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Entwurf

**Kommunikation im Energiemarkt –
Teil 451-6: Veröffentlichung von Marktinformationen, kontextbezogene
Modelle und Einbindungsmodelle für den europäischen Markt
(IEC 57/1529/CD:2014);
Text in Englisch**

Framework for energy market communications –
Part 451-6: Publication of information on market, contextual and assembly models for
European market
(IEC 57/1529/CD:2014);
Text in English

Anwendungswarnvermerk

Dieser Norm-Entwurf mit Erscheinungsdatum 2015-06-12 wird der Öffentlichkeit zur Prüfung und
Stellungnahme vorgelegt.

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

Stellungnahmen werden erbeten

- vorzugsweise online im Norm-Entwurfs-Portal des DIN unter www.entwuerfe.din.de bzw. für Norm-Entwürfe der DKE auch im Norm-Entwurfs-Portal der DKE unter www.entwuerfe.normenbibliothek.de, sofern dort wiedergegeben;
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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 165 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Nationales Vorwort

Die englische Originalfassung des internationalen Dokuments IEC 57/1529/CD:2014 „Framework for energy market communications – Part 451-6: Publication of information on market, contextual and assembly models for European market“ (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 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 prEN nur 2 Monate 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 eine Norm ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnittsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils neueste gültige Ausgabe der in Bezug genommenen Norm.

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

Der Zusammenhang der zitierten Normen mit den entsprechenden Deutschen Normen 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.

Es wird auf die Möglichkeit hingewiesen, dass einige Elemente dieses Dokuments Patentrechte berühren können. ISO [und/oder] IEC sind nicht dafür verantwortlich, einige oder alle diesbezüglichen Patentrechte zu identifizieren.

Da sich die Benutzer des vorliegenden Normentwurfs der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der EN 62325-451-6 veröffentlicht. Zu deren Abschnitt 1, Abschnitt 3, der die Begriffe festlegt, Abschnitt 4 und Abschnitt 5, einschließlich Unterabschnitt 5.5, 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.

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)

3 Begriffe

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

ANMERKUNG Siehe Internationales Elektrotechnisches Wörterbuch, IEC 600500, für allgemeine Glossardefinitionen.

3.1

aggregierte Geschäfts-Informationseinheit **ABIE**

(en: **aggregate business information entity**)

Wiederverwendung einer aggregierten Kernkomponente (ACC) in einem festgelegten Geschäftsbereich

3.2

aggregierte Kernkomponente **ACC**

(en: **aggregate core component**)

Sammlung aufeinander bezogener Stücke von Geschäftsinformationen, welche zusammen eine bestimmte Geschäftsbedeutung tragen, unabhängig von einem bestimmten Geschäftskontext

Anmerkung 1 zum Begriff: Ausgedrückt durch Modellierungsbegriffe, ist dies die Darstellung einer Objektklasse, unabhängig von einem bestimmten Geschäftskontext.

[QUELLE: ISO/TS 15000-5:2005, Abschnitt 9, modifiziert (zweiter Satz wurde in eine Anmerkung zum Begriff überführt)]

3.3

Anwendungsprogramm-Schnittstelle **API**

(en: **application program interface**)

Menge von öffentlichen Funktionen, welche von einer ausführbaren Anwendungskomponente für die Verwendung durch andere ausführbare Anwendungskomponente bereitgestellt wird

3.4

Einbindungsmodell (en: **assembly model**)

Modell, welches Informationen in einem Geschäftskontext für das Einbinden in elektronische Dokumente für den Datenaustausch aufbereitet

3.5

basierend auf oder IsBasedOn (en: **based on or IsBasedOn**)

Verwendung eines Artefakts, welches entsprechend den Anforderungen eines spezifischen Geschäftskontexts eingeschränkt wurde

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

3.6

Geschäftskontext (en: **business context**)

formale Beschreibung eines spezifischen Geschäftszusammenhangs, welcher durch die Werte einer Menge von Kontextkategorien festgelegt ist, und es ermöglicht, unterschiedliche Geschäftszusammenhänge eindeutig voneinander zu unterscheiden

[QUELLE: UN/Cefact, Unified Context Methodology Technical Specification]

3.7**europäischer Marktprofiltyp
ESMP****(en: European style market profile)**

der europäische Marktprofiltyp, das Ziel der vorliegenden Internationalen Norm

3.8**Informationsmodell****(en: information model)**

Repräsentation von Konzeptionen, Beziehungen, Beschränkungen, Regeln und Operationen zur Festlegung von Datensemantiken für eine ausgewählte Diskursdomäne

Anmerkung 1 zum Begriff: Es kann gemeinsam anwendbare, feste und geordnete Informationsstrukturanforderungen für den Domänenkontext bereitstellen.

[QUELLE: IEC 62325-450:2013, 3.6]

3.9**Marktmanagementsystem****MMS****(en: market management system)**

aus einer Softwareplattform bestehendes Computersystem, welches grundlegende unterstützende Dienste und eine Reihe von Anwendungen bereitstellt, welche die für ein effektives Management des Elektrizitätsmarktes erforderliche Funktionalität bereitstellen

Anmerkung 1 zum Begriff: Diese Softwaresysteme in einem Elektrizitätsmarkt dürfen Unterstützung für die Kapazitätsvergabe, Energiezeitplanung, zusätzliche und andere Dienste, Echtzeit-Operationen und Abrechnungen einschließen.

3.10**Nachricht-Geschäfts-Informationseinheit****MBIE****(en: message business information entity)**

Zusammenfassung einer Gruppe von ABIEs, die eine definierte Menge von Einbindungsvorschriften berücksichtigt

3.11**Profil****(en: profile)**

grundlegender Rahmen für alle Informationen, welche erforderlich sind, um einer spezifischen Umgebung zu genügen

[QUELLE: IEC 62325-450:2013, 3.7]

4 Grundlegende Konzepte eines Dokumentenkonzeptmodells und eines Nachrichten-Einbindungsmodells

4.1 Überblick

IEC 62325-450 definiert eine Reihe von CIM-Profilen, die einem geschichteten Modellierungs-Rahmenwerk folgt, wie in Bild 1 dargelegt, welches vom allgemeinen Informationsmodell (CIM; en: Common Information Model) bis zu verschiedenen regionalen Kontextmodellen und ihren daraus folgenden kontextualisierten Dokumenten zum Informationsaustausch reicht; wobei der abschließende Schritt die Nachrichtenspezifizierung für den Informationsaustausch ist.

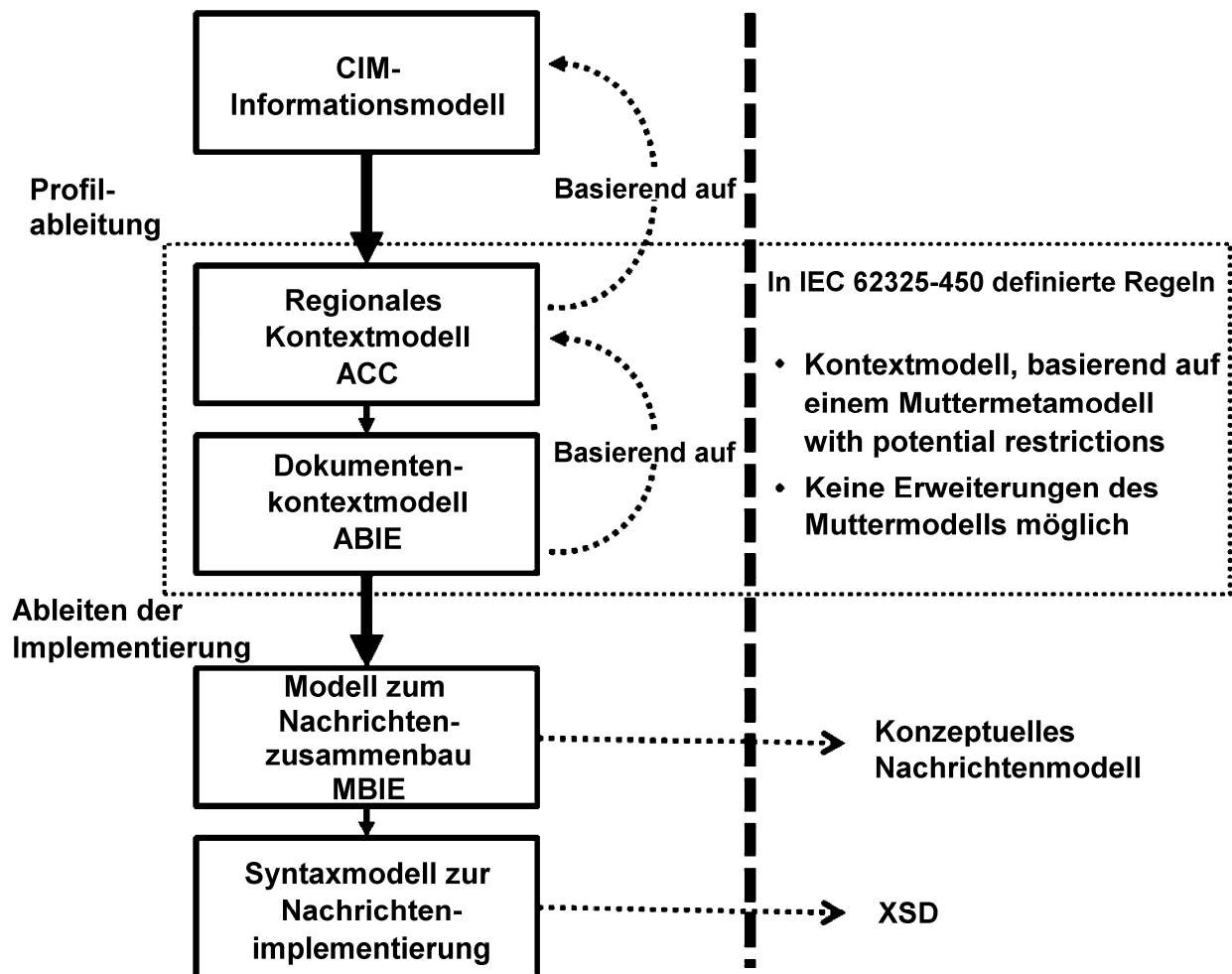


Bild 1 – Modellierungs-Rahmenwerk nach IEC 62325-450

Die regionalen Kontextmodelle sind die erforderlichen grundlegenden Komponenten, zur Erstellung elektronischer Dokumente für den Informationsaustausch. Das Konzeptmodell des europäischen Markttyps (IEC 62325-351) ist beispielsweise ein regionales Kontextmodell auf der Grundlage von IEC 62325-301. Die Komponenten werden auch als aggregierte Kernkomponenten (ACC) bezeichnet.

Ein Dokumentenkontextmodell basiert auf einer spezifischen Festlegung von Geschäftsanforderungen und wird aus der Kontextualisierung der ACC gebildet, welche im Konzeptmodell des europäischen Markttyps zu finden sind. Die kontextualisierten ACC werden auf dieser Stufe als aggregierte Geschäfts-Informationseinheit (ABIE) bezeichnet. Diese ABIE sind die Konstrukte, welche zu einem spezifischen elektronischen Dokument zusammengestellt werden, um die in der Spezifikation der Geschäftsanforderungen umrissenen Informationsanforderungen zu erfüllen. Die Überführung von einer ACC in eine ABIE muss den in IEC 62325-450 definierten Regeln folgen.

Nachdem ein Dokumentenkontextmodell erstellt wurde, welches die Geschäftsanforderungen zufriedenstellend erfüllt, kann ein Nachrichteneinbindungsmodell automatisch daraus erstellt werden. Die automatische Erstellung folgt den in IEC 62361-100 definierten Regeln.

