ENERGY PROGNOSIS DOCUMENT
UML MODEL AND SCHEMA

2021-01-27
APPROVED DOCUMENT
VERSION 1.0
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Maintenance notice:

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

<table>
<thead>
<tr>
<th>Version</th>
<th>Release</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>2021-01-27</td>
<td>Updates in Energy Prognosis document v1.2:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Optional process type attribute added to EnergyPrognosis_marketDocument class</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Order of attributes in Series_Period class is changed. Now the first one is timeInterval and the second resolution. Reason is to align with the rest of market documents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Approved by MC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></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 EnergyPrognosis_MarketDocument.

The schema of the EnergyPrognosis_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 EnergyPrognosis_MarketDocument

2.1 Energy prognosis contextual model

2.1.1 Overview of the model

Figure 1 shows the 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>
<thead>
<tr>
<th>Name</th>
<th>Complete IsBasedOn Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain</td>
<td>TC57CIM::IEC62325::MarketManagement::Domain</td>
</tr>
<tr>
<td>EnergyPrognosis_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</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>MktPSRType</td>
<td>TC57CIM::IEC62325::MarketManagement::MktPSRType</td>
</tr>
<tr>
<td>Point</td>
<td>TC57CIM::IEC62325::MarketManagement::Point</td>
</tr>
<tr>
<td>Process</td>
<td>TC57CIM::IEC62325::MarketManagement::Process</td>
</tr>
<tr>
<td>Quantity</td>
<td>TC57CIM::IEC62325::MarketManagement::Quantity</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>UncertaintyPercentage_Quantity</td>
<td>TC57CIM::IEC62325::MarketManagement::Quantity</td>
</tr>
</tbody>
</table>
2.2 Energy prognosis assembly model

2.2.1 Overview of the model

Figure 2 shows the model.

Figure 2 - Energy prognosis 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

<table>
<thead>
<tr>
<th>Name</th>
<th>Complete IsBasedOn Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnergyPrognosis_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Point</td>
<td>TC57CIM::IEC62325::MarketManagement::Point</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>UncertaintyPercentage_Quantity</td>
<td>TC57CIM::IEC62325::MarketManagement::Quantity</td>
</tr>
</tbody>
</table>

### 2.2.3 Detailed Energy prognosis assembly model

#### 2.2.3.1 EnergyPrognosis_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 EnergyPrognosis_MarketDocument.

#### Table 3 - Attributes of Energy prognosis assembly model::EnergyPrognosis_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 ESPVersion_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. --- The 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. --- The document owner. --- The role associated with a MarketParticipant.</td>
</tr>
<tr>
<td>5</td>
<td>[1..1]</td>
<td>receiver_MarketParticipant.mRID PartyID_String</td>
<td>The identification of a party in the energy market. --- The document recipient.</td>
</tr>
<tr>
<td>6</td>
<td>[1..1]</td>
<td>receiver_MarketParticipant.marketRole.type MarketRoleKind_String</td>
<td>The identification of the role played by a market player. --- The document recipient. --- The role associated with a MarketParticipant.</td>
</tr>
<tr>
<td>7</td>
<td>[1..1]</td>
<td>createdDateTime ESPM_DateTime</td>
<td>The date and time of the creation of the document.</td>
</tr>
<tr>
<td>8</td>
<td>[1..1]</td>
<td>time_Period.timeInterval ESPM_DateTimeInterval</td>
<td>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.</td>
</tr>
<tr>
<td>9</td>
<td>[0..1]</td>
<td>process.processType ProcessKind_String</td>
<td>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.</td>
</tr>
</tbody>
</table>
Table 4 shows all association ends of EnergyPrognosis_MarketDocument with other classes.

