



BSI Standards Publication

Framework for energy market communications

Part 451-10: Profiles for Energy Consumption Data ("My Energy Data")

National foreword

This British Standard is the UK implementation of EN IEC 62325-451-10:2021. It is identical to IEC 62325-451-10:2020.

The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power systems management and associated information exchange.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Amendments/corrigenda issued since publication

Date	Text affected
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English Version

Framework for energy market communications - Part 451-10:
Profiles for Energy Consumption Data ("My Energy Data")
(IEC 62325-451-10:2020)

Cadre pour les communications pour le marché de l'énergie
- Partie 451-10: Profils de données sur la consommation
d'énergie ("Mes données d'énergie")
(IEC 62325-451-10:2020)

Kommunikation im Energiemarkt - Teil 451-10: Profile für
Energieverbrauchsdaten ("Meine Energiedaten")
(IEC 62325-451-10:2020)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 57/2266/FDIS, future edition 1 of IEC 62325-451-10, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62325-451-10:2021.

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- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-10-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-01-01

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Endorsement notice

The text of the International Standard IEC 62325-451-10:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61968-11	NOTE	Harmonized as EN 61968-11
IEC 61970-301	NOTE	Harmonized as EN IEC 61970-301
IEC 62325-301	NOTE	Harmonized as EN IEC 62325-301
IEC 62325-351	NOTE	Harmonized as EN 62325-351
IEC 62325-450	NOTE	Harmonized as EN 62325-450
IEC 62351-3	NOTE	Harmonized as EN 62351-3
IEC 61968-9	NOTE	Harmonized as EN 61968-9

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/TS 61970-2	2004	Energy management system application program interface (EMS-API) - Part 2: Glossary	CLC/TS 61970-2	2005
IEC 62325-351	-	Framework for energy market communications - Part 351: CIM European market model exchange profile	EN 62325-351	-
IEC 62325-450	2013	Framework for energy market communications - Part 450: Profile and context modelling rules	EN 62325-450	2013
IEC 62361-100	-	Power systems management and associated information exchange - Interoperability in the long term - Part 100: CIM profiles to XML schema mapping	EN 62361-100	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 451-10: Profiles for Energy Consumption Data ("My Energy Data")

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62325-451-10 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this standard is based on the following documents:

FDIS	Report on voting
57/2266/FDIS	57/2312/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62325 series, published under the general title *Framework for energy market communications*, can be found on the IEC website.

This IEC standard includes Code Components i.e. components that are intended to be directly processed by a computer. Such content is any text found between the markers <CODE BEGINS> and <CODE ENDS>, or otherwise is clearly labelled in this standard as a Code Component.

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The Code Components included in this IEC standard are also available as electronic machine readable file at: http://www.iec.ch/public/TC57/IEC_62325-451-10.zip.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62325 is one of the IEC 62325 series for deregulated energy market communications.

The principal objective of the IEC 62325 series is to produce standards which facilitate the integration of market application software developed independently by different vendors into a market management system, between market management systems and market participant systems. This is accomplished by defining message exchanges to allow these applications or systems access to public data and exchange information independent of how such information is represented internally.

The common information model (CIM), i.e. IEC 62325-301, IEC 61970-301 and IEC 61968-11, specifies the basis for the semantics for message exchange.

This European style market profile is based on different parts of the CIM IEC standard, i.e. IEC 61970-301, IEC 62325-301, IEC 62325-351, and specifies the content of the messages exchanged.

"My Energy Data" (MED) is the term adopted in Europe as a generic description of services to offer customers (residential, municipalities, ...) the possibility of downloading their energy consumption information and granting access to third parties to that information to enable service providers to offer analytical and other services to customers (residential, municipalities, ...).

Europe needs to define a standard to support the "My Energy Data" requirements.

The application domain of this work is limited to customers connected to Distribution System Operator (DSO) grids.

The main objective is to have a standardized and interoperable format so that various actors (customers, municipalities, ...) can download electrical energy data. The content of the standard will mainly be an XML schema (XSD) associated with a message. The message will consist of an envelope and a semantic part. The semantic part will be essentially based on IEC 61970-301, IEC 61968-11, IEC 62325-301. The envelope part will take into account standards IEC 61968-100, IEC 62325-503, IEC 62325-504.

My Energy Data is primarily subject to Regulation (EU) 2019/943 of the European parliament and of the council of 5 june 2019 on the internal market for electricity.

As stated in the "My Energy Data" document (published in November 2016 by European Smart Grids Task Force Expert Group 1 – Standards and Interoperability):

- "My Energy Data services are primarily subject to the EU General Data Protection Regulation (GDPR) 2016/679/EC, the Energy Efficiency Directive 2012/27/EU, the Electricity Directive 2009/72/EC, the Gas Directive 2009/73/EC and further country-specific legislation"
- "One of the key aspects that would significantly contribute to opening the European internal market for future Energy Services is for the industrial initiative to establish a common format for energy data interchange that allows companies to seamlessly provide their services throughout the EU Member State. The ad hoc group intends to continue its work and invite to join all interested stakeholders which have not been extensively consulted due to time constraints. It recommends therefore that – after the publication of the European Commission Winter Package – a European industry initiative consisting of all interested stakeholders, such as, but not limited to manufacturers, utilities, vendors, laboratories and national regulators will be formed in early 2017 with the aim to provide further detailed specifications on a common format for energy data interchange under consideration of the high-level requirements provided by this report."

"This document will support the European Regulation. It will increase interoperability. The following parties which will benefit from this standard are: customers, suppliers, transmission and distribution system operators, aggregators, energy service companies, and other parties which provide energy or other services to customers."

This document provides the profile associated to use case "Download My Data" and is named "EUMED Market" profile. The first use case, "Download my data", is described in Annex A. The previous version of EUMED, called "EUMED Metering" circulated among the task force in January 2018 is described in Annex B, Annex C and Annex D.

The "EUMED Metering" proposal was based on IntervalBlock and IntervalReading CIM classes as proposed in 61968-9 IS standard to Model Time Series. It was based on a European project proposal (Flexiciency deliverable D6.0).

As an alternative, and in order to be consistent with IEC European Style Market Profiles (ESMP), experts familiar with 62325 and ESMP proposed to investigate a EUMED CIM based on Time Series.

As a consequence, the decision was to postpone circulation of first CD among National Committees in order to define a solution based on TimeSeries.

Figure 1 presents the two models, EUMED Market and EUMED Metering.

