Business Requirements

for

Alignment of Metering Configuration Characteristics for a Metering Point

Status: Approved by ebIX® Forum
Version: 1.1
Revision: A
Date: June 2017

C O N T E N T

A. About this document

This document is a business requirements specification for the alignment of metering configuration characteristics for a MP process within the structuring process of the European energy market.

The alignment of metering configuration characteristics is a process where a party can notify changes to metering configuration characteristics or requests such configuration characteristics. The metering configuration characteristics is always related to a Metering Point. It is a prerequisite that the requesting party is authorised to receive metering configuration characteristics, i.e. that the requesting party has a formal responsibility for the Meter, such as Balance Supplier or Grid Access Provider. The Request metering configuration characteristics process may return all metering configuration characteristics elements the requesting party may need to fulfil its obligations in the energy market.

As a general introduction ebIX® has published a separate document "Introduction to ebIX® Business Requirements and Business Information Models" [3]. The introduction also includes the generic model elements that are not specific for a particular business process.

In line with UN/CEFACT Modelling Methodology version 2 (UMM-2) ebIX® defines the business requirements before starting the actual modelling. These requirements have been specified by the ebIX® work group "ebIX® working group for Master Data Structuring and harmonisation in the European energy market" (MDS) and are the basis for the Business Information Model (BIM) which is published in a separate document.

The Business Information Model is in turn the basis for the creation of XML schema's and is expected to be the basis for the specification of web services in a next version of the model document. Since ebIX® supports both EDIFACT and XML the model will also serve as the basis for the creation of Message Implementation Guides for the mapping to EDIFACT UNSM's. The Business Information Model and the syntax specific structures are specified by the ebIX® "Technical Committee" (ETC).

A.1. Comments to the ebIX® model

If you have comments or suggestions to the requirements please contact any member of the project group or directly to Ove Nesvik, ove.nesvik@edisys.no.

A.2. References

A.2.1. Standards

[1] UML Profile for UN/CEFACT's Modelling Methodology (UMM), Base Module 2.0, (http://www.unece.org/cefact/umm/umm_index.html)

[2] The Harmonized Role Model (for the Electricity Market) by ebIX®, ENTSO-E, and EFET (www.ebix.org)

A.2.2. ebIX® Documents

[3] Introduction to ebIX® Business Requirements and Business Information Models (www.ebix.org)

[4] Recommended Identification Schemes for the European Energy Market (www.ebix.org)

[5] ebIX® code lists (www.ebix.org)

A.3. Participants in the project

These Business Requirements as part of the ebIX® Model for the European Energy Market *(see [3])* are made in a project with the members of CuS. For a list of members of CuS see www.ebix.org .

A.4. Main changes since last version

Old	New	Clarification	Date
	Version 1.0.A		
		First published version	20161201
	Version 1.1.A		
	1. Added an overall Business process UseCase 2. Linked the business process activity diagram for Request metering configuration characteristics with the business process activity diagram for Notify metering configuration characteristics. 3. Added an enumeration “Incrementation Type” with two literals; “Cumulative” and “non-cumulative”.		20170105
	1. Updated class diagram for metering configuration characteristics 2. The attribute Communication Protocol in the Communication Gateway class is split into Communication Protocol and Communication Carrier		20170208
	1. Renamed CuS to MDS 2. Updated Metering configuration characteristics Class Diagram 3. Added Communication Protocol Types (without enumeration literals) as footnote		20170511

Old	New	Clarification	Date
	4. Added attribute: Communication Carrier 5. Renamed “Cumulative Reading Indicator” to “Incrementation Type”		

1. Business Requirements View: Alignment of metering configuration characteristics

1.1. Alignment of metering configuration characteristics (Business Process UseCase)

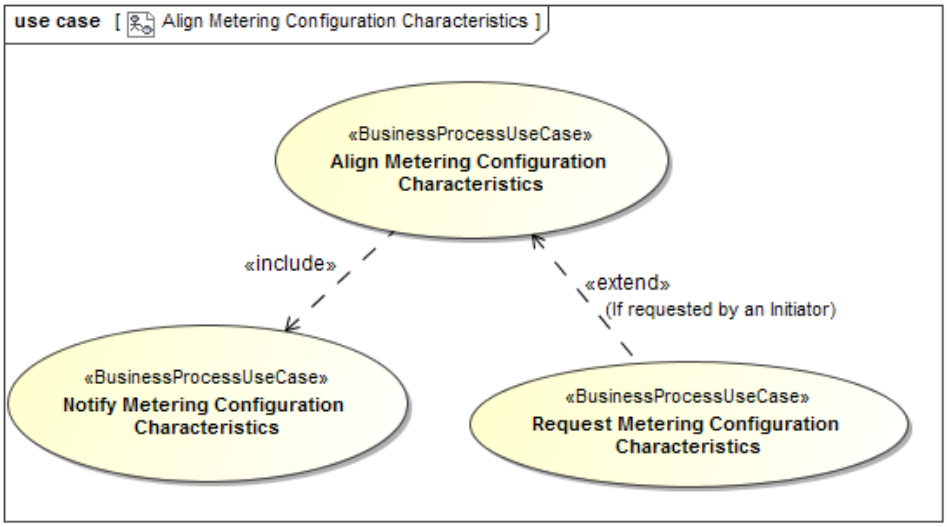

Figure 1 Alignment of metering configuration characteristics

1.1.1. Description

UseCase description: Alignment of metering configuration characteristics	
definition	This is the process where a *Meter Administrator* can notify changes to metering configuration characteristics to parties (roles) linked to a *Meter*. As an extension, a *Linked* Role can request such configuration characteristics. The processes may be run at predefined time intervals for periodical alignments. The metering configuration characteristics is always related to a Metering Point. The Request metering configuration characteristics process may return all metering configuration characteristics elements the requesting party may need to fulfil its obligations in the energy market.
beginsWhen	When the *Meter Administrator* need to inform the *Linked Roles* of changes to the metering configuration characteristics, or a *Linked Role* has requested such information.
preCondition	The *Meter Administrator* has a need to inform the *Linked Roles* about changes to metering configuration characteristics. If metering configuration characteristics is requested by a *Linked Role*, the requestor must be authorised to receive metering configuration

	characteristics, i.e. that the requestor has a formal responsibility for the *Meter*, such as a *Balance Supplier* or a *Grid Access Provider*.
endsWhen	When the *Linked Role(s)* has received the metering configuration characteristics, or a request for metering configuration characteristics has been rejected.
postCondition	The metering configuration characteristics are aligned between the *Meter Administrator* and *Linked Role*.
exceptions	None
actions	Not relevant at this level.