Ein XML-Schema kann dann automatisch aus dem Nachrichteneinbindungsmodell erstellt werden. Wenn dies erforderlich ist, kann auf dieser Stufe eine spezifische Zuordnung stattfinden, um die CIM-Klasse und Attributnamen in markgerechtere Namen zu überführen.

4.2 Struktur des Pakets für den europäischen Markttyp (ESMP; en: European style market package structure)

Die wichtigste Paketstruktur des Profils des europäischen Markttyps ist in Bild 2 beschrieben.

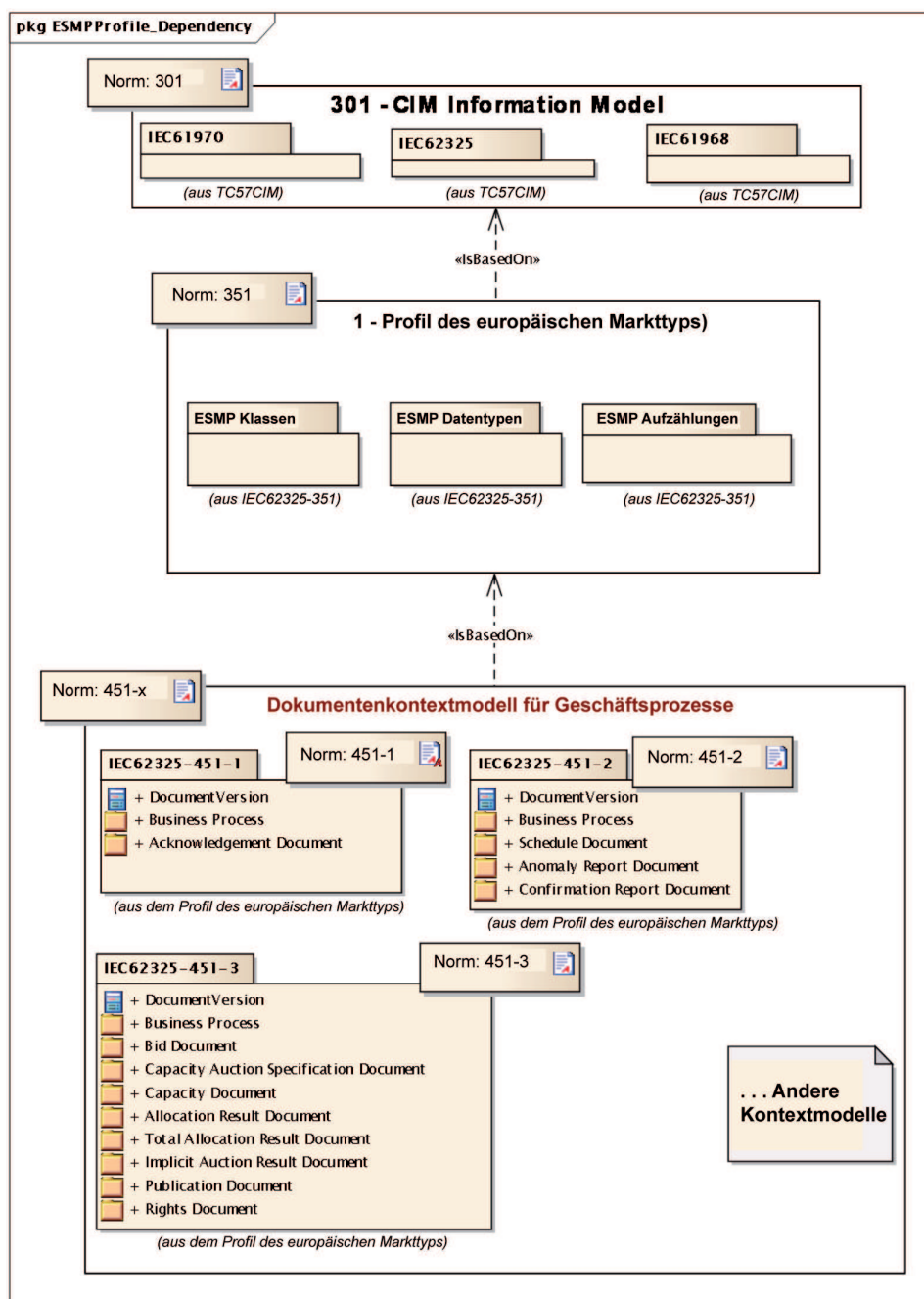


Bild 2 – Überblick über die Abhängigkeiten des Profils des europäischen Markttyps

Für jeden Geschäftsprozess ist in einer Norm IEC 62325-452-x ein Geschäftsprozesspaket beschrieben. Ein Geschäftsprozesspaket umfasst:

- das Dokumentenkontextmodell (ABIE) und das automatisch erstellte Nachrichteneinbindungsmodell (MBIE) für jedes elektronische Dokument, welches erforderlich ist, um die Fertigstellung des Geschäftsprozesses zu ermöglichen, Jedes Dokument stellt ein Unter-Kontextmodell dar, welches durch Einschränkung aus dem Profil des europäischen Markttyps abgeleitet ist;
- das XML-Schema des Geschäftsdokuments, welches automatisch aus dem Nachrichteneinbindungsmodell erstellt wird;

Das Profil des europäischen Markttyps (ESMP), wie in IEC 62325-351 definiert, liefert die Kernkomponenten, welche für die Verwendung in einer Norm IEC 62325-451-x zulässig sind. Alle ABIE müssen „basierend auf“ den Kernkomponenten von IEC 62325-351 sein:

- ESMP-Klassen: definieren alle halbkontextuellen Klassen des Profils des europäischen Markttyps, durch Einschränkung abgeleitet aus dem Profil des CIM-Informationsmodells;
- ESMP-Datentypen: definieren alle Kern-Datentypen, welche innerhalb der ESMP-Klassen verwendet werden.

Alle Kernkomponenten, welche in jeder Struktur eines elektronischen Dokuments verwendet werden, wurden im Profil des europäischen Markttyps harmonisiert und zentralisiert. Diese Kernkomponenten sind folglich die grundlegenden Bausteine, aus welchen alle ABIE von elektronischen Dokumenten abgeleitet werden.

4.3 Vom Profil des europäischen Markttyps zum Dokumentenkontextmodell

Das Dokumentenkontextmodell für einen gegebenen Geschäftsprozess wird durch einen Informationsanalysten erstellt, welcher alle Informationsanforderungen identifiziert, die zur Erfüllung des Geschäftsprozesses erforderlich sind.

Nachdem die Informationsanforderungen identifiziert wurden, identifiziert der Informationsanalyst die zugehörigen ACC, welche im Profil des europäischen Markttyps verfügbar sind, und kontextualisiert sie so, dass sie den Informationsanforderungen genügen. Dieser Kontextualisierungsschritt schafft eine Gruppe von aggregierten Geschäfts-Informationseinheiten (ABIE).

In einem abschließenden Schritt bindet der Informationsanalyst die ABIE in ein spezifisches Paket eines Dokumentenkontextmodells ein, um ein Dokumentenmodell zu erstellen, welches den Geschäftsanforderungen genügt.

4.4 Vom Dokumentenkontextmodell zum Nachrichteneinbindungsmodell

Nachdem das Dokumentenkontextmodell fertiggestellt ist, kann das Nachrichteneinbindungsmodell automatisch erstellt werden.

Alle Dokumentenkontextmodelle teilen die gleichen Kernkomponenten und Kern-Datentypen. Diese sind im Profil des europäischen Markttyps definiert (IEC 62325-351) und in allen Dokumentenkontextmodellen (Normenreihe IEC 62325-451-x) kontextualisiert und erneut definiert, wobei die in IEC 62325-450 beschriebenen Regeln befolgt werden.

4.5 Vom Einbindungsmodell zum XML-Schema

Im abschließenden Modellierungsschritt wird ein genormter Kriterienkatalog angewendet, um aus dem Einbindungsmodell ein einheitliches XML-Schema zu erstellen. Dieser Überführungsvorgang folgt den in IEC 62361-100 definierten Regeln.

5 Der Geschäftsprozess der Veröffentlichung von Marktinformatioren

5.1 Allgemeines

Der Geschäftsprozess der Veröffentlichung von Marktinformatioren (Transparenz) ermöglicht es, alle maßgeblichen Informationen, die den Elektrizitätsmarkt betreffen, in einer transparenten und zusammenhängenden Form zugänglich zu machen.

Die Verfügbarkeit solcher Informationen ist für die Marktteilnehmer entscheidend, um effiziente Entscheidungen bezüglich Produktion, Verbrauch und Handel zur treffen.

Eine tiefere Marktintegration und die schnelle Entwicklung von periodischen Ressourcen der erneuerbaren Energieerzeugung, wie z. B. Wind und Sonnenenergie, erfordern die Veröffentlichung von zeitnah verfügbaren, qualitativ hochwertigen und leicht zu verarbeitenden Informationen in Bezug auf die Lieferungs- und Bedarfsgrundlagen (VERORDNUNG Nr. 543/2013 der EU-Kommission).

Folglich ermöglichen die in der vorliegenden Norm beschriebenen Dokumente die Veröffentlichung von Marktinformatioren zu Verbrauch und Produktion zusammen mit der Identifizierung von strukturellen Engpässen im Stromversorgungsnetz, welche die ordnungsgemäße Verfügbarkeit von Energie beeinträchtigen könnten.

5.2 Die Rolle des Marktinformatioren-Aggregators

Das Profil des europäischen Markttyps betreffend kann ein Marktinformatioren-Aggregator wie folgt definiert werden:

- „Dies sind Beteiligte, welche für die Zusammenstellung gesammelter Informationen (Integration, Verarbeitung und Speicherung) und deren Veröffentlichung (Formatierung und Präsentation) für einen Empfänger von Marktinformatioren verantwortlich sind.“

Die Rolle des Marktinformatioren-Aggregators ist an die Rolle des „Datenanbieters“ gebunden, was bedeutet:

- „Dies kann entweder ein Betreiber eines Übertragungsnetzes sein oder ein Dritter, der als Datenanbieter handelt. Der Datenanbieter ist nicht zwingenderweise der einzige Besitzer von Informationen, aber es ist die Instanz, welche die Informationen an eine Transparenzplattform liefert.“

5.3 Geschäftsprozess der Veröffentlichung von Marktinformatioren

Bild 3 liefert einen Überblick des Geschäftsprozesses. Dieser umfasst die Informationen, welche ein Marktinformatioren-Aggregator im Umfeld einer Transparenzplattform bereitstellen muss, d. h. ein IT-System, welches die Veröffentlichung von Marktdaten ermöglicht.

Die Anwendungsfälle, welche den Prozess der Veröffentlichung von Marktinformatioren abbilden, verwenden mehrere verschiedene allgemeine Strukturen von elektronischen Dokumenten, um die Informationen für den Marktinformatioren-Aggregator bereitzustellen. Die Strukturen der elektronischen Dokumente selbst werden später im vorliegenden Dokument detailliert behandelt.

