Business Requirements

for

Combined
grid and supply billing

C O N T E N T

A. About this document

This document is a Business Requirements Specification (BRS) for the Combined grid and supply billing process within the structuring process of the European energy market. In this BRS we use business terms for the actors, and we map them to the terms used in the Harmonised Role Model from ENTSO-E, ebIX® and EFET [1].

As a general introduction ebIX® has published a separate document "Introduction to ebIX® Business Requirements and Business Information Models" [4]. The introduction also includes the generic model elements that are not specific for a business process.

In line with UN/CEFACT Modelling Methodology version 2 (UMM-2) ebIX® defines the business requirements as the first step in modelling energy market processes. This document specifies an UMM Business Requirements View, which consist of the three sub views: Business Domain View, Business Partner View and Business Entity View.

The Business Information Model is in turn the basis for the creation of XML schema's and is the basis for the specification of web services. The Business Information Model and the syntax specific structures are specified by the "ebIX® Technical Committee" (ETC).

Since the ebIX® model is open for national customisation, some attributes are added as optional for usage for regional/national customisation. If used, these attributes must be specified nationally.

A.1. Acknowledgement

We thank Chechia (OTE), Demark (Energinet.dk) and Estonia (Elering) for sharing their experiences and knowledge and for discussing this BRS with the project members in setting up this BRS.

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/tradewelcome/un-centre-for-trade-facilitation-and-e-business-uncefact/outputs/technical-specifications/uncefact-modelling-methodology-umm.html);

[2] UML Profile for UN/CEFACT's Modelling Methodology (UMM), Foundation Module 2.0., (http://www.unece.org/tradewelcome/un-centre-for-trade-facilitation-and-e-business-uncefact/outputs/technical-specifications/uncefact-modelling-methodology-umm.html);

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

A.2.2. ebIX® Documents

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

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

[6] ebIX® code lists (www.ebix.org);

[7] ebIX® Business Requirements for measure (www.ebix.org);

[8] ebIX® Business Requirements for Alignment of Accounting Point characteristics (www.ebix.org);

[9] ebIX® Business Requirements for Alignment of metering configuration characteristics (www.ebix.org).

A.3.   Main changes since last version

Old	New	Clarification	Date
		Version 1.0	
	1.0.A	First ebIX® Forum approved version	20201030
1.0.A	1.0.B	• Harmonised the introduction with other ebIX® BRSs. • Hiding attributes from the root class in Appendix A, to make the class. • Correction of spelling and grammatical errors.	20230815
1.0.B	1.0.C	Since ebIX® is closing down from the end of 2023, the link to the ebIX® secretary has been removed.	20230815

1   Business Domain View: Combined grid and supply billing

1.1   Basic principles and definitions

The following principles have been used when drafting this Business Requirement Specification (BRS) document:

- This BRS focuses on the household Customers and small and medium sized enterprises.
- The BRS intends to cover both electricity and gas markets.
- It is assumed that the measured data for consumption and/or production used as basis for grid billing data calculations already are distributed when the grid billing data are produced and sent. The grid billing data may have a reference to these distributed measured data.
- In this document the term Charge is used as a generic term for tariffs, fees, subscriptions, taxes etc.
- The ebIX® model assumes a supplier centric market model and one of the centre pieces of a supplier centric market model is a combined grid and supply billing process, where the supplier bills the customer both for the energy supplied and the grid cost. Two distinct models can achieve a combined grid and supply billing process, i.e.:

    - A "subcontractor model" (also called wholesale model and cascading model) where the Supplier bills the Customer for the whole cost, both grid and energy cost. The grid cost is settled between the Grid Company and the Supplier, independent of the settlement with the Customer;
    - A "power of attorney model" where the Grid Company still owns the debt against the customer, even if the grid cost is billed by the supplier.

    In the rest of this document, a subcontractor model is assumed. Such a process includes extensive exchange of grid billing characteristics, both related to exchange of master data, such as fees, tariffs and subscriptions, and exchange of which fees, tariffs and subscriptions that apply to a specific Accounting Point.

- Grid billing characteristics (master data) is used in two different Business Areas, i.e.:

MGA billing characteristics	Billing characteristics for grid related charges for products and services that apply for the whole Metering Grid Area the billed Accounting Point is part of, i.e., the Grid Company's price list;
AP billing characteristics	Grid related billing characteristics with charges, specialities and exceptions that apply for this Accounting Point (AP).

- In this BRS we assume that:
    - The Area Administrator is responsible also for the MGA billing characteristics administration.
    - The Metering Point Administrator is also responsible for the administration of the Accounting Point billing characteristics.
    - An MGA is the responsibility of only one Grid Company.

