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Entwurf

**Kommunikation im Energiemarkt –
Teil 451-4: Abwicklungs- und Abstimmungsgeschäftsprozesse,
kontextbezogene Modelle und Einbindungsmodelle für den
europäischen Markt
(IEC 57/1410/CD:2013), Text in Englisch**

Framework for energy market communications –
Part 451-4: Settlement and reconciliation business process, contextual and assembly
models for European market
(IEC 57/1410/CD:2013), Text in English

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Gesamtumfang 53 Seiten

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Nationales Vorwort

Die englische Originalfassung des internationalen Dokuments IEC 57/1410/CD:2013 „Framework for energy market communications – Part 451-4: Settlement and reconciliation business process, 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.

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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.

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 die vorliegenden Normentwurf erfüllt.

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Nationaler Anhang NA (informativ)

3 Begriffe

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

ANMERKUNG Für allgemeine Glossardefinitionen siehe das Internationale Elektrotechnische Wörterbuch IEC 60050.

3.1

aggregierte Geschäfts-Informationseinheit

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

aggregierte Geschäfts-Informationseinheit ist eine Wiederverwendung einer aggregierten Kernkomponente (ACC) in einem festgelegten Geschäftsbereich (ISO 15000-5)

3.2

aggregierte Kernkomponente

(en: **aggregate core component – ACC**)

Anhäufung zusammengehöriger Geschäftsinformationsteile, die unabhängig von einem bestimmten Geschäftskontext zusammen eine gesonderte Bedeutung für das Geschäft haben.

ANMERKUNG zum Begriff Als Terme bei der Modellierung stellen diese unabhängig von einem bestimmten Geschäftskontext eine Objektklasse dar (ISO 15000-5)

3.3

Anwendungsprogramm-Schnittstelle

(en: **application program interface – API**)

Menge von öffentlichen Funktionen, die von einer ausführbaren Komponente zum Aufruf durch andere Anwendungskomponenten zur Verfügung gestellt wird

3.4

Einbindungsmodell

(en: **assembly Model**)

Modell, das Informationen in einem Geschäftskontext für die Einbindung in elektronische Dokumente für den Datenaustausch aufbereitet

3.5

basiert auf oder IsBasedOn

(en: **based on or IsBasedOn**)

Einsetzen eines Artefakts, das Einschränkungen besitzt, die nach den Anforderungen eines bestimmten Geschäftskontextes vorgenommen wurden (IEC 62325-450)

3.6

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 (UN/CEFACT)

3.7

Profil des Europäischen Marktes

(en: **European style market profile – ESMP**)

Profil, das am Europäischen Markt ausgerichtet und Ziel dieser Internationalen Norm ist

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

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

ANMERKUNG zum Begriff Es kann gemeinsam anwendbare, feste und geordnete Datenstrukturanforderungen an den Domänenkontext enthalten

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

Computersystem, das eine Softwareplattform für die grundlegenden Supportdienstleistungen und eine Reihe von Anwendungen mit der Funktionalität beinhaltet, die für das effiziente Management des Elektrizitätsmarktes notwendig ist.

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

3.10**Geschäfts-Informationseinheiten-Nachrichten****(en: message business information entity – MBIE)**

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Framework for energy market communications –
Part 451-4: Settlement and reconciliation business process, contextual
and assembly models for European market**

FOREWORD

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Power systems management and associated information exchange.

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

FDIS	Report on voting
XX/XX/FDIS	XX/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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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

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Name of intervening person	Document received		Brief description of the changes introduced	Document sent	
	From	Date		To	Date
Maurizio Monti	Project leader	2013-07-29	From the outlines submitted with the NP, draft the Committee Draft document	IEC Secretary	2013-08-29
Margareta Nöth	Maurizi o Monti	2013-08-29	CD draft for circulation	CO	2013-09-26

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211

INTRODUCTION

212 This standard is one of the IEC 62325 series which define protocols for deregulated energy
213 market communications.