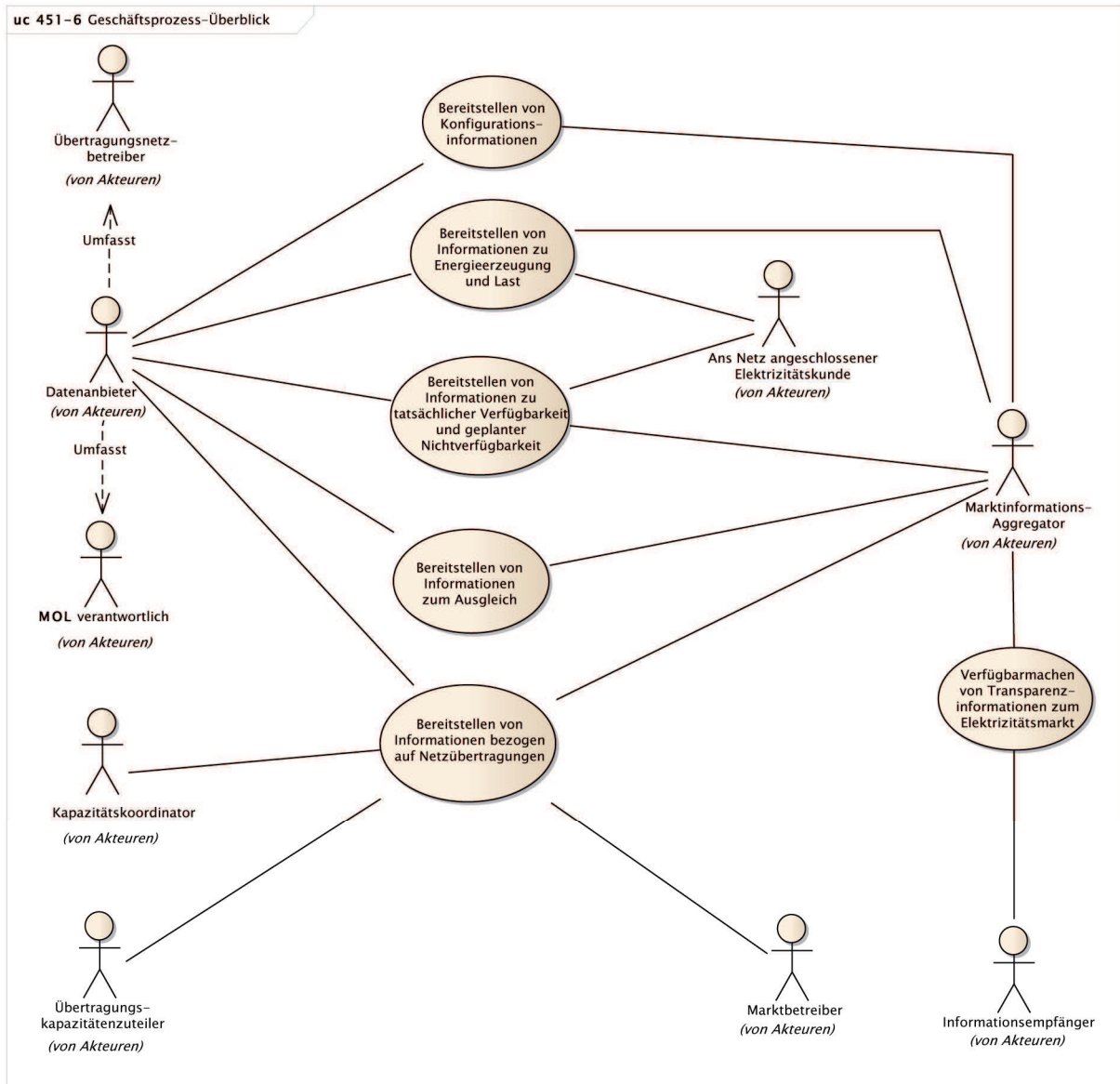


**Bild 3 – Überblick des Prozesses der Veröffentlichung von Marktinformati-
onen**

5.4 Die Anwendungsfälle

5.4.1 Allgemeiner Überblick

Wie in Bild 3 gezeigt, werden die grundlegenden Informationsanforderungen für die Übertragung der maßgeblichen Informationen von einem Datenanbieter für einen Marktinformati-
ons-Aggregator zusammengestellt.

Der Datenanbieter kann verschiedene Marktrolle einnehmen. In bestimmten Kontexten kann der Datenanbieter diese Informationen an spezifische Rollen übertragen, welche Informationen direkt dem Marktinformati-
ons-Aggregator bereitstellen können. Wie in Bild 3 dargestellt, können beispielsweise die Rollen Kapazitätskoordinators, Übertragungskapazitätszuteiler oder Marktbetreiber direkt Informationen an den Marktinformati-
ons-Aggregator senden.

Der Marktinformati-
ons-Aggregator hat die Aufgabe der Zusammenstellung der Informationen und der Harmonisierung ihres Inhalts (zum Beispiel sicherstellen, dass die Information mit der gleichen Messgenauigkeit bereitgestellt wird). Nachdem die Informationen zusammengestellt und harmonisiert wurden, veröffentlicht der Marktinformati-
ons-Aggregator sie auf einer Transparenzplattform, welche für die Öffentlichkeit zugänglich ist.

5.4.2 Bereitstellung von Konfigurationsinformationen

Die Bereitstellung von Konfigurationsinformationen wird verwendet, um Informationen zur Konfiguration von Ressourcenobjekten zu liefern; dies umfasst:

- a) Informationen bezüglich der Konfiguration von Produktionseinheiten; und kann Informationen zur Konfiguration von Kraftwerkseinheiten einschließen. Das Management einer Kraftwerkseinheit wird durch eine Produktionseinheit ausgeübt. Folglich erfordert dies, dass im Fall einer Hinzufügung einer Kraftwerkseinheit oder einer Änderung einer Kraftwerkseinheit, die Änderung als eine Änderung der Produktionseinheit durchgeführt wird.
- b) Die Bereitstellung von Informationen zur Konfiguration von Vermögenswerten.
- c) Die Bereitstellung von Informationen zur Konfiguration von Verbrauchseinheiten.

Diese grundlegende Konfiguration ist erforderlich, um die Validierung und Kohärenz der Informationen sicherzustellen, welche durch den Datenanbieter zur Veröffentlichung übertragen werden. Die Konfigurationsinformationen können sich mit der Zeit entwickeln und folglich werden Abänderungen oder Deaktivierungen bereitzustellen sein.

5.4.3 Bereitstellen von Informationen zu Energieerzeugung und Last

Die Informationen zu Energieerzeugung und Last werden in Abhängigkeit von der geforderten Genauigkeit für die Produktions- und Verbrauchseinheiten bereitgestellt, welche berichtet werden müssen. Sie decken sowohl Informationen zu Umsetzungen als auch zu Vorhersagen ab.

5.4.4 Bereitstellen von Informationen zu tatsächlicher Verfügbarkeit und geplanter Nichtverfügbarkeit

Das Bereitstellen von Informationen zu Nichtverfügbarkeit (Ausfall und vorhergesagter Ausfall) ist verhältnismäßig unkompliziert und deckt im Wesentlichen die Bereitstellung von Informationen zu geplantem Ausfall und die Bereitstellung von Informationen zu Änderungen der tatsächlichen Verfügbarkeit ab.

5.4.5 Informationen zum Ausgleich

Das Bereitstellen von Informationen zum Ausgleich deckt die Informationsanforderungen in einem gegebenen Zeitintervall ab, zum Beispiel für solche Dinge wie vertragliche Rücklagen, angenommene Angebote, aktivierte Ausgleichsenergie, Unausgewogenheitsumfang und Preise, usw.

5.4.6 Bereitstellen von Informationen bezogen auf Netzübertragungen

Das Bereitstellen von Informationen bezogen auf Netzübertragungen deckt die Informationsanforderungen für die Weiterentwicklung des Netzes bezogen auf wesentlich Netzbestandteile, Kapazitätsinformationen, explizite und implizite Auktionen und Ernennungsinformationen ab, und auch Maßnahmen zum Engpassmanagement.

5.5 Ablaufdiagramm

Das Ablaufdiagramm in Bild 4 stellt die Informationsflüsse dar, welche zwischen den verschiedenen Faktoren ausgetauscht werden, um die Veröffentlichung von Marktinformationen sicherzustellen.

Die dargestellten Informationsflüsse im Ablaufdiagramm werden verwendet, um alle erforderlichen Informationen zur Sicherstellung der Veröffentlichung der Marktinformationen zu übertragen.

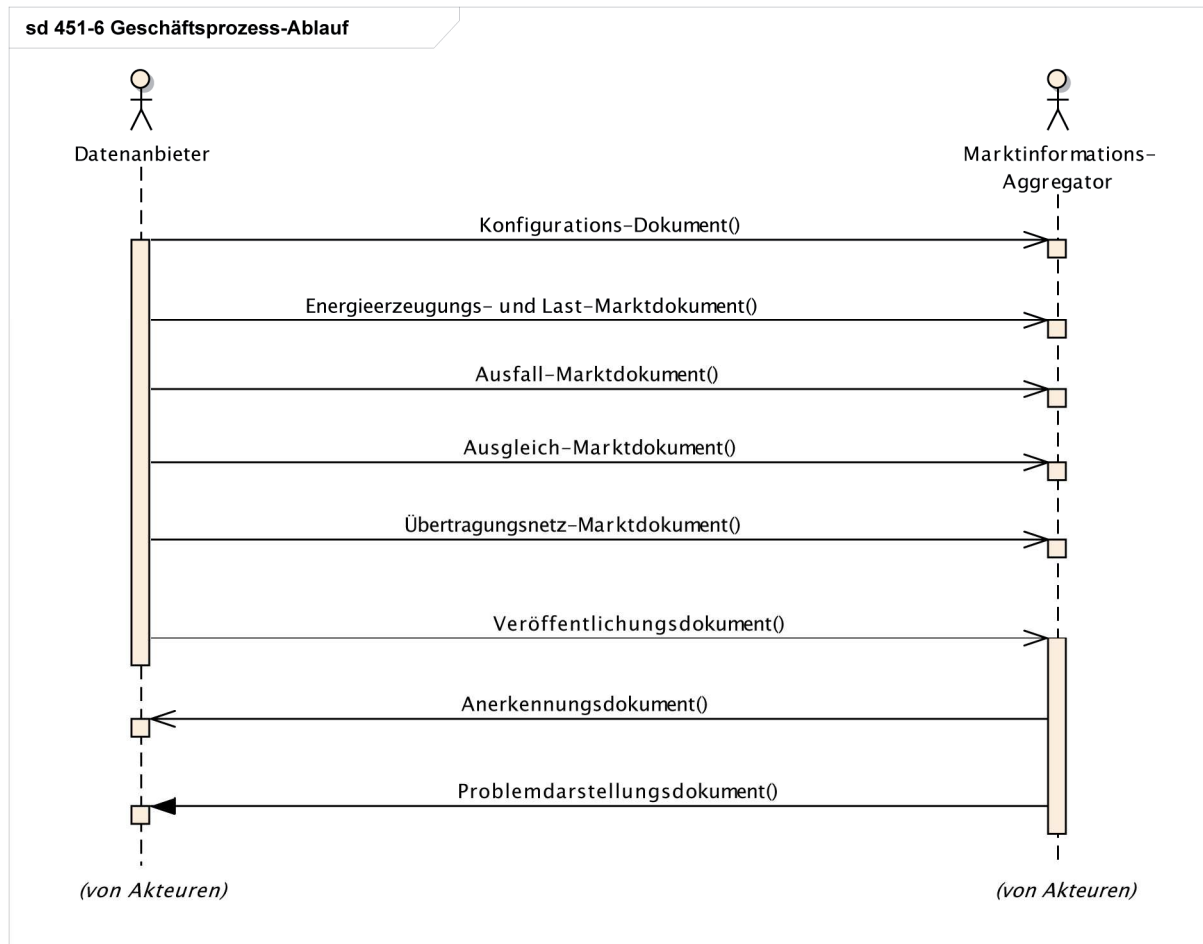


Bild 4 – Ablaufdiagramm für die Informationsflüsse

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FRAMEWORK FOR ENERGY
MARKET COMMUNICATIONS –****Part 451-6: Publication of information on market, contextual and assembly
models for European style market.**

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International Standard IEC 62325-451-6 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:

CDV	Report on voting

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.

