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Entwurf

**Kommunikation im Energiemarkt –
Teil 451-10: Profile für Energieverbrauchsdaten („Meine Energiedaten“)
(IEC 57/2027/CD:2018);
Text Englisch**

Framework for energy market communications –
Part 451-10: Profiles for energy consumption data (“My Energy Data”)
(IEC 57/2027/CD:2018);
Text in English

Anwendungswarnvermerk

Dieser Norm-Entwurf mit Erscheinungsdatum 2019-04-19 wird der Öffentlichkeit zur Prüfung und Stellungnahme vorgelegt.

Weil die beabsichtigte Norm von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses Entwurfs besonders zu vereinbaren.

Stellungnahmen werden erbeten

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- oder in Papierform an die DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Stresemannallee 15, 60596 Frankfurt am Main.

Die Empfänger dieses Norm-Entwurfs werden gebeten, mit ihren Kommentaren jegliche relevanten Patentrechte, die sie kennen, mitzuteilen und unterstützende Dokumentationen zur Verfügung zu stellen.

Gesamtumfang 158 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Nationales Vorwort

Die englische Originalfassung des internationalen Dokuments IEC 57/2027/CD:2018 „Framework for energy market communications – Part 451-10: Profiles for energy consumption data (‘‘My Energy Data’’)“ (CD, en: Committee Draft) ist unverändert in diesen Norm-Entwurf übernommen worden.

Das internationale Dokument wurde vom TC 57 „Power systems management and associated information exchange“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet und den nationalen Komitees zur Stellungnahme vorgelegt.

Die Internationale Elektrotechnische Kommission (IEC) und das Europäische Komitee für Elektrotechnische Normung (CENELEC) haben vereinbart, dass ein auf IEC-Ebene erarbeiteter Entwurf für eine Internationale Norm zeitgleich (parallel) bei IEC und CENELEC zur Umfrage (CDV-Stadium) und Abstimmung als FDIS (en: Final Draft International Standard) bzw. Schluss-Entwurf für eine Europäische Norm gestellt wird, um eine Beschleunigung und Straffung der Normungsarbeit zu erreichen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

Da der Abstimmungszeitraum für einen FDIS bzw. Schluss-Entwurf FprEN nur 6 Wochen beträgt, und dann keine sachlichen Stellungnahmen mehr abgegeben werden können, sondern nur noch eine „JA/NEIN“-Entscheidung möglich ist, wobei eine „NEIN“-Entscheidung fundiert begründet werden muss, wird bereits der CD als DIN-Norm-Entwurf veröffentlicht, um die Stellungnahmen aus der Öffentlichkeit frühzeitig berücksichtigen zu können.

Für dieses Dokument ist das nationale Arbeitsgremium K 952 „Netzleittechnik“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE (www.dke.de) zuständig.

Für den Fall einer undatierten Verweisung im normativen Text (Verweisung auf ein Dokument ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnittsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils aktuellste Ausgabe des in Bezug genommenen Dokuments.

Für den Fall einer datierten Verweisung im normativen Text bezieht sich die Verweisung immer auf die in Bezug genommene Ausgabe des Dokuments.

Der Zusammenhang der zitierten Dokumente mit den entsprechenden deutschen Dokumenten ergibt sich, soweit ein Zusammenhang besteht, grundsätzlich über die Nummer der entsprechenden IEC-Publikation. Beispiel: IEC 60068 ist als EN 60068 als Europäische Norm durch CENELEC übernommen und als DIN EN 60068 ins Deutsche Normenwerk aufgenommen.

Das Präsidium des DIN hat mit Präsidialbeschluss 1/2004 festgelegt, dass DIN-Normen, deren Inhalt sich auf internationale Arbeitsergebnisse der Informationsverarbeitung gründet, unter bestimmten Bedingungen allein in englischer Sprache veröffentlicht werden dürfen. Diese Bedingungen sind für den vorliegenden Normentwurf erfüllt.

Da sich die Benutzer des vorliegenden Normentwurfs der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der EN 62325-451-10 veröffentlicht. Zu deren Einleitung, Abschnitt 1, der den Anwendungsbereich festlegt, Abschnitt 3, der die Begriffe festlegt, Abschnitt 4 und Abschnitt 5 wurde eine Übersetzung angefertigt und als informativer Nationaler Anhang NA des vorliegenden Normentwurfs hinzugefügt. Für viele der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Dieser Normentwurf steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

Es ist vorgesehen, auch bei der entsprechenden zukünftigen Deutschen Norm auf die deutsche Sprachfassung zu verzichten und diese in der englischsprachigen Fassung zu veröffentlichen.

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Das Original-Dokument enthält Bilder in Farbe, die in der Papierversion in einer Graustufen-Darstellung wiedergegeben werden. Elektronische Versionen dieses Dokuments enthalten die Bilder in der originalen Farbdarstellung.

Nationaler Anhang NA (informativ)

Auszugsweise Übersetzung^{N1}

Einleitung

Dieser Normenteil gehört zur Normenreihe IEC 62325 für Kommunikation im deregulierten Energiemarkt.

Hauptziel der Serie IEC 62325 ist es, Normen zu schaffen, die die Integration von unabhängig von verschiedenen Lieferanten entwickelter Marktanwendungssoftware in ein Marktmanagementsystem, zwischen Marktmanagementsystemen und Marktteilnehmersystemen, erleichtert. Dies wird durch die Festlegung von Nachrichtenaustauschen entwickelt, die den Anwendungen oder Systemen Zugang zu öffentlichen Daten und den Informationsaustausch, unabhängig von der internen Informationsdarstellung, ermöglichen.

Das allgemeine Informationsmodell (CIM), d. h. IEC 62325-301, IEC 61970-301 und IEC 61968-11, spezifiziert die Semantikgrundlage für den Nachrichtenaustausch.

Dieses Profil des Europäischen Marktes basiert auf verschiedenen Teilen der CIM-IEC-Norm und spezifiziert den Inhalt der ausgetauschten Nachrichten.

Dieses Dokument liefert das Profil mit dem Namen „EUMED-Markt“, das mit dem Anwendungsfall „Meine Daten herunterladen“ zusammenhängt. Der erste Anwendungsfall, „Meine Daten herunterladen“ wird in ANHANG A beschrieben. Die vorherige Version von EUMED mit dem Namen „EUMED-Messung“, die in der Task Force im Januar 2018 verbreitet wurde, wird in den Anhängen B, C und D beschrieben.

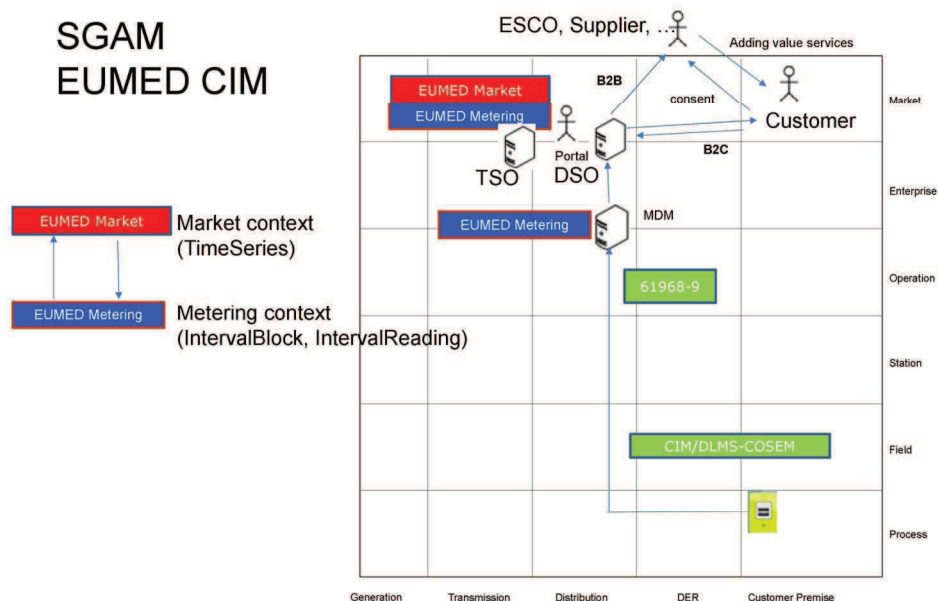
Der „EUMED-Messung“-Vorschlag basierte auf den „IntervalBlock IntervalReading“-CIM-Klassen, wie sie in der IS-Norm 61968-9 für Modellzeitreihen vorgeschlagen wurden. Diese basierten auf einem europäischen Projektvorschlag (Flexiciency-Liefergegenstand D6.0).