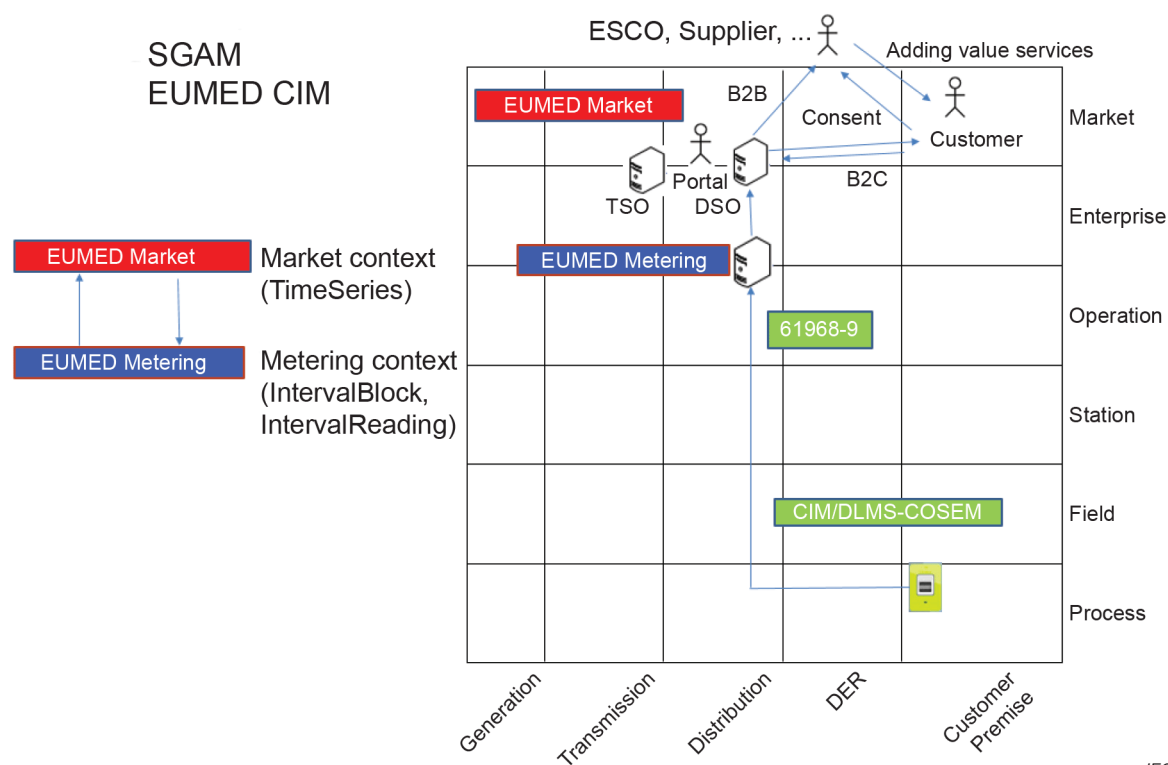


Figure 1 – Positioning of EUMED Market and EUMED Metering

The EUMED Metering profile has been described in Annex B of this document. The compatibility between EUMED Metering and EUMED Market will be studied later, and EUMED Metering profile will potentially be integrated in IEC 61968 series.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 451-10: Profiles for Energy Consumption Data ("My Energy Data")

1 Scope

Based on the European style market contextual model (IEC 62325-351), this part of IEC 62325 specifies a UML package for the Energy Consumption Data business process and its associated document contextual model, assembly model and XML schema for use within the European style electricity markets.

The relevant aggregate core components (ACCs) defined in IEC 62325-351 have been contextualised into aggregated business information entities (ABIEs) to satisfy the requirements of the European style market Energy Consumption Data business process.

The contextualised ABIEs have been assembled into the Energy Consumption Data document contextual model.

A related assembly model and an XML schema for the exchange of Energy Consumption information between market participants is automatically generated from the assembled document contextual model. The XML schema follows IEC Code Components management and copyright licensing.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 61970-2:2004, *Energy management system application program interface (EMS-API) – Part 2: Glossary*

IEC 62325-351, *Framework for energy market communications – Part 351: CIM European market model exchange profile*

IEC 62325-450:2013, *Framework for energy market communications – Part 450: Profile and context modelling rules*

IEC 62361-100, *Power systems management and associated information exchange – Interoperability in the long term – Part 100: CIM profiles to XML schema mapping*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 61970-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

aggregate business information entity

ABIE

re-use of an aggregate core component (ACC) in a specified business

3.2

aggregate core component

ACC

collection of related pieces of business information that together convey a distinct business meaning, independent of any specific business context

Note 1 to entry: Expressed in modelling terms, this is the representation of an object class, independent of any specific business context.

[SOURCE: ISO/TS 15000-5:2005, Clause 9]

3.3

based on

IsBasedOn

use of an artefact that has been restricted according to the requirements of a specific business context

[SOURCE IEC 62325-450:2013, 3.4]

3.4

business context

specific business circumstance as identified by the values of a set of context categories, allowing different business circumstances to be uniquely distinguished

[SOURCE: ISO/TS 15000-5:2005, 4.6.2]

3.5

code component

any piece of information, intended to be directly processed by a computer and encoded in accordance with specific software code language rules (typically XML, XSD, Java, C, ...)

Note 1 to entry: There may be multiple code components into one standard.

3.6

information model

information model is a representation of concepts, relationships, constraints, rules, and operations to specify data semantics for a chosen domain of discourse

Note 1 to entry: It can provide shareable, stable, and organized structure of information requirements for the domain context.

3.7

internal European market

IEM

market of any commodity, service, etc. within the European Community

Note 1 to entry: In particular, European Directives and Regulation are defining the energy IEM.

Note 2 to entry: These software systems in an electricity market may include support for capacity allocation, scheduling energy, ancillary or other services, real-time operations and settlements.

3.8

profile

basic outline of all the information that is required to satisfy a specific environment

3.9

Smart Meter

SM

end device with a combination of meter-related functions

Note 1 to entry: For more explanation refer to CEN-CENELEC-ETSI Smart Grid Coordination Group- Sustainable Processes – Nov 2012 – Annex A Actor List.

4 Document contextual model and message assembly model basic concepts

4.1 Overview

IEC 62325-450 defines how to develop a set of CIM profiles that follows a layered modelling framework as outlined in Figure 2 going from the common information model (CIM, IEC 61968-11, IEC 61970-301 and IEC 62325-301), to different regional contextual models and their subsequent contextualized documents for information exchange; the final step being the message specifications for information interchange.

