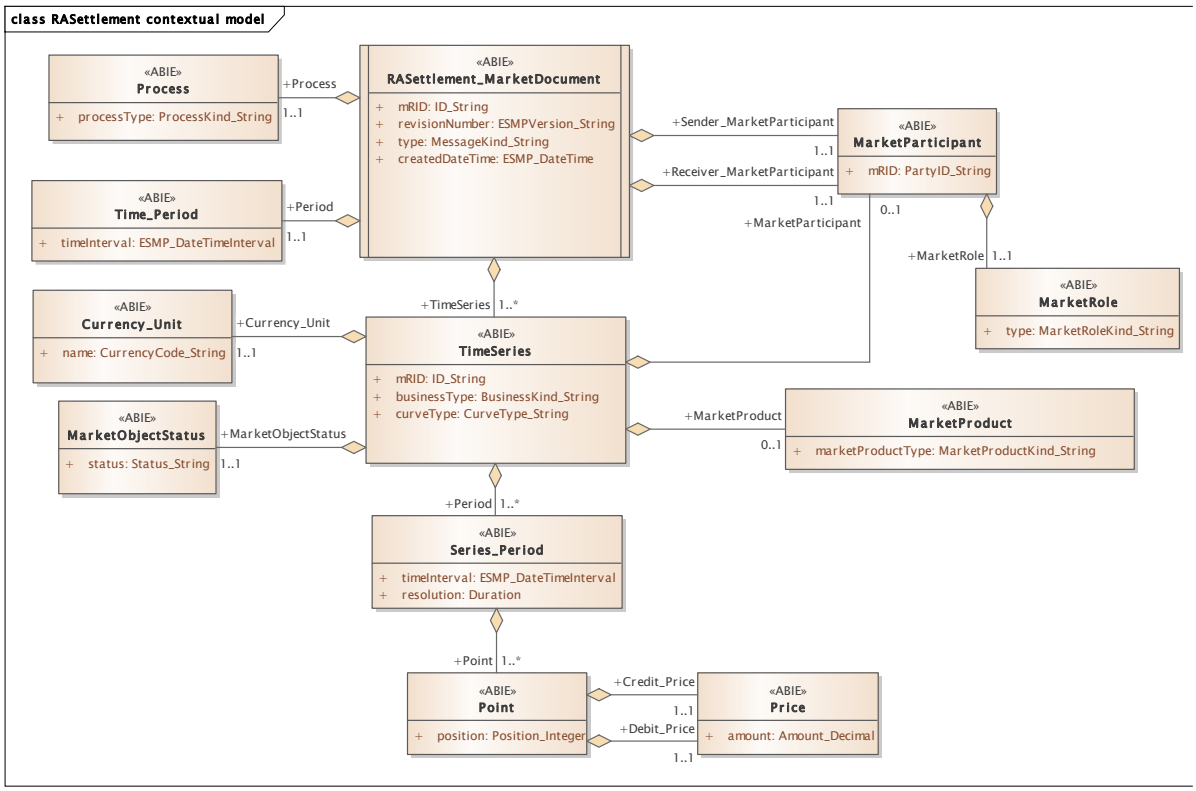

Figure 1 - RASettlement contextual model

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
Currency_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MarketObjectStatus	TC57CIM::IEC62325::MarketManagement::MarketObjectStatus
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketProduct	TC57CIM::IEC62325::MarketCommon::MarketProduct
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Point	TC57CIM::IEC62325::MarketManagement::Point
Price	TC57CIM::IEC62325::MarketManagement::Price
Process	TC57CIM::IEC62325::MarketManagement::Process
RASettlement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

2.2. RASettlement assembly model

2.2.1. Overview of the model

Figure 2 shows the model.