1.2. Business Domain View: Notify metering configuration characteristics (Business Process UseCase)

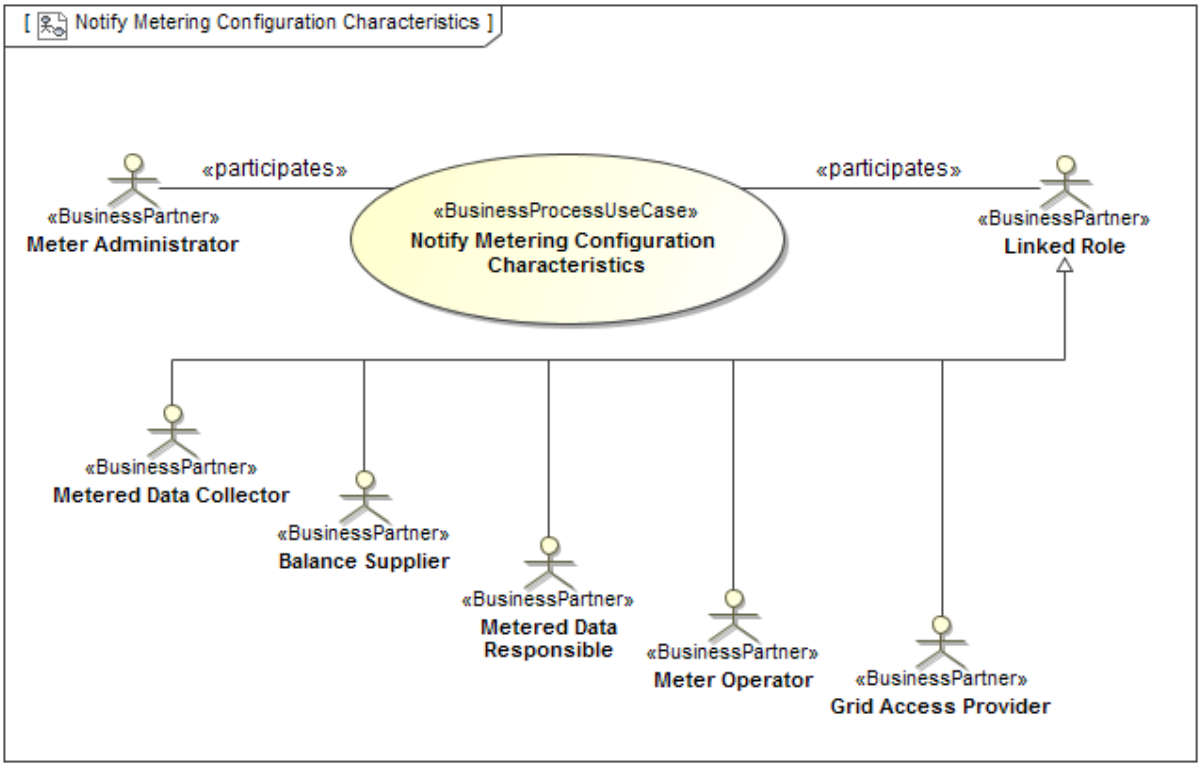

Figure 2 Notify metering configuration characteristics

1.2.1. Description

UseCase description: Notify metering configuration characteristics	
definition	In this process the Meter Administrator distributes metering configuration characteristics to Linked parties[1, 2]: • Balance Supplier[3] • Grid Access Provider • Meter Operator • Metered Data Collector[4] • Metered Data Responsible after update of one or more of these metering configuration characteristics of one or more Meters in a Metering Point.

[1] The number of *Linked parties* may vary between countries

[2] A party is linked to the *Meter* at a given time, i.e. the old supplier should not receive *Metering configuration characteristics* after a change

[3] The Balance Supplier is a Linked Party because of his role towards the Customer in a supplier centric market model

[4] The *Metered Data Collector* is linked to the Meter for practical purposes and may need the *Metering configuration characteristics*, but is according to the Harmonised role model [1], linked to the *Register*

beginsWhen	When there have been changes to the metering configuration characteristics of one of more Meters in a Metering Point. Time constraints are based on national rules.
preCondition	• One or more parties linked to the Meter and known by the Meter Administrator are entitled to receive metering configuration characteristics; • One or more of the intended metering configuration characteristics have been changed.
endsWhen	When the Linked parties have received the notification.
postCondition	The metering configuration characteristics have been notified by the Meter Administrator to the Linked parties.
exceptions	Note that master data should not be cancelled, but updated.
actions	See 1.2.2