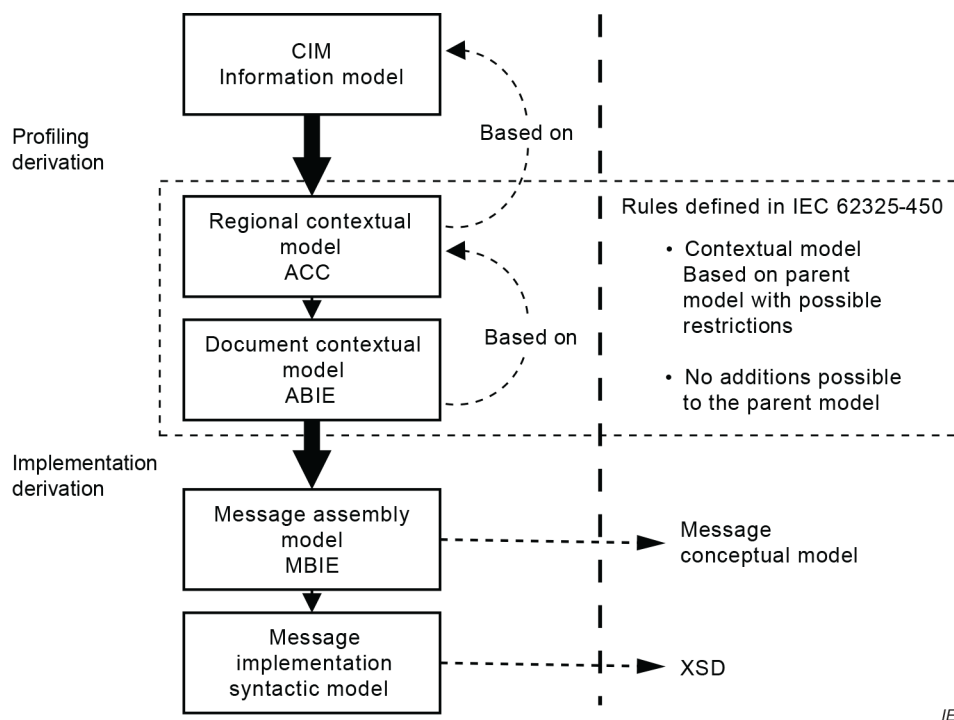


Figure 2 – IEC 62325-450 modelling framework

The regional contextual models are the basic core components that are necessary to build electronic documents for information interchange. This is defined in the European style market contextual model (IEC 62325-351). These core components are also termed aggregate core components (ACCs).

A document contextual model is based upon a specific business requirements specification and is constructed from the contextualisation of the ACCs that can be found in the European style market contextual model. The contextualised ACCs at this stage are termed aggregate business information entities (ABIEs). These ABIEs are the constructs that are assembled together into a specific electronic document to satisfy the information requirements outlined in the business requirements specification. The transformation from an ACC to an ABIE shall respect the rules defined in IEC 62325-450.

Once a document contextual model has been built that satisfactorily meets the business requirements, a message assembly model can be automatically generated from it.

XML schema, which is the syntax used by other ESMP profiles, then may be automatically generated from the message assembly model. If necessary specific mapping can take place at this stage to transform the CIM class and attribute names into more market legacy names.

4.2 European style market package structure

Figure 3 describes the main package structure of the European style market profile.

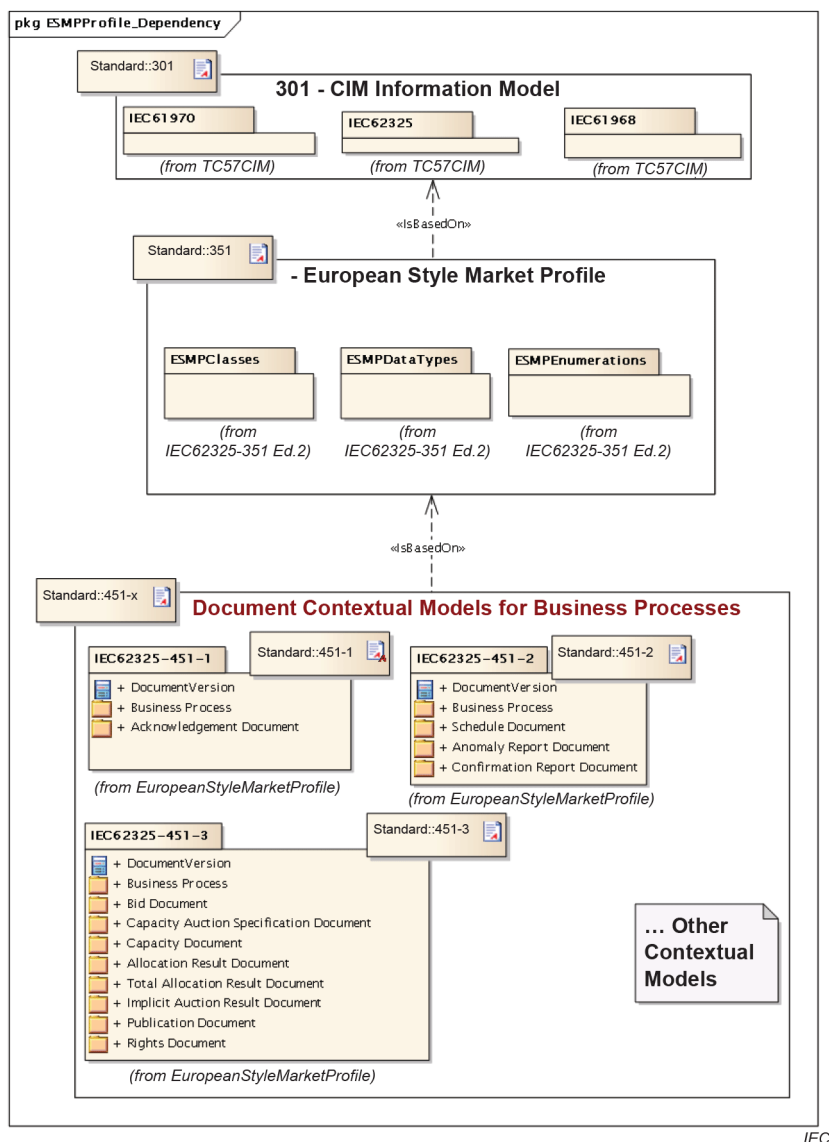


Figure 3 – Overview of European style market profile dependency

For each business process, a business process package is described in an IEC 62325-451-x standard. A business process package contains:

- The document contextual model (ABIE) and the automatically generated message assembly model (MBIE) for each electronic document required to enable the completion of the business process. Each document is a sub contextual model derived by restriction from the European style market profile.
- The XML schema of the business document that is automatically generated from the message assembly model.