— Entwurf —

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– 11 –

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

429 The committee has decided that the contents of this publication will remain unchanged until
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- 432 • reconfirmed,
- 433 • withdrawn,
- 434 • replaced by a revised edition, or
- 435 • amended.

436

437 The National Committees are requested to note that for this publication the stability date
 438 is

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 440 DELETED AT THE PUBLICATION STAGE.

441

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442

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

446 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	
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Margareta Nöth	Maurizio Monti	2014-11-28	CD document	CO	2014-12-01

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

449

450

INTRODUCTION

451 This International Standard is one of the IEC 62325-451-x series for deregulated energy
452 market data exchanges based on the European style market profile. This standard defines the
453 document contextual models, the message assembly models as well as the XML schemas to
454 be used for the market information publication process, also called transparency process.

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

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

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

465 This document provides for the European style market profile the publication (or
466 transparency) information exchanges to submit either to a data aggregator or to an electronic
467 publication platform the necessary information to be published about the electricity market.
468 These market processes are based on the European regulations (No 1227/2011 and No
469 543/2013), and on the concepts of third party access and zonal market. This standard was
470 originally based upon the work of the European Network of Transmission System Operators
471 (ENTSO-E) Working Group EDI.

472

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 451-6: Publication of information on market, contextual and assembly models for European style market

Scope

This part of IEC 62325 specifies a UML package for the market information publication business process and its associated document contextual models, assembly models and XML schemas for use within the European style electricity markets.

This International Standard is based on the European style market contextual model (IEC 62325-351). The business process covered by this International Standard is described in Clause 5.

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 publication business process.

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 62325-301, *Framework for energy market communications – Part 301: Common information model (CIM) – Extensions for markets*¹

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

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

IEC 62325-451-1, *Framework for energy market communications – Part 451-1: Acknowledgement business process and contextual model for CIM European market*

IEC 62325-451-3, *Framework for energy market communications – Part 451-3: Transmission capacity allocation business process (explicit or implicit auction) and contextual models for European market*

IEC 62325-451-5, *Framework for energy market communications – Part 451-5: Problem statement and status request business processes, contextual and assembly models for European market*

IEC 62361-100, *Power systems management and associated information exchange – Interoperability in the long term – Part 100: CIM profiles to XML schema mapping*²

¹ To be published.

512 **Terms and definitions**

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

515 NOTE General glossary definitions can be found in IEC 60050, *International Electrotechnical Vocabulary*.

516 **3.1**517 **aggregate business information entity**518 **ABIE**

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

520 **3.2**521 **aggregate core component**522 **ACC**

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

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

527 [SOURCE: ISO/TS 15000-5:2005, Clause 9, modified (second sentence has been transformed
 528 into Note 1 to entry)]

529 **3.3**530 **application program interface**531 **API**

532 set of public functions provided by an executable application component for use by other
 533 executable application components

534 **3.4**535 **assembly model**

536 assembly model is a model that prepares information in a business context for assembly into
 537 electronic documents for data interchange

538 **3.5**539 **based on**540 **IsBasedOn**

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

543 [SOURCE: IEC 62325-450:2013, 3.4]

544 **3.6**545 **business context**

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

548 [SOURCE: UN/Cefact, Unified Context Methodology Technical Specification]

549 **3.7**550 **European style market profile**551 **ESMP**

552 the European style market profile, the object of this International Standard

² To be published.

553 **3.8**
554 **information model**
555 representation of concepts, relationships, constraints, rules, and operations to specify data
556 semantics for a chosen domain of discourse

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

559 [SOURCE: IEC 62325-450:2013, 3.6]

560 **3.9**
561 **market management system**
562 **MMS**
563 computer system comprised of a software platform providing basic support services and a set
564 of applications providing the functionality needed for the effective management of the
565 electricity market

566 Note 1 to entry: These software systems in an electricity market may include support for capacity allocation,
567 scheduling energy, ancillary or other services, real-time operations and settlements.

568 **3.10**
569 **message business information entity**
570 **MBIE**
571 aggregation of a set of ABIEs that respects a define set of assembly rules

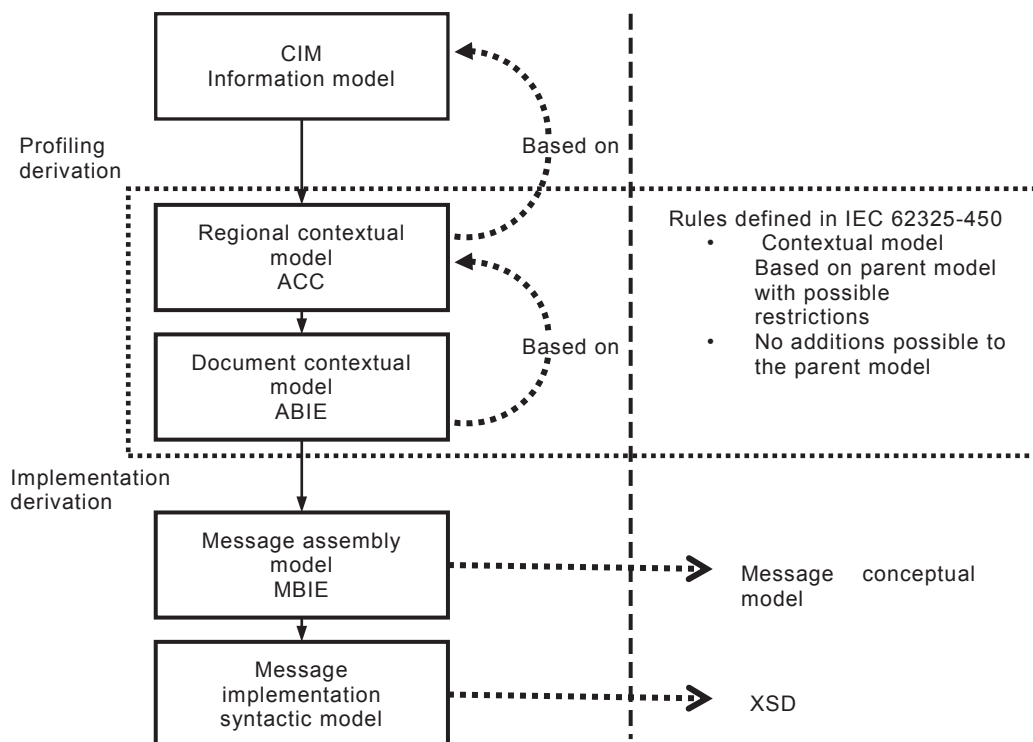
572 **3.11**
573 **profile**
574 basic outline of all the information that is required to satisfy a specific environment

575 [SOURCE: IEC 62325-450:2013, 3.7]

Document contextual model and message assembly model basic concepts

4.1 Overview

IEC 62325-450 defines a set of CIM profiles that follows a layered modelling framework as outlined in Figure 1 going from the common information model (CIM), to different regional contextual models and their subsequent contextualized documents for information exchange; the final step being the message specifications for information interchange.



IEC 1368/14

Figure 1 – IEC 62325-450 modelling framework

The regional contextual models are the basic components that are necessary to build electronic documents for information interchange. The European style market contextual model (IEC 62325-351) is, as an example, a regional contextual model based on IEC 62325-301. The 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. The automatic generation respects the rules defined in IEC 62361-100.

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 resilient names.

4.2 European style market package structure (ESMP)

The main package structure of the European style market profile is described in Figure 2.

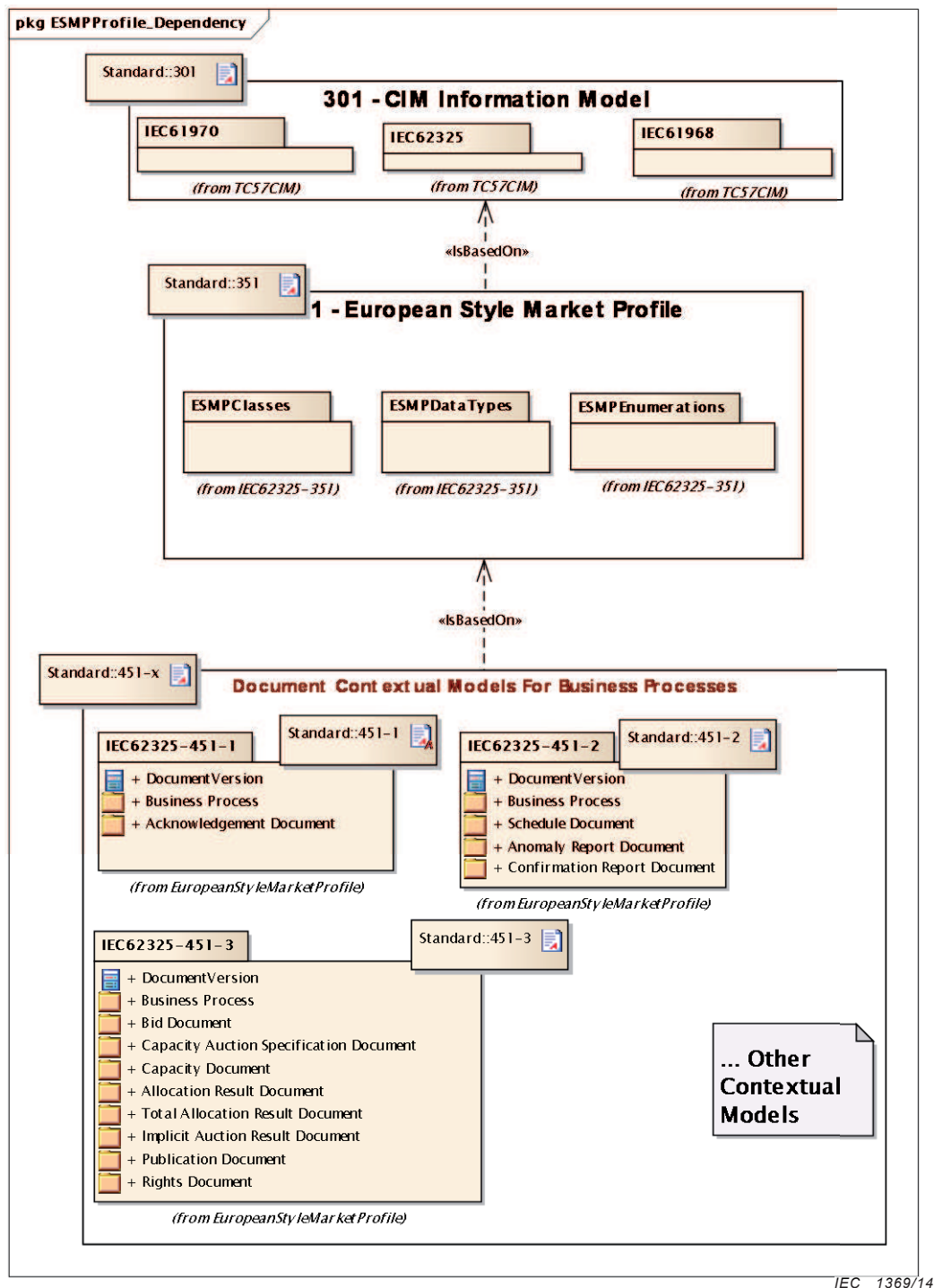


Figure 2 – Overview of European style market profile dependency

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;

- 611 • the XML schema of the business document that is automatically generated from the
- 612 message assembly model.

613 The European style market profile (ESMP), as defined in the IEC 62325-351, provides the
 614 core components permitted for use in an IEC 62325-451-x standard. All ABIEs shall be “based
 615 on” the IEC 62325-351 core components:

- 616 • ESMPClasses: defining all the semi-contextual classes of the European style market
- 617 profile derived by restriction from the CIM information model;
- 618 • ESMPPDataTypes: defining all the core Datatypes used within the ESMP classes.

