PUBLICATION DOCUMENT
UML MODEL AND SCHEMA
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## Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Release</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2017-01-27</td>
<td>First drafting of the document.</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>2017-01-30</td>
<td>Version to be submitted to Market Committee following WG EDI meeting in March 2017.</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2018-05-02</td>
<td>EMFIP 46. Added docStatus attribute with cardinality 0..1 to the document header. Approved document by MC.</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2019-03-28</td>
<td>EMFIP 53. Added a Update_DateAndOrTime attribute with cardinality 0..1 to the Timeseries and EMFIP 55. Added a ConnectingLine_RegisteredResource attribute with cardinality 0..1 to the Timeseries. Approved by MC.</td>
</tr>
</tbody>
</table>
1 Objective

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

The schema of the Publication_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 Publication MarketDocument

2.1 Publication contextual model

2.1.1 Overview of the model

Figure 1 shows the model.

---

Figure 1 - Publication 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

<table>
<thead>
<tr>
<th>Name</th>
<th>Complete IsBasedOn Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>AttributeInstanceComponent</td>
<td>TC57CIM::IEC62325::MarketManagement::AttributeInstanceComponent</td>
</tr>
<tr>
<td>Auction</td>
<td>TC57CIM::IEC62325::MarketManagement::Auction</td>
</tr>
<tr>
<td>Contract_MarketAgreement</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketAgreement</td>
</tr>
<tr>
<td>Currency_Unit</td>
<td>TC57CIM::IEC62325::MarketManagement::Unit</td>
</tr>
<tr>
<td>DateAndOrTime</td>
<td>TC57CIM::IEC62325::MarketManagement::DateAndOrTime</td>
</tr>
<tr>
<td>Domain</td>
<td>TC57CIM::IEC62325::MarketManagement::Domain</td>
</tr>
<tr>
<td>MarketParticipant</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketParticipant</td>
</tr>
<tr>
<td>MarketRole</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketRole</td>
</tr>
<tr>
<td>Measure_Unit</td>
<td>TC57CIM::IEC62325::MarketManagement::Unit</td>
</tr>
<tr>
<td>Point</td>
<td>TC57CIM::IEC62325::MarketManagement::Point</td>
</tr>
<tr>
<td>Price</td>
<td>TC57CIM::IEC62325::MarketManagement::Price</td>
</tr>
<tr>
<td>Publication_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Reason</td>
<td>TC57CIM::IEC62325::MarketManagement::Reason</td>
</tr>
<tr>
<td>RegisteredResource</td>
<td>TC57CIM::IEC62325::MarketCommon::RegisteredResource</td>
</tr>
<tr>
<td>Series_Period</td>
<td>TC57CIM::IEC62325::MarketManagement::Period</td>
</tr>
<tr>
<td>Time_Period</td>
<td>TC57CIM::IEC62325::MarketManagement::Period</td>
</tr>
<tr>
<td>TimeSeries</td>
<td>TC57CIM::IEC62325::MarketManagement::TimeSeries</td>
</tr>
<tr>
<td>Winners_MarketParticipant</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketParticipant</td>
</tr>
</tbody>
</table>
2.2 Publication assembly model

2.2.1 Overview of the model

Figure 2 shows the model.

Figure 2 - Publication 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>
<thead>
<tr>
<th>Name</th>
<th>Complete IsBasedOn Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point</td>
<td>TC57CIM::IEC62325::MarketManagement::Point</td>
</tr>
<tr>
<td>Publication_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Reason</td>
<td>TC57CIM::IEC62325::MarketManagement::Reason</td>
</tr>
<tr>
<td>Series_Period</td>
<td>TC57CIM::IEC62325::MarketManagement::Period</td>
</tr>
<tr>
<td>TimeSeries</td>
<td>TC57CIM::IEC62325::MarketManagement::TimeSeries</td>
</tr>
<tr>
<td>Winners_MarketParticipant</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketParticipant</td>
</tr>
</tbody>
</table>

2.2.3 Detailed Publication assembly model

2.2.3.1 Publication_MarketDocument root class

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

A publication document is issued by the transmission capacity allocator at the end of a specific auctioning cycle or by the system operator once the NTC values have been agreed.

