



European Network of
Transmission System Operators
for Electricity

ENTSO-E CODING SCHEMES MAPPING IMPLEMENTATION GUIDE

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Revision History

Version	Release	Date	Comments
0	0	2015-12-18	First drafting of the document based on discussion with CGMES project team on data exchanges.
0	1	2016-01-14	Version taking into account the comments issued by WG EDI after review.
1	0	2016-01-21	Version to be submitted to Market Committee following WG EDI meeting.

59

60 1 Objective

61 The purpose of this document is to enable the exchange of information about the mapping of
62 objects modelled with different level of aggregation.

63 The main purpose is to be used for individual grid model or the common grid model when some
64 information are coming from market oriented or coordinated actions, such as coordinated
65 outage planning, etc.

66 2 The mapping data exchange process

67 2.1 Overall business context

68 A TSO is using different levels of aggregation or views about the network elements, i.e. power
69 system resources in the common information model.

70 As an example, let us consider the object “line”:

- 71 • in a bus-branch model, the line is a single object connecting two electrical nodes, this object
72 is also the one used within the energy identification coding scheme (EIC) and thus has a
73 single master record identification number (mRID);
- 74 • in a node-breaker model, the line is a set of individual components such as line segments,
75 isolators, circuit breakers, etc. Each of these individual components requires to have also a
76 single mRID.

77 Thus a mapping is to be provided between the single EIC mRID and the multiple mRIDs.

78 Mapping is necessary when different modellings are used such as market resource object and
79 power system resource objects. In order to enable network studies when inputs are coming
80 from market results (outage coordination, etc.) and network models (common grid model, etc.),
81 mapping is necessary. Examples of network studies are:

- 82 • contingency analysis to validate the consequences of a given planned outage (identified in
83 the outage planning coordination);
- 84 • generation of a base case depending on the planned outages,
- 85 • etc.

86 2.2 Business Description

87 As stated previously, the TSO is the only one who masters the mapping between the detailed
88 physical views and the “market-oriented” views.

89 The TSO is thus able to provide the necessary mapping information to different service
90 providers (RSCIs, coordinated capacity calculator, etc.) who need it for network study purposes.
91 In particular, the TSO shall ensure the consistency of the mapping provided, e.g. for a given
92 EIC code there shall be only one mapping description at a given time with CGM mRID.

93 The TSO shall use the ResourceMapping_MarketDocument to provide the mapping of a
94 “market” code in a given coding scheme towards the detailed physical configuration using the
95 CGMES mRIDs, or another coding scheme.

96 In addition, for each “market” code, the TSO shall provide the information when this mapping is
97 effective.

98 An existing mapping between a “market” code and CGMES mRIDs is valid from the start date,
99 and if necessary time, provided in start_DateAndOrTime.date and/or
100 start_DateAndOrTime.time either up to the next document submission providing a new start
101 date and time or to the end_DateAndOrTime.date and/or end_DateAndOrTime.time.

102 It shall be mentioned that this document is related only to the exchange of mapping information;
103 the repository to store these master data is out of scope and under the sole responsibility of
104 the receiver.