- In this BRS we introduce the role Billing Calculator, responsible for determining quantities and calculating associated grid costs, both on an Accounting Point and aggregated level. This role can be performed by the Grid Company itself, a central data hub or the Energy Supplier. Based on national rules where the role is performed, some of the data exchange in this BRS may not be explicit.
- The MGA billing characteristics may be published, including its actual price, on a public web site, instead of being explicitly aligned between parties using electronic data exchange.
- Actual prices for the charges applicable at Accounting Point level are supposed to be published according to the bullet point above.
- Dispute (rectification) processes can be initiated at many levels and may be solved by resending data, such as measured data or master data, or starting a formal rectification process. The rectification process can eventually lead to resending (corrections) of grid billing data. These processes must be based on National rules.
- We expect combined billing of the Customer to be performed by the Energy supplier and not the Grid Company.
- The Validity End Date determines if a Charge is valid or not.
- The codes shown in the Business Entity View, chapter 3, are general codes used in several countries. Each country may add national extensions to these code list where applicable.

1.2 Combined grid and supply billing (Business Area)
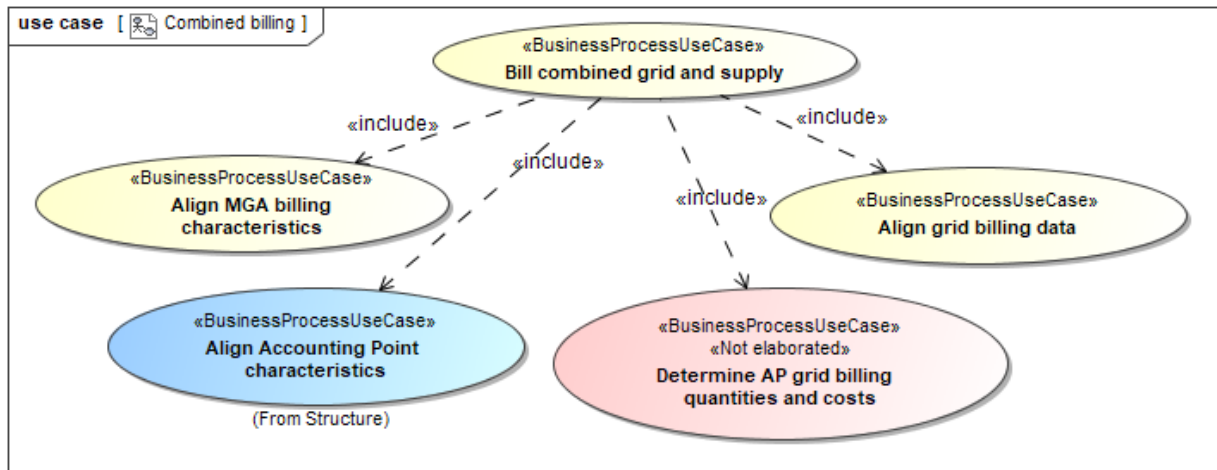
Figure 1 Business Area: Combined grid and supply billing (Business Area)

1.2.1 Description

UseCase description: Combined grid and supply billing (Business Area)	
definition	This process enables the Energy Supplier to integrate the grid costs from the Grid Company in its bill to the Customer. This includes: • Alignment of grid billing characteristics for Metering Grid Areas and individual Accounting Points; • Determination of quantities, which may include exchange of measured data for grid billing, and calculation of the costs associated with the quantities; • Alignment of the grid billing data with Energy Supplier and Grid Company.
beginsWhen	At scheduled grid billing times or triggered by incidental processes, like change of Energy Supplier or Customer move out.
preCondition	Combined billing agreements have been established between the Energy Supplier and the Grid Company.
endsWhen	When the Energy Supplier and Grid Company have received grid billing data.
postCondition	The Energy Supplier can make a combined grid and energy bill and the Grid Company knows what grid costs will be billed.
exceptions	None.
actions	Not relevant at this level.

1.2.2 Align MGA billing characteristics (Business Process UseCase)

Figure 2 Business Process UseCase: Align MGA billing characteristics

1.2.2.1 Description

UseCase description: Align MGA billing characteristics	
definition	In this process MGA billing characteristics[1] are aligned between the Grid Company, the MGA billing characteristics administration and the Energy Supplier.
beginsWhen	When there is a need for alignment of MGA billing characteristics.
preCondition	None.
endsWhen	When the Energy Supplier has received the MGA billing characteristics.
postCondition	The MGA billing characteristics are aligned between the Grid Company, the MGA billing characteristics administration and the Energy Supplier.
exceptions	None.
actions	None at this level.