**Table 4 - Association ends of Energy prognosis assembly model::EnergyPrognosis_MarketDocument 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></td>
<td></td>
<td></td>
<td>Energy prognosis contextual model::TimeSeriesDETAILS.Area_TimeSeries[1..*]</td>
</tr>
</tbody>
</table>

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 Energy prognosis assembly model::Point**

<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>position</td>
<td>A sequential value representing the relative position within a given time interval.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position_Integer</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>[1..1]</td>
<td>quantity</td>
<td>The principal quantity identified for a point.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decimal</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>[1..1]</td>
<td>quality</td>
<td>The quality of the information being provided. This quality may be estimated, not available, as provided, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quality_String</td>
<td></td>
</tr>
</tbody>
</table>

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

**Table 6 - Association ends of Energy prognosis assembly model::Point 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>3</td>
<td>[0..*]</td>
<td>UncertaintyPercentage_Quantity</td>
<td>The percentage of uncertainty of the quantity value provided. Association Based On: Energy prognosis contextual model::Point.[]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Energy prognosis contextual model::UncertaintyPercentage_Quantity[0..*]</td>
</tr>
</tbody>
</table>

2.2.3.3 Series_Period

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

Table 7 shows all attributes of Series_Period.

**Table 7 - Attributes of Energy prognosis 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</td>
<td>The start and end time of the period.</td>
</tr>
</tbody>
</table>
Table 8 shows all association ends of 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</td>
<td>The Point information associated with a given Series_Period.within a TimeSeries.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Point</td>
<td>Association Based On:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Energy prognosis contextual model::Series_Period[]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>----- Energy prognosis contextual model::Point.Point[1..*]</td>
</tr>
</tbody>
</table>

2.2.3.4 TimeSeries

A set of time-ordered quantities being exchanged.

Table 9 shows all attributes of 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>[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>2</td>
<td>[1..1]</td>
<td>domain.mRID</td>
<td>The unique identification of the domain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AreaID_String</td>
<td>... The domain associated with a TimeSeries that provides the identification of the area concerned by the prognosis.</td>
</tr>
<tr>
<td>3</td>
<td>[0..1]</td>
<td>registeredResource.mRID</td>
<td>The unique identification of a resource.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ResourceID_String</td>
<td>In the ESMP context, the &quot;model authority&quot; 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.</td>
</tr>
<tr>
<td>4</td>
<td>[1..1]</td>
<td>mktPSRTyp.psrType_psrType</td>
<td>The coded type of a power system resource.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PsrType_String</td>
<td>... The identification of the type of resource associated with a TimeSeries.</td>
</tr>
<tr>
<td>5</td>
<td>[1..1]</td>
<td>measurement_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>... The unit of measure associated with the quantities in a TimeSeries.</td>
</tr>
<tr>
<td>6</td>
<td>[1..1]</td>
<td>curveType</td>
<td>The identification of the coded representation of the type of curve being described.</td>
</tr>
</tbody>
</table>

Table 10 shows all association ends of TimeSeries with other classes.
### Table 10 - Association ends of Energy prognosis assembly model::TimeSeries with other classes

<table>
<thead>
<tr>
<th>Order</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Series_Period</td>
<td>The time interval and resolution for a period associated with a TimeSeries. Association Based On: Energy prognosis contextual model::TimeSeries.[]... Energy prognosis contextual model::Series_Period.Series_Period[1..*]</td>
</tr>
</tbody>
</table>

#### 2.2.3.5 UncertaintyPercentage_Quantity

The quantity attribute provides the information relative to the percentage level of quality of the prognosis quantity.

Table 11 shows all attributes of UncertaintyPercentage_Quantity.

### Table 11 - Attributes of Energy prognosis assembly model::UncertaintyPercentage_Quantity

<table>
<thead>
<tr>
<th>Order</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>quantity</td>
<td>The quantity value. The percentage of uncertainty of the provided quantity.</td>
</tr>
<tr>
<td>1</td>
<td>minimumPercentage_Quantity.quantity</td>
<td>The quantity value. ... The minimum uncertainty percentage.</td>
</tr>
<tr>
<td>2</td>
<td>maximumPercentage_Quantity.quantity</td>
<td>The quantity value. ... The maximum uncertainty percentage.</td>
</tr>
</tbody>
</table>

#### 2.2.4 Datatypes

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

- ESMP_DateTimeInterval compound
- AreaID_String datatype, codelist CodingSchemeTypeList
- BusinessKind_String datatype, codelist BusinessTypeList
- 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
- ProcessKind_String datatype, codelist ProcessTypeList
- PsrType_String datatype, codelist AssetTypeList
- Quality_String datatype, codelist QualityTypeList
- ResourceID_String datatype, codelist CodingSchemeTypeList
- YMDHM_DateTime datatype
2.2.5 **EnergyPrognosis_MarketDocument XML schema structure**