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

622 **4.3 From the European style market profile to the document contextual model**

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

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

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

632 **4.4 From the document contextual model to the message assembly model**

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

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

639 **4.5 From the assembly model to the XML schema**

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

643 **The market information publication business process**

644 **5.1 General**

645 The market information publication (transparency) business process enables all the relevant
 646 information concerning the electricity markets to be made available in a transparent and
 647 coherent fashion.

648 The availability of such information is vital for market participants to take efficient production,
 649 consumption and trading decisions.

650 Deeper market integration and the rapid development of intermittent renewable energy
 651 generation sources such as wind and solar require the disclosure of complete, timely

652 available, high quality and easily digestible information relating to supply and demand
653 fundamentals (EU Commission Regulation No 543/2013).

654 Thus, the documents described in this standard enable the publication of the market
655 consumption and production information along with the identification of structural
656 unavailabilities in the power system network that may impact the normal availability of energy.

657 **5.2 The market information aggregator role**

658 As concerns the European style market profile, an information market aggregator may be
659 defined as follows:

- 660 • “This is a party that is responsible for the assembling of collected information (integration,
661 processing and storage) and their publishing (formatting and presentation) to a market
662 information receiver”.

663 The role market information aggregator is tied to the role “data provider” which is to say:

- 664 • “This may either be a transmission system operator or a third party acting as a data
665 provider. The data provider is not necessarily the primary owner of information but it is the
666 entity that submits information to a transparency platform”.

667 **5.3 Market information publication business process**

668 Figure 3 provides the overview of the business process. This incorporates the information that
669 a market information aggregator has to provide in the context of a transparency platform, i.e.
670 an IT system allowing to publish the market data.

671 The use cases that outline the market information publication process make use of several
672 different generic electronic document structures to provide the information to the market
673 information aggregator. The electronic document structures themselves are detailed later in
674 this document.

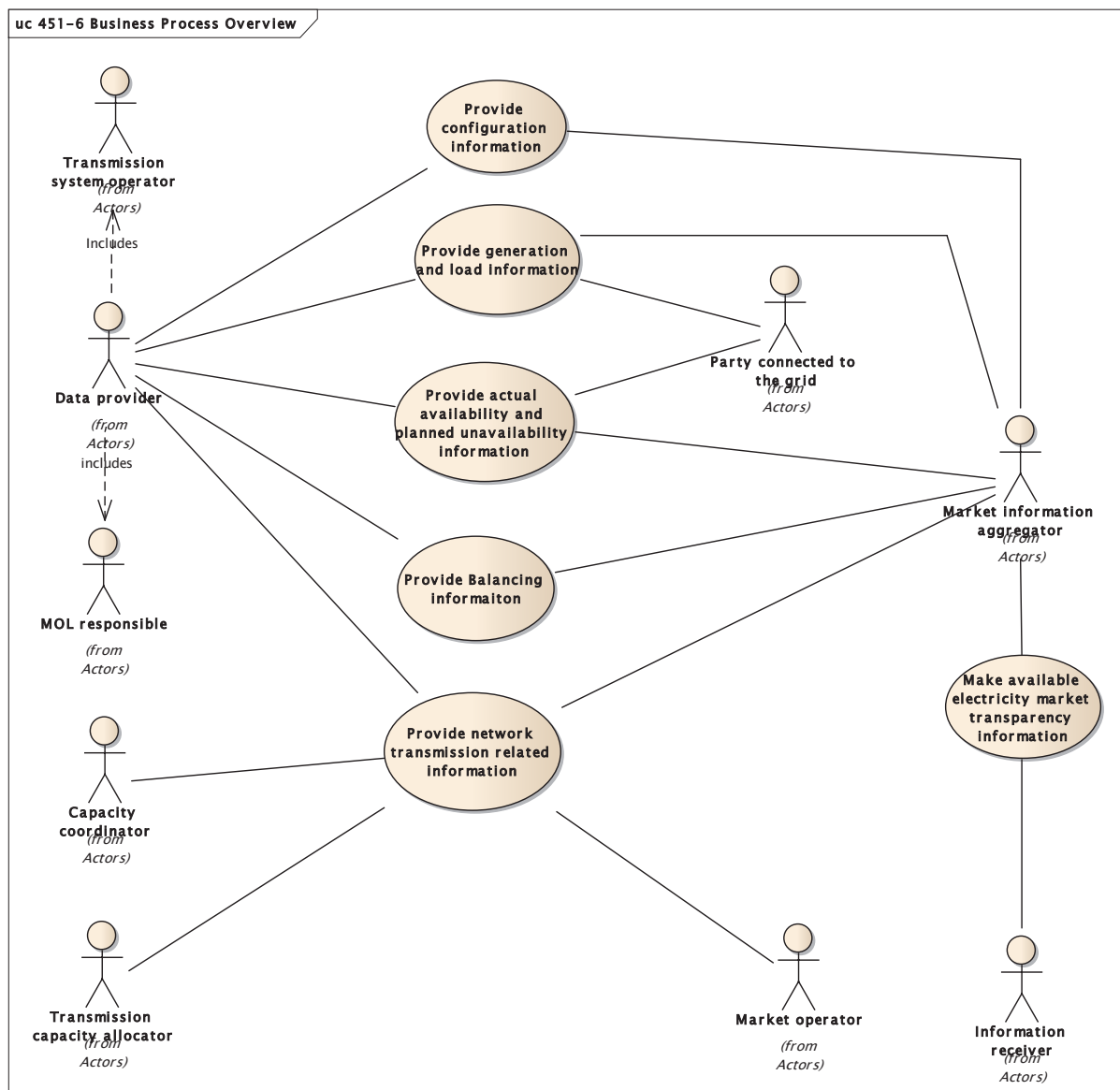


Figure 3 – Market information publication process overview

5.4 The use cases

5.4.1 General overview

As indicated in Figure 3, the basic information requirements are for the transmission of the relevant information assembled together by a data provider to a market information aggregator.

The data provider may englobe several different market roles. In certain contexts, the data provider may delegate this information to specific roles that may provide information directly to the market information aggregator. For example as shown in Figure 3 the roles of capacity coordinator, transmission capacity allocator or market operator may directly send information to the market information aggregator.

The market information aggregator has the task of assembling the information together and of harmonising its content (for example ensuring the the information is provided with the same measurement granularity). Once the information has been assembled together and harmonised the market information aggregator publishes it on a transparency platform whose access is publically available.

692 5.4.2 Provide configuration information

693 The provision of configuration information is used to provide resource object configuration
694 information; this includes:

695 a) Production unit configuration information and may include generation unit configuration
696 information. The management of a generation unit is handled through the production
697 unit. Consequently if there is an addition of a generation unit or change to a generation unit
698 this requires that the change is carried out as a change of the production unit.

699 b) Provide transmission asset configuration information.

700 c) Provide consumption unit configuration information.

701 This basic configuration is required in order to ensure the validation and coherence of the
702 information that is transmitted by the data providers for publication. The configuration
703 information may evolve over time and consequently modifications or deactivations will have to
704 be provided.

705 5.4.3 Provide generation and load information

706 The generation and load information is provided depending on the granularity required for the
707 production and consumption units that have to be reported. It covers both realised and
708 forecast information.

709 5.4.4 Provide actual availability and planned unavailability information

710 The provision of unavailability (outages and forced outages) information is relatively
711 straightforward and covers basically the provision of planned unavailability information and
712 the provision of changes in actual availability.

713 5.4.5 Provide balancing information

714 The provision of balancing information covers the information requirements within a given
715 time interval for such things as contractual reserves, accepted offers, activated balancing
716 energy, imbalance volumes and prices etc.

717 5.4.6 Provide network transmission related information

718 The provision of network transmission information covers the information requirements for the
719 network evolution of critical network elements, capacity information, explicit and implicit
720 auctions, and nomination information as well as congestion management measures.

721 5.5 Sequence diagram

722 The sequence diagram in Figure 4 presents the information flows that are exchanged between
723 the different actors that intervene in the transparency process.

724 The information flows outlined in the sequence diagram are used to transmit all the
725 information necessary in order to ensure the market information publication.

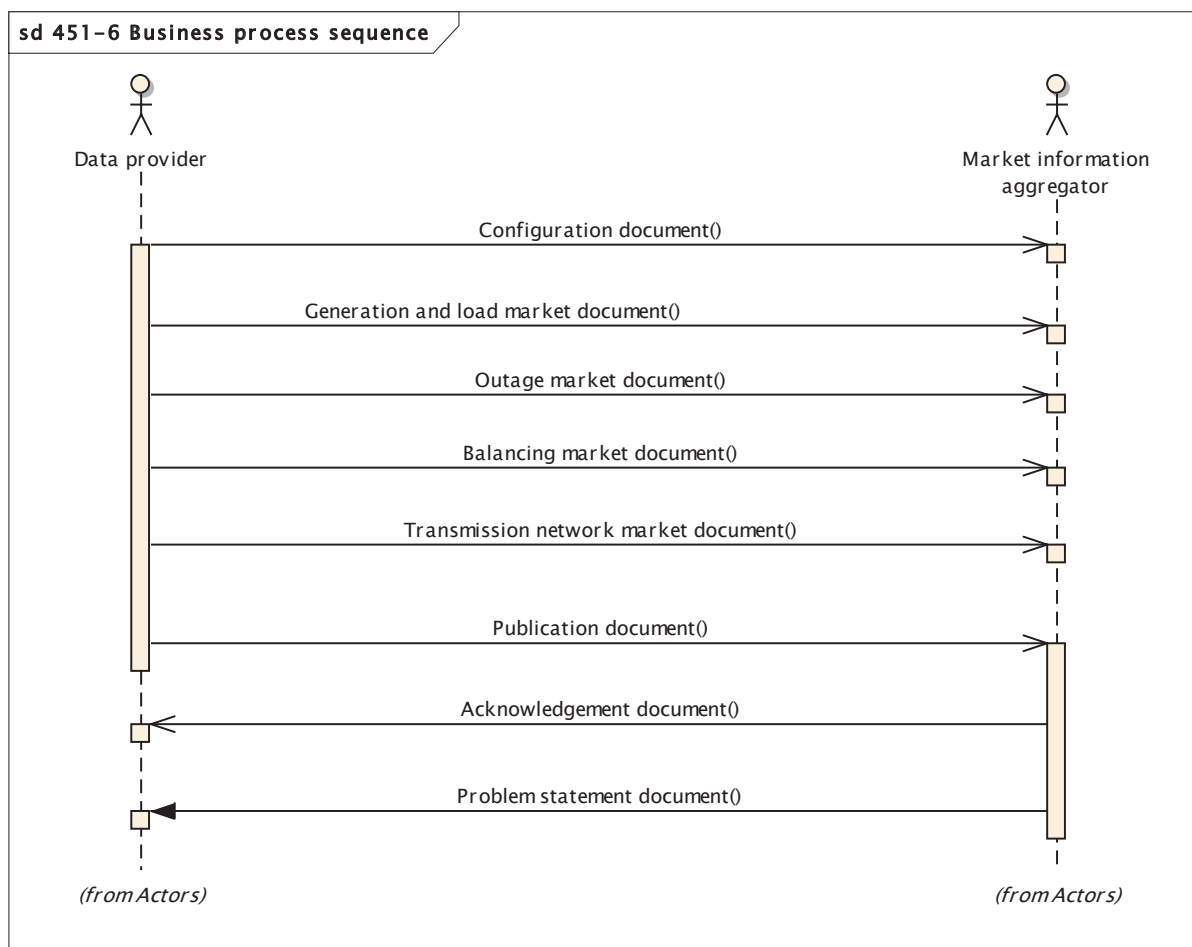


Figure 4 – Sequence diagram of the information flows

5.6 Electronic documents used.

5.6.1 Configuration_MarketDocument

The Configuration_MarketDocument enables the initialisation and update of basic configuration data required to ensure the validity of the market information that is submitted by the other electronic documents. The information provided essentially concerns:

- Production unit information,
- Transmission asset information
- Consumption unit information

The document may also be used to update any information initially provided as changes or evolutions occur. It may also be used to ensure the synchronisation of the data between the transparency platform and the data providers.