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

220 The common information model (CIM) specifies the basis for the semantics for this message
221 exchange.

222 The European style market profile is based on different parts of the CIM IEC standard. The
223 CIM is defined through a series of standard, i.e. IEC 62325-301, IEC 61970-301 and IEC
224 61968-11 standards.

225 This document provides for the European style market profile the settlement and
226 reconciliation business process that can be used throughout a European style market. This
227 standard was originally based upon the work of the European Transmission System Operators
228 (ETSO) Task Force EDI (Electronic Data Interchange) and then on the work of the European
229 Network of Transmission System Operators (ENTSO-E) Working Group EDI.

230 This document describes the settlement and reconciliation process for wholesale markets; it is
231 brought to the attention of the reader that it is envisaged to initiate work on a combined
232 reconciliation process for retail and wholesale markets.

**Framework for energy market communications –
Part 451-4: Settlement and reconciliation business process, contextual
and assembly models for European market**

1 Scope

Based on the European style market profile (IEC 62325-351), this particular International Standard specifies a package for the settlement and reconciliation business process and the associated document contextual model, assembly model and XML schema for use within European style 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 this business process. The contextualised ABIEs have been assembled into the relevant document contextual models. Related assembly models and XML schema for the exchange of information between market participants are automatically generated from the assembled document contextual models.

This International Standard provides a uniform layout for the transmission of aggregated data in order to settle the electricity market. It is however not the purpose of this International Standard to define the formula to be taken into account to settle or reconcile a market. The purpose of this standard is only to enable the information exchange necessary to carry out the computation of settlement and reconciliation.

The settlement process or reconciliation process is the way to compute the final position of each market participant as well as its imbalance amounts.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62325-301, *Framework for energy market communications - Common information model (CIM) Extensions for markets*.

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

IEC 62325-450, *Profile and context modeling rules*.

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

IEC-62325-451-2, *Framework for energy market communications - Scheduling business process and contextual model for European market*.

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

3 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 61970-2 apply, as well as the following.

NOTE Refer to International Electrotechnical Vocabulary, IEC 60050, for general glossary definitions.

3.1

aggregate business information entity

ABIE

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

[SOURCE: ISO 15000-5]

279 **3.2**
280 **aggregate core component**
281 **ACC**
282 collection of related pieces of business information that together convey a distinct business
283 meaning, independent of any specific business context.

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

286 [SOURCE: ISO 15000-5]

287 **3.3**
288 **application program interface**
289 **API**
290 set of public functions provided by an executable application component for use by other
291 executable application components.

292 **3.4**
293 **assembly model**
294 assembly model is a model that prepares information in a business context for assembly into
295 electronic documents for data interchange.

296 **3.5**
297 **based on or IsBasedOn**
298 use of an artefact that has been restricted according to the requirements of a specific
299 business context.

300 [SOURCE: IEC 62325-450]

301 **3.6**
302 **business context**
303 formal description of a specific business circumstance as identified by the values of a set of
304 context categories, allowing different business circumstances to be uniquely distinguished

305 [SOURCE: UN/Cefact]

306 **3.7**
307 **European style market profile**
308 **ESMP**
309 the European style market profile, the object of this International Standard.

310 **3.8**
311 **information model**
312 representation of concepts, relationships, constraints, rules, and operations to specify data
313 semantics for a chosen domain of discourse.

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

316 **3.9**
317 **market management system**
318 **MMS**
319 computer system comprised of a software platform providing basic support services and a set
320 of applications providing the functionality needed for the effective management of the
321 electricity market.

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

324 **3.10**
325 **message business information entity**
326 **MBIE**
327 aggregation of a set of ABIEs that respects a define set of assembly rules.

4 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, 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.