Als Alternative und um Kohärenz zu den europäischen Marktprofiltypen (ESMP) TC57 WG16 herzustellen, haben Experten, die mit 62325 und ESMP vertraut sind, die Untersuchung eines auf Zeitreihen basierenden EUMED-CIM vorgeschlagen.

Dementsprechend wurde die Entscheidung zur Verschiebung der Verbreitung des ersten CD unter den nationalen Komitees gefällt, um eine auf Zeitreihen basierende Lösung festzulegen.

Das folgende Bild stellt die beiden Modelle, EUMED-Markt und EUMED-Messung, dar.

^{N1} Nationale Fußnote: Die Nummerierung aus IEC 57/2027/CD:2018-08 wurde beibehalten.

**Text im Bild:****Englisch**

EUMED Market
Market context (TimeSeries)
EUMED Metering
Metering context (IntervalBlock, IntervalReading)
ESCO, Supplier, ...
Adding value services
consent
TSO
Portal DSO
MDM
Market
Enterprise
Operation
Station
Field
Process
Generation
Transmission
Distribution
DER
Customer Premise

Deutsch

EUMED-Markt
Marktkontext (TimeSeries)
EUMED-Messung
Messkontext (IntervalBlock, IntervalReading)
ESCO, Lieferant, ...
Mehrwertdienste
Einverständnis
TSO
Portal DSO
MDM
Markt
Unternehmen
Betrieb
Station
Feld
Prozess
Erzeugung
Übertragung
Verteilung
DER
Gebäude des Kunden

Bild 1 – Positionierung von EUMED-Markt und EUMED-Messung

Das EUMED-Marktprofil, Hauptthema dieses Dokuments, wird definiert, und einige CIM-Probleme müssen gelöst werden. Wir liefern eine Liste von CIM-Problemen und Diskussionspunkten, die in den kommenden Monaten behandelt werden müssen:

- mehrere Bewertungspunkte je Zeitreihe wurden eingeführt, die kann für lokale Energiegemeinschaften von Interesse sein

- spezifische Vertragsinformationen müssen besprochen werden
- neben Sender/Empfänger müssen Rollen hinzugefügt werden
- Bestimmung der Flussrichtung: Die Flussrichtung (vorwärts oder rückwärts) ergibt sich aus den Endpunkten des Flusses, aber es wird derselbe Attributname (area_Domain.mRID) verwendet, um auf diese beiden Endpunkte zu verweisen
- Wie sollen DSO/ESO-Kalender verwaltet werden?
- Abschnitt 6.1.3.1, Tabelle 2 (und alle ähnlichen Tabellen)
Die Vermischung von Attributnamen und -typen in derselben Spalte erschwert das Lesen und die Prüfung und macht Fehler wahrscheinlicher. Aufteilung der Namen/Typenspalte in zwei Spalten: die Namenspalte und die Typenspalte.
- Abschnitt 6.1.3.1, Tabelle 3 (und alle ähnlichen Tabellen)
Die Vermischung von Klassennamen und -rollen in derselben Spalte erschwert das Lesen und die Prüfung und macht Fehler wahrscheinlicher. Aufteilung der Klassen/Rollenspalte in zwei Spalten: die Klassenspalte und die Rollenspalte.
- Abschnitt 6.1.3.1, Tabelle 3
Die Verbindung zur Domänenklasse sollte in Source_Domain umbenannt werden, um Unklarheiten in Bezug auf Eingangs-/Ausgangswerte zu vermeiden.
- Abschnitt 6.1.3.12, Tabelle 19
Die Verbindung zur Domänenklasse sollte in Target_Domain umbenannt werden, um Unklarheiten in Bezug auf Eingangs-/Ausgangswerte zu vermeiden.

Das Profil „EUMED-Messung“ wurde in einem Anhang dieses Dokuments beschrieben. Die Kompatibilität zwischen „EUMED-Messung“ und „EUMED-Markt“ wird zu einem späteren Zeitpunkt untersucht, und das Profil „EUMED-Messung“ wird möglicherweise in einen Teil von IEC 61968-9 aufgenommen.

1 Anwendungsbereich

Auf Grundlage des kontextuellen Markt-Modells nach europäischer Art (IEC 62325-351) legt dieser spezielle Teil der IEC 62325-Normenreihe ein UML-Paket für den Energieverbrauchsdaten-Geschäftsprozess, das zugeordnete Dokument-kontextbezogene Modell, das Einbindungsmodell und das XML-Schema für die Verwendung in europäischen Elektrizitätsmarkttypen fest.

Die relevanten, in IEC 62325-351 definierten aggregierten Kernkomponenten (ACC) wurden kontextualisiert in die aggregierten Geschäfts-Informationseinheiten (ABIE), um den Anforderungen des Energieverbrauchsdaten-Geschäftsprozesses für Märkte nach europäischer Art zu entsprechen.

Die kontextualisierten ABIEs wurden in den Energieverbrauchsdatendokument-kontextbezogenen Modellen eingebunden.

Ein verwandtes Einbindungsmodell und ein XML-Schema für den Austausch von Energieverbrauchs-Informationen zwischen Marktteilnehmern werden automatisch auf Grundlage des zusammengesetzten Dokument-kontextbezogenen Modells erzeugt.

3 Begriffe

Für die Anwendung dieses Dokuments gelten die Begriffe nach IEC TS 61970-2 und die folgenden Begriffe.

3.1

aggregierte Geschäfts-Informationseinheit

ABIE

(en: aggregate business information entity)

für ein bestimmtes Geschäftsfeld wiederverwendete aggregierte Kernkomponente (ACC)

3.2

aggregierte Kernkomponente

ACC

(en: aggregate core component)

Gruppe zusammengehöriger Geschäftsinformationselemente, die unabhängig von jeder Art spezifischen Geschäftskontexts gemeinsam eine bestimmte Geschäftsbedeutung übermitteln

Anmerkung 1 zum Begriff Als Terme bei der Modellierung stellen diese unabhängig von einem bestimmten Geschäftskontext eine Objektklasse dar.

[QUELLE: ISO/TS 15000-5:2005, Abschnitt 9]

3.3

basiert auf

IsBasedOn

(en: based on)

Einsetzen eines Artefakts, das Einschränkungen besitzt, die nach den Anforderungen eines bestimmten Geschäftskontextes vorgenommen wurden

[QUELLE: IEC 62325-450:2013, 3.4]

3.4

Geschäftskontext

(en: business context)

formale Beschreibung einer speziellen Geschäftssituation, die aus den Werten einer Gruppe von Kontextkategorien bestimmt wurde und es ermöglicht, unterschiedliche Geschäftssituationen eindeutig voneinander zu trennen

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

3.5

Informationsmodell

(en: information model)

das Informationsmodell ist eine Repräsentation von Konzeptionen, Beziehungen, Beschränkungen, Regeln und Operationen zur Festlegung von Datensemantiken für ein ausgewähltes Diskursuniversum

Anmerkung 1 zum Begriff Es kann gemeinsam anwendbare, feste und geordnete Datenstrukturanforderungen an den Domänenkontext enthalten.

3.6

interner europäischer Markt

IEM

(en: internal european market)

Markt für Waren, Dienste usw. innerhalb der Europäischen Gemeinschaft

Anmerkung 1 zum Begriff Insbesondere definieren Europäische Direktiven und Regularien den Energie-IEM.

Anmerkung 2 zum Begriff Diese Softwaresysteme für einen Elektrizitätsmarkt können Unterstützung bei der Kapazitätsaufteilung, der Energieplanung, bei Hilfs- oder anderen Diensten, Echtzeit-Abläufen und Abrechnungen einschließen.