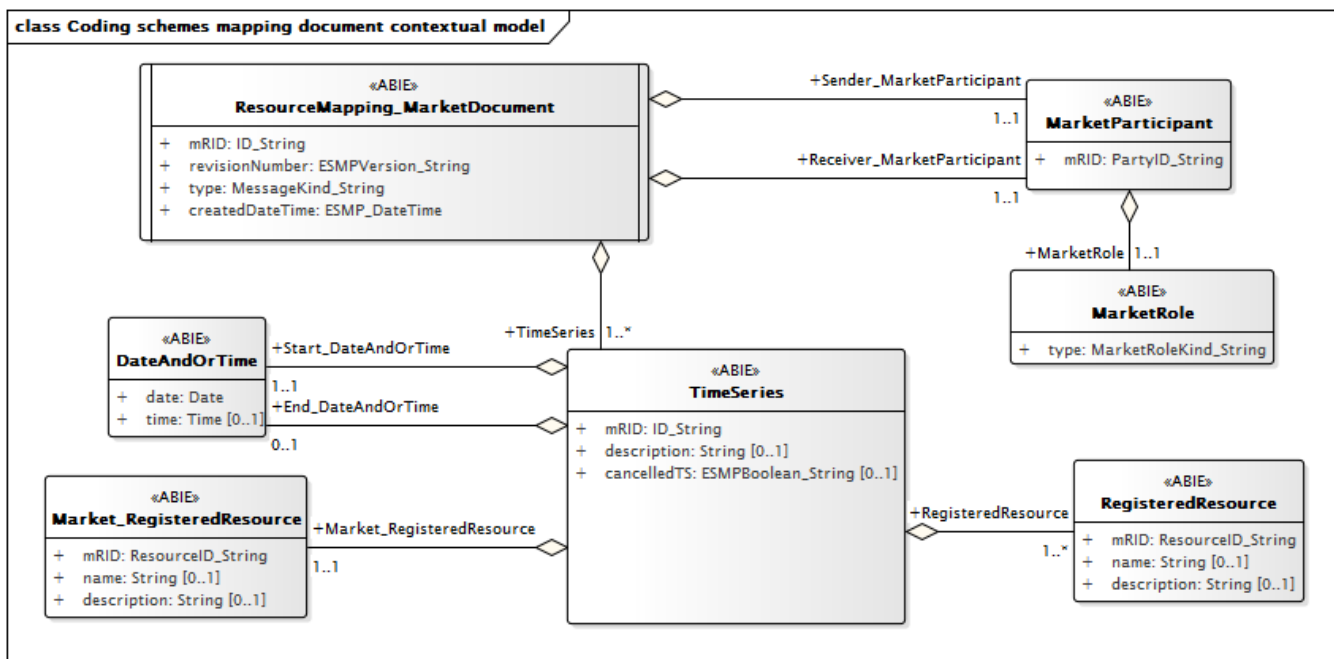
105 **2.3 Codelist values**

106 The “type” attribute of the ResourceMapping_MarketDocument shall have the value A95, i.e.
107 configuration document.