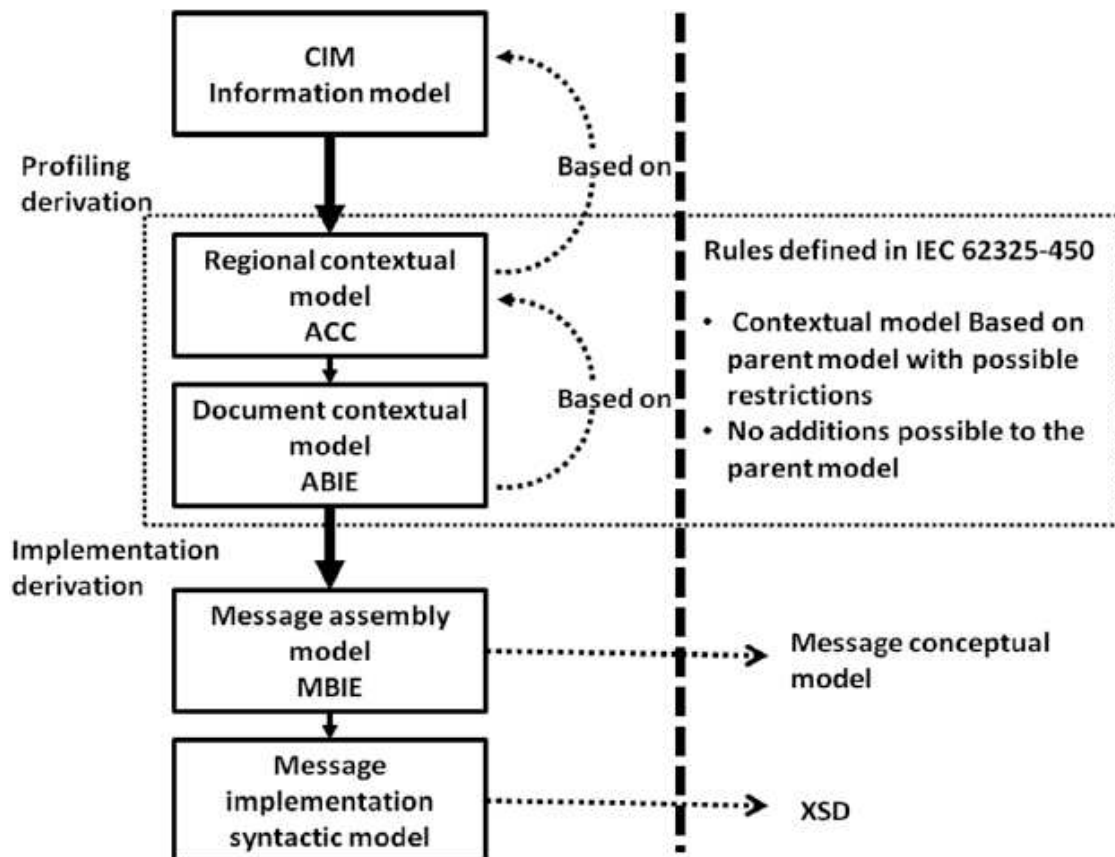


Figure 1 - IEC 62325-450 modelling framework

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 2 describes the main package structure of the European style market profile.