3.7

Profil

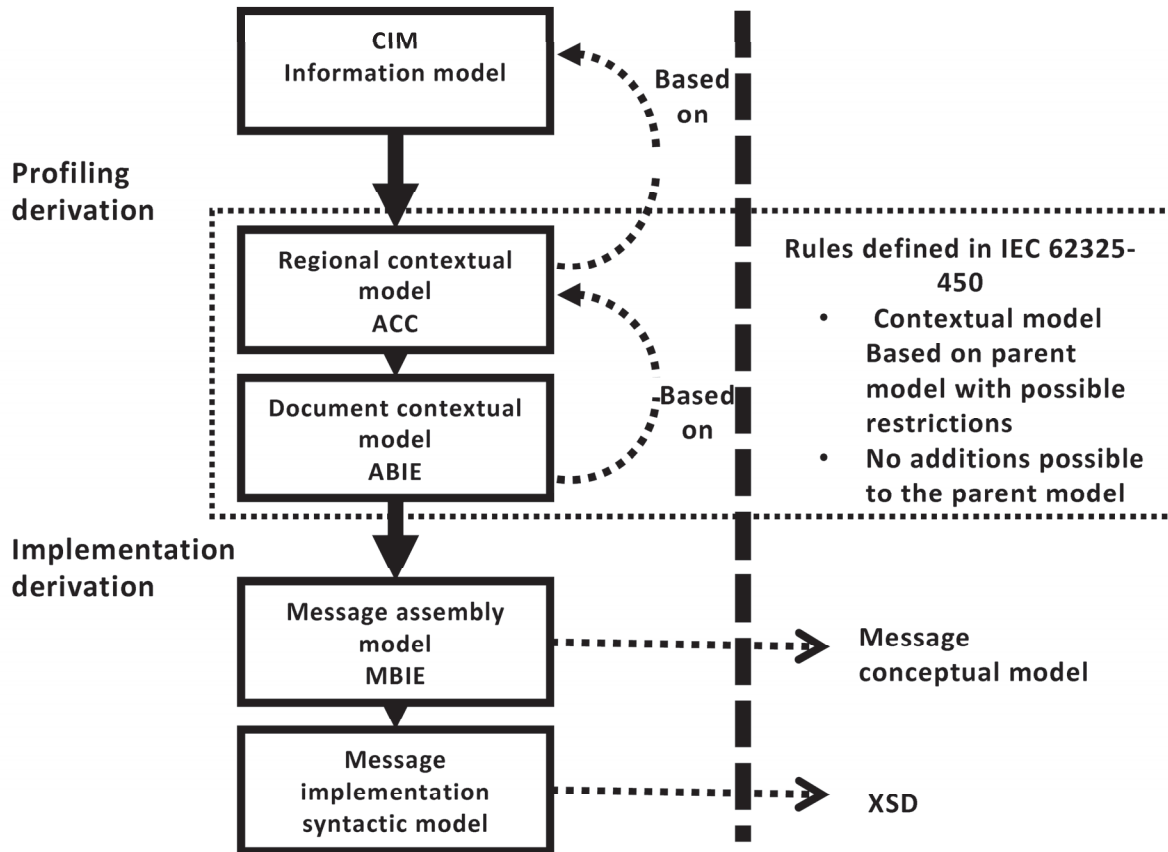
(en: profile)

grundlegender Strukturrahmen aller Daten, die erforderlich sind, um für eine spezielle Umgebung geeignet zu sein

4 Grundkonzepte des kontextabhängigen Dokumentenmodells und des Nachrichten-Einbindungsmodells

4.1 Überblick

IEC 62325-450 legt die Entwicklung von CIM-Profilen fest, die einem wie in Bild 2 dargestellten schichtigen Modellierungsrahmen folgen, der zum Informationsaustausch vom allgemeinen Informationsmodell (CIM, IEC 61968-11, IEC 61970-301 und IEC 62325-301) zu verschiedenen regionalen Kontextmodellen und deren nachfolgenden kontextuellen Dokumenten verläuft, wobei der letzte Schritt in der Nachrichtenspezifikation zum Informationsaustausch besteht.

**Text im Bild:****Englisch**

CIM Information model
 Based on
 Profiling derivation
 Regional contextual model
 ACC
 Document contextual model
 ABIE
 Rules defined in IEC 62325-450
 Contextual model
 Based on parent model with possible
 restrictions
 No additions possible to the parent model

 Implementation derivation
 Message assembly model
 MBIE
 Message conceptual model
 Message implementation syntactic model

Deutsch

CIM Informationsmodell
 Basierend auf
 Profilierungsableitung
 Regionales Kontextmodell
 ACC
 Kontextabhängiges Dokumentenmodell
 ABIE
 In IEC 62325-450 festgelegte Regeln
 Das kontextabhängige Modell basiert auf einem
 Ausgangsmodell mit möglichen
 Einschränkungen
 Keine Ergänzungen zum Ausgangsmodell
 möglich
 Implementierungsableitung
 Nachrichten-Einbindungsmodell
 MBIE
 Nachrichten-Konzeptmodell
 Syntaktisches Modell zur Nachrichtenumsetzung

Bild 2 – IEC 62325-450 Modellierungsrahmen

Die regionalen Kontextmodelle sind die grundlegenden Kernkomponenten, die für die Schaffung elektronischer Dokumente zum Informationsaustausch notwendig sind. Dies wird im kontextuellen Markt-Modell nach europäischer Art (IEC 62325-351) definiert. Diese Kernkomponenten werden auch als aggregierte Kernkomponenten (ACC) bezeichnet.

Ein kontextabhängiges Dokumentenmodell basiert auf einer spezifischen Geschäftsanforderungsspezifikation und wird aus der Kontextualisierung der ACC gebildet, die im kontextuellen Markt-Modell nach europäischer

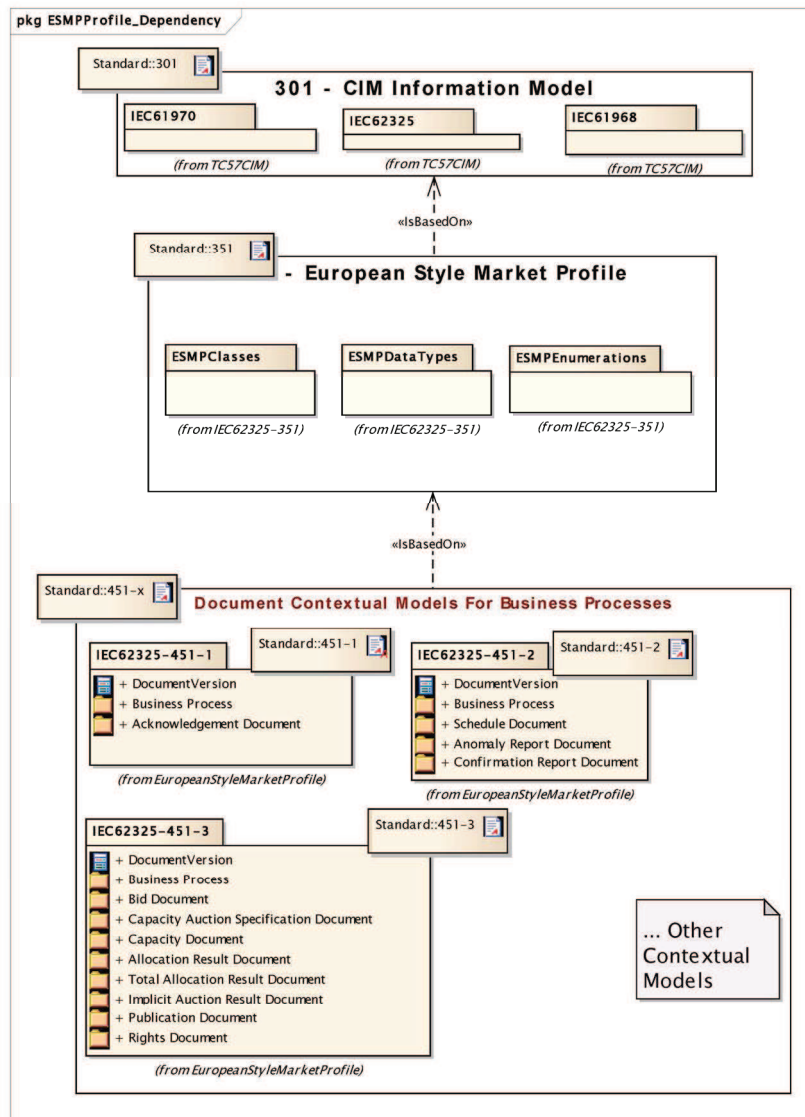
Art vorhanden sind. Die kontextualisierten ACC werden in diesem Stadium als aggregierte Geschäfts-Informationseinheiten (ABIE) bezeichnet. Bei diesen ABIE handelt es sich um die Konstrukte, die zu einem spezifischen elektronischen Dokument zusammengesetzt werden, um die in der Geschäftsanforderungsspezifikation dargelegten Informationsanforderungen zu erfüllen. Die Umwandlung einer ACC in eine ABIE muss den in IEC 62325-450 festgelegten Regeln folgen.