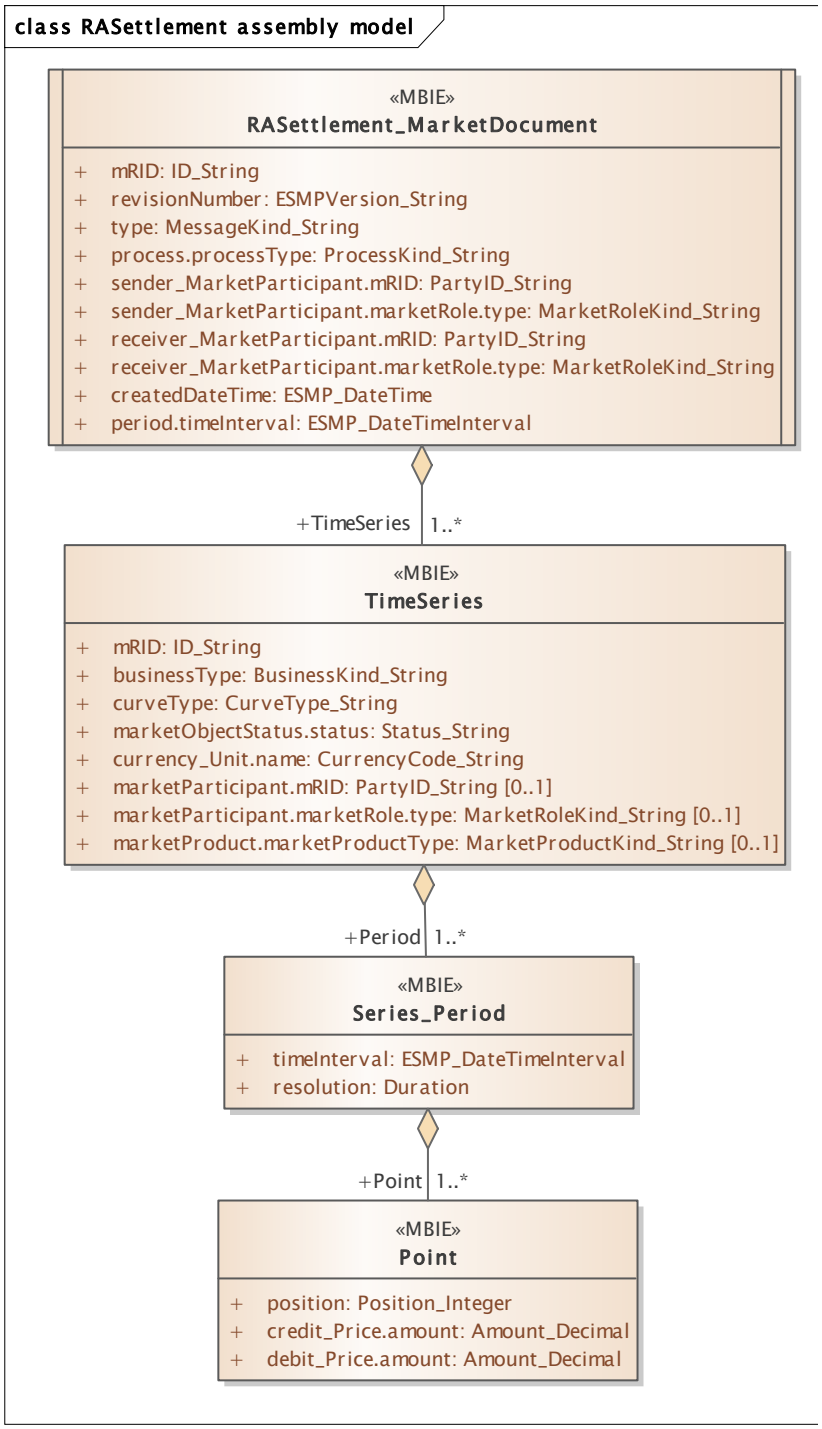

Figure 2 - RASettlement assembly model

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
Point	TC57CIM::IEC62325::MarketManagement::Point
RASettlement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

2.2.3. Detailed RASettlement assembly model

2.2.3.1. RASettlement_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 RASettlement_MarketDocument.

Table 3 - Attributes of RASettlement assembly model::RASettlement_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. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides an identification in the context of a business exchange such as document 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]	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.