The European style market profile (ESMP), as defined in IEC 62325-351, provides the core components permitted for use in an IEC 62325-451-x standard as all ABIEs shall be "based on" the IEC 62325-351 core components:

- **ESMPClasses:** Defining all the semi-contextual classes of the European style market profile derived by restriction from the CIM model.
- **ESMPDataTypes:** Defining all the core datatypes used within the ESMP classes.

All the core components that are used in every electronic document structure have been harmonized and centralized in the European style market profile. These core components are consequently the basic building blocks from which all electronic document ABIEs are derived.

4.3 From the European style market profile to the document contextual model

The document contextual model for a given business process is constructed by an information analyst who identifies all the information requirements necessary to satisfy the business process.

Once the information requirements have been identified the information analyst identifies the related ACCs that are available in the European style market profile and contextualises them to meet the information requirements. This contextualisation step creates a set of aggregate business information entities (ABIEs).

In a final step the information analyst assembles together into a specific document contextual model package the ABIEs to form a document model satisfying the business requirements.

4.4 From the document contextual model to the message assembly model

Once the document contextual model has been finalised, the message assembly model may be automatically generated.

All document contextual models share the same core components and core datatypes. These are defined in the European style market profile (IEC 62325-351) and are contextualised and refined in all document contextual models (IEC 62325-451-x series) respecting the rules as described in IEC 62325-450.

4.5 From the assembly model to the XML schema

The final modelling step applies a standardized set of criteria in order to generate a uniform XML schema from the assembly model. This transformation process respects the rules defined in IEC 62361-100.

5 The My Energy Data business process

5.1 Business process definition

The Business Process is defined in Annex A of this document. Originally the use case had been defined by IEC System Committee working group 6, in IEC 62913-2-2. The use case has been reviewed and consolidated by the European Smart Grid Task Force Expert Group 1, Emerging Services sub-group. The use case is only supporting "Download My Data".

5.2 Business rules for the My Energy Data document

5.2.1 General

All the business rules described in IEC 62325-351 are also valid for this document. Additional rules are provided hereafter.

The following entities are associated to the Contextual Model defined in 6.1, and the Assembly Model defined in 6.2.

As Contextual and Assembly models use several optional attributes (cardinality [0,1] or [0,n]), it is expected to find usage description of not required attributes in (local) implementation guides.

Entity	Number	Description
MyEnergyData_MarketDocument	01	Market participants shall be uniquely referenced by their respective mRIDs. Their additional attributes (name and role) are optional.
	02	Area domain shall correspond to one source area domain. If it is different from area domain referenced in one time series included in the concerned document, then this time series reports on energy exchanges between one source area domain (referenced in the Market Document) and one target area domain (referenced in this time series).
	03	Area domain shall correspond to one source area domain. If it is the same as area domain referenced in one time series included in the concerned document, then this time series reports on energy exchanges inside one single area domain (referenced both in the Market Document and in this time series).
	04	Area domain shall correspond to one source area domain. If it is missing, then area domains referenced in time series included in the concerned document shall be present and each time series reports on energy exchanges inside one single area domain (referenced in this time series).
TimeSeries	01	Area domain shall correspond to one target area domain. If it is different from area domain referenced in including market document, then this time series reports on energy exchanges between one source area domain (referenced in the Market Document) and one target area domain (referenced in this time series).
	02	Area domain shall correspond to one target area domain. If it is the same as area domain referenced in including market document, then this time series reports on energy exchanges inside one single area domain (referenced both in the Market Document and in this time series).

Entity	Number	Description
	03	Area domain shall correspond to one target area domain. If it is missing, then area domains referenced in including document shall be present and each time series reports on energy exchanges inside one single area domain (referenced in the Market Document).
	04	If businessType is equal to "Net Production / Consumption", then either In Quantities or (exclusively) Out Quantities should be used in points included in this time series and these quantities may have a negative value.
Series_Period	01	The start date of the timeInterval attribute shall be less or equal to its end date.
Point	01	The quantity of the In_Quantity attribute shall correspond to energy exchanged from the source area domain included in the market document to the target area domain included in the time series.
	02	The quantity of the Out_Quantity attribute shall correspond to energy exchanged from the target area domain included in the time series to the source area domain included in the market document.
Quantity	01	If quantity is missing, then quality shall be equal to "Not available".

IEC 62325-451-5 could be used to download data and get data associated with IEC 62325-451-10. The use case in Annex A describes some information exchanges between different roles established by Smart Grid Task Force Expert Group 1.

An acknowledgement document (IEC 62325-451-1) is not required by this document. The usage of acknowledgements can be described in (local) implementation guides. The usage of an acknowledgement document can depend on bilateral agreements, on national legislation and generally if an exchange is a part of a Notify exchange or not.

6 Contextual and assembly models

6.1 My Energy Data contextual model

6.1.1 Overview of the model

Figure 4 shows the model.