5.6.2 GenerationLoad_MarketDocument

The GenerationLoad_MarketDocument enables the transmission of generation and load information on a regular basis. The frequency of the transmission of this information depends on the market requirements where the platform is implemented. The periodicity may be yearly, monthly, weekly, daily or hourly as necessary.

The information transmitted may be actual generation and load, planned generation and load or forecast generation and load depending on market requirements.

746 5.6.3 Outage_MarketDocument

747 The unavailability process basically follows two different periodicities; a regular periodicity for
748 the provision of the planned unavailability and an event based periodicity for the provision of
749 changes in actual availability.

750 The unavailability process covers all the significant resources within the energy grid that may
751 impact the quantity of energy that can be produced or consumed.

752 5.6.4 Balancing_MarketDocument

753 The balancing transparency process can be basically divided into five groups of information
754 requirements:

- 755 • Balancing procurement requirements,
- 756 • Accepted offers,
- 757 • Reserve activation,
- 758 • Imbalance,
- 759 • Situation and financial settlement.

760 The process covers all the operations necessary to ensure that the bulk power system is
761 always in balance.

762 5.6.5 TransmissionNetwork_MarketDocument

763 The TransmissionNetwork_MarketDocument enables the information concerning the
764 transmission network to be provided to the transparency platform. The information provided
765 concerns:

- 766 • Network evolution,
- 767 • Redispatch measures,
- 768 • Counter trade measures,
- 769 • Congestion management costs.

770 The process covers all the information concerning the above mentioned areas and the
771 reporting frequency necessary to ensure transparency.

772 5.6.6 Publication_MarketDocument

773 The Publication_MarketDocument is a generic document that is defined in IEC 62325-451-3. It
774 is used in the case of the transmission to the transparency platform to provide transmission
775 capacity and auction information concerning the electricity market. The sort of information in
776 this respect that it can provide is as follows:

- 777 • Forecasted transmission capacity,
- 778 • Offered transmission capacity,
- 779 • DC link capacity restrictions,
- 780 • Explicit transmission capacity auction information,
- 781 • Already allocated transmission capacity,
- 782 • Day ahead prices,
- 783 • Net bidding zone positions,
- 784 • Total nominated transmission capacity,
- 785 • Aggregated day ahead schedule information,
- 786 • Physical flows,

- Internal market and external allocations.

5.7 Generic business rules for documents

5.7.1 General

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

When a document is received, it shall be check at the application level to ensure that there are no faults in it that could prevent its normal processing. After this check, an acknowledgement document, as defined in IEC 62325-451-1, shall be generated either accepting in its entirety the document in question or rejecting it with the reasons for the rejection.

5.7.2 Document instance implementation

The XML documents described in this standard are to be used for the upload of information to a transparency platform managed by the information market aggregator; they may also be used for the download of information to market participants in order to enable automatic processing of the information within their systems.

Consequently attributes that describe basic configuration information (such as name, voltage level, etc.) have been included in the XML documents as optional attributes that may be used only in the case where information is downloaded from the transparency platform. This information shall not be used in the case where information is uploaded to the platform.

The implementation of a data exchange shall be based upon dependency tables that are constructed as outlines in Table 1. In case of the European market such tables are used to describe the different conditions in which all the optional attributes (i.e. the attributes that have a multiplicity of [0..1]) within a document structure are used.

The table contains in the left hand column the mandatory coded attributes as well as the optional attributes. The top row provides the context where the contexts in which the use of the model is intended (i.e. installed production capacity aggregated per production type, day-ahead aggregated generation, transmission assets, etc.).

Within each context row the possible values for the mandatory coded attributes are provided and an indication if the optional attributes are to be used (used, not used, used for upload only, etc.).

Table 1 – Dependency table outline for the market information publication processes

Information model attribute	Usage context 1	Usage context 2	Usage context 3	Usage context n
type (Document)	Type code value 1	Type code value 2	Type code value 3	Type code value n
process.processType	Type code value	Type code value	Type code value	Type code value
businessType (TimeSeries)	Type code value	Type code value	Type code value	Type code value
Attribute value 1	Usage indication	Usage indication	Usage indication	Usage indication
Attribute value n	Usage indication	Usage indication	Usage indication	Usage indication

Table 2 provides a partial example of dependency table use for the transmission network market document.

**Table 2 – Example of dependency table use for the
TransmissionNetwork_MarketDocument**

Information model attribute	Article 9.1 Transmission infrastructure	Article 13(a) Redispatch	Article 13 (b) Countertrading	Article 13 © Congestion costs
type (Document)	A90 interconnector network expansion	A63 redispatch notice	A91 counter trade notice	A92 congestion costs
process.processType	A35 network information	A16 realised	A16 realised	A16 realised
businessType (TimeSeries)	B01 interconnector network evolution B02 interconnector network dismanteling	A46 system operator redispatching A85 internal redispatch	B03 counter trade	B04 congestion costs B03 counter trade A46 system operator redispatch
in_Domain.mRid	used	used	used	in_Domain same as out_Domain
out_Domain.mRID	used	used	used	out_Domain same as in_Domain
measurement_Unit.name	MAW	MAW	MAW	not used
currency_Unit.name	not used	not used	not used	used
mktPSRType.psrType	not used	used	not used	not used
curveType	used	used	used	used
end_Date.date	used	not used	not used	not used
flowDirection	not used	used	used	not used
etc..				

Such tables are to be provided in dedicated implementation guides for each relevant information to be delivered.

5.7.3 Rules governing the GenerationLoad_MarketDocument

5.7.3.1 Retransmission of historical information

Information for a given period in time (e.g. a day) may, depending of the nature of the information, be sent via several distinct transmissions (e.g. a document for each hour of the day). For example a separate electronic document could be sent every hour containing a quantity for the hour in question. Such documents will each have a distinct identification and version. The version could change in this case to correct the hour's quantity.

It may be necessary to retransmit at the end of the period the complete set of historical information. This is carried out through the creation of a new document covering the complete period (e.g. all the hours in the day) that includes all the quantities that have been previously sent with any corrections that are necessary.

Every document version has a creation date and time that could be effectively used as the document timestamp since a new version of a document cancels and replaces the previous version of the document.

5.7.3.2 Missing information

If for a given period there is missing information then the use of gaps as defined in IEC 62325-351 section 4.5.6 shall be applied. A gap is identified through the use of two

843 periods, where the end of the first period does not coincide with the period of the second. The
844 difference between the two periods represents a gap where data is missing.

845 **5.7.3.3 Absence of times series in a document**

846 An electronic document under certain circumstances may contain no time series. This
847 signifies that in a download condition none of the requested information was available.

848 In a submission scenario it may be used to meet a submission deadline although no
849 information is available.

850 **5.7.3.4 Rules governing the Time Series class**

851 If the information contained in a previously transmit time series is to be cancelled then a new
852 version of the original document shall be sent with the time series in question completed with
853 the information from the previous transmission in addition to the attribute cancelledTS being
854 put to "cancelled". All the Periods below the time series shall be removed.

855 **5.7.4 Rules governing the Outage_MarketDocument**

856 **5.7.4.1 The transmission of unavailability information**

857 Each unavailability (planned maintenance or forced unavailability) should be transmitted in a
858 single document with the identification of the document being used as the identification of the
859 unavailability in question.

860 An Outage_MarketDocument may be revised through the use of the revision number. The
861 latest revision of the document provides the current state of the unavailability.

862 **5.7.4.2 Status information**

863 An Outage_MarketDocument when transmitted may have two states, it is by default always
864 active or it has the status of cancelled or withdrawn.

865 A cancellation are foreseen where a planned unavailability will not take place,

866 A withdrawal is foreseen where there has been an error in the transmission of the information
867 (in this case, a reason should be given).

868 Note that an unavailability is deemed terminated when its end date is past. If the end date approaches and the
869 unavailability is always in vigor the data provider must provide an update to the unavailability with a new end date.

870 **5.7.4.3 Rules governing the Time Series class**

871 A time series shall exist to describe a specific piece of an unavailability situation. It conveys
872 the data related to the unavailability. For consumption or generation unit unavailability it
873 identifies the available capacity during the event. For transmission asset unavailability it
874 identifies the impact on cross zonal capacity per direction.

875 **5.7.4.4 Rules governing the Series_Period class**

876 At least one series period class shall exist.

877 There may be several series period classes for a time series per object type (installed,
878 unavailable or wind power feedin). The overall time interval covered by the period shall be
879 within the complete TimeInterval of the series period.

880 The number of periods within a time series as characterized by the resolution must completely
881 cover the period's time interval.

882 5.7.5 Rules governing the Balancing_MarketDocument**883 5.7.5.1 The transmission of balancing information**

884 Each transmission of balancing information should be transmitted in a single document. Any
885 changes necessary to the information transmitted should be adjusted through the use of a
886 new version of the document in question. This is particularly true in the case of the
887 transmission of activated balancing energy, the imbalance volumes and the settlement
888 information.

889 The latest revision of a document provides the current state of the information contained in
890 the document.

891 5.7.5.2 Status information

892 A balancing document shall have a docStatus class instance in the case where the
893 information provided is final.

894 5.7.6 Rules governing the TransmissionNetwork_MarketDocument**895 5.7.6.1 Status information**

896 Network information when transmitted may have two states, either it is active or it has been
897 cancelled.

898 Two other cases are foreseen:

- 899 • A status of cancelled where the planned network evolution will not take place,
- 900 • A status of withdrawn where there has been an error in the transmission of the information
901 (in this case, a "proper" reason should be given).

902 5.7.6.2 Rules governing the Time Series class

903 A time series shall exist to describe a specific piece of a transmission network structure or
904 congestion management information. It conveys the data related to the evolution of a network
905 or provides congestion management measures. It identifies the impact on cross zonal
906 capacity per direction.

907 5.7.7 Rules governing the Configuration_MarketDocument**908 5.7.7.1 Management of production unit configuration**

909 The creation of a production unit shall be composed of all dependent generation units.

910 The creation, modification or deactivation of a generation unit represents a change in the
911 production unit configuration and consequently a modification to the production unit is
912 necessary with all the valid generation units.