108 **2.4 Mapping document contextual model**

109 **2.4.1 Overview of the model**

110 Figure 1 shows the model.



111

112 **Figure 1 - Coding schemes mapping document contextual model**

113 **2.4.2 IsBasedOn relationships from the European style market profile**

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

116 **Table 1 - IsBasedOn dependency**

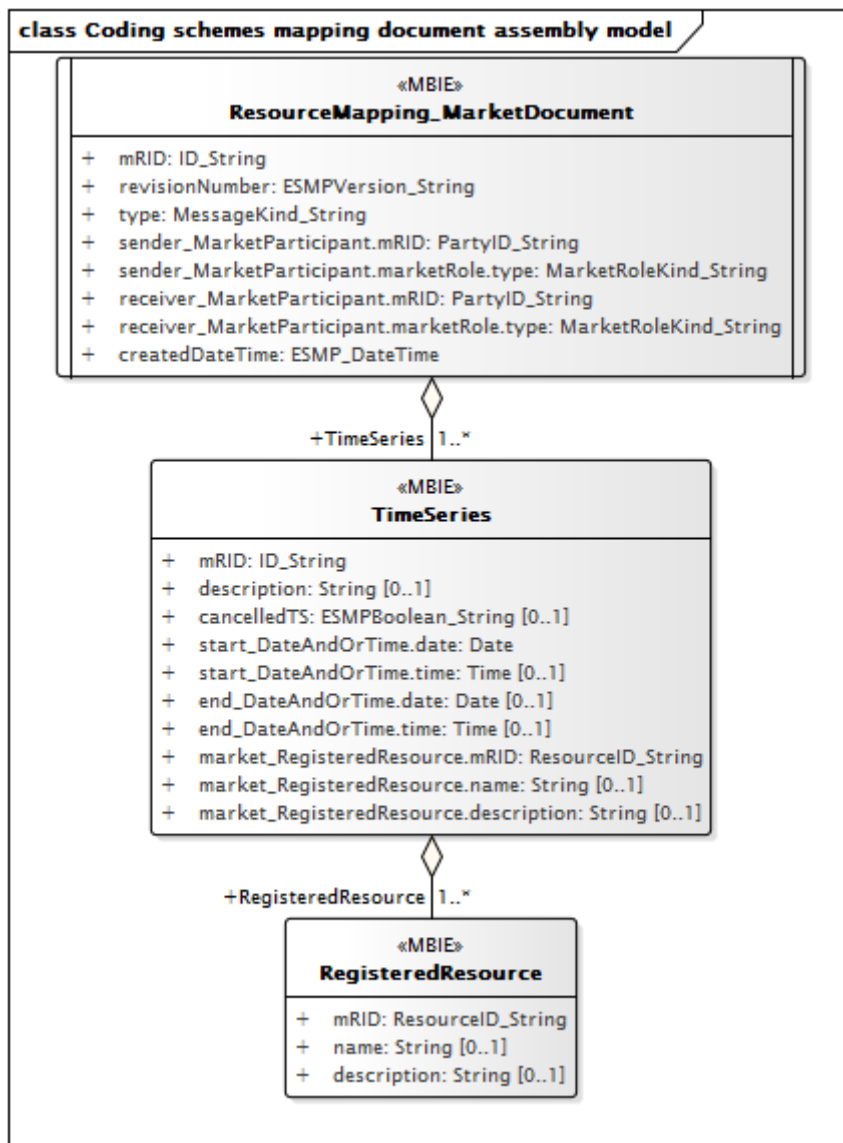
Name	Complete IsBasedOn Path
DateAndOrTime	TC57CIM::IEC62325::MarketManagement::DateAndOrTime
Market_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
ResourceMapping_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

117

118 **2.5 Coding schemes mapping document assembly model**

119 **2.5.1 Overview of the model**

120 Figure 2 shows the model.



121

122 **Figure 2 - Coding schemes mapping document assembly model**

123 **2.5.2 IsBasedOn relationships from the European style market profile**

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

126

Table 2 - IsBasedOn dependency

Name	Complete IsBasedOn Path
RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
ResourceMapping_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

127

128 **2.5.3 Detailed Coding schemes mapping document assembly model**

129 **2.5.3.1 ResourceMapping_MarketDocument root class**

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

132 The mapping document provides association between an object identified by a code in a given
133 coding scheme and all the detailed objects in the CGMES detailed topology (e.g. a line with
134 one EIC code is composed of N object for CGMES, segments, isolators, circuit breakers, etc.).

135 Table 3 shows all attributes of ResourceMapping_MarketDocument.

136 **Table 3 - Attributes of Coding schemes mapping document assembly**
137 **model::ResourceMapping_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]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document owner.
4	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The document owner.
5	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document recipient.
6	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The document recipient.
7	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.

138

139 Table 4 shows all association ends of ResourceMapping_MarketDocument with other classes.

140 **Table 4 - Association ends of Coding schemes mapping document assembly**
141 **model::ResourceMapping_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
8	[1..*]	TimeSeries TimeSeries	Association Based On: Coding schemes mapping document contextual model::TimeSeries.TimeSeries[1..*] ----- Coding schemes mapping document contextual model::ResourceMapping_MarketDocument.[]

142

143 **2.5.3.2 RegisteredResource**

144 A resource that is registered through the market participant registration system. Examples
145 include generating unit, load, and non-physical generator or load.

146 Table 5 shows all attributes of RegisteredResource.

147
148

**Table 5 - Attributes of Coding schemes mapping document assembly
model::RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	The unique identification of a resource.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[0..1]	description String	The description is a free human readable text describing or naming the object. It may be non unique and may not correlate to a naming hierarchy.