1.2.2. Business Process

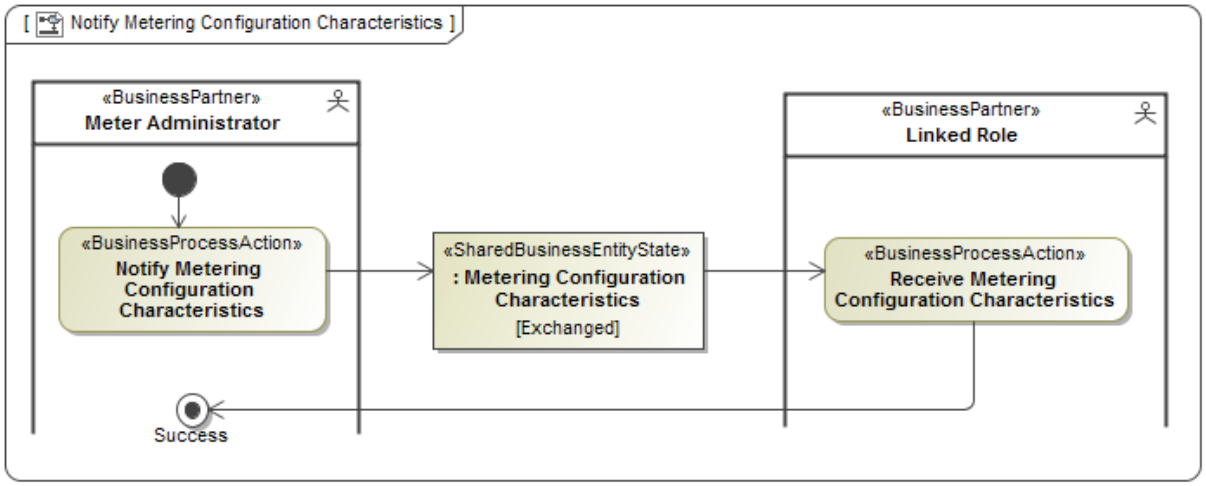

Figure 3 Business Process Notify metering configuration characteristics

1.3. Request metering configuration characteristics (Business Process UseCase)

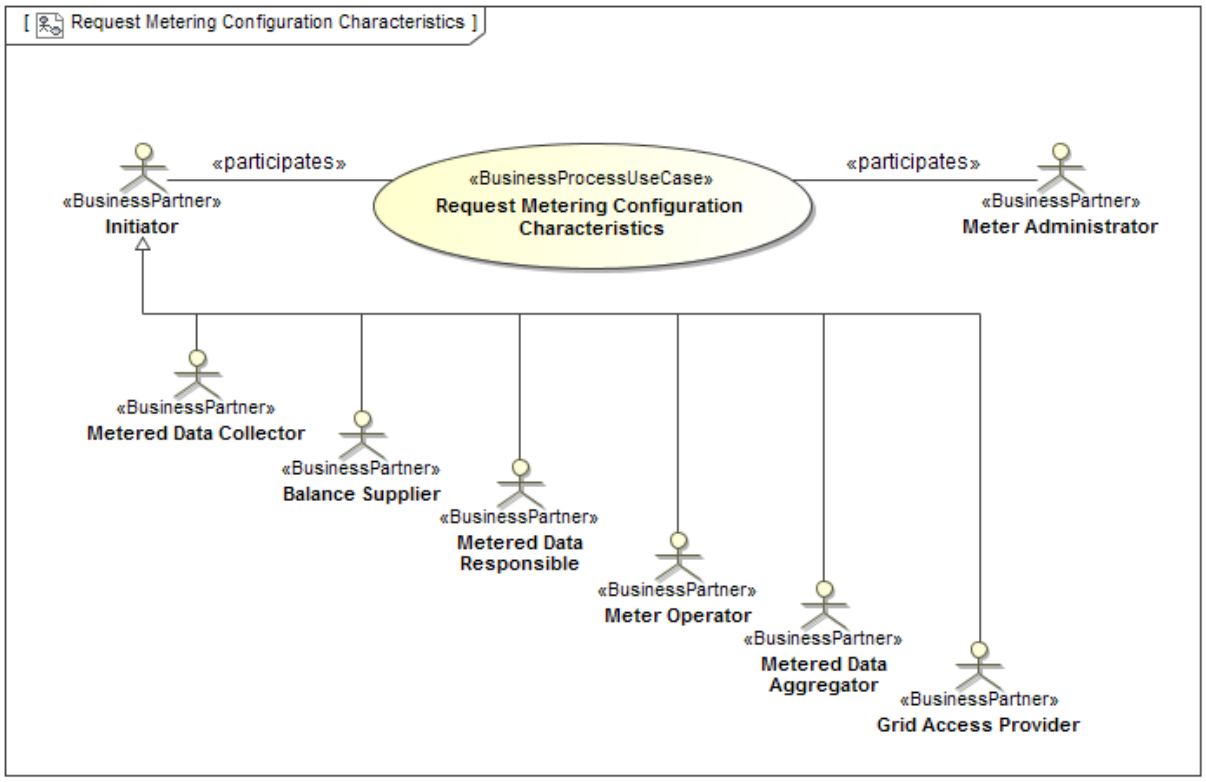

Figure 4 Request metering configuration characteristics

1.3.1. Description

UseCase description: Request metering configuration characteristics	
definition	This is the process where an *Initiator*[5] *(Market Role)*, i.e.: • Balance Supplier • Grid Access Provider • Meter Operator • Metered Data Aggregator • Metered Data Collector[6] • Metered Data Responsible

[5] The number of *Initiators* may vary between countries

[6] The *Metered Data Collector* is linked to the Meter for practical purposes and may need the *Metering configuration characteristics*, but is according to the Harmonised role model [1], linked to the *Register*

	can align its metering configuration characteristics with the Meter Administrator. The process is aimed to exchange information for all meters in a Metering point.
beginsWhen	When the Initiator needs to align its master data.
preCondition	• The Initiator is allowed to receive metering configuration characteristics, e.g. by having an authorisation by the Customer. • The *Initiator* is known by the Meter Administrator.
endsWhen	When the Initiator has received the metering configuration characteristics from the Meter Administrator or the request was rejected.
postCondition	Metering configuration characteristics are received by the Initiator or the request is rejected, e.g. if the Initiator is not allowed access to the data (based on national rules).
exceptions	A request for master data may be cancelled, dependent on national rules.
actions	See 1.3.2