Order	mult.	Attribute name / Attribute type	Description
4	[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.
5	[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.
6	[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.
7	[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.
8	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
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.

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

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

Order	mult.	Class name / Role	Description
10	[1..*]	TimeSeries TimeSeries	The time series that is associated with an electronic document. Association Based On: RASettlement contextual model::TimeSeries.TimeSeries[1..*] ----- RASettlement contextual model::RASettlement_MarketDocument.[]

2.2.3.2. Point

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

Table 5 shows all attributes of Point.

Table 5 - Attributes of RASettlement 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]	credit_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The Price information associated with a given Point.
2	[1..1]	debit_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The Price information associated with a given Point.

2.2.3.3. Series_Period

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

Table 6 shows all attributes of Series_Period.

Table 6 - Attributes of RASettlement 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 7 shows all association ends of Series_Period with other classes.

Table 7 - Association ends of RASettlement 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: RASettlement contextual model::Point.Point[1..*] ----- RASettlement contextual model::Series_Period.[]

2.2.3.4. 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.

Table 8 shows all attributes of TimeSeries.

131 **Table 8 - Attributes of RASettlement assembly model::TimeSeries**

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]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
3	[1..1]	marketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- The status of an object associated with a TimeSeries.
4	[1..1]	currency_Unit.name CurrencyCode_String	The identification of the formal code for a currency (ISO 4217). --- The currency associated with a TimeSeries.
5	[0..1]	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.
6	[0..1]	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.
7	[0..1]	marketProduct.marketProductType MarketProductKind_String	The Type of product on a market view

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133 Table 9 shows all association ends of TimeSeries with other classes.

134 **Table 9 - Association ends of RASettlement assembly model::TimeSeries with other**
135 **classes**

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

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2.2.4. Datatypes

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

- ESMP_DateTimeInterval compound
- Amount_Decimal datatype
- BusinessKind_String datatype, codelist BusinessTypeList
- CurrencyCode_String datatype, codelist CurrencyTypeList
- CurveType_String datatype, codelist CurveTypeList
- ESMP_DateTime datatype
- ESMPVersion_String datatype
- ID_String datatype
- MarketProductKind_String datatype, codelist MarketProductTypeList
- MarketRoleKind_String datatype, codelist RoleTypeList
- MessageKind_String datatype, codelist MessageTypeList
- PartyID_String datatype, codelist CodingSchemeTypeList
- Position_Integer datatype
- ProcessKind_String datatype, codelist ProcessTypeList
- Status_String datatype, codelist StatusTypeList
- YMDHM_DateTime datatype