913 5.7.8 Rules governing the Publication_MarketDocument

914 The Publication_MarketDocument is described in IEC 62325-451-3.

915 This document is used to exchange information related to transmission capacity auction.

916 5.7.9 Rules governing the ProblemStatement_MarketDocument

917 The ProblemStatement_MarketDocument is described in IEC 62325-451-5.

918 This document is used to report troubles to deliver information.

919 Contextual and assembly models

920 6.1 GenerationLoad contextual model

921 6.1.1 Overview of the model

922 Figure 5 shows the model.

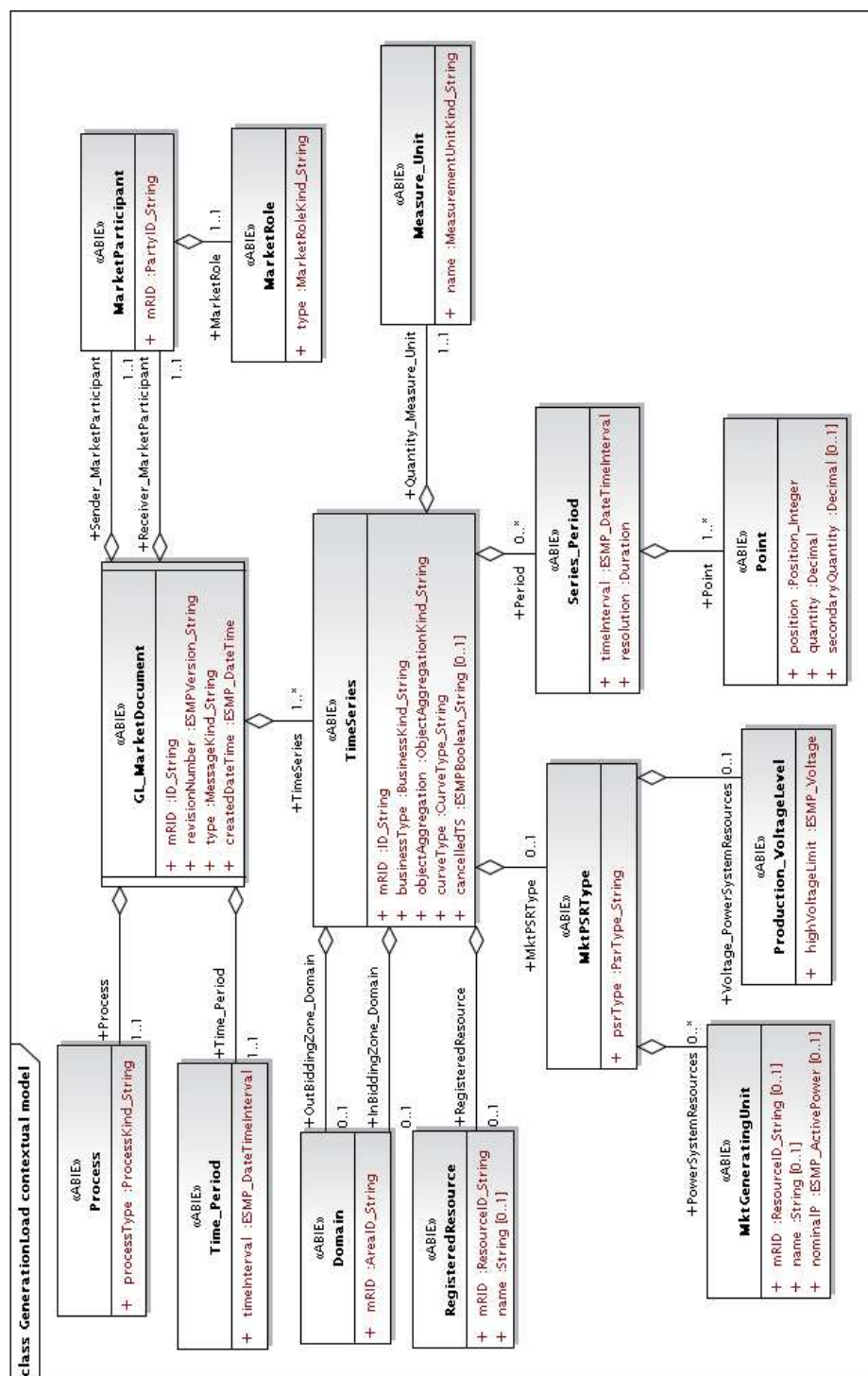


Figure 5 – GenerationLoad contextual model

6.1.2 IsBasedOn relationships from the European style market profile

Table 3 shows the traceability dependency of the classes used in this package towards the upper level.

Table 3 – IsBasedOn dependency

Name	Is BasedOn Class	Complete IsBasedOn Path
Domain	MarketManagement::Domain	TC57CIM::IEC62325::MarketManagement
GL_MarketDocument	MarketManagement::MarketDocument	TC57CIM::IEC62325::MarketManagement
MarketParticipant	MarketCommon::MarketParticipant	TC57CIM::IEC62325::MarketCommon
MarketRole	MarketCommon::MarketRole	TC57CIM::IEC62325::MarketCommon
Measure_Unit	MarketManagement::Unit	TC57CIM::IEC62325::MarketManagement
MktGeneratingUnit	MarketCommon::MktGeneratingUnit	TC57CIM::IEC62325::MarketCommon
MktPSRType	MarketManagement::MktPSRType	TC57CIM::IEC62325::MarketManagement
Point	MarketManagement::Point	TC57CIM::IEC62325::MarketManagement
Process	MarketManagement::Process	TC57CIM::IEC62325::MarketManagement
Production_VoltageLevel	Core::VoltageLevel	TC57CIM::IEC61970::Base::Core
RegisteredResource	MarketCommon::RegisteredResource	TC57CIM::IEC62325::MarketCommon
Series_Period	MarketManagement::Period	TC57CIM::IEC62325::MarketManagement
Time_Period	MarketManagement::Period	TC57CIM::IEC62325::MarketManagement
TimeSeries	MarketManagement::TimeSeries	TC57CIM::IEC62325::MarketManagement

6.1.3 Detailed GenerationLoad contextual model

6.1.3.1 GL_MarketDocument root class

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

This electronic document enables the transmission of the following forms of generation and load information for given periods:

- Daily, monthly, weekly and yearly generation and load forecasts
- Yearly forecast margin
- Actual load information
- Actual generation unit information
- Available and installed capacity
- Wind and solar information
- Pumped storage and reservoir capacity

IsBasedOn: ESMPClasses::MarketDocument

Table 4 shows all attributes of GL_MarketDocument.

945 **Table 4 – Attributes of GenerationLoad contextual model::GL_MarketDocument**

mult.	Attribute name	Attribute type	Description
[1..1]	createdDateTime	ESMP_DateTime	The date and time of the creation of the document.
[1..1]	mRID	ID_String	The unique identification of the document being exchanged within a business process flow.
[1..1]	revisionNumber	ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
[1..1]	type	MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.

946

947 Table 5 shows all association ends of GL_MarketDocument with other classes.

948 **Table 5 – Association ends of GenerationLoad contextual model::GL_MarketDocument**
949 **with other classes**

mult.	Role	Class type name	Description
[1..1]	Process	Process	Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::Process.Process[0..*]
[1..1]	Sender_MarketParticipant	MarketParticipant	The document owner. Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
[1..1]	Receiver_MarketParticipant	MarketParticipant	The document recipient. Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
[1..1]	Time_Period	Time_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..*]
[1..*]	TimeSeries	TimeSeries	The time series that is associated with an electronic document. Association Based On : ESMPClasses::MarketDocument.[] ----- ESMPClasses::TimeSeries.TimeSeries[0..*]

950

951 **6.1.3.2 Domain**952 A domain covering a number of related objects, such as market balance area, grid area,
953 borders etc.

954 IsBasedOn: ESMPClasses::Domain

955 Table 6 shows all attributes of Domain.

Table 6 – Attributes of GenerationLoad contextual model::Domain

mult.	Attribute name	Attribute type	Description
[1..1]	mRID	AreaID_String	The unique identification of the domain.

6.1.3.3 MarketParticipant

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

IsBasedOn: ESMPClasses::MarketParticipant

Table 7 shows all attributes of MarketParticipant.

Table 7 – Attributes of GenerationLoad contextual model::MarketParticipant

mult.	Attribute name	Attribute type	Description
[1..1]	mRID	PartyID_String	The identification of a party in the energy market.

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

Table 8 – Association ends of GenerationLoad contextual model::MarketParticipant with other classes

mult.	Role	Class type name	Description
[1..1]	MarketRole	MarketRole	The role associated with a MarketParticipant. Association Based On : ESMPClasses::MarketParticipant.[] ----- ESMPClasses::MarketRole.MarketRole[0..1]

6.1.3.4 MarketRole

The identification of the intended behaviour of a market participant played within a given business process.

IsBasedOn: ESMPClasses::MarketRole

Table 9 shows all attributes of MarketRole.

Table 9 – Attributes of GenerationLoad contextual model::MarketRole

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

975 **6.1.3.5 Measure_Unit**

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

978 IsBasedOn: ESMPClasses::Measure_Unit

979 Table 10 shows all attributes of Measure_Unit.

980 **Table 10 – Attributes of GenerationLoad contextual model::Measure_Unit**

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

981

982 **6.1.3.6 MktGeneratingUnit**

983 The information about a generating unit.

984 IsBasedOn: ESMPClasses::MktGeneratingUnit

985 Table 11 shows all attributes of MktGeneratingUnit.

986 **Table 11 – Attributes of GenerationLoad contextual model::MktGeneratingUnit**

mult.	Attribute name	Attribute type	Description
[0..1]	mRID	ResourceID_String	The unique identification of a resource.
[0..1]	name	String	The name is any free human readable and possibly non unique text naming the object.
[0..1]	nominalP	ESMP_ActivePower	The nominal power of the generating unit. This represents the installed generation capacity for the generation unit being described.

987

988 **6.1.3.7 MktPSRType**

989 The type of a power system resource

990 IsBasedOn: ESMPClasses::MktPSRType

991 Table 12 shows all attributes of MktPSRType.

992 **Table 12 – Attributes of GenerationLoad contextual model::MktPSRType**

mult.	Attribute name	Attribute type	Description
[1..1]	psrType	PsrType_String	The coded type of a power system resource.

993

994 Table 13 shows all association ends of MktPSRType with other classes.

Table 13 – Association ends of GenerationLoad contextual model::MktPSRType with other classes

mult.	Role	Class type name	Description
[0..*]	PowerSystemResources	MktGeneratingUnit	The generating unit(s) of the production unit identified by the RegisteredResource. Association Based On : ESMPClasses::MktGeneratingUnit.PowerSystemResources[0..*] ----- ESMPClasses::MktPSRType.[]
[0..1]	Voltage_PowerSystemResources	Production_VoltageLevel	The voltage level of the RegisteredResource. Association Based On : ESMPClasses::VoltageLevel.PowerSystemResources[0..1] ----- ESMPClasses::MktPSRType.[]

6.1.3.8 Point

The identification of the values being addressed within a specific interval of time.

IsBasedOn: ESMPClasses::Point

Table 14 shows all attributes of Point.

Table 14 – Attributes of GenerationLoad contextual model::Point

mult.	Attribute name	Attribute type	Description
[1..1]	position	Position_Integer	A sequential value representing the relative position within a given time interval.
[1..1]	quantity	Decimal	The principal quantity identified for a point. --- This information defines the quantity of the load or generation that is taken from or put into the area for the position within the interval period.
[0..1]	secondaryQuantity	Decimal	The secondary quantity identified for a point. --- This quantity corresponds to the value for the previous year that is taken from or put into the area for the position within the interval period.

6.1.3.9 Process

A formal identification of the business process in which a flow of information is exchanged.

IsBasedOn: ESMPClasses::Process

Table 15 shows all attributes of Process.

1008 **Table 15 – Attributes of GenerationLoad contextual model::Process**

mult.	Attribute name	Attribute type	Description
[1..1]	processType	ProcessKind_String	The identification of the nature of process that the document addresses. The identified processes are year ahead, month ahead, week ahead, day ahead and realised.

1009

1010 **6.1.3.10 Production_VoltageLevel**

1011 For a production unit or a generating unit, the high voltage level at the network side.

1012 For other network equipment the voltage level.

1013 IsBasedOn: ESMPClasses::VoltageLevel

1014 Table 16 shows all attributes of Production_VoltageLevel.

1015 **Table 16 – Attributes of GenerationLoad contextual model::Production_VoltageLevel**

mult.	Attribute name	Attribute type	Description
[1..1]	highVoltageLimit	ESMP_Voltage	The bus bar's high voltage limit

1016

1017 **6.1.3.11 RegisteredResource**1018 A resource that is registered with a recognized registration authority. Examples include
1019 generating unit, customer meter, and a non-physical generator or load.