---

[1] The MGA billing characteristics are the Grid Companies price list and are typically updated once or twice a year.

1.2.2.2 Update MGA billing characteristics (Business Process UseCase)
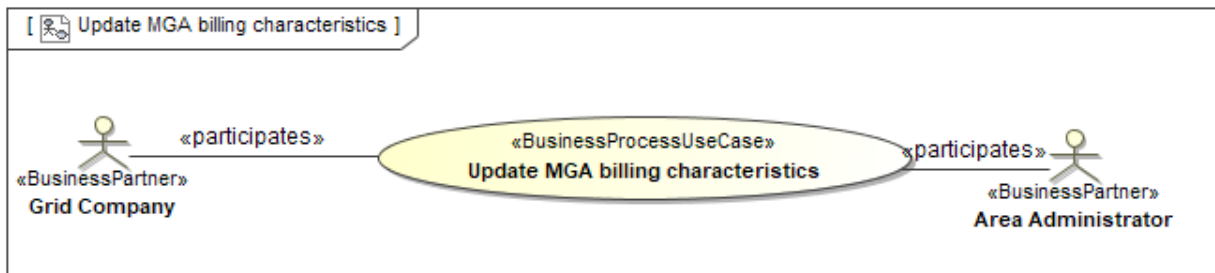
Figure 3 Business Process UseCase: Update MGA billing characteristics

1.2.2.2.1 Description

UseCase description: Update MGA billing characteristics	
definition	In this process the Grid Company updates the MGA billing characteristics at the Area administration.
beginsWhen	When there have been changes to the MGA billing characteristics.
preCondition	None.
endsWhen	When the Area Administrator has confirmed the update of the MGA billing characteristics.
postCondition	The MGA billing characteristics administration is updated.
exceptions	The request is rejected. If the TSO has charges at the DSO level, that are charged via the combined grid and supply cost to the Customer, the TSO needs to update the MGA billing characteristics at the Area administration.
actions	See 1.2.2.2.2

1.2.2.2.2 Business Process
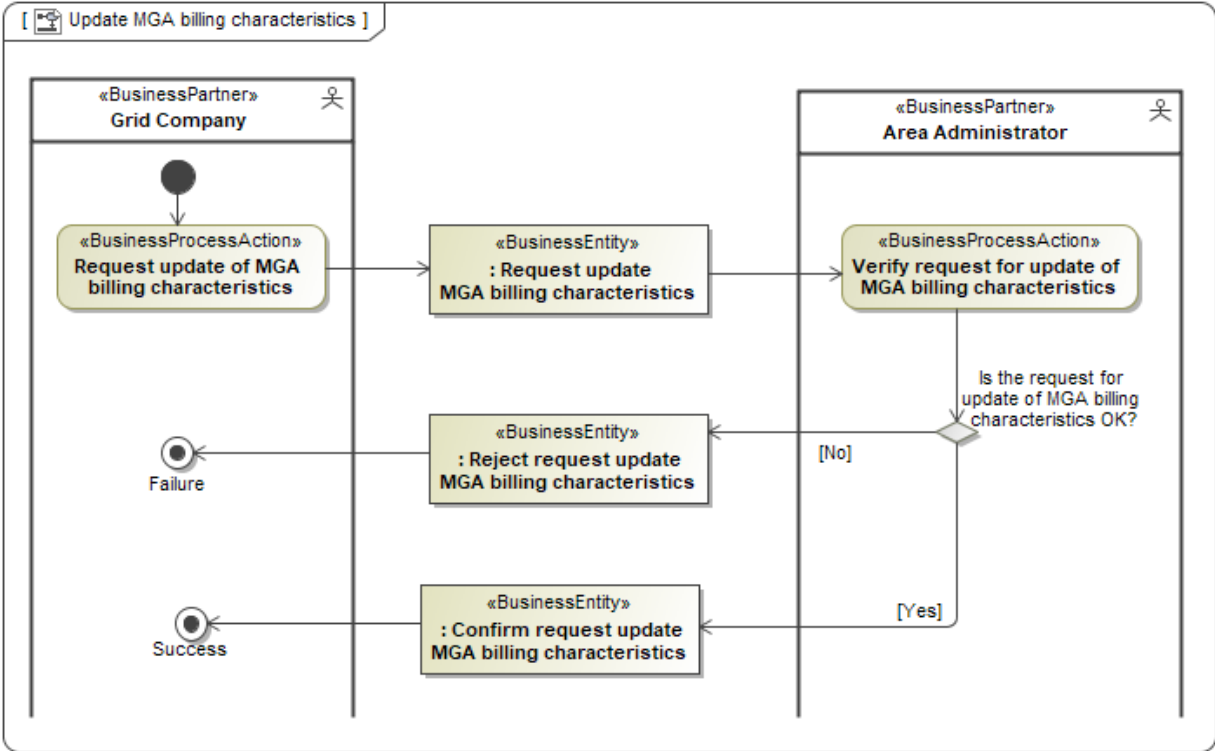
Figure 4 Business Process: Update MGA billing characteristics