2.2.5. RASettlement_MarketDocument XML schema structure

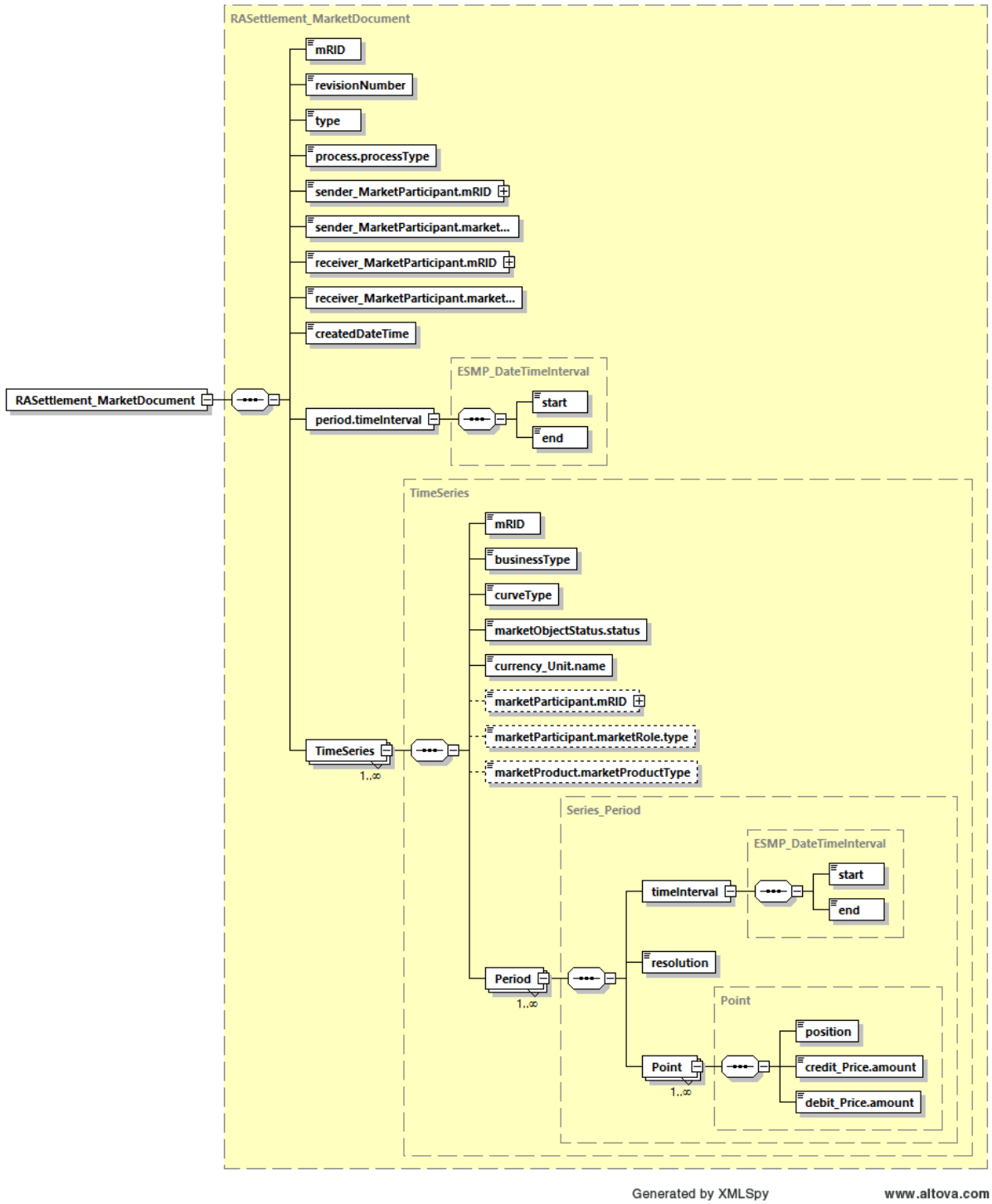

Figure 3 - RASettlement_MarketDocument schema structure

2.2.6. RASettlement _MarketDocument XML schema

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

urn:iec62325.351:tc57wg16:451-n:rasettlementdocument:1:2

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
xmlns="urn:iec62325.351:tc57wg16:451-n:rasettlementdocument:1:2"
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:rasettlementdocument:1:2"
elementFormDefault="qualified" attributeFormDefault="unqualified">
	<xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
entsoe-eu-wgedi-codelists.xsd"/>
	<xs:element name="RASettlement_MarketDocument"
type="RASettlement_MarketDocument"/>
	<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="Amount_Decimal"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Decimal">
		<xs:restriction base="xs:decimal">
			<xs:totalDigits value="17"/>
		</xs:restriction>
	</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"/>
			<xs:element name="credit_Price.amount" type="Amount_Decimal"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Price.amount"/>
			<xs:element name="debit_Price.amount" type="Amount_Decimal"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Price.amount"/>
		</xs:sequence>
	</xs:complexType>
	<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}"/>
```