Sobald ein kontextabhängiges Dokumentenmodell erstellt wurde, das die Geschäftsanforderungen zufriedenstellend erfüllt, kann aus diesem automatisch ein Nachrichten-Einbindungsmodell generiert werden.

Das XML-Schema darf dann automatisch aus dem Nachrichten-Einbindungsmodell generiert werden. Falls notwendig, kann zu diesem Zeitpunkt ein spezifisches Mapping durchgeführt werden, um die Namen der CIM-Klasse und der Attribute in etabliertere Marktnamen umzuwandeln.

4.2 Paketstruktur des Europäischen Marktes

Bild 3 Beschreibt die Hauptpaketstruktur des Profils des Europäischen Marktes.

**Text im Bild:****Englisch**

Standard
 301 – CIM-Information model
 from
 European Style Market Profile
 Document Contextual Models for Business
 Processes
 DocumentVersion
 Business Process
 Acknowledgement Document
 (from EuropeanStyleMarketProfile)
 Schedule Document
 Anomaly Report Document
 Confirmation Report Document
 Bid document
 Capacity auction Specification Document
 Capacity Document
 Allocation Result Document
 Total Allocation Result Document
 Implicit Auction Result Document

Deutsch

Norm
 301 – CIM-Informationsmodell
 aus
 Profil des Europäischen Marktes
 Kontextbezogene Dokumentmodelle für
 Geschäftsprozesse
 Dokumentenversion
 Geschäftsprozess
 Bestätigungsdokument
 (Vom Profil des Europäischen Marktes)
 Zeitplan-Dokument
 Anomaliebericht-Dokument
 Bestätigungsbericht-Dokument
 Angebotsdokument
 Kapazitätsauktion-Spezifikationsdokument
 Kapazitätsdokument
 Zuweisungsergebnis-Dokument
 Gesamtzuweisungsergebnis-Dokument
 Ergebnisdokument zur impliziten Auktion

Publication Document
Rights Document
... Other contextual models

Veröffentlichungsdokument
Rechtsdokument
... Andere Kontextmodelle

Bild 3 – Übersicht über die Abhängigkeit des Profils des Europäischen Marktes

Für jeden Geschäftsprozess wird in einer Norm IEC 62325-451-x (x von 1 bis n) ein Geschäftsprozess-Paket beschrieben. Ein Geschäftsprozess-Paket enthält:

- Das kontextabhängige Dokumentenmodell (ABIE) und das automatisch generierte Nachrichten-Einbindungsmodell (MBIE) für jedes elektronische Dokument, das für den Abschluss des Geschäftsprozesses notwendig ist. Jedes Dokument ist ein subkontextuelles Modell, das durch Einschränkung vom Profil des Europäischen Marktes hergeleitet wird.
- Das XML-Schema des Geschäftsdokuments, das automatisch aus dem Nachrichten-Einbindungsmodell generiert wird.

Das Profil des Europäischen Marktes (ESMP), wie in IEC 62325-351 festgelegt, liefert die Kernkomponenten die in einer Norm IEC 62325-451-x verwendet werden dürfen, da alle ABIE auf den IEC 62325-351-Kernkomponenten „basieren“ müssen:

- ESMPClasses: Definieren alle semikontextuellen Klassen des Profils des Europäischen Marktes, die durch Einschränkung vom CIM-Modell hergeleitet werden.
- ESMPDataTypes: Definieren alle Kern-Komponenten, die innerhalb der ESMP-Klassen verwendet werden.

Sämtliche Kernkomponenten, die in jeder elektronischen Dokumentenstruktur verwendet werden, wurden im Profil des Europäischen Marktes harmonisiert und zentralisiert. Diese Kernkomponenten sind folglich die grundlegenden Bausteine, von denen alle elektronischen Dokument-ABIE abgeleitet werden.

4.3 Vom Profil des Europäischen Marktes zum kontextabhängigen Dokumentenmodell

Das kontextabhängige Dokumentenmodell für einen bestehenden Geschäftsprozess wird von einem Informationsanalytiker konstruiert, der alle zur Erfüllung des Geschäftsprozesses nötigen Informationsanforderungen ermittelt.

Nach Ermittlung der Informationsanforderungen ermittelt der Informationsanalytiker die zugehörigen im Profil des Europäischen Marktes verfügbaren ACC und kontextualisiert sie, damit sie die Informationsanforderungen erfüllen. Dieser Kontextualisierungsschritt schafft eine Reihe von aggregierten Geschäfts-Informationseinheiten (ABIE).

Im letzten Schritt fügt der Informationsanalytiker die ABIE in einem spezifischen kontextabhängigen Dokumentenmodell zusammen, um ein den Geschäftsanforderungen entsprechendes Dokumentenmodell zu schaffen.

4.4 Vom kontextabhängigen Dokumentenmodell zum Nachrichten-Einbindungsmodell

Nach Fertigstellung des kontextabhängigen Dokumentenmodells kann das Nachrichten-Einbindungsmodell automatisch generiert werden.

Alle kontextabhängigen Dokumentenmodelle enthalten die gleichen Kernkomponenten und Kern-Datentypen. Diese sind im Profil des Europäischen Marktes festgelegt (IEC 62325-351) und, unter Berücksichtigung der in IEC 62325-450 festgelegten Regeln, in allen kontextabhängigen Dokumentenmodellen (Serie IEC 62325-451-x) kontextualisiert und weiterentwickelt.

4.5 Vom Einbindungsmodell zum XML-Schema

Im finalen Modellierungsschritt wird eine standardisierte Reihe von Kriterien angewandt, um aus dem Einbindungsmodell ein gleichmäßiges XML-Schema zu generieren. Dieser Transformationsprozess folgt den in IEC 62361-100 festgelegten Regeln.

5 Der Geschäftsprozess „Meine Energiedaten“

5.1 Definition des Geschäftsprozesses

Der Geschäftsprozess wird in Anhang A dieses Dokuments definiert.

5.2 Geschäftsregeln für das „Meine Energiedaten“-Dokument

5.2.1 Allgemeines

Alle in IEC 62325-351 beschriebenen Geschäftsregeln gelten auch für diese Norm. Zusätzliche Regeln werden im Folgenden dargelegt.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 451-10: My Energy Data

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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/XX/FDIS	57/XX/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.

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.

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.

The National Committees are requested to note that for this publication the stability date is 2022.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

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.

Document history

Any person intervening in the present document is invited to complete the table below before sending the document elsewhere. The purpose is to allow all actors to see all changes introduced and the intervening persons.

Any important message to IEC editors should also be included in the table below.

Name of intervening person	Document received		Brief description of the changes introduced	Document sent	
	From	Date		To	Date
Eric Lambert	Project leader			Project team	
Eric Lambert	Project leader		Following review of the document – Creation of ANNEX A (Use Case "Download My Data" which was defined in 62913-2-2) and ANNEX B (EUMED Metering models). Some CIM issues and associated questions have still to be addressed as described in the Introduction paragraph.	IEC TC57	2018-07-11
M. Braun	PJL	2018-07-13	Forwarded to CO for circulation	CO	2018-07-13

This table will be removed by IEC editors before FDIS circulation (in case of IS) or before final publication (in case of TS or TR).

74

INTRODUCTION

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

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

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

85 This European style market profile is based on different parts of the CIM IEC standard and
86 specifies the content of the messages exchanged.

87 This document provides the profile associated to Use Case “Download My Data”, and is
88 named “EUMED Market” profile. The first Use Case, “Download my data”, is described in
89 ANNEX A. The previous version of EUMED, called “EUMED Metering” circulated among the
90 task force in January 2018 is described in ANNEX B, C, D.

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

94 As an alternative, and in order to be consistent with TC57 WG16 European Style Market
95 Profiles (ESMP), experts familiar with 62325 and ESMP proposed to investigate a EUMED
96 CIM based on Time Series.