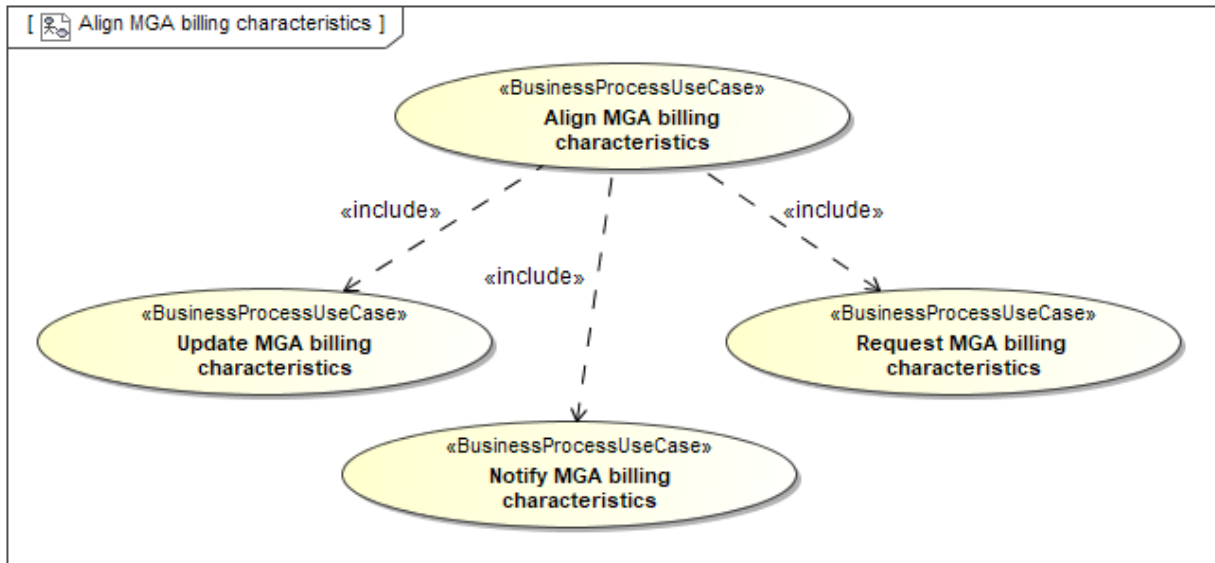### 1.2.2.3   Notify MGA billing characteristics (Business Process UseCase)
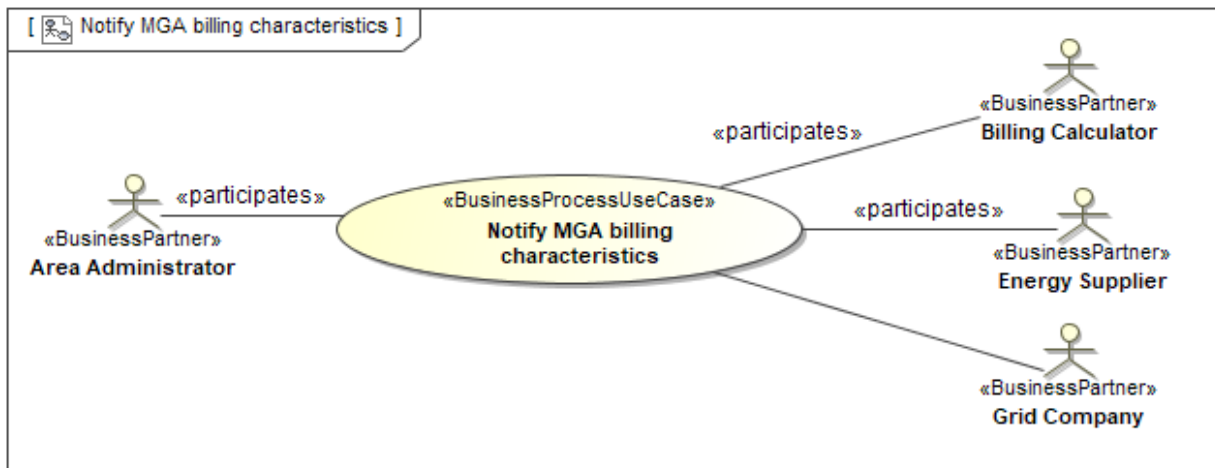
Figure 5 Business Process UseCase: Notify MGA billing characteristics