149

150 2.5.3.3 TimeSeries

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

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

154 Table 6 shows all attributes of TimeSeries.

**Table 6 - Attributes of Coding schemes mapping document assembly
model::TimeSeries**

155
156

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series.
1	[0..1]	description String	The description of the mapping between the objects. The description is a free human readable text describing or naming the object. It may be non unique and may not correlate to a naming hierarchy.
2	[0..1]	cancelledTS ESMPBoolean_String	An indicator stating that the TimeSeries, identified by the mRID, is withdrawn. The mapping information is no longer valid.
3	[1..1]	start_DateAndOrTime.date Date	The date as "YYYY-MM-DD", which conforms with ISO 8601. --- The date from which the mapping is to be applied between the objects.
4	[0..1]	start_DateAndOrTime.time Time	The time as "hh:mm:ss.sssZ", which conforms with ISO 8601. --- The date from which the mapping is to be applied between the objects.
5	[0..1]	end_DateAndOrTime.date Date	The date as "YYYY-MM-DD", which conforms with ISO 8601. --- The date up to which the mapping is to be applied between the objects, i.e. the end date.
6	[0..1]	end_DateAndOrTime.time Time	The time as "hh:mm:ss.sssZ", which conforms with ISO 8601. --- The date up to which the mapping is to be applied between the objects, i.e. the end date.
7	[1..1]	market_RegisteredResource.mRID ResourceID_String	The unique identification of a resource. --- The identification of a resource associated with a TimeSeries. The code in a given coding scheme that is to be mapped with the detailed configuration, e.g. a line described by a single EIC code will have a detailed mapping with the CGMES coding scheme objects (segment of lines, isolators, circuit breakers, etc.).

Order	mult.	Attribute name / Attribute type	Description
8	[0..1]	market_RegisteredResource.name String	The name is any free human readable and possibly non unique text naming the object. --- The identification of a resource associated with a TimeSeries. The code in a given coding scheme that is to be mapped with the detailed configuration, e.g. a line described by a single EIC code will have a detailed mapping with the CGMES coding scheme objects (segment of lines, isolators, circuit breakers, etc.).
9	[0..1]	market_RegisteredResource.description String	The description is a free human readable text describing or naming the object. It may be non unique and may not correlate to a naming hierarchy. --- The identification of a resource associated with a TimeSeries. The code in a given coding scheme that is to be mapped with the detailed configuration, e.g. a line described by a single EIC code will have a detailed mapping with the CGMES coding scheme objects (segment of lines, isolators, circuit breakers, etc.).

157

158 Table 7 shows all association ends of TimeSeries with other classes.

159 **Table 7 - Association ends of Coding schemes mapping document assembly**
160 **model::TimeSeries with other classes**

Order	mult.	Class name / Role	Description
10	[1..*]	RegisteredResource RegisteredResource	The identification of a resource associated with a TimeSeries. The detailed configuration, based on CGMES coding scheme, of the object described by a code.in a given coding scheme (e.g. an EIC code) Association Based On: Coding schemes mapping document contextual model::RegisteredResource.RegisteredResource[1..*] ----- Coding schemes mapping document contextual model::TimeSeries.[]

161

162 2.5.4 Datatypes

163 The list of datatypes used for the Coding schemes mapping document assembly model is as
164 follows:

- 165 • ESMP_DateTime datatype
- 166 • ESMPBoolean_String datatype, codelist IndicatorTypeList
- 167 • ESMPVersion_String datatype
- 168 • ID_String datatype
- 169 • MarketRoleKind_String datatype, codelist RoleTypeList
- 170 • MessageKind_String datatype, codelist MessageTypeList
- 171 • PartyID_String datatype, codelist CodingSchemeTypeList
- 172 • ResourceID_String datatype, codelist CodingSchemeTypeList