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

99 The following figure presents the two models, EUMED Market and EUMED Metering.

SGAM EUMED CIM

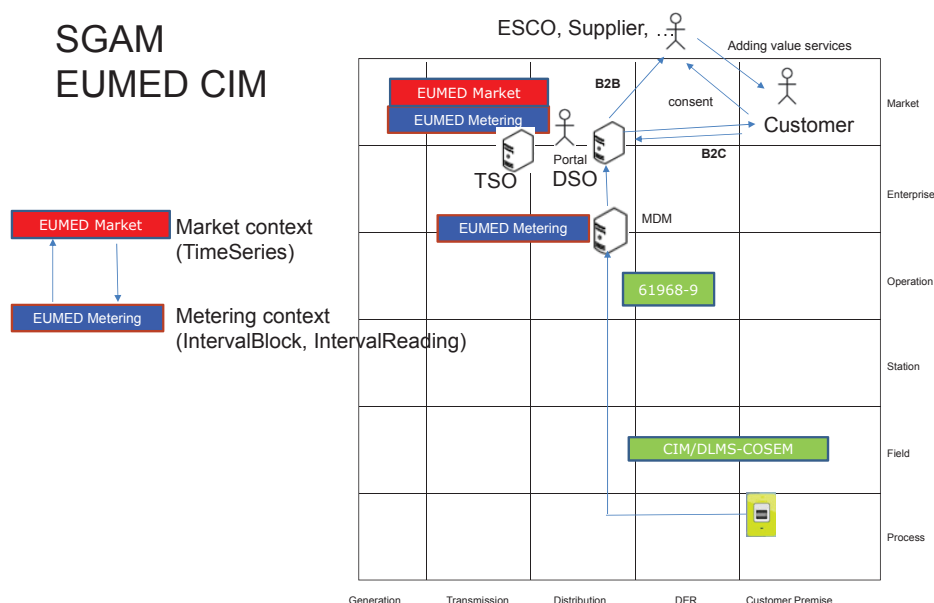


Figure 1 Positioning of EUMED Market and EUMED Metering

The EUMED Market profile, at the core of this document, is under definition and some CIM Issues need to be solved. We provide a list of the CIM issues and discussion items that need to be addressed in the coming months:

- several evaluation points per time series have been introduced and it can be interesting for local energy communities
- specific contract information needs to be discussed
- add roles in addition to sender/receiver
- flow direction identification : Flow direction (forward or reverse) is given by extremities of the flow but the same attribute name (area_Domain.mRID) is used to reference these two extremities
- How to manage DSO/ESO calendars?
- Section 6.1.3.1, Table 2 (and all other similar tables)
Mixing attribute name and type in the same column makes reading and checking difficult and is error prone. Split the name/type column into two columns: name column and type column.
- Section 6.1.3.1, Table 3 (and all other similar tables)
Mixing class name and role in the same column makes reading and checking difficult and is error prone. Split the class name/role column into two columns: class name column and role column.
- Section 6.1.3.1, Table 3
The association to Domain class should be renamed to Source_Domain to avoid ambiguity on in/out values.
- Section 6.1.3.12, Table 19
The association to Domain class should be renamed to Target_Domain to avoid ambiguity on in/out values.

The EUMED Metering profile has been described in some annex 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 61968-9 part.

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 particular part of IEC 62325 series 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.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 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: Naming and design rules for 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, as well as the following apply.

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**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.

3.6**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 1 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.

3.7**profile**

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

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.

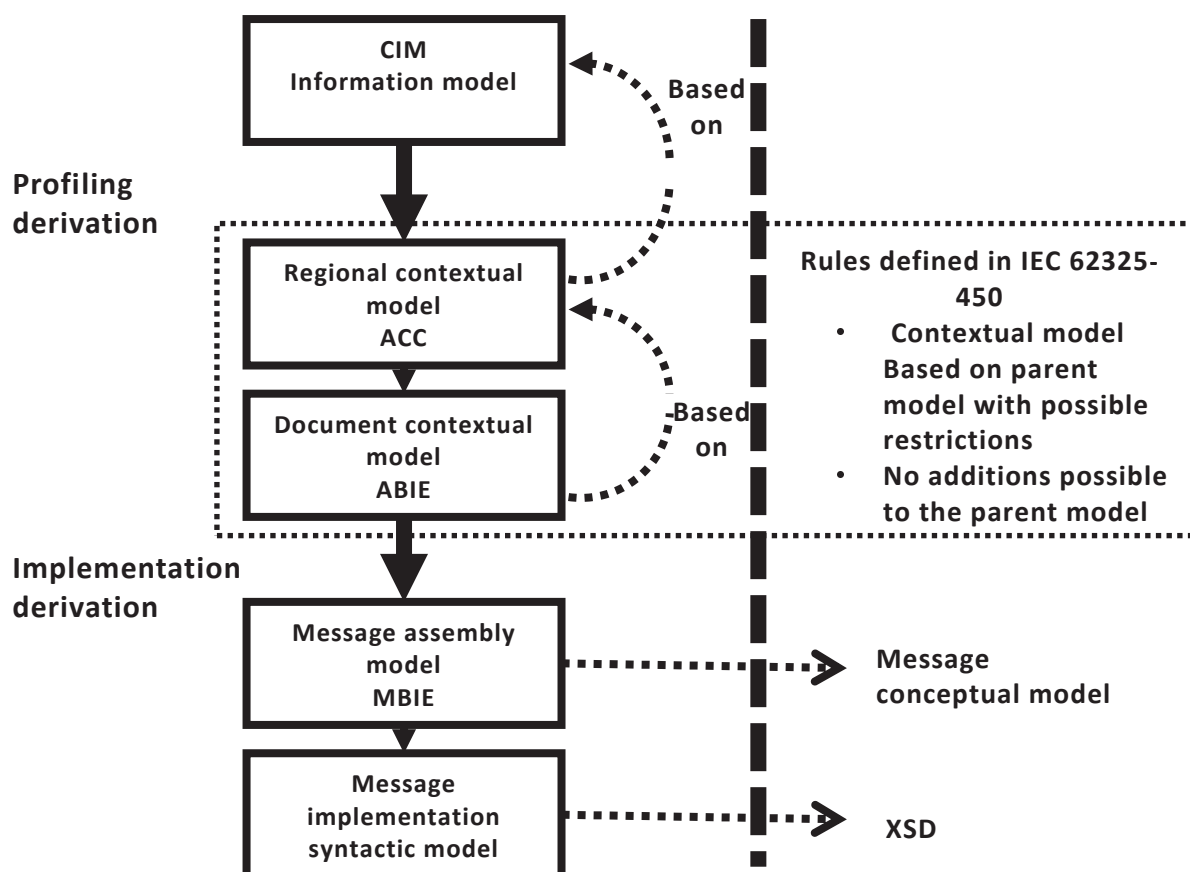


Figure 2 IEC 62325-450 modelling framework

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 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.