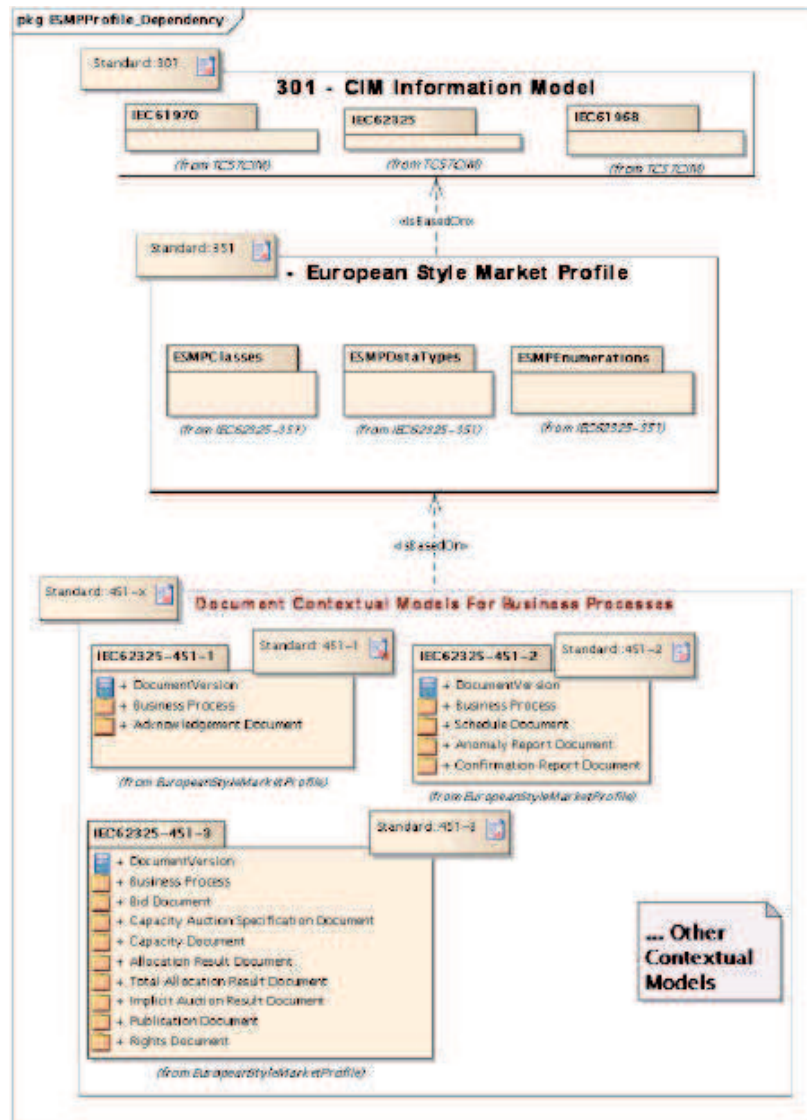


Figure 2 - Overview of European style market profile dependency

For each business process, a business process package is described in an IEC 62325-451-x (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 the IEC 62325-351, provides the core components permitted for use in an IEC 62325-451-x standard as all ABIEs shall be "based on" the IEC 62325-351 core components:

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

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

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

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

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

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

4.4 From the document contextual model to the message assembly model

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

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

4.5 From the assembly model to the XML schema

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

5 The settlement and reconciliation business process

5.1 Balance responsible party and settlement

As indicated in the IEC 62325-301 "MarketRoleKind enumeration", in the European style electricity market, a balance responsible party could be defined as:

- A party that has a contract proving financial security and identifying balance responsibility with the imbalance settlement responsible of the market balance area entitling the party to operate in the market. This is the only role allowing a party to nominate energy on a wholesale level.

Note: The meaning of the word "balance" in this context signifies that the quantity contracted to provide or to consume shall be equal to the quantity really provided or consumed.

The role of balance responsible party is linked to the role of balance supplier, i.e.

- A party that markets the difference between actual metered energy consumption and the energy bought with firm energy contracts by the party connected to the grid. In addition the balance supplier markets any difference with the firm energy contract (of the party connected to the grid) and the metered production. There is one balance supplier for each accounting point.

A party connected to the grid could be defined as:

- A party that contracts for the right to consume or produce electricity at an accounting point.