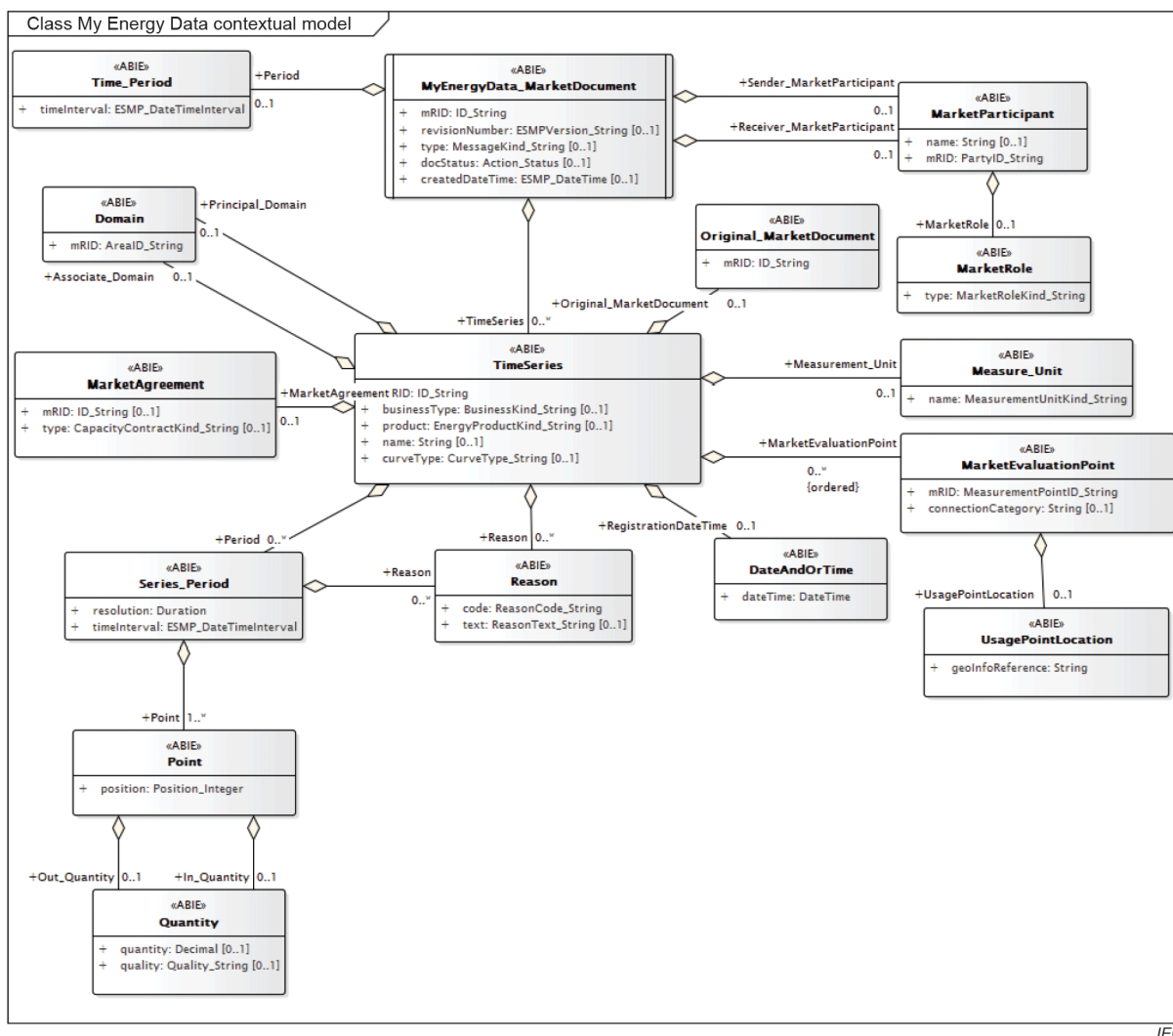


Figure 4 – My Energy Data contextual model

6.1.2 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
MarketAgreement	TC57CIM::IEC62325::MarketManagement::MarketAgreement
MarketEvaluationPoint	TC57CIM::IEC62325::MarketManagement::MarketEvaluationPoint
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MyEnergyData_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Original_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Point	TC57CIM::IEC62325::MarketManagement::Point

Name	Complete IsBasedOn Path
Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries
UsagePointLocation	TC57CIM::IEC61968::Metering::UsagePointLocation

6.1.3 Detailed My Energy Data contextual model

6.1.3.1 MyEnergyData_MarketDocument root class

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

Table 2 shows all attributes of MyEnergyData_MarketDocument.

Table 2 – Attributes of My Energy Data contextual model::MyEnergyData_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 of this document. 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	[0..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
2	[0..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.
3	[0..1]	docStatus Action_Status	The identification of the condition or position of the document with regard to its standing.
4	[0..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.

Table 3 shows all association ends of MyEnergyData_MarketDocument with other classes.

Table 3 – Association ends of My Energy Data contextual model::MyEnergyData_MarketDocument with other classes

Order	mult.	Class name / Role	Description
5	[0..1]	MarketParticipant Sender_MarketParticipant	The sender market participant Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
6	[0..1]	MarketParticipant Receiver_MarketParticipant	The receiver market participant Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
7	[0..1]	Time_Period Period	The time interval that is associated with an electronic document and which is valid for the whole document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Time_Period.Period[0..*]
9	[0..*]	TimeSeries TimeSeries	The time series that are associated with an electronic document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::TimeSeries.TimeSeries[0..*]

6.1.3.2 DateAndOrTime

The Date and or the Time.

Table 4 shows all attributes of DateAndOrTime.

Table 4 – Attributes of My Energy Data contextual model::DateAndOrTime

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	dateTime DateTime	Date and time as per ISO 8601 YYYY-MM-DDThh:mm:ss.sssZ.

6.1.3.3 Domain

Table 5 shows all attributes of Domain.

Table 5 – Attributes of My Energy Data contextual model::Domain

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID AreaID_String	The unique identification of the domain. In the ESM 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.

6.1.3.4 MarketAgreement

Table 6 shows all attributes of MarketAgreement.

Table 6 – Attributes of My Energy Data contextual model::MarketAgreement

Order	mult.	Attribute name / Attribute type	Description
0	[0..1]	mRID ID_String	The unique identification of the agreement. In the ESMP context, the "model authority" is defined as an emitting company that provides an agreed identification unique for this market agreement. 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	[0..1]	type CapacityContractKind_String	The specification of the kind of the agreement, e.g. long term, daily contract.

6.1.3.5 MarketEvaluationPoint

The location where one or more products are measured. This may be a physical or virtual location.

Table 7 shows all attributes of MarketEvaluationPoint.

Table 7 – Attributes of My Energy Data contextual model::MarketEvaluationPoint

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	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.
1	[0..1]	connectionCategory String	A code used to specify the connection category.

Table 8 shows all association ends of MarketEvaluationPoint with other classes.

Table 8 – Association ends of My Energy Data contextual model::MarketEvaluationPoint with other classes

Order	mult.	Class name / Role	Description
2	[0..1]	UsagePointLocation UsagePointLocation	Location of this usage point. Association Based On: ESMPClasses::UsagePointLocation.UsagePointLocation[0..1] ----- ESMPClasses::MarketEvaluationPoint.[]

6.1.3.6 MarketParticipant

Table 9 shows all attributes of MarketParticipant.

Table 9 – Attributes of My Energy Data contextual model::MarketParticipant

Order	mult.	Attribute name / Attribute type	Description
0	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[1..1]	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.

Table 10 shows all association ends of MarketParticipant with other classes.