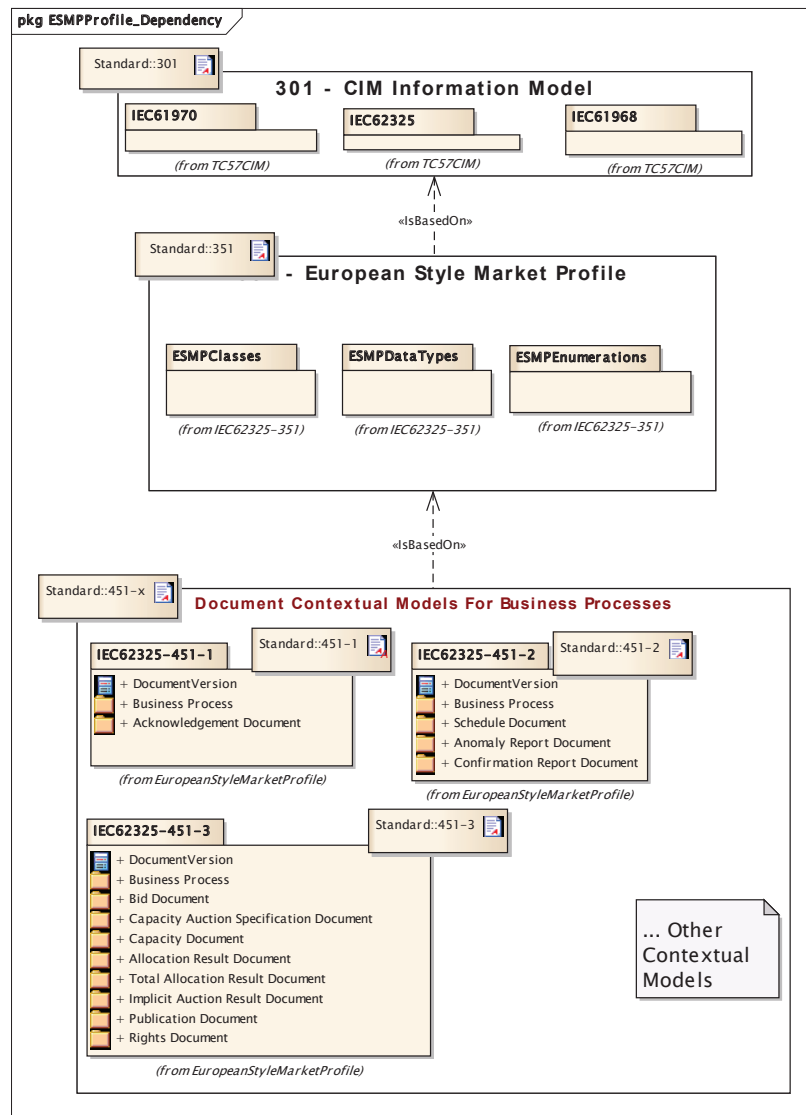


Figure 3 Overview of European style market profile dependency

For each business process, a business process package is described in an IEC 62325-451-x (x from 1 to n) 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.

253 4.3 From the European style market profile to the document contextual model

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

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

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

263 4.4 From the document contextual model to the message assembly model

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

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

270 4.5 From the assembly model to the XML schema

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

274 5 The My Energy Data business process

275 5.1 Business process definition

276 The Business Process is defined in Annex A of the document.

277 5.2 Business rules for the My Energy Data document

278 5.2.1 General

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

6 Contextual and assembly models

6.1 My Energy Data contextual model

6.1.1 Overview of the model

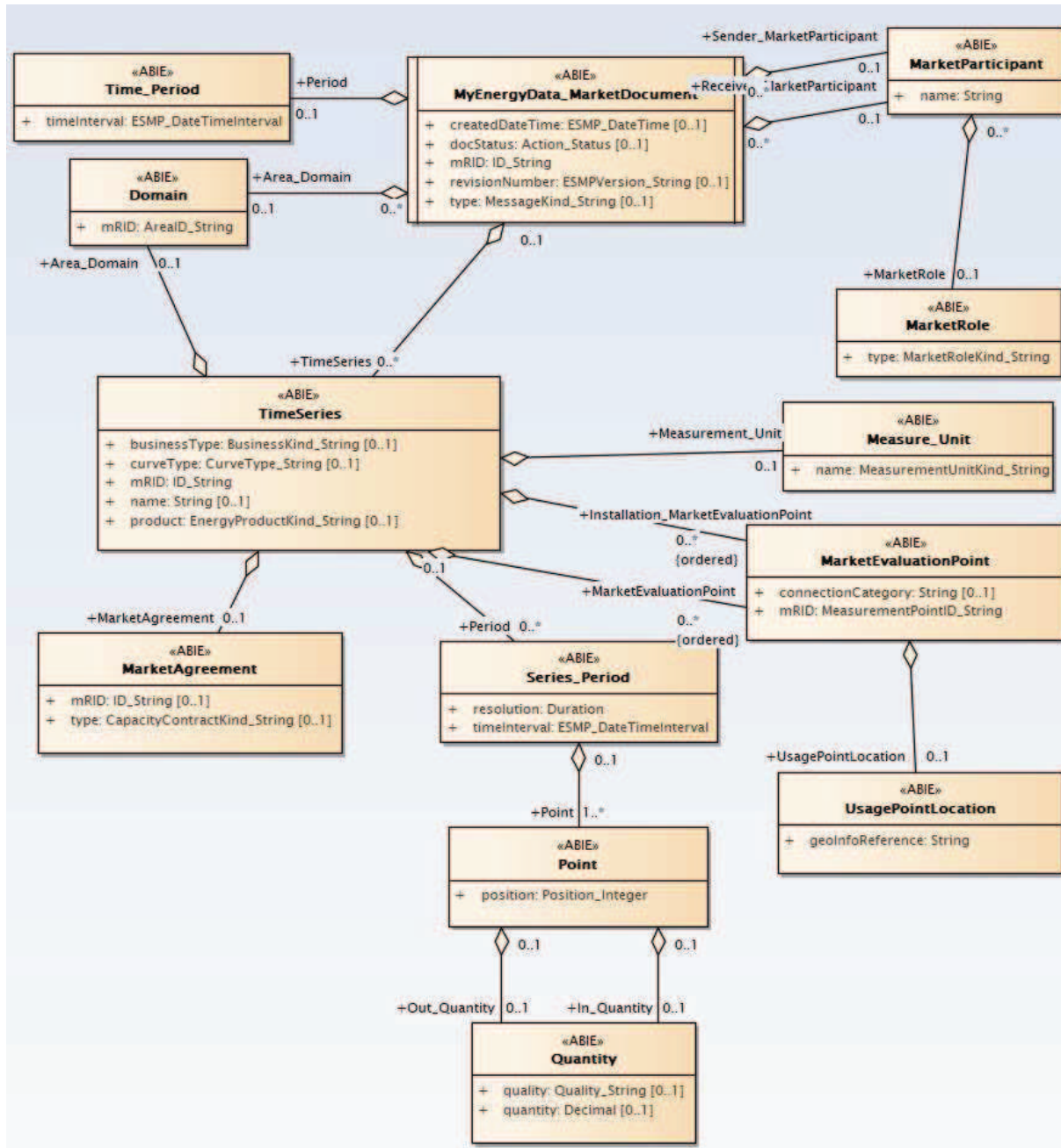


Figure 4 My Energy Data contextual model

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.

289

Table 1 – IsBasedOn dependency

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

290

291 6.1.3 Detailed My Energy Data contextual model

292 6.1.3.1 MyEnergyData_MarketDocument root class

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

295 Table 2 shows all attributes of MyEnergyData_MarketDocument.

296 **Table 2 – Attributes of My Energy Data contextual**
 297 **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 in the context of a business exchange such as document identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[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	Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
6	[0..1]	MarketParticipant Receiver_MarketParticipant	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..*]
8	[0..1]	Domain Area_Domain	The Domain associated with an electronic document header. Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::Domain.Domain[0..1]
9	[0..*]	TimeSeries TimeSeries	The time series that is associated with an electronic document. Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::TimeSeries.TimeSeries[0..*]

6.1.3.2 Domain

Table 4 shows all attributes of Domain.

Table 4 – 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 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.

6.1.3.3 MarketAgreement

Table 5 shows all attributes of MarketAgreement.

309 **Table 5 – 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 within a business context such as capacity auction identification, market agreement identification, etc. 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.

310

311 **6.1.3.4 MarketEvaluationPoint**

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

314 Table 6 shows all attributes of MarketEvaluationPoint.

315 **Table 6 – 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.

316

317 Table 7 shows all association ends of MarketEvaluationPoint with other classes.

318 **Table 7 – Association ends of My Energy Data contextual model::MarketEvaluationPoint**
319 **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.[]

320

6.1.3.5 MarketParticipant

Table 8 shows all attributes of MarketParticipant.

Table 8 – Attributes of My Energy Data contextual model::MarketParticipant

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

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

Table 9 – 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]

6.1.3.6 MarketRole

Table 10 shows all attributes of MarketRole.

Table 10 – 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.

6.1.3.7 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 11 shows all attributes of Measure_Unit.

Table 11 – 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).

6.1.3.8 Point

Table 12 shows all attributes of Point.

Table 12 – 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 13 shows all association ends of Point with other classes.

Table 13 – 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 Quantity information associated with a given Point. Association Based On : ESMPClasses::Quantity.Quantity[0..*] ----- ESMPClasses::Point.[]
2	[0..1]	Quantity Out_Quantity	The Quantity information associated with a given Point. Association Based On : ESMPClasses::Quantity.Quantity[0..*] ----- ESMPClasses::Point.[]

6.1.3.9 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 14 shows all attributes of Quantity.