The Figure 3 describes the different transactions of a balance responsible party that could have to be considered when carrying out a settlement or a reconciliation process:

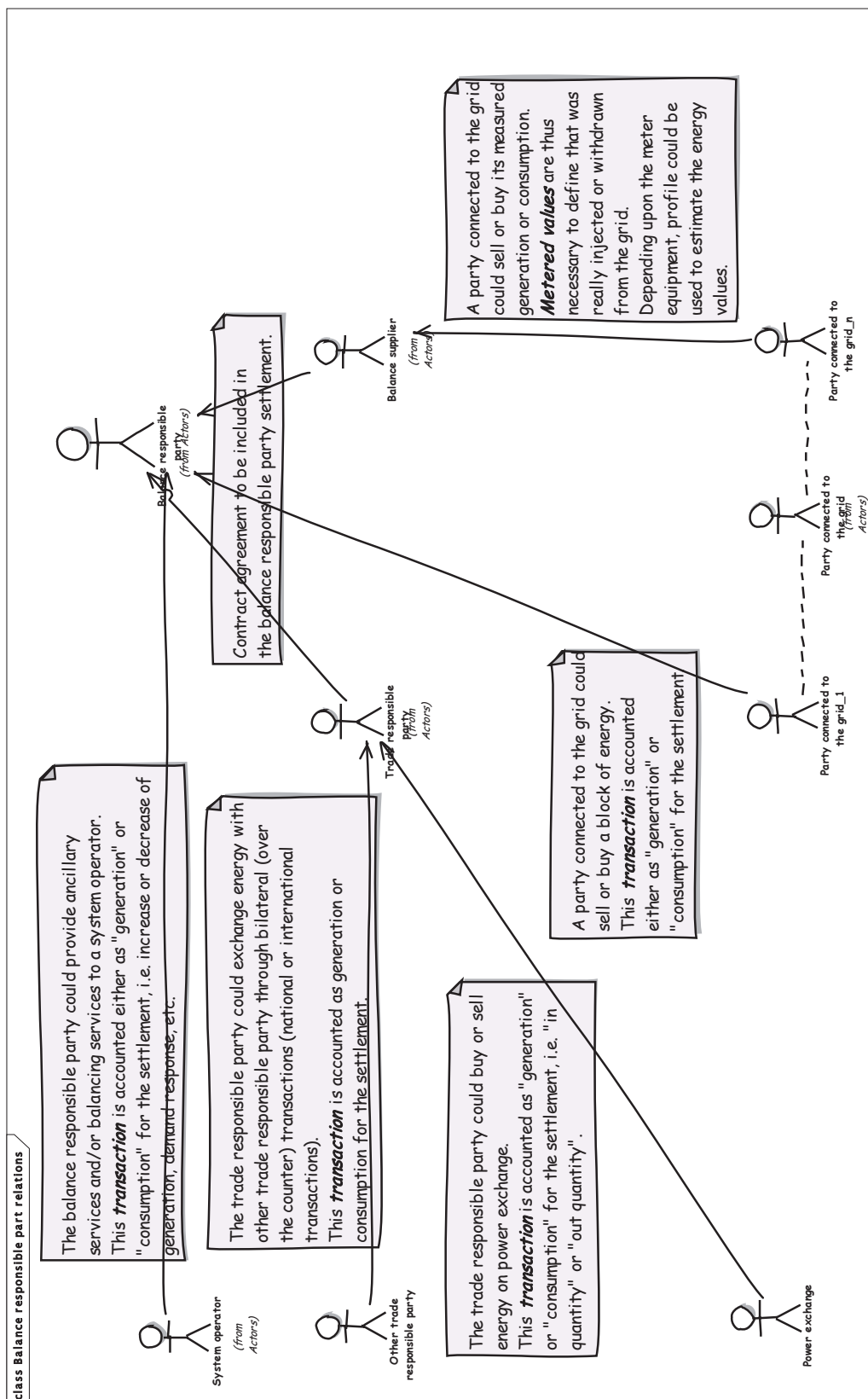


Figure 3 – Balance responsible party relations

The settlement process enables thus to reconcile all the "commercial transactions" with the actual measured values either from meters, estimated values or profiles.

The main purpose is thus to assess, after the fact, that the balance responsible party was balanced and if not to compute the deviations and to settle them.