1020 IsBasedOn: ESMPClasses::RegisteredResource

1021 Table 17 shows all attributes of RegisteredResource.

1022 **Table 17 – Attributes of GenerationLoad contextual model::RegisteredResource**

mult.	Attribute name	Attribute type	Description
[1..1]	mRID	ResourceID_String	The unique identification of a resource.
[0..1]	name	String	The name is any free human readable and possibly non unique text naming the object. The name of the productionunit for which the generation information is provided.

1023

1024 **6.1.3.12 Series_Period**

1025 The identification of the period of time corresponding to a given time interval and resolution.

1026 IsBasedOn: ESMPClasses::Series_Period

1027 Table 18 shows all attributes of Series_Period.

Table 18 – Attributes of GenerationLoad contextual model::Series_Period

mult.	Attribute name	Attribute type	Description
[1..1]	resolution	Duration	The definition of the number of units of time that compose an individual step within a period.
[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 GenerationLoad contextual model::Series_Period with other classes

mult.	Role	Class type name	Description
[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..*]

6.1.3.13 Time_Period

The identification of a time interval.

IsBasedOn: ESMPClasses::Time_Period

Table 20 shows all attributes of Time_Period.

Table 20 – Attributes of GenerationLoad contextual model::Time_Period

mult.	Attribute name	Attribute type	Description
[1..1]	timeInterval	ESMP_DateTimeInterval	The start and end date and time for a given interval. As a convention for these data exchanges: - a week starts on a Monday and ends on a Sunday; - a week is assigned to a month if the Monday of the week in question is included in the month that the data is intended to cover.

6.1.3.14 TimeSeries

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

IsBasedOn: ESMPClasses::TimeSeries

Table 21 shows all attributes of TimeSeries.

1044

Table 21 – Attributes of GenerationLoad contextual model::TimeSeries

mult.	Attribute name	Attribute type	Description
[1..1]	businessType	BusinessKind_String	The identification of the nature of the time series.
[0..1]	cancelledTS	ESMPBoolean_String	An indicator stating that the TimeSeries, identified by the mRID, is cancelled as well as all the values sent in a previous version of the TimeSeries in a previous document. When this indicator has a A01 (Yes) value, the meaning is that the data for the time series has been withdrawn. This differentiates between a time series with no values and one with values that have been revoked.
[1..1]	curveType	CurveType_String	The identification of the coded representation of the type of curve being described.
[1..1]	mRID	ID_String	A unique identification of the time series.
[1..1]	objectAggregation	ObjectAggregationKind_String	The identification of the domain that is the common denominator used to aggregate a time series. The identified object aggregation are: - area; - resource object; - resource type.

1045

1046 Table 22 shows all association ends of TimeSeries with other classes.

1047 **Table 22 – Association ends of GenerationLoad contextual model::TimeSeries with**
 1048 **other classes**

mult.	Role	Class type name	Description
[0..1]	InBiddingZone_Domain	Domain	The identification of the bidding zone where energy is going associated with a TimeSeries. Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::Domain.Domain[0..*]
[0..1]	MktPSRType	MktPSRType	The identification of the type of the RegisteredResource associated with a TimeSeries. Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::MktPSRType.MktPSRType[0..*]
[0..1]	OutBiddingZone_Domain	Domain	The identification of the bidding zone where energy is taken from associated with a TimeSeries. In the case of generation, this indicates the load used by the generation unit (consumption). Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::Domain.Domain[0..*]
[0..*]	Period	Series_Period	The time interval and resolution for a period associated with a TimeSeries Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::Series_Period.Period[0..*]

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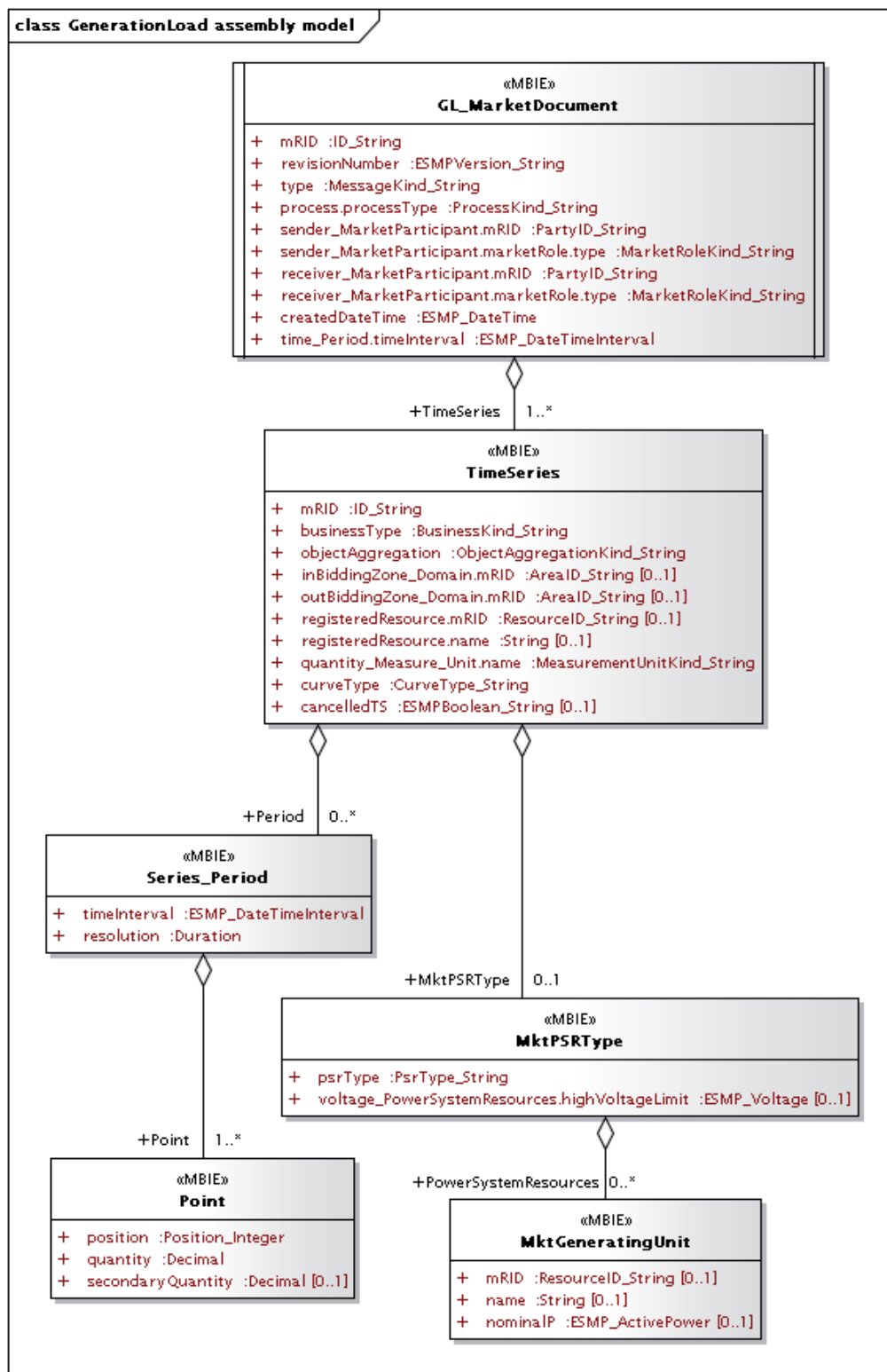
– 37 –

mult.	Role	Class type name	Description
[1..1]	Quantity_Measure_Unit	Measure_Unit	The unit of measure associated with the quantities in the Point class (quantity and secondaryQuantity). Association Based On : ESMPClasses::TimeSeries.[] ----- ESMPClasses::Measure_Unit.Measurement_Unit[0..*]
[0..1]	RegisteredResource	RegisteredResource	The identification of a resource associated with a time series. Association Based On : ESMPClasses::RegisteredResource.RegisteredResource[0..*] ----- ESMPClasses::TimeSeries.[]

1049

1050 **6.2 GenerationLoad assembly model**1051 **6.2.1 Overview of the model**

1052 Figure 6 shows the model.

1054 **Figure 6 – GenerationLoad assembly model**

6.2.2 IsBasedOn relationships from the European style market profile

Table 23 shows the traceability dependency of the classes used in this package towards the upper level.

Table 23 – IsBasedOn dependency

Name	Is BasedOn Class	Complete IsBasedOn Path
GL_MarketDocument	MarketManagement::MarketDocument	TC57CIM::IEC62325::MarketManagement
MktGeneratingUnit	MarketCommon::MktGeneratingUnit	TC57CIM::IEC62325::MarketCommon
MktPSRType	MarketManagement::MktPSRType	TC57CIM::IEC62325::MarketManagement
Point	MarketManagement::Point	TC57CIM::IEC62325::MarketManagement
Series_Period	MarketManagement::Period	TC57CIM::IEC62325::MarketManagement
TimeSeries	MarketManagement::TimeSeries	TC57CIM::IEC62325::MarketManagement

6.2.3 Detailed GenerationLoad assembly model**6.2.3.1 GL_MarketDocument root class**

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

This electronic document enables the transmission of the following forms of generation and load information for given periods:

- Daily, monthly, weekly and yearly generation and load forecasts
- Yearly forecast margin
- Actual load information
- Actual generation unit information
- Available and installed capacity
- Wind and solar information
- Pumped storage and reservoir capacity

IsBasedOn: GenerationLoad contextual model::GL_MarketDocument

Table 24 shows all attributes of GL_MarketDocument.

Table 24 – Attributes of GenerationLoad assembly model::GL_MarketDocument

mult.	Attribute name	Attribute type	Description
[1..1]	createdDateTime	ESMP_DateTime	The date and time of the creation of the document.
[1..1]	mRID	ID_String	The unique identification of the document being exchanged within a business process flow.
[1..1]	process.processType	ProcessKind_String	The identification of the nature of process that the document addresses.
[1..1]	receiver_MarketParticipant.marketRole.type	MarketRoleKind_String	The identification of the role played by a market player. --- The document recipient. --- The role associated with a MarketParticipant

mult.	Attribute name	Attribute type	Description
[1..1]	receiver_MarketParticipant.mRID	PartyID_String	The identification of a party in the energy market. --- The document recipient.
[1..1]	revisionNumber	ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
[1..1]	sender_MarketParticipant.marketRole.type	MarketRoleKind_String	The identification of the role played by a market player. --- The document owner. --- The role associated with a MarketParticipant.
[1..1]	sender_MarketParticipant.mRID	PartyID_String	The identification of a party in the energy market. --- The document owner.
[1..1]	time_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.
[1..1]	type	MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.

1076

1077 Table 25 shows all association ends of GL_MarketDocument with other classes.

1078 **Table 25 – Association ends of GenerationLoad assembly model::GL_MarketDocument**
 1079 **with other classes**

mult.	Role	Class type name	Description
[1..*]	TimeSeries	TimeSeries	The time series that is associated with an electronic document. Association Based On : GenerationLoad contextual model::GL_MarketDocument.[] ----- GenerationLoad contextual model::TimeSeries.TimeSeries[1..*]

1080

1081 6.2.3.2 MktGeneratingUnit

1082 The information about a generating unit.

1083 IsBasedOn: GenerationLoad contextual model::MktGeneratingUnit

1084 Table 26 shows all attributes of MktGeneratingUnit.

1085 **Table 26 – Attributes of GenerationLoad assembly model::MktGeneratingUnit**

mult.	Attribute name	Attribute type	Description
[0..1]	mRID	ResourceID_String	The unique identification of a resource.
[0..1]	name	String	The name is any free human readable and possibly non unique text naming the object.
[0..1]	nominalP	ESMP_ActivePower	The nominal power of the generating unit.

1086