Table 14 – 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.

6.1.3.10 Series_Period

Table 15 shows all attributes of Series_Period.

Table 15 – 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 16 shows all association ends of Series_Period with other classes.

Table 16 – 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..*]

6.1.3.11 Time_Period

Table 17 shows all attributes of Time_Period.

Table 17 – 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.

6.1.3.12 TimeSeries

Table 18 shows all attributes of TimeSeries.

Table 18 – 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 in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[0..1]	businessType BusinessKind_String	The identification of the nature of the time series.

Order	mult.	Attribute name / Attribute type	Description
2	[0..1]	product EnergyProductKind_String	The identification of the nature of an energy product such as power, energy, reactive power, etc.
4	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
9	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.

371

372 Table 19 shows all association ends of TimeSeries with other classes.

373 **Table 19 – Association ends of My Energy Data contextual model::TimeSeries with other**
 374 **classes**

Order	mult.	Class name / Role	Description
3	[0..1]	Domain Area_Domain	The domain associated with a TimeSeries. Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::Domain.Domain[0..*]
5	[0..*]	MarketEvaluationPoint MarketEvaluationPoint	The identification of a measurement point associated with a TimeSeries. Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::MarketEvaluationPoint.MarketEvaluationPoint[0..1]
6	[0..*]	MarketEvaluationPoint Installation_MarketEvaluationPoint	The identification of a measurement point associated with a TimeSeries. Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::MarketEvaluationPoint.MarketEvaluationPoint[0..1]
7	[0..1]	MarketAgreement MarketAgreement	The identification of an agreement associated with a TimeSeries. Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::MarketAgreement.MarketAgreement[0..*]
8	[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..*]	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..*]

375

376 **6.1.3.13 UsagePointLocation**

377 Table 20 shows all attributes of UsagePointLocation.

Table 20 – 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.

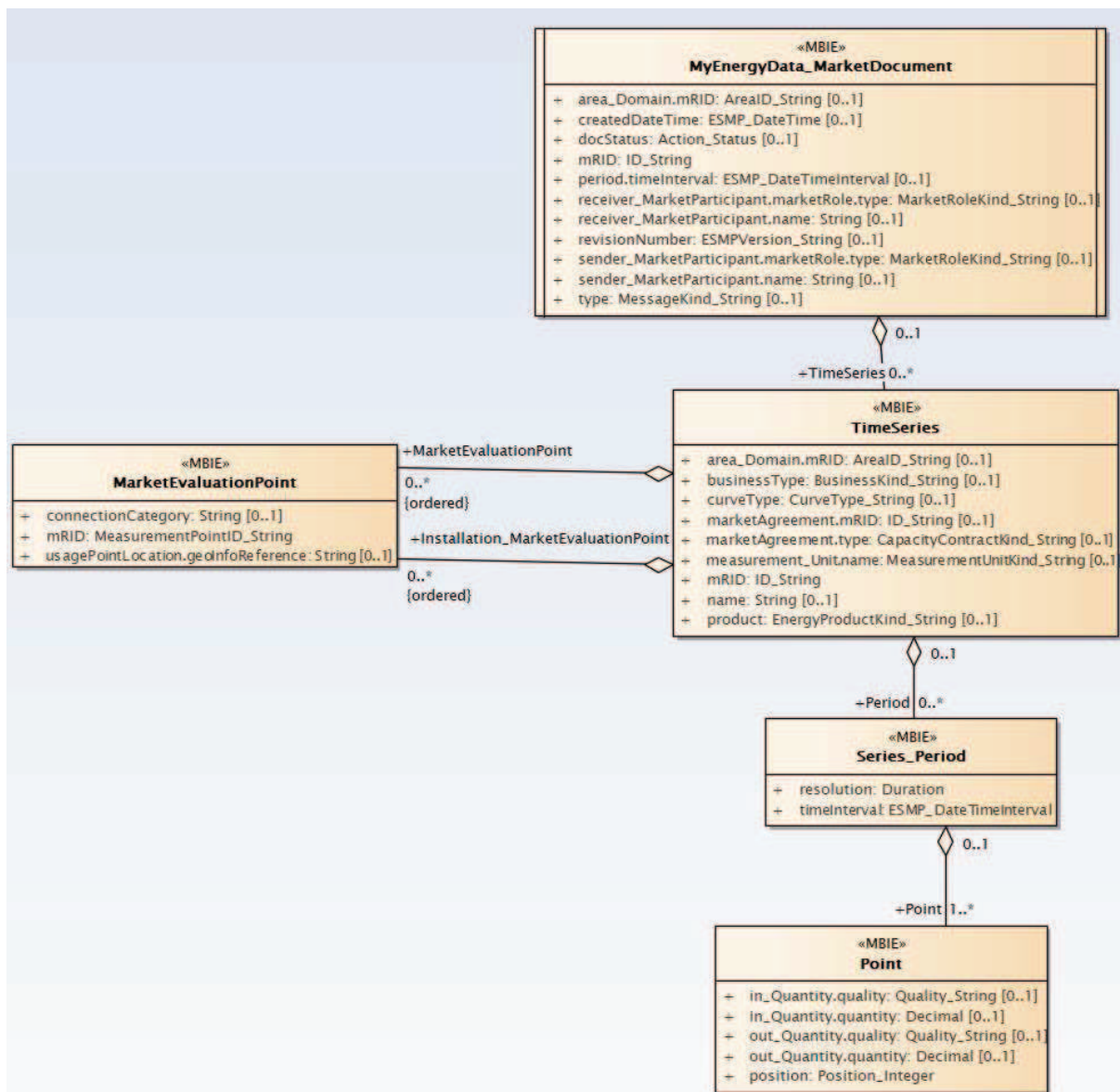


Figure 5 My Energy Data assembly model

6.2.2 IsBasedOn relationships from the European style market profile

Table 21 shows the traceability dependency of the classes used in this package towards the upper level.

Table 21 – IsBasedOn dependency

Name	Complete IsBasedOn Path
MarketEvaluationPoint	TC57CIM::IEC62325::MarketManagement::MarketEvaluationPoint
MyEnergyData_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Point	TC57CIM::IEC62325::MarketManagement::Point
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 22 shows all attributes of MyEnergyData_MarketDocument.

Table 22 – 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 in the context of a business exchange such as document identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[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.
6	[0..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player.

Order	mult.	Attribute name / Attribute type	Description
7	[0..1]	receiver_MarketParticipant.name String	The name is any free human readable and possibly non unique text naming the object.
8	[0..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player.
9	[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.
10	[0..1]	area_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 Domain associated with an electronic document header.

398

399 Table 23 shows all association ends of MyEnergyData_MarketDocument with other classes.

400

401

**Table 23 – Association ends of My Energy Data assembly
model::MyEnergyData_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
11	[0..*]	TimeSeries TimeSeries	The time series that is associated with an electronic document. Association Based On : My Energy Data contextual model::TimeSeries.TimeSeries[0..*] ----- My Energy Data contextual model::MyEnergyData_MarketDocument.[0..1]

402

403 6.2.3.2 MarketEvaluationPoint

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

406 Table 24 shows all attributes of MarketEvaluationPoint.

407 **Table 24 – 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.

Order	mult.	Attribute name / Attribute type	Description
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.

408

409 **6.2.3.3 Point**

410 Table 25 shows all attributes of Point.

411 **Table 25 – 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 Quantity information associated with a given Point.
2	[0..1]	in_Quantity.quality Quality_String	The description of the quality of the quantity. --- The Quantity information associated with a given Point.
3	[0..1]	out_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The Quantity information associated with a given Point.
4	[0..1]	out_Quantity.quality Quality_String	The description of the quality of the quantity. --- The Quantity information associated with a given Point.

412

413 **6.2.3.4 Series_Period**

414 Table 26 shows all attributes of Series_Period.

415 **Table 26 – 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.

416

417 Table 27 shows all association ends of Series_Period with other classes.

Table 27 – 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.[0..1]

6.2.3.5 TimeSeries

Table 28 shows all attributes of TimeSeries.

Table 28 – 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 in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[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]	area_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 domain associated with a TimeSeries.
4	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
7	[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 within a business context such as capacity auction identification, market agreement identification, etc. 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
8	[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.
9	[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.
10	[0..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.