1.3.2. Business Process

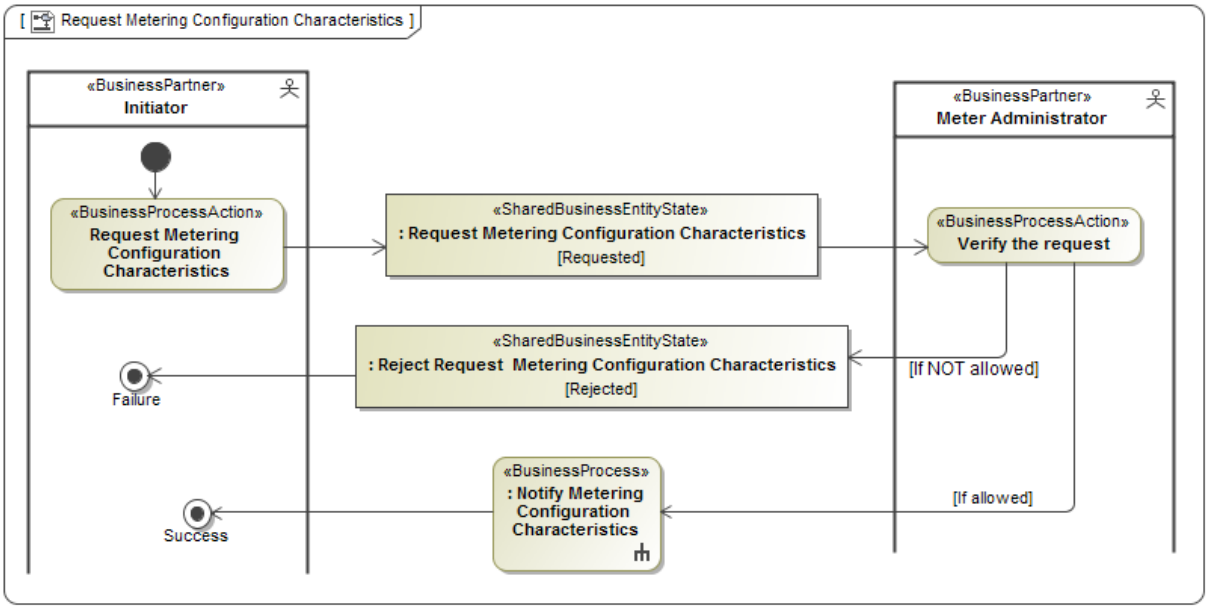

Figure 5 Business Process: Request metering configuration characteristics

1.4. Business Partner View

1.4.1. Business Partners for alignment of metering configuration characteristics

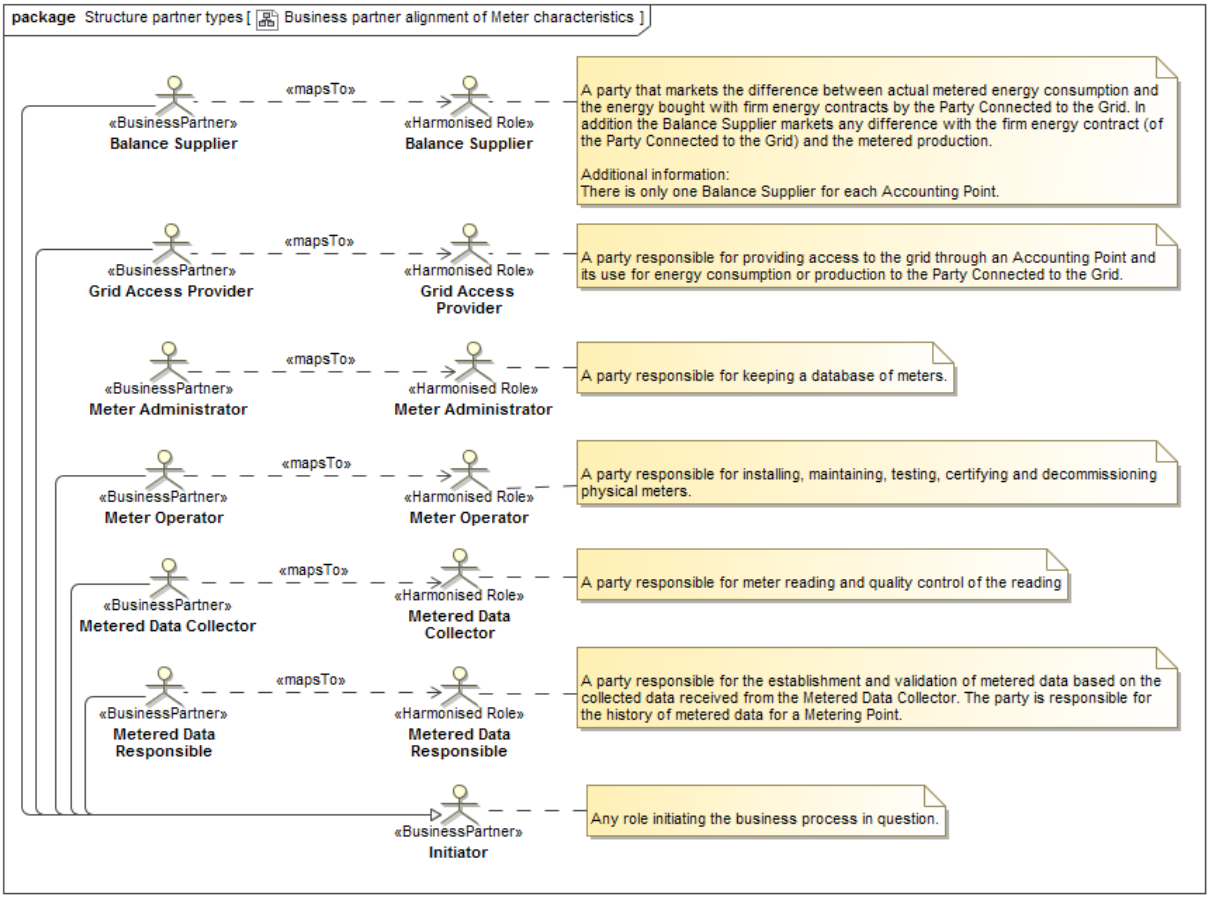

Figure 6 Business Partners related to alignment of metering configuration characteristics

1.5. Business Data View

A general introduction to the Business Data View can be found in the Introduction to ebIX® Business Requirements and Business Information Models (www.ebix.org) [3].