Table 3 shows all attributes of Publication_MarketDocument.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>mRID ID_String</td>
<td>The unique identification of the document being exchanged within a business process flow.</td>
</tr>
<tr>
<td>1</td>
<td>[1..1]</td>
<td>revisionNumber ESMPVersion_String</td>
<td>The identification of the version that distinguishes one evolution of a document from another.</td>
</tr>
<tr>
<td>3</td>
<td>[1..1]</td>
<td>sender_MarketParticipant.mRID PartyID_String</td>
<td>The identification of a party in the energy market. --- Document owner.</td>
</tr>
<tr>
<td>4</td>
<td>[1..1]</td>
<td>sender_MarketParticipant.marketRole.type MarketRoleKind_String</td>
<td>The identification of the role played by a market player. --- Document owner.</td>
</tr>
<tr>
<td>5</td>
<td>[0..1]</td>
<td>receiver_MarketParticipant.mRID PartyID_String</td>
<td>The identification of a party in the energy market. --- Document recipient.</td>
</tr>
<tr>
<td>6</td>
<td>[0..1]</td>
<td>receiver_MarketParticipant.marketRole.type MarketRoleKind_String</td>
<td>The identification of the role played by a market player. --- Document recipient.</td>
</tr>
<tr>
<td>7</td>
<td>[1..1]</td>
<td>createdDateTime ESMP_DateTime</td>
<td>The date and time of the creation of the document.</td>
</tr>
<tr>
<td>8</td>
<td>[1..1]</td>
<td>period.timeInterval ESMP_DateTimeInterval</td>
<td>The start and end date and time for a given interval. --- The beginning and ending date and time of the period that the publication document is covering.</td>
</tr>
</tbody>
</table>
Table 4 shows all association ends of Publication_MarketDocument with other classes.

**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 6 shows all association ends of Point with other classes.

**2.2.3.3 Reason**

The motivation of an act.
Table 7 shows all attributes of Reason.

### Table 7 - Attributes of Publication assembly model::Reason

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>code ReasonCode_String</td>
<td>The motivation of an act in coded form.</td>
</tr>
<tr>
<td>1</td>
<td>[0..1]</td>
<td>text ReasonText_String</td>
<td>The textual explanation corresponding to the reason code.</td>
</tr>
</tbody>
</table>

2.2.3.4 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 Publication assembly model::Series_Period

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>timeInterval ESMP_DateTimeInterval</td>
<td>The start and end time of the period.</td>
</tr>
<tr>
<td>1</td>
<td>[1..1]</td>
<td>resolution Duration</td>
<td>The definition of the number of units of time that compose an individual step within a period.</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>[1..*]</td>
<td>Point Point</td>
<td>Association Based On:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Publication contextual model::Point.Point[1..*]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Publication contextual model::Series_Period.[]</td>
</tr>
</tbody>
</table>

2.2.3.5 TimeSeries

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

Table 10 shows all attributes of TimeSeries.

### Table 10 - Attributes of Publication assembly model::TimeSeries

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>mRID ID_String</td>
<td>A unique identification of the time series.</td>
</tr>
<tr>
<td>1</td>
<td>[0..1]</td>
<td>auction.mRID ID_String</td>
<td>The unique identification of the auction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>--- A unique identification of the set of specifications that clearly defines the allocation process to which the time series is addressed.</td>
</tr>
<tr>
<td>Order</td>
<td>mult.</td>
<td>Attribute name / Attribute type</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2</td>
<td>[0..1]</td>
<td>auction.type</td>
<td>The kind of the auction (e.g. implicit, explicit, ...).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AuctionKind_String</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>[0..1]</td>
<td>auction.category</td>
<td>The product category of an auction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Category_String</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>[1..1]</td>
<td>businessType</td>
<td>The identification of the nature of the time series.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BusinessKind_String</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>[1..1]</td>
<td>in_Domain.mRID</td>
<td>The unique identification of the domain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AreaID_String</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>[1..1]</td>
<td>out_Domain.mRID</td>
<td>The unique identification of the domain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AreaID_String</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>[0..1]</td>
<td>contract_MarketAgreement.type</td>
<td>The specification of the kind of the agreement, e.g. long term, daily contract.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CapacityContractKind_String</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>[0..1]</td>
<td>quantity_Measure_Unit.name</td>
<td>The identification of the formal code for a measurement unit (UN/ECE Recommendation 20).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MeasurementUnitKind_String</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>[0..1]</td>
<td>currency_Unit.name</td>
<td>The identification of the formal code for a currency (ISO 4217).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CurrencyCode_String</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>[0..1]</td>
<td>price_Measure_Unit.name</td>
<td>The identification of the formal code for a measurement unit (UN/ECE Recommendation 20).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MeasurementUnitKind_String</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>[0..1]</td>
<td>classificationSequence_AttributeInstanceComponent.position</td>
<td>A sequential value representing a relative sequence number.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position_Integer</td>
<td></td>
</tr>
</tbody>
</table>

---

The unique identification of the set of specifications that clearly defines the allocation process to which the time series is addressed.

The area where the energy is to be put.

The area where the energy is coming from.

The contract type defines the conditions under which the capacity was allocated and handled, e.g.: daily auction, weekly auction, monthly auction, yearly auction, long term contract, etc. The significance of this type is dependent on the in area and out area specific coded working methods.

The unit of measure in which the quantities in the times series are expressed, e.g. MAW.

The currency in which the monetary amount is expressed.

The unit of measure in which the price in the time series is expressed per unit of currency (MW per unit, MWh per unit, etc.).