**Figure 3 – EnergyPrognosis_MarketDocument schema structure**
2.2.6 EnergyPrognosis_MarketDocument XML schema

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

```xml
```

```xml
<xs:simpleType name="ID_String">
  <xs:restriction base="xs:string">
    <xs:maxLength value="60"/>
  </xs:restriction>
</xs:simpleType>
```

```xml
<xs:simpleType name="ESMPVersion_String">
  <xs:restriction base="xs:string">
    <xs:pattern value="[1-9][0-9]*"/>
  </xs:restriction>
</xs:simpleType>
```

```xml
<xs:simpleType name="MessageKind_String">
  <xs:restriction base="ecl:MessageTypeList"/>
</xs:simpleType>
```

```xml
<xs:simpleType name="PartyID_String">
  <xs:maxlength value="16"/>
</xs:simpleType>
```

```xml
<xs:simpleType name="PartyRoleKind_String">
  <xs:restriction base="ecl:RoleTypeList"/>
</xs:simpleType>
```

```xml
<xs:simpleType name="ESMP_DateTime">
  <xs:restriction base="xs:dateTime">
    <xs:pattern value="(\d{1,2})(\d{2})(\d{2})\.(\d{2})\.(\d{4})\.(\d{2})\:(\d{2})\:(\d{2})Z\d{2}"/>
  </xs:restriction>
</xs:simpleType>
```
ENTSO-E Energy Prognosis document – UML model and schema
VERSION 1.0

Canada's current and future energy consumption continues to grow.

Transmission System Operators
European Network of Transmission System Operators for Electricity

1. "Energy Prognosis"
<xs:element name="receiver_MarketParticipant.mRID">
  <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#IdentifiedObject.mRID/>
</xs:element>

<xs:element name="receiver_MarketParticipant.marketRole.type">
</xs:element>

<xs:element name="createdDateTime" type="ESMP_DateTime">
  <xs:minOccurs>"1"</xs:minOccurs>
  <xs:maxOccurs>"1"</xs:maxOccurs>
  <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#Document.createdDateTime/>
</xs:element>

<xs:element name="time_Period.timeInterval">
  <xs:minOccurs>"1"</xs:minOccurs>
  <xs:maxOccurs>"1"</xs:maxOccurs>
  <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#Period.timeInterval/>
</xs:element>

<xs:element name="process.processType">
  <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#Process.processType/>
</xs:element>

<xs:element name="Area_TimeSeries" type="TimeSeries">
  <xs:minOccurs>"1"</xs:minOccurs>
  <xs:maxOccurs>"unbounded"</xs:maxOccurs>
</xs:element>

<xs:complexType>
  <xs:simpleType name="Position_Integer">
    <xs:sawsd1: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:sawsd1:modelReference>
  </xs:simpleType>
  <xs:simpleType name="Quality_String">
    <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#String">
      <xs:restriction base="ecl:QualityTypelist"/>
    </xs:sawsd1:modelReference>
  </xs:simpleType>
  <xs:complexType name="Point">
    <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#Point">
      <xs:element name="position" type="Position_Integer"/>
      <xs:element name="quantity" type="xs:decimal" minOccur="1"/>
      <xs:element name="quality" type="Quality_String" minOccur="1"/>
      <xs:element name="UncertaintyPercentage.Quantity" minOccur="0" maxOccur="unbounded"/>
    </xs:sawsd1:modelReference>
  </xs:complexType>
  <xs:complexType name="Series_Period">
    <xs:sawsd1:modelReference http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
      <xs:element name="timeInterval" type="ESMP_DateTimeInterval"/>
    </xs:sawsd1:modelReference>
  </xs:complexType>
</xs:complexType>
<xs:element name="resolution" type="xs:duration" minOccurs="1">
  <xs:complexType>
    <xs:simpleType name="BusinessKind_String">
      <xs:restriction base="ecl:BusinessTypeList"/>
    </xs:simpleType>
    <xs:complexType name="AreaID_String">
      <xs:extension base="ecl:AreaID_String"/>
      <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList" use="required"/>
    </xs:complexType>
    <xs:complexType name="ResourceID_String">
      <xs:restriction base="ecl:ResourceID"/>
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