173 **2.5.5 ResourceMapping_MarketDocument XML schema**

174 Figure 3 provides the structure of the schema.

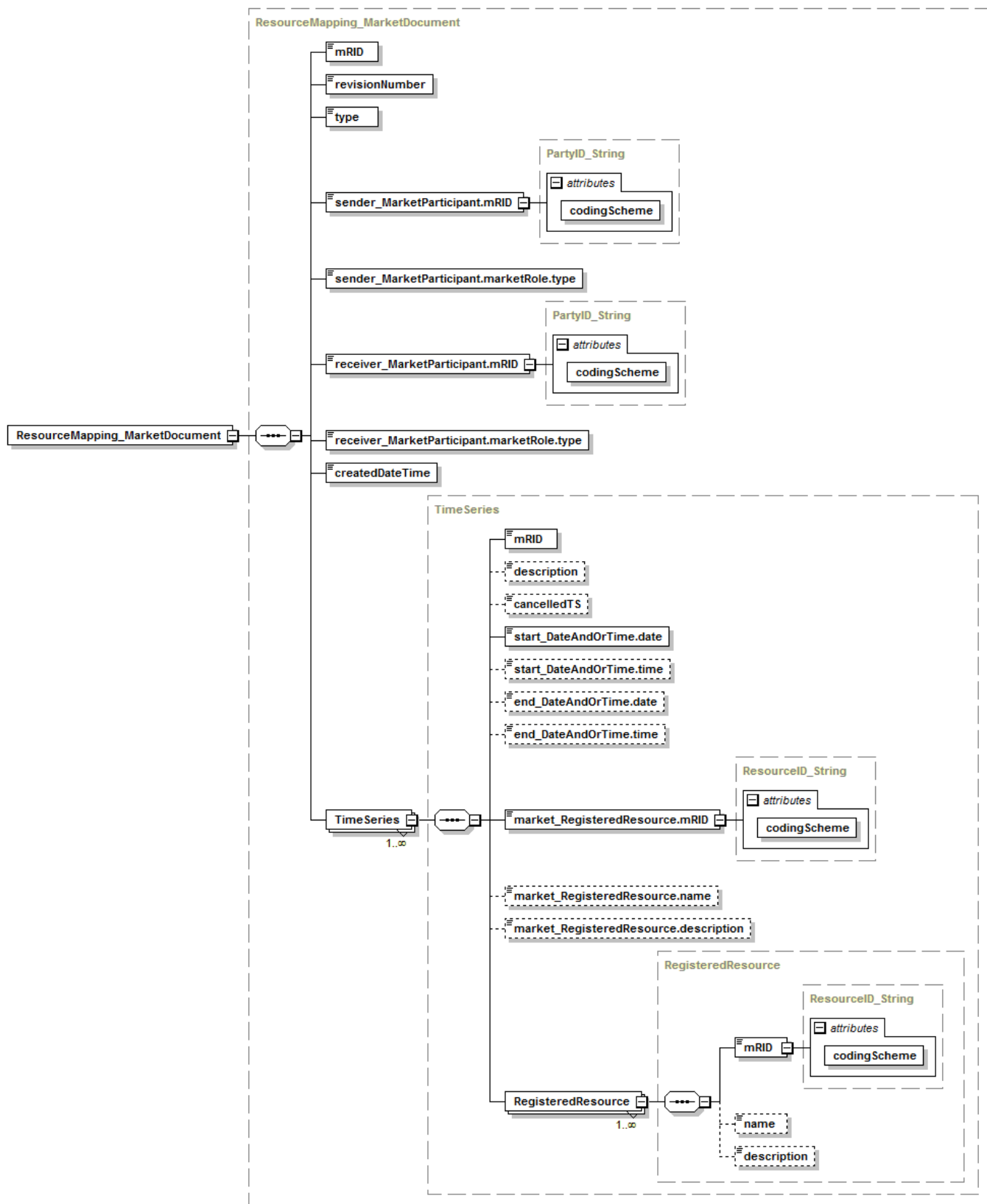


Figure 3 – ResourceMapping_MarketDocument schema structure

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