424

425 Table 29 shows all association ends of TimeSeries with other classes.

426 **Table 29 – Association ends of My Energy Data assembly model::TimeSeries with other**
427 **classes**

Order	mult.	Class name / Role	Description
5	[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.[]
6	[0..*]	MarketEvaluationPoint Installation_MarketEvaluationPoint	The identification of a measurement point associated with a TimeSeries. Association Based On : My Energy Data contextual model::MarketEvaluationPoint.Installation_MarketEvaluationPoint[0..*] ----- My Energy Data contextual model::TimeSeries.[]
11	[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.[0..1]

428

429 6.2.4 Primitives

430 6.2.4.1 DateTime primitive

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

433 **Note:** the time within ESMP is expressed in UTC.

434 6.2.4.2 Decimal primitive

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

436 6.2.4.3 Duration primitive

437 Duration as "PnYnMnDTnHnMnS" which conforms to ISO 8601, where nY expresses a
438 number of years, nM a number of months, nD a number of days. The letter T separates the
439 date expression from the time expression and, after it, nH identifies a number of hours, nM a

440 number of minutes and nS a number of seconds. The number of seconds could be expressed
441 as a decimal number, but all other numbers are integers.

442 6.2.4.4 Integer primitive

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

444 6.2.4.5 String primitive

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

447 6.2.5 Datatypes

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

449 6.2.5.1 Action_Status compound

450 The coded identification of the status of an object.

451 Table 30 shows all attributes of Action_Status.

452 Table 30 – Attributes of ESMPDataTypes::Action_Status

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

453

454 6.2.5.2 ESMP_DateTimeInterval compound

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

457 Table 31 shows all attributes of ESMP_DateTimeInterval.

458 Table 31 – 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.

459

460 6.2.5.3 AreaID_String datatype

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

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

464 Table 32 shows all attributes of AreaID_String.

465 **Table 32 – Attributes of ESMPDataTypes::AreaID_String**

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

466

467 Table 33 shows all restrictions applied to the attributes of AreaID_String.

468 **Table 33 – Restrictions of attributes for ESMPDataTypes::AreaID_String**

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

469

4706.2.5.4 **BusinessKind_String datatype**

471 The coded identification of the business type.

472 Table 34 shows all attributes of BusinessKind_String.

473 **Table 34 – Attributes of ESMPDataTypes::BusinessKind_String**

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

474

4756.2.5.5 **CapacityContractKind_String datatype**

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

478 Table 35 shows all attributes of CapacityContractKind_String.

479 **Table 35 – Attributes of ESMPDataTypes::CapacityContractKind_String**

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

480

4816.2.5.6 **CurveType_String datatype**

482 The coded identification of the type of curve.

483 Table 36 shows all attributes of CurveType_String.

Table 36 – Attributes of ESMPDataTypes::CurveType_String

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

EnergyProductKind String datatype

The identification of the nature of an energy product such as power, energy, reactive power, etc.

Table 37 shows all attributes of EnergyProductKind String.

Table 37 – Attributes of ESMPDataTypes::EnergyProductKind String

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

ESMP DateTime datatype

In ESMP, the dateTime shall be expressed in UTC as YYYY-MM-DDThh:mm:ssZ.

Table 38 shows all attributes of ESMP DateTime.

Table 38 – Attributes of ESMPDataTypes::ESMP_DateTime

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

Table 39 shows all restrictions applied to the attributes of ESMP DateTime.

Table 39 – Restrictions of attributes for ESMPDataTypes::ESMP DateTime

Na m e	Cons train t	Typ e	Expression of constraint
val ue	patte rn	O C L	inv: self->Pattern(((([0-9]{4})[\-](0[13578] 1[02])[\-](0[1-9] ([12][0-9] 3[01]))([0-9]{4})[\-]((0[469]) (11))[\-](0[1-9] ([12][0-9] 30))T(((0[1] 0-9] 2[0-3]):[0-5][0-9]:[0-9])Z))((([13579][26][02468][048]]([13579][01345789](0)[48]]([13579][01345789][2468][048]]([02468][048]]([02468][1235679](0)[48]]([02468][1235679][2468][048]]([0-9][0-9][13579][26])[\-](02)[\-](0[1-9] 1[0-9] 2[0-9])T(((0[1] 0-9] 2[0-3]):[0-5][0-9]:[0-5][0-9])Z))((([13579][26][02468][1235679]]([13579][01345789](0)[01235679]]([13579][01345789][2468][1235679][02468][048]]([02468][1235679]]([02468][1235679][01235679][02468][1235679][2468][1235679]]([0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9] 1[0-9] 2[0-8])T(((0[1] 0-9] 2[0-3]):[0-5][0-9]:[0-5][0-9])Z)))

ESMPVersion_String datatype

In ESMP, the coded value is restricted to digits.

502 A code that distinguishes one evolution of an identified object from another. Information about
503 a specific object may be sent several times, each transmission being identified by a different
504 version number.

505 Table 40 shows all attributes of ESMPVersion_String.

506 **Table 40 – Attributes of ESMPDataTypes::ESMPVersion_String**

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

507

508 Table 41 shows all restrictions applied to the attributes of ESMPVersion_String.

509 **Table 41 – Restrictions of attributes for ESMPDataTypes::ESMPVersion_String**

Name	Constraint	Type	Expression of constraint
value	pattern	OCL	inv: self->Pattern([1-9]([0-9]){0,2})

510

5116.2.5.10 ID_String datatype

512 A code to uniquely distinguish one occurrence of an entity from another.

513 In the ESMP context, the code is defined either by:

514 - an emitting company that provides an agreed identification unique within a business context
515 such as capacity auction identification, market agreement identification, etc.

516 - a party (originator of the exchange) that provides a unique identification in the framework of
517 a business exchange such as document identification, time series identification, bid
518 identification, ...

519 Table 42 shows all attributes of ID_String.

520 **Table 42 – Attributes of ESMPDataTypes::ID_String**

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

521

522 Table 43 shows all restrictions applied to the attributes of ID_String.

523 **Table 43 – Restrictions of attributes for ESMPDataTypes::ID_String**

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(35)

524

5256.2.5.11 MarketRoleKind_String datatype

526 The identification of the role played by a party.

527 Table 44 shows all attributes of MarketRoleKind_String.

528 **Table 44 – Attributes of ESMPDataTypes::MarketRoleKind_String**

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

529

5306.2.5.12 MeasurementPointID_String datatype

531 The coded identification of a domain covering a number of related objects, such as metering
532 point, accounting point, etc.

533 In the ESMP context, it is an authorized issuing office that provides an agreed identification
534 coding scheme for measurement point identification.

535 Table 45 shows all attributes of MeasurementPointID_String.

536 **Table 45 – Attributes of ESMPDataTypes::MeasurementPointID_String**

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

537

538 Table 46 shows all restrictions applied to the attributes of MeasurementPointID_String.

539 **Table 46 – Restrictions of attributes for ESMPDataTypes::MeasurementPointID_String**

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(35)

540

5416.2.5.13 MeasurementUnitKind_String datatype

542 The coded identification of a unit of measure that is applied to a quantity. The measurement
543 units shall be in compliance with UN/ECE Recommendation 20.

544 Table 47 shows all attributes of MeasurementUnitKind_String.

545 **Table 47 – Attributes of ESMPDataTypes::MeasurementUnitKind_String**

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

546

5476.2.5.14 MessageKind_String datatype

548 The coded type of a document.

549 Table 48 shows all attributes of MessageKind_String.

550 **Table 48 – Attributes of ESMPDataTypes::MessageKind_String**

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

551

5526.2.5.15 Position_Integer datatype

553 An integer value, this value is used as a sequential value representing the relative position of
554 an entity within a space such as a time interval.

555 Table 49 shows all attributes of Position_Integer.

556 **Table 49 – Attributes of ESMPDataTypes::Position_Integer**

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

557

558 Table 50 shows all restrictions applied to the attributes of Position_Integer.

559 **Table 50 – Restrictions of attributes for ESMPDataTypes::Position_Integer**

Name	Constraint	Type	Expression of constraint
value	maxInclusive	OCL	inv: self->maxInclusive(999999)
value	minInclusive	OCL	inv: self->minInclusive(1)

560

5616.2.5.16 Quality_String datatype

562 The coded identification of the quality of the information.

563 Table 51 shows all attributes of Quality_String.