```
212                 </xs:restriction>
213           </xs:simpleType>
214           <xs:simpleType name="MessageKind_String"
215     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
216                 <xs:restriction base="ecl:MessageTypeList"/>
217           </xs:simpleType>
218           <xs:simpleType name="ProcessKind_String"
219     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
220                 <xs:restriction base="ecl:ProcessTypeList"/>
221           </xs:simpleType>
222           <xs:simpleType name="PartyID_String-base"
223     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
224                 <xs:restriction base="xs:string">
225                       <xs:maxLength value="16"/>
226                 </xs:restriction>
227           </xs:simpleType>
228           <xs:complexType name="PartyID_String"
229     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
230                 <xs:simpleContent>
231                       <xs:extension base="PartyID_String-base">
232                             <xs:attribute name="codingScheme"
233     type="ecl:CodingSchemeTypeList" use="required"/>
234                       </xs:extension>
235                 </xs:simpleContent>
236           </xs:complexType>
237           <xs:simpleType name="MarketRoleKind_String"
238     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
239                 <xs:restriction base="ecl:RoleTypeList"/>
240           </xs:simpleType>
241           <xs:simpleType name="ESMP_DateTime"
242     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
243                 <xs:restriction base="xs:dateTime">
244                       <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
245     9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
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247     9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
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251     9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
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253     8][1235679][2468][1235679]|[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
254     9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
255                 </xs:restriction>
256           </xs:simpleType>
257           <xs:simpleType name="YMDHM_DateTime"
258     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
259                 <xs:restriction base="xs:string">
260                       <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-
261     9]|[12][0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
262     9]|30))T(([01][0-9]|2[0-3]):[0-5][0-
263     9])Z)|(([13579][26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
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265     0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T(([01][0-9]|2[0-3]):[0-
266     5][0-
267     9])Z)|(([13579][26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
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9]|2[0-8])T(([01][0-9]|2[0-3]):[0-5][0-9])Z)"/>
            </xs:restriction>
      </xs:simpleType>
      <xs:complexType name="ESMP_DateTimeInterval"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
            <xs:sequence>
                  <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#DateTimeInterval.start"/>
                  <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#DateTimeInterval.end"/>
            </xs:sequence>
      </xs:complexType>
      <xs:complexType name="RASettlement_MarketDocument"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
            <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="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="createdDateTime" type="ESMP_DateTime"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#Document.createdDateTime"/>
                  <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="TimeSeries" type="TimeSeries" minOccurs="1"
maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#MarketDocument.TimeSeries"/>
```

```
            </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:simpleType name="BusinessKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
            <xs:restriction base="ecl:BusinessTypeList"/>
        </xs:simpleType>
        <xs:simpleType name="CurveType_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
            <xs:restriction base="ecl:CurveTypeList"/>
        </xs:simpleType>
        <xs:simpleType name="Status_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
            <xs:restriction base="ecl:StatusTypeList"/>
        </xs:simpleType>
        <xs:simpleType name="CurrencyCode_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
            <xs:restriction base="ecl:CurrencyTypeList"/>
        </xs:simpleType>
        <xs:simpleType name="MarketProductKind_String"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
            <xs:restriction base="ecl:MarketProductTypeList"/>
        </xs:simpleType>
        <xs:complexType name="TimeSeries"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
            <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="businessType" type="BusinessKind_String"
minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
schema-cim16#TimeSeries.businessType"/>
                <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="marketObjectStatus.status"
type="Status_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
cim16#MarketObjectStatus.status"/>
                <xs:element name="currency_Unit.name"
type="CurrencyCode_String" minOccurs="1" maxOccurs="1"
sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>
```

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379                     <xs:element name="marketParticipant.mRID" type="PartyID_String"
380   minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
381   schema-cim16#IdentifiedObject.mRID"/>
382                     <xs:element name="marketParticipant.marketRole.type"
383   type="MarketRoleKind_String" minOccurs="0" maxOccurs="1"
384   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
385                     <xs:element name="marketProduct.marketProductType"
386   type="MarketProductKind_String" minOccurs="0" maxOccurs="1"
387   sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
388   cim16#MarketProduct.marketProductType"/>
389                     <xs:element name="Period" type="Series_Period" minOccurs="1"
390   maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
391   cim16#TimeSeries.Period"/>
392                 </xs:sequence>
393           </xs:complexType>
394   </xs:schema>
395
```