1.5.1. Metering configuration characteristics (Class Diagram)

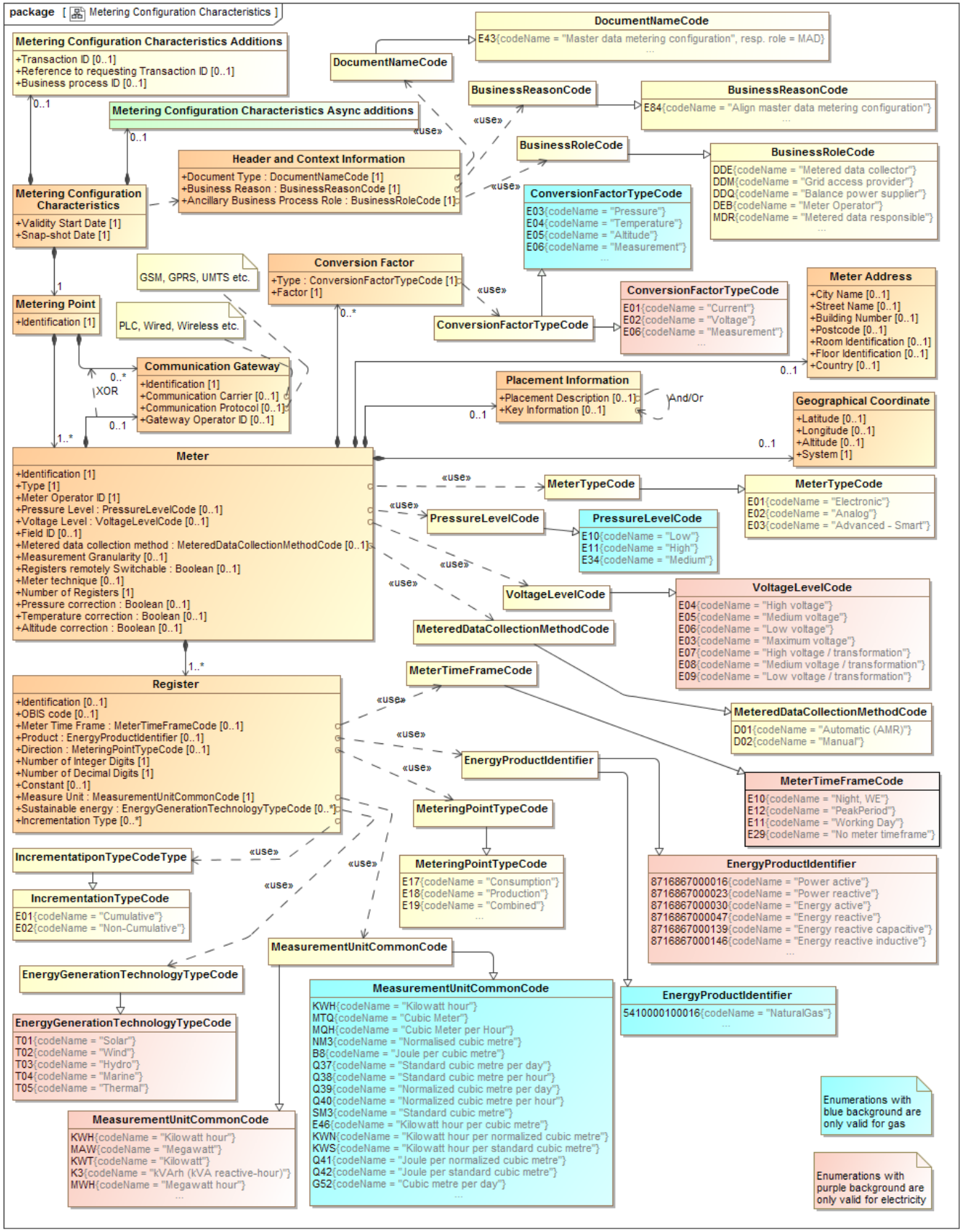

Figure 7 Metering configuration characteristics

1.5.1.1. Element definitions, Metering configuration characteristics

Class/attribute	Sector[7]	Description
«Business entity» Metering Configuration Characteristics		The information set of metering configuration characteristics in a Metering Point sent by the Meter Administrator to the requesting or linked roles in response of a request or when notifying metering configuration characteristics. Possible requesting or linked roles: • Balance Supplier • Grid Access Provider • Meter Operator • Metered Data aggregator • Metered Data Collector • Metered Data Responsible
Validity start date		The date when the set of information for this Metering Point in this business document becomes or became valid.
Snap-shot date		The date and time when the set of information was extracted from the Meter register.
«Business entity» Metering Point		An entity where energy products are measured or computed.
Identification		The unique identification of the Metering Point.
«Business entity» Meter		A physical device containing one or more registers.
Identification		The unique identification of the Meter.
Type		A code representing the type of Meter.
Meter Operator ID		The identification of the Meter Operator for this Meter, which is the party responsible for installing, maintaining, testing, certifying and physically decommissioning this Meter.
Pressure Level	Gas	The Pressure level at which the Meter operates **Dependency**: • Required if different from “standard low national distribution pressure”.
Voltage Level	Elec.	The Voltage level at which the Meter operates. **Dependency**: • Required if different from “standard low distribution voltage (230V/400V)“

[7] It is assumed that Metering Points are uniquely dedicated to either electricity or to gas.

Class/attribute	Sector[7]	Description
Field ID		The unique identification of the Field (as part of the Connection) where this Meter is installed. A Field is a physical entity connecting a Grid to the Installation belonging to a Party Connected to Grid. The Field contains objects, such as Transformers, Meters and Fuses. The field is sometimes referred to as (measure) street in Gas sector, or Bay in the electricity sector. **Dependency**: • Only used for complex installations
Metered data collection method		Indication of the way the Meter is read and offering the corresponding functionality to access reads. **Dependency**: • Dependent on national rules
Measurement Granularity		The actual measurement intervals of the Meter, such as 15 minutes or monthly. **Dependency**: • Dependent on national rules
Registers remotely switchable	Elec	Indication that the Meter is remotely switchable between the registers, for example by a tone frequency receiver. **Dependency**: • Dependent on national rules
Meter technique		A code indicating what kind of technique is used in the Meter. **Dependency**: • Dependent on national rules
Number of Registers		Number of Registers available in the Meter.
Pressure correction	Gas	Indication whether the Meter corrects measured values for pressure or not. **Dependency**: • Dependent on national rules
Temperature correction	Gas	Indication whether the Meter corrects measured values for the temperature or not. **Dependency**: • Dependent on national rules
Altitude correction	Gas	Indication whether the Meter corrects the measured values for altitude or not. **Dependency**: • Dependent on national rules

Class/attribute	Sector[7]	Description
Conversion factor		A value that specifies a conversion factor for this specific Metering configuration, such as for voltage, current, pressure, temperature. There can be more than one Factor of each Type for a Meter, but only one of each Type.
Type		A code representing the type of Conversion Factor.
Factor		The conversion factor used in the calculation of a volume from the reading of register(s) of this Meter.
Communication Gateway[8]		A communication device or service to exchange data between one or more physical equipment, and relevant market roles. It may have additional intelligent functions related to the exchange and/or the data. Examples of intelligent functions: Connection/disconnection, changing resolutions, handling time of use, multiplication of correction factors and other algorithms. Examples of equipment; Meters and Disconnector Switch.
Identification		The unique identification of this Communication Gateway.
Communication Protocol[9]		The Type of communication protocol used by this Communication Gateway.