Table 10 – Association ends of My Energy Data contextual model::MarketParticipant with other classes

Order	mult.	Class name / Role	Description
1	[0..1]	MarketRole MarketRole	Association Based On: ESMPClasses::MarketParticipant.[] ----- ESMPClasses::MarketRole.MarketRole[0..1]

6.1.3.7 MarketRole

Table 11 shows all attributes of MarketRole.

Table 11 – Attributes of My Energy Data contextual model::MarketRole

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	type MarketRoleKind_String	The identification of the role played by a market player.

6.1.3.8 Measure_Unit

The particular quantity, defined and adopted by convention, with which other quantities of the same kind are compared in order to express their magnitudes relative to that quantity.

Table 12 shows all attributes of Measure_Unit.

Table 12 – Attributes of My Energy Data contextual model::Measure_Unit

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20).

6.1.3.9 Original_MarketDocument

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

Table 13 shows all attributes of Original_MarketDocument.

Table 13 – Attributes of My Energy Data contextual model::Original_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 of this document. 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.

6.1.3.10 Point

Table 14 shows all attributes of Point.

Table 14 – Attributes of My Energy Data contextual 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.

Table 15 shows all association ends of Point with other classes.

**Table 15 – Association ends of My Energy Data contextual model::
Point with other classes**

Order	mult.	Class name / Role	Description
1	[0..1]	Quantity In_Quantity	The in Quantity information associated with a given Point. If only Principal_Domain is present, amount of product delivered to the local area behind MarketEvaluationPoints associated to the TimeSeries. Else, amount of product delivered to Principal_Domain and extracted from Associate_Domain. Association Based On: ESMPClasses::Quantity.Quantity[0..*] ----- ESMPClasses::Point.[]
2	[0..1]	Quantity Out_Quantity	The out Quantity information associated with a given Point. If only Principal_Domain is present, amount of product extracted from the local area behind MarketEvaluationPoints associated to the TimeSeries. Else, amount of product extracted from Principal_Domain and delivered to Associate_Domain. Association Based On: ESMPClasses::Quantity.Quantity[0..*] ----- ESMPClasses::Point.[]

6.1.3.11 Quantity

Description of quantities needed in the data exchange.

The type of the quantity is described either by the role of the association or the quantityType attribute.

The quality attribute provides the information about the quality of the quantity (measured, estimated, etc.).

Table 16 shows all attributes of Quantity.

Table 16 – Attributes of My Energy Data contextual model::Quantity

Order	mult.	Attribute name / Attribute type	Description
0	[0..1]	quantity Decimal	The quantity value. The association role provides the information about what is expressed.
1	[0..1]	quality Quality_String	The description of the quality of the quantity.

6.1.3.12 Reason

The motivation of an act.

Table 17 shows all attributes of Reason.

Table 17 – Attributes of My Energy Data contextual model::Reason

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

6.1.3.13 Series_Period

Table 18 shows all attributes of Series_Period.

Table 18 – Attributes of My Energy Data contextual model::Series_Period

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

Table 19 shows all association ends of Series_Period with other classes.

Table 19 – Association ends of My Energy Data contextual 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: ESMPClasses::Series_Period.[] ----- ESMPClasses::Point.Point[1..*]
3	[0..*]	Reason Reason	The reason information associated with a Series_Period providing motivation information. Association Based On: ESMPClasses::Reason.Reason[0..*] ----- ESMPClasses::Series_Period.[]

6.1.3.14 Time_Period

Table 20 shows all attributes of Time_Period.

Table 20 – Attributes of My Energy Data contextual model::Time_Period

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.

6.1.3.15 TimeSeries

Table 21 shows all attributes of TimeSeries.

Table 21 – Attributes of My Energy Data contextual 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 of this time series. 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	[0..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.
3	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
5	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.

Table 22 shows all association ends of TimeSeries with other classes.

Table 22 – Association ends of My Energy Data contextual model::TimeSeries with other classes

Order	mult.	Class name / Role	Description
4	[0..1]	DateAndOrTime RegistrationDateTime	A date and/or time associated with a TimeSeries. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::DateAndOrTime.DateAndOrTime[0..*]
6	[0..1]	Domain Principal_Domain	The principal domain designate the domain for which "in" values are to be interpreted as amount of product delivered and "out" values as amount of product extracted. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Domain.Domain[0..1]
7	[0..1]	Domain Associate_Domain	The associate domain is the second domain in the relation "Principal" / "Associate" when two domains are to be referenced. The "in" and "out" values are to be interpreted in the opposite way of the principal domain. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Domain.Domain[0..*]
8	[0..1]	MarketAgreement MarketAgreement	The identification of an agreement associated with a TimeSeries. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::MarketAgreement.MarketAgreement[0..*]

Order	mult.	Class name / Role	Description
9	[0..1]	Measure_Unit Measurement_Unit	The unit of measure associated with the quantities in a TimeSeries. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Measure_Unit.Measurement_Unit[0..*]
10	[0..1]	Original_MarketDocument Original_MarketDocument	The identification of an electronic document associated with a TimeSeries. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::MarketDocument.Original_MarketDocument[0..1]
11	[0..*]	Series_Period Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Series_Period.Period[0..*]
12	[0..*]	MarketEvaluationPoint MarketEvaluationPoint	The identification of a measurement point associated with a TimeSeries. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::MarketEvaluationPoint.MarketEvaluationPoint[0..1]
13	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Reason.Reason[0..*]

6.1.3.16 UsagePointLocation

Table 23 shows all attributes of UsagePointLocation.