A classification sequence is only provided in the case where there are several auctions in the same category and contract type.
### Table 11 - Association ends of Publication assembly model::TimeSeries with other classes

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>[0..*]</td>
<td>Series_Period</td>
<td>Association Based On: Publication contextual model::Series_Period.Period[0..*] Publication contextual model::TimeSeries[]</td>
</tr>
<tr>
<td>18</td>
<td>[0..*]</td>
<td>Reason</td>
<td>Association Based On: Publication contextual model::Reason.Reason[0..*] Publication contextual model::TimeSeries[]</td>
</tr>
</tbody>
</table>
2.2.3.6 Winners_MarketParticipant

The identification of the party participating in energy market business processes.

Table 12 shows all attributes of Winners_MarketParticipant.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>mRID</td>
<td>The identification of a party in the energy market.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PartyID_String</td>
<td></td>
</tr>
</tbody>
</table>

2.2.4 Datatypes

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

- Action_Status compound
- ESMP_DateTimeInterval compound
- Amount_Decimal datatype
- AreaID_String datatype, codelist CodingSchemeTypeList
- AuctionKind_String datatype, codelist AuctionTypeList
- BusinessKind_String datatype, codelist BusinessTypeList
- CapacityContractKind_String datatype, codelist ContractTypeList
- Category_String datatype, codelist CategoryTypeList
- CurrencyCode_String datatype, codelist CurrencyTypeList
- CurveType_String datatype, codelist CurveTypeList
- ESMP_DateTime datatype
- ESMPVersion_String datatype
- ID_String datatype
- MarketRoleKind_String datatype, codelist RoleTypeList
- MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- MessageKind_String datatype, codelist MessageTypeList
- PartyID_String datatype, codelist CodingSchemeTypeList
- Position_Integer datatype
- ReasonCode_String datatype, codelist ReasonCodeTypeList
- ReasonText_String datatype
- ResourceID_String datatype, codelist CodingSchemeTypeList
- Status_String datatype, codelist StatusTypeList
- YMDHM_DateTime datatype
2.2.5 Publication_MarketDocument XML schema structure

Figure 3 - Publication_MarketDocument schema structure
2.2.6 Publication_MarketDocument XML schema

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

urn:iec62325.351:tc57wg16:451-3:publicationdocument:7:3

```xml
  <xs:element name="Publication_MarketDocument" type="Publication_MarketDocument"/>
  <xs:simpleType name="Position_Integer" sawsdll: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" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Decimal">
    <xs:restriction base="xs:decimal">
      <xs:totalDigits value="17"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="Point" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
    <xs:extension base="cim16#Point">
      <xs:sequence>
        <xs:element name="position" type="Position_Integer" minOccurs="1" maxOccurs="1" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point.position"/>
        <xs:element name="quantity" type="Amount_Decimal" minOccurs="0" maxOccurs="1" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point.quantity"/>
        <xs:element name="price.amount" type="Amount_Decimal" minOccurs="0" maxOccurs="1" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point.Reason"/>
      </xs:sequence>
    </xs:extension>
  </xs:simpleType>
  <xs:simpleType name="ID_String" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
    <xs:restriction base="xs:string">
      <xs:maxLength value="35"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="ESMPVersion_String" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
    <xs:restriction base="xs:string">
      <xs:pattern value="[1-9][0-9]*"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="MessageKind_String" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
    <xs:restriction base="xs:string">
      <xs:maxLength value="16"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="PartyID_String-base" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
    <xs:restriction base="xs:string">
      <xs:maxLength value="16"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="PartyID_String" sawsdll:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
    <xs:simpleContent>
      <xs:extension base="PartyID_String-base">
        <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList" use="required"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:schema>
```
<xs:simpleType name="MeasurementUnitKind_String">
  <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
</xs:simpleType>

<xs:simpleType name="CurrencyCode_String">
  <xs:restriction base="ecl:CurrencyTypeList"/>
</xs:simpleType>

<xs:simpleType name="CurveType_String">
  <xs:restriction base="ecl:CurveTypeList"/>
</xs:simpleType>

<xs:simpleType name="ResourceId_String_base">
  <xs:restriction base="xs:string" maxOccurs="1" use="required"/>
</xs:simpleType>

<xs:simpleType name="TimeSeries">
  <xs:extension base="cim16#TimeSeries">
    <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"/>
  </xs:extension>
</xs:simpleType>

<xs:complexType name="MeasurementUnitKind_String">
  <xs:restriction base="cim16#IdentifiedObject.mRID" minOccurs="1" maxOccurs="1" />
  <xs:restriction base="cim16#Unit" minOccurs="0" maxOccurs="1" />
  <xs:restriction base="xs:string" maxOccurs="1" use="required"/>
</xs:complexType>

<xs:complexType name="CurrencyCode_String">
  <xs:restriction base="ecl:CurrencyTypeList" maxOccurs="1"/>
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<xs:complexType name="CurveType_String">
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</xs:sequence>

</xs:complexType>

<xs:complexType name="Winners_MarketParticipant" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketParticipant">

<xs:sequence>

<xs:element name="mRID" type="PartyID_String" minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#IdentifiedObject.mRID"/>

</xs:sequence>

</xs:complexType>

</xs:schema>