[8] The Communication Gateway and Gateway Operator are not yet agreed added to the Harmonised Role Model [2];

[9] Power Line Carrier

- Legacy NB-PLC (BPSK, FSK, CHIRP)
  - IEC 61334
- NextGen NB-PLC (OFDM)
  - G3-PLC (ITU-T G.9903)
  - PRIME (ITU-T G9904)
  - IEEE 1901.2

Wireless communication

- xG (Cellular Networks)
  - 2G (FDMA)
    - GSM
    - GPRS
    - EDGE
  - 3G (TDMA/CDMA)
    - UMTS
    - HSPA
    - HSPA+
  - 4G (CDMA)
    - LTE (450MHz/800MHz/1800MHz/2,6GHz)
    - LTE Advanced
  - 5G (CDMA)
- WiMax
- Mobile Networks (CDMA450)

Wired Communications

- POTS (Plain Old Telephone Service)

Class/attribute	Sector[7]	Description
Communication Carrier		The Type of carrier, such as PLC, wired or wireless, used to contact the Communication Gateway.
Gateway Operator ID		The identification of the Gateway Operator responsible for this Communication Gateway.
Meter Address		The address where this Meter is physically located. **Dependency:** • Dependent on national rules
City Name		The name, expressed as text, of the city, town or village of this address.
Street Name		The name, expressed as text, of this street or thoroughfare of this address.
Building Number		The number, expressed as text, of the building or house on this street at this address.10
Postcode		The code specifying the postcode of this address.
Room Identification		The identification, expressed as text, of the room, suite, office or apartment as part of this address.
Floor Identification		The identification by name or number, expressed as text, of the floor in the building as part of this address.
Country		The unique identifier of the country for this address (Reference ISO 3166 and UN/ECE Rec 3).
Geographical Coordinates		The set of geographical coordinates of the exact location of this Meter. Dependency: • Dependent on national rules
Latitude		The measure of the latitude as an angular distance north or south from the Equator meridian to the meridian of the location of this Meter for its geographical coordinate. (Reference ISO 6709). **Dependency**: • Must be used together with Longitude

- PSTN (Public Switched Telecommunication Network)
- Ethernet
- PPP
- xDSL
- Fiber Optic (FTTH)

Reference

[1] B. Sörries: Communication technologies and networks for Smart Grid and Smart Metering, CDG 450 Connectivity Special Interest Group (450 SIG), 2013.

[2] N. Andreadou, M. Olariaga Guardiola and G. Fulli: Telecommunication Technologies for Smart Grid Projects with Focus on Smart Metering Applications, 2016.

[10]The Building Number may include a "Building Number Extension", such as one or more character making the address unique.

Class/attribute	Sector[7]	Description
Longitude		The measure of the longitude as an angular distance east or west from the Greenwich meridian to the meridian of the location of this Meter (Reference ISO 6709). **Dependency**: • Must be used together with Latitude
Altitude	Gas	The measure of the altitude that reflects the vertical elevation of this Meter above a surface for the geographical coordinate of the location of this Meter (Reference ISO 6709).
System		The unique identifier of the reference system used for measuring these geographical coordinates.
Placement Information		Information on how to physically get to the location of the installation where this Meter is installed.
Placement Description		Textual description of the placement (where and how) of this Meter.
Key Information		Textual description of how to get hold of key(s) to get access to this Meter.
<<Business Entity>> Register		A physical or logical counter measuring energy products. **Dependency**: • At least one of Identification, OBIS Code, Meter Time Frame and/or Product must be present • If no OBIS Code, the Product, Direction and Measure Unit are required
Identification		The unique identification of the Register (within this Meter).
OBIS code		A coded string to indicate the function of this Register. **Dependency**: • Dependent on national rules
Meter Time Frame	Elec.	A code specifying the tariff time frame for this Register.
Product		A code specifying a type of product for the quantity measured by this register.
Direction		The direction of the measured energy flow, such as production or consumption.
Number of Integer Digits		The number of digits in the log of this Register, without decimals.
Number of Decimal Digits		The number of decimals in the log of this Register.
Constant		The multiplication factor for this Register, used to calculate a metric volume or meter read for a meter reading. **Dependency**: • The constant is required if different from 1

Class/attribute	Sector[7]	Description
Measure Unit		The unit of measure for this Register.
Sustainable energy		An indication of what kind of sustainable energy (in case of production) is measured in this Register. **Dependency**: • Only used for Direction equal to production (E18) or combined (E19) • Dependent on national rules
Incrementation Type		A code showing if a Register provides cumulative readings or volumes between two points in time. **Dependency**: • Dependent on national rules
Metering Configuration Characteristics Additions		Additional information related to these metering configuration characteristics s, to be agreed on a national level.
Transaction ID		The unique identification of this set of information, given by the Meter Administrator.
Reference to requesting Transaction ID		A reference to the requesting business document, used in the responding business document in a business transaction. **Dependency**: • Only used when responding to a request.
Business process ID		The unique identification, given by the Meter Administrator, of this metering configuration characteristics process that this response is part of.
Metering Configuration Characteristics, Async Additions		Additional information related to these metering configuration characteristics, needed when using asynchronous communication.
Header and Context Information		The set of information specifying the information to be added to this payload “metering configuration characteristics” in order to enable the exchange as a document.
Document Type		A code representing the document type used for the exchange of this set of information.
Business Reason		A code representing the business reason for the exchange of this set of information.
Ancillary Business Process Role		A code representing the market role taking part in this exchange together with the Meter Administrator, responsible for the process/this exchange.