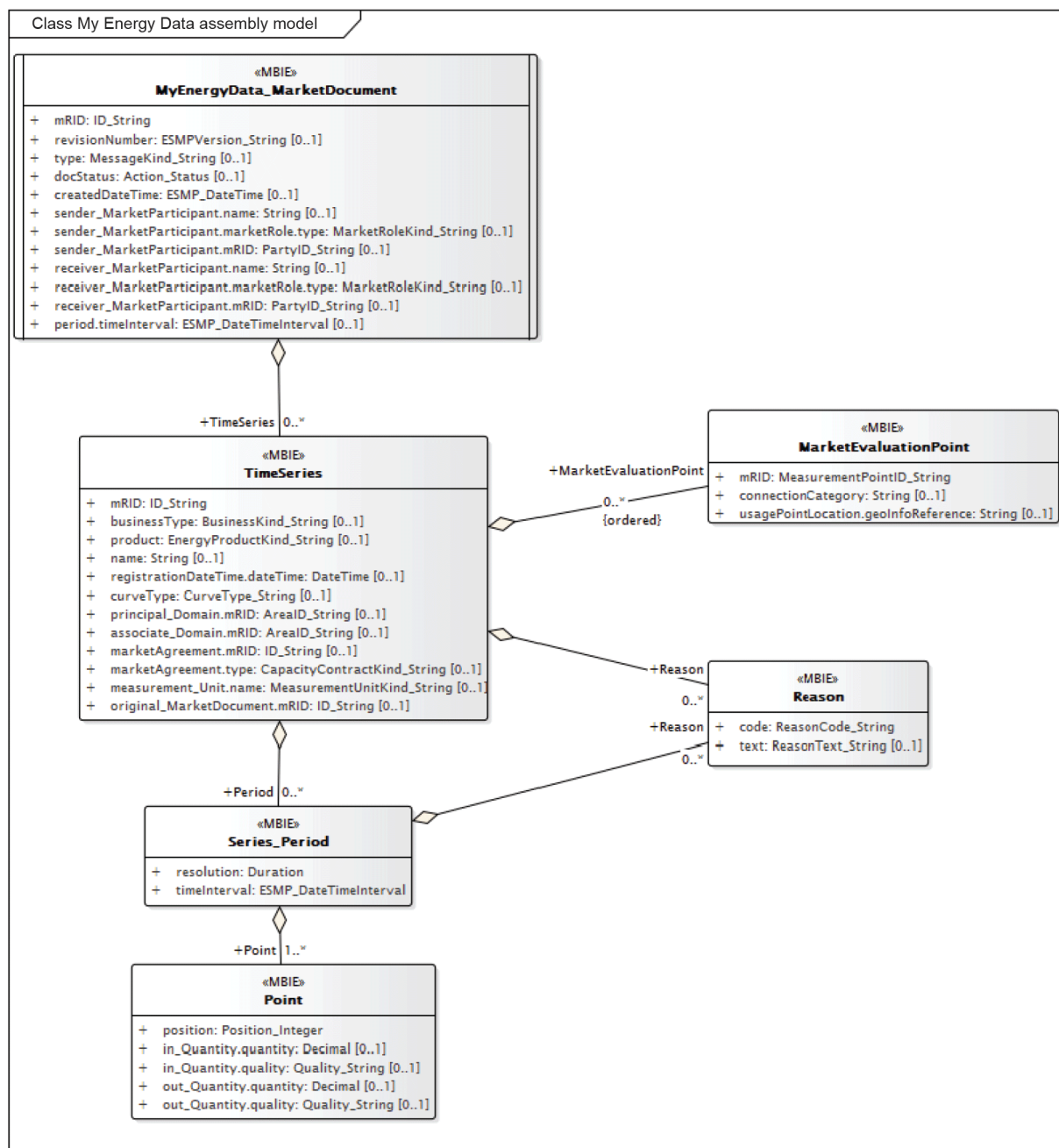
Table 23 – Attributes of My Energy Data contextual model::UsagePointLocation

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	geoInfoReference String	(if applicable) Reference to geographical information source, often external to the utility.

6.2 My Energy Data assembly model

6.2.1 Overview of the model

Figure 5 shows the model.



IEC

Figure 5 – My Energy Data assembly model

6.2.2 IsBasedOn relationships from the European style market profile

Table 24 shows the traceability dependency of the classes used in this package towards the upper level.

Table 24 – IsBasedOn dependency

Name	Complete IsBasedOn Path
MarketEvaluationPoint	TC57CIM::IEC62325::MarketManagement::MarketEvaluationPoint
MyEnergyData_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Point	TC57CIM::IEC62325::MarketManagement::Point
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

6.2.3 Detailed My Energy Data assembly model

6.2.3.1 MyEnergyData_MarketDocument root class

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

Table 25 shows all attributes of MyEnergyData_MarketDocument.

Table 25 – Attributes of My Energy Data assembly model::MyEnergyData_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 of this document. 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	[0..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
2	[0..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.
3	[0..1]	docStatus Action_Status	The identification of the condition or position of the document with regard to its standing.
4	[0..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
5	[0..1]	sender_MarketParticipant.name String	The name is any free human readable and possibly non unique text naming the object. --- The sender market participant
6	[0..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The sender market participant

Order	mult.	Attribute name / Attribute type	Description
7	[0..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 sender market participant
8	[0..1]	receiver_MarketParticipant.name String	The name is any free human readable and possibly non unique text naming the object. --- The receiver market participant
9	[0..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The receiver market participant
10	[0..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 receiver market participant
11	[0..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 26 shows all association ends of MyEnergyData_MarketDocument with other classes.

**Table 26 – Association ends of My Energy Data assembly
model::MyEnergyData_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
13	[0..*]	TimeSeries TimeSeries	The time series that are associated with an electronic document. Association Based On: My Energy Data contextual model::TimeSeries.TimeSeries[0..*] ----- My Energy Data contextual model::MyEnergyData_MarketDocument.[.]

6.2.3.2 MarketEvaluationPoint

The location where one or more products are measured. This may be a physical or virtual location.

Table 27 shows all attributes of MarketEvaluationPoint.

Table 27 – Attributes of My Energy Data assembly model::MarketEvaluationPoint

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	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.
1	[0..1]	connectionCategory String	A code used to specify the connection category.
2	[0..1]	usagePointLocation.geolInfoReference String	(if applicable) Reference to geographical information source, often external to the utility. --- Location of this usage point.

6.2.3.3 Point

Table 28 shows all attributes of Point.

Table 28 – Attributes of My Energy Data 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]	in_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The in Quantity information associated with a given Point. If only Principal_Domain is present, amount of product delivered to the local area behind MarketEvaluationPoints associated to the TimeSeries. Else, amount of product delivered to Principal_Domain and extracted from Associate_Domain.
2	[0..1]	in_Quantity.quality Quality_String	The description of the quality of the quantity. --- The in Quantity information associated with a given Point. If only Principal_Domain is present, amount of product delivered to the local area behind MarketEvaluationPoints associated to the TimeSeries. Else, amount of product delivered to Principal_Domain and extracted from Associate_Domain.
3	[0..1]	out_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The out Quantity information associated with a given Point. If only Principal_Domain is present, amount of product extracted from the local area behind MarketEvaluationPoints associated to the TimeSeries. Else, amount of product extracted from Principal_Domain and delivered to Associate_Domain.
4	[0..1]	out_Quantity.quality Quality_String	The description of the quality of the quantity. --- The out Quantity information associated with a given Point. If only Principal_Domain is present, amount of product extracted from the local area behind MarketEvaluationPoints associated to the TimeSeries. Else, amount of product extracted from Principal_Domain and delivered to Associate_Domain.