1.5.1.2. Metering configuration characteristics (State Diagram)

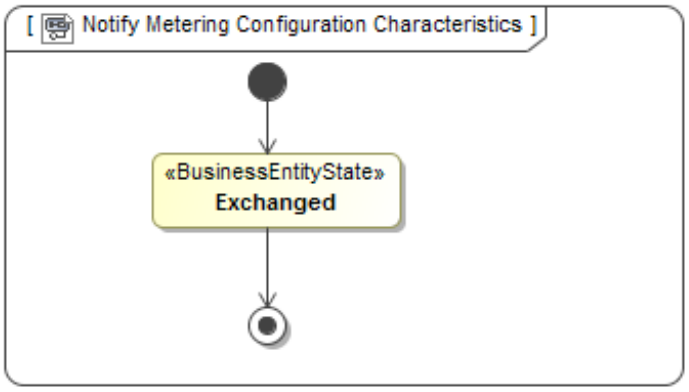

Figure 8 Metering configuration characteristics

1.5.2. Request metering configuration characteristics (Class Diagram)

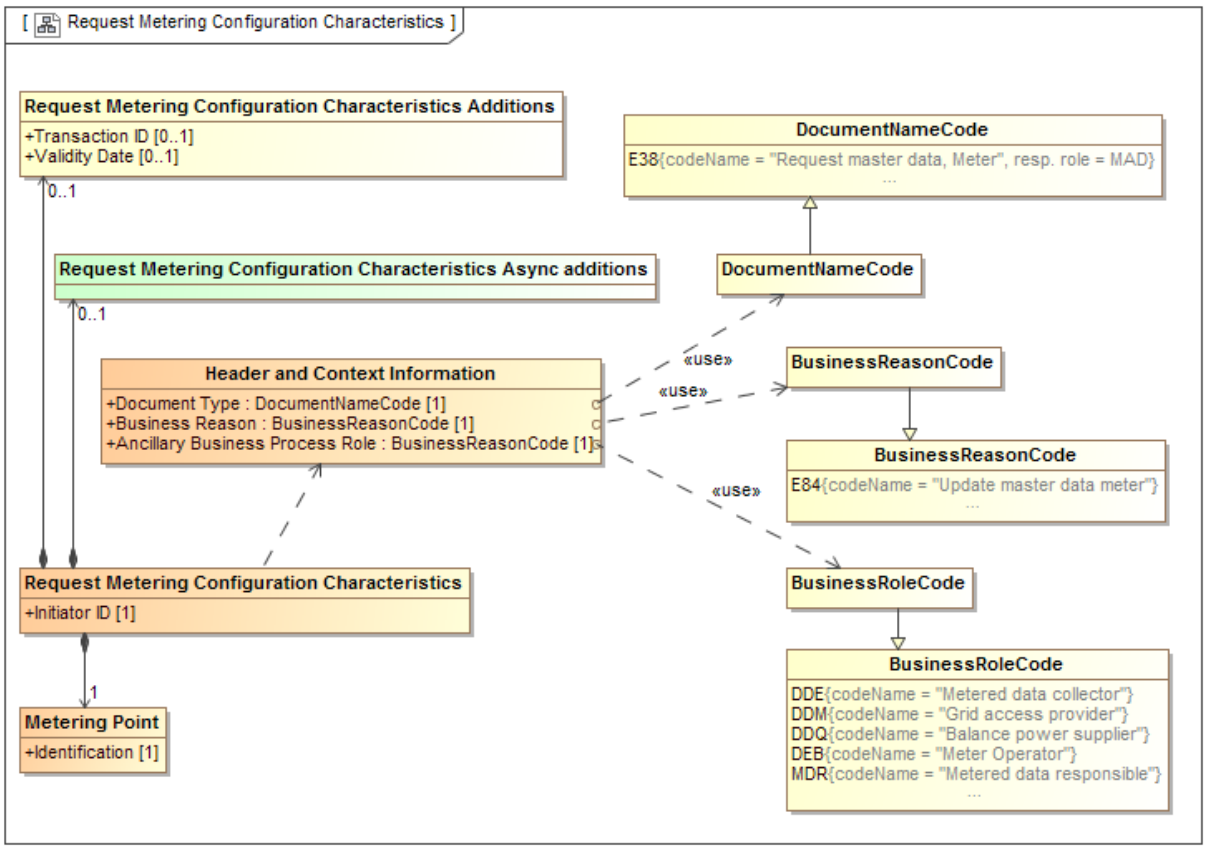

Figure 9 Request metering configuration characteristics

1.5.2.1. Element definitions, Request metering configuration characteristics

Class/attribute	Sector[11]	Description
«Business entity» Request Metering Configuration Characteristics		The information set to be sent by an *Initiator*, i.e.: • Balance Supplier • Grid Access Provider • Meter Operator • Metered Data Collector • Metered Data Responsible to the Meter Administrator when requesting metering configuration characteristics for a Metering Point
Initiator ID		The unique identification of the party that requests metering configuration characteristics.

[11] It is assumed that Metering Points are uniquely dedicated to either electricity or to gas.

«Business entity» Metering Point		An entity where energy products are measured or computed.
Identification		The unique identification of the Metering Point this "Request metering configuration characteristics" is intended for.
Request Metering Configuration Characteristics Additions		Additional information, related to this Request metering configuration characteristics, to be agreed on a national level.
Transaction ID		The unique identification of this set of information, given by the Initiator.
Validity Date		The date validated data are requested for.
Request Metering Configuration Characteristics Async Additions		Additional information, related to Requested metering configuration characteristics, needed when using asynchronous communication (however not used in this request).
Header and Context Information		The set of information specifying the information to be added to this payload "Request metering configuration characteristics" in order to enable the exchange as a document.
Document Type		A code representing the document type used for the exchange of this set of information.
Business Reason		A code representing the business reason for the exchange of this set of information.
Ancillary Business Process Role		A code representing the market role taking part in this exchange together with the requesting role, responsible for this exchange.

1.5.2.2. Request metering configuration characteristics (State Diagram)

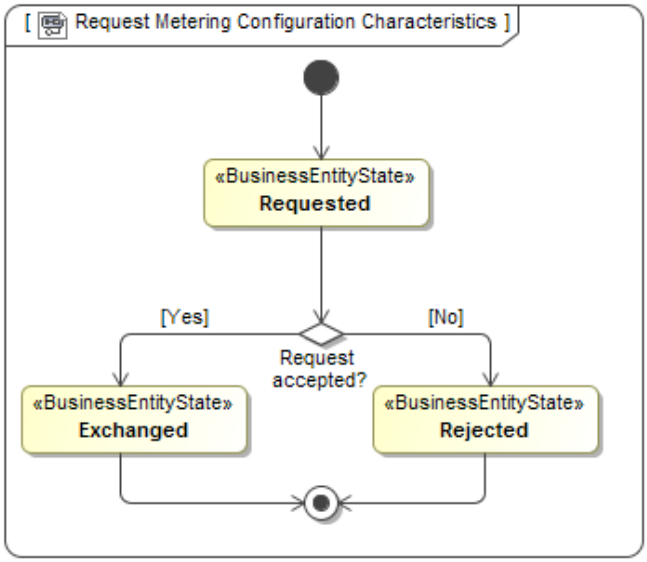

Figure 10 Request metering configuration characteristics

1.5.3. Reject Request metering configuration characteristics (Class Diagram)

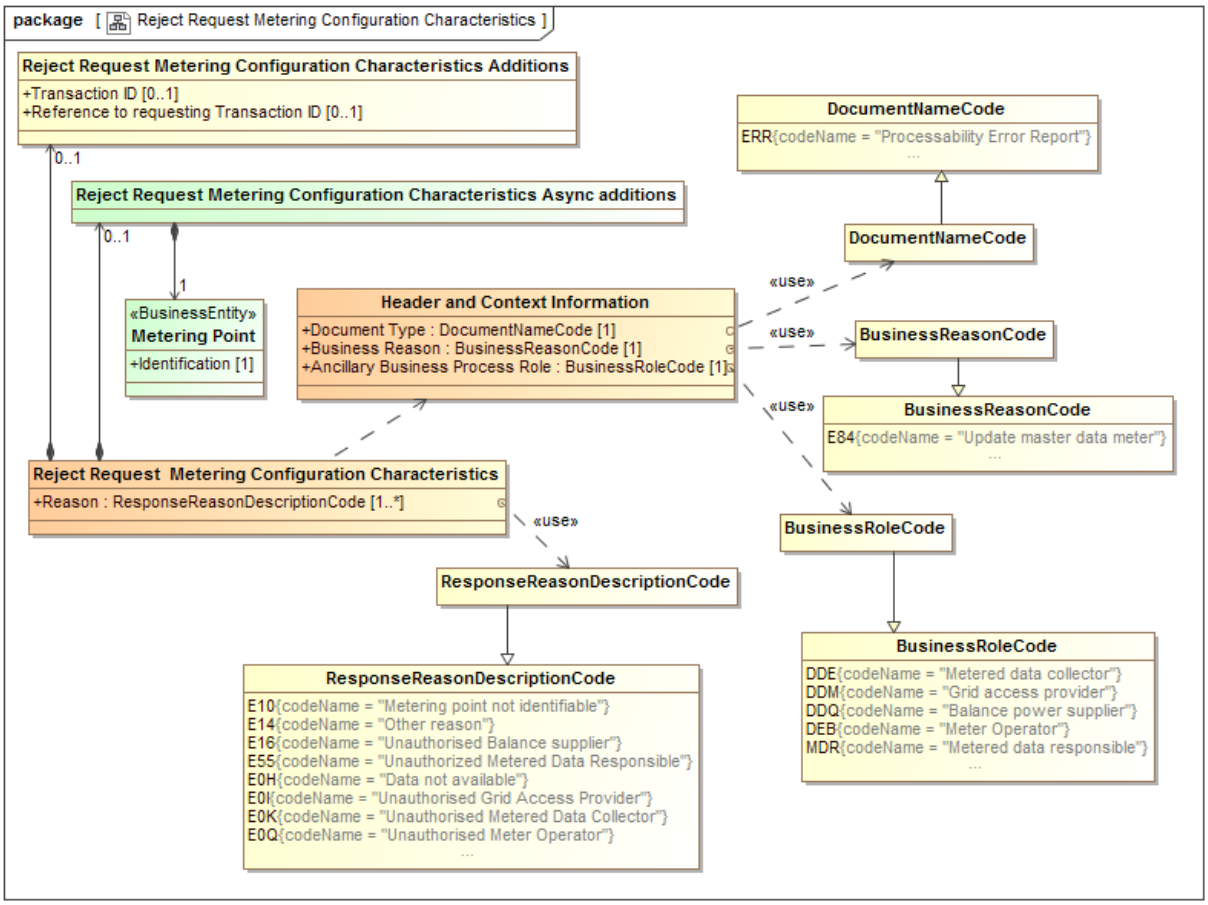

Figure 11 Reject Request metering configuration characteristics

1.5.3.1. Element definitions, Reject Request metering configuration characteristics

Class/attribute	Sector[12]	Description
«Business entity» Reject Request Metering Configuration Characteristics		The information set sent from the Meter Administrator to the requesting Initiator, i.e.: • Balance Supplier • Grid Access Provider • Grid Operator • Metered Data Aggregator • Metered Data Collector • Metered Data Responsible when rejecting a Request metering configuration characteristics.
Reason		One or more codes specifying the reason(s) for the rejection of the Request metering configuration characteristics.
Reject Request Metering configuration characteristics Additions		Additional information related to rejecting the Request metering configuration characteristics, to be agreed on a national level.
Transaction ID		The unique identification of this set of information given by the Meter Administrator.
Reference to requesting Transaction ID		The Transaction ID from the request, where this is the response for, given by the requesting Initiator.
Reject Request Metering Configuration Characteristics Async Additions		Additional information, related to the rejection of the Request metering configuration characteristics, needed when using asynchronous communication.
«Business entity» Metering Point		An entity where energy products are measured or computed.
Identification		The unique identification of the Metering Point.
Header and Context Information		The set of information specifying the information to be added to this payload “Reject Request metering configuration characteristics” in order to enable the exchange as a document.
Document Type		A code representing the document type used for the exchange of this set of information.

[12] It is assumed that Metering Points are uniquely dedicated to either electricity or to gas.

Business Reason		A code representing the business reason for the exchange of this set of information.
Ancillary Business Process Role		A code representing the market role taking part in this exchange together with the role responsible for the process/this exchange.