6.2.3.4 Reason

The motivation of an act.

Table 29 shows all attributes of Reason.

Table 29 – Attributes of My Energy Data assembly model::Reason

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

6.2.3.5 Series_Period

Table 30 shows all attributes of Series_Period.

Table 30 – Attributes of My Energy Data assembly model::Series_Period

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

Table 31 shows all association ends of Series_Period with other classes.

Table 31 – Association ends of My Energy Data 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: My Energy Data contextual model::Point.Point[1..*] ----- My Energy Data contextual model::Series_Period.[]
3	[0..*]	Reason Reason	The reason information associated with a Series_Period providing motivation information. Association Based On: My Energy Data contextual model::Reason.Reason[0..*] ----- My Energy Data contextual model::Series_Period.[]

6.2.3.6 TimeSeries

Table 32 shows all attributes of TimeSeries.

Table 32 – Attributes of My Energy Data 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 of this time series. 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	[0..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.
3	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
4	[0..1]	registrationDateTime.dateTime DateTime	Date and time as per ISO 8601 YYYY-MM-DDThh:mm:ss.sssZ. --- A date and/or time associated with a TimeSeries.
5	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
6	[0..1]	principal_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 principal domain designate the domain for which "in" values are to be interpreted as amount of product delivered and "out" values as amount of product extracted.
7	[0..1]	associate_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 associate domain is the second domain in the relation "Principal" / "Associate" when two domains are to be referenced. The "in" and "out" values are to be interpreted in the opposite way of the principal domain.
8	[0..1]	marketAgreement.mRID ID_String	The unique identification of the agreement. In the ESMP context, the "model authority" is defined as an emitting company that provides an agreed identification unique for this market agreement. 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 an agreement associated with a TimeSeries.

Order	mult.	Attribute name / Attribute type	Description
9	[0..1]	marketAgreement.type CapacityContractKind_String	The specification of the kind of the agreement, e.g. long term, daily contract. --- The identification of an agreement associated with a TimeSeries.
10	[0..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.
11	[0..1]	original_MarketDocument.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 of this document. 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 an electronic document associated with a TimeSeries.

Table 33 shows all association ends of TimeSeries with other classes.

**Table 33 – Association ends of My Energy Data assembly model::
TimeSeries with other classes**

Order	mult.	Class name / Role	Description
12	[0..*]	Series_Period Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: My Energy Data contextual model::Series_Period.Period[0..*] ----- My Energy Data contextual model::TimeSeries.[]
13	[0..*]	MarketEvaluationPoint MarketEvaluationPoint	The identification of a measurement point associated with a TimeSeries. Association Based On: My Energy Data contextual model::MarketEvaluationPoint.MarketEvaluationPoint[0..*] ----- My Energy Data contextual model::TimeSeries.[]
14	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: My Energy Data contextual model::Reason.Reason[0..*] ----- My Energy Data contextual model::TimeSeries.[]

6.2.4 Primitives

6.2.4.1 DateTime primitive

Date and time as "YYYY-MM-DDThh:mm:ss.sssZ", which conforms with ISO 8601 UTC time zone.

NOTE The time within ESMP is expressed in UTC.

6.2.4.2 Decimal primitive

Decimal is the base-10 notational system for representing real numbers.

6.2.4.3 Duration primitive

Duration as "PnYnMnDTnHnMnS" which conforms to ISO 8601, where nY expresses a number of years, nM a number of months, nD a number of days. The letter T separates the date expression from the time expression and, after it, nH identifies a number of hours, nM a number of minutes and nS a number of seconds. The number of seconds could be expressed as a decimal number, but all other numbers are integers.

6.2.4.4 Integer primitive

An integer number. The range is unspecified and not limited.

6.2.4.5 String primitive

A string consisting of a sequence of 8 bit characters. The character encoding is UTF-8. The string length is unspecified and unlimited.

6.2.5 Datatypes

6.2.5.1 General

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

6.2.5.2 Action_Status compound

The coded identification of the status of an object.

Table 34 shows all attributes of Action_Status.

Table 34 – Attributes of ESMPDataTypes::Action_Status

mult.	Attribute name / Attribute type	Description
[1..1]	value Status_String	Main Core value Space.

6.2.5.3 ESMP_DateTimeInterval compound

This datatype enables to express the start date and time, and the end date and time of a time interval with a specific pattern. This pattern is the YYYY-MM-DDThh:mmZ.

Table 35 shows all attributes of ESMP_DateTimeInterval.

Table 35 – Attributes of ESMPDataTypes::ESMP_DateTimeInterval

mult.	Attribute name / Attribute type	Description
[1..1]	start YMDHM_DateTime	The start date and time of the interval with a minute resolution.
[1..1]	end YMDHM_DateTime	The end date and time of the interval with a minute resolution.

6.2.5.4 AreaID_String datatype

The coded identification of a domain, i.e. balance area, grid area, etc.

In the ESMP context, it is an authorized issuing office that provides an agreed identification coding scheme for domain identification.

Table 36 shows all attributes of AreaID_String.

Table 36 – Attributes of ESMPDataTypes::AreaID_String

mult.	Attribute name / Attribute type	Description
[1..1]	codingScheme CodingSchemeTypeList	DomainQualification.
[1..1]	value String	Main Core value Space.

Table 37 shows all restrictions applied to the attributes of AreaID_String.

Table 37 – Restrictions of attributes for ESMPDataTypes::AreaID_String

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(18)

6.2.5.5 BusinessKind_String datatype

The coded identification of the business type.

Table 38 shows all attributes of BusinessKind_String.

Table 38 – Attributes of ESMPDataTypes::BusinessKind_String

mult.	Attribute name / Attribute type	Description
[1..1]	value BusinessTypeList	Main Core value Space.

6.2.5.6 CapacityContractKind_String datatype

The coded identification of a contract type, e.g. daily auction, weekly auction, monthly auction, yearly auction, etc.

Table 39 shows all attributes of CapacityContractKind_String.

Table 39 – Attributes of ESMPDataTypes::CapacityContractKind_String

mult.	Attribute name / Attribute type	Description
[1..1]	value ContractTypeList	Main Core value Space.

6.2.5.7 CurveType_String datatype

The coded identification of the type of curve.

Table 40 shows all attributes of CurveType_String.