1.2.2.3.1   Description

UseCase description: Notify MGA billing characteristics	
definition	In this process the Area Administrator notifies MGA billing characteristics to the Billing Calculator, the Energy Supplier and depending on national rules to the Grid Company.
beginsWhen	When there is a scheduled time for alignment of MGA billing characteristics or there have been changes to the MGA billing characteristics.
preCondition	None.
endsWhen	When the Billing Calculator and Energy Supplier have received updated MGA billing characteristics.
postCondition	The MGA billing characteristics are aligned between the MGA billing characteristics administration and the Billing Calculator, Grid Company and Energy Supplier.
exceptions	When charges of the TSO are updated then the notification is also sent to the TSO.
actions	See 1.2.2.3.2

1.2.2.3.2   Business Process
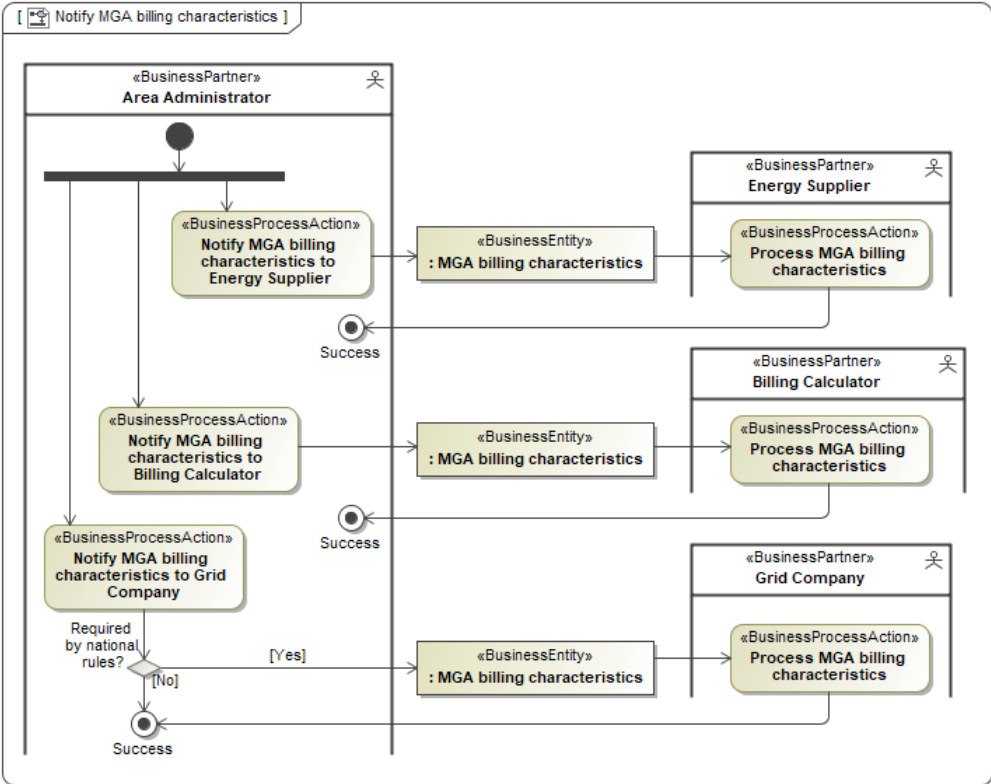
Figure 6 Business Process: Notify MGA billing characteristics

1.2.2.4 Request MGA billing characteristics (Business Process UseCase)

1.2.2.4.1 Description

UseCase description: Request MGA billing characteristics	
definition	In this process, an Initiator, i.e., an Energy Supplier or Billing Calculator, requests MGA billing characteristics from the Area Administrator.
beginsWhen	When the Initiator has a need to align its MGA billing characteristics (master data).
preCondition	The requesting Initiator is known by the Area Administrator.
endsWhen	When the Initiator has received the MGA billing characteristics from the Area Administrator.
postCondition	The Initiator has its MGA billing characteristics aligned.
exceptions	The request for MGA billing characteristics is rejected. If the TSO has charges that are charged via the combined grid billing to the Customer, both the Grid Company (DSO) and the TSO may need to request MGA billing characteristics.
actions	See 1.2.2.4.2

1.2.2.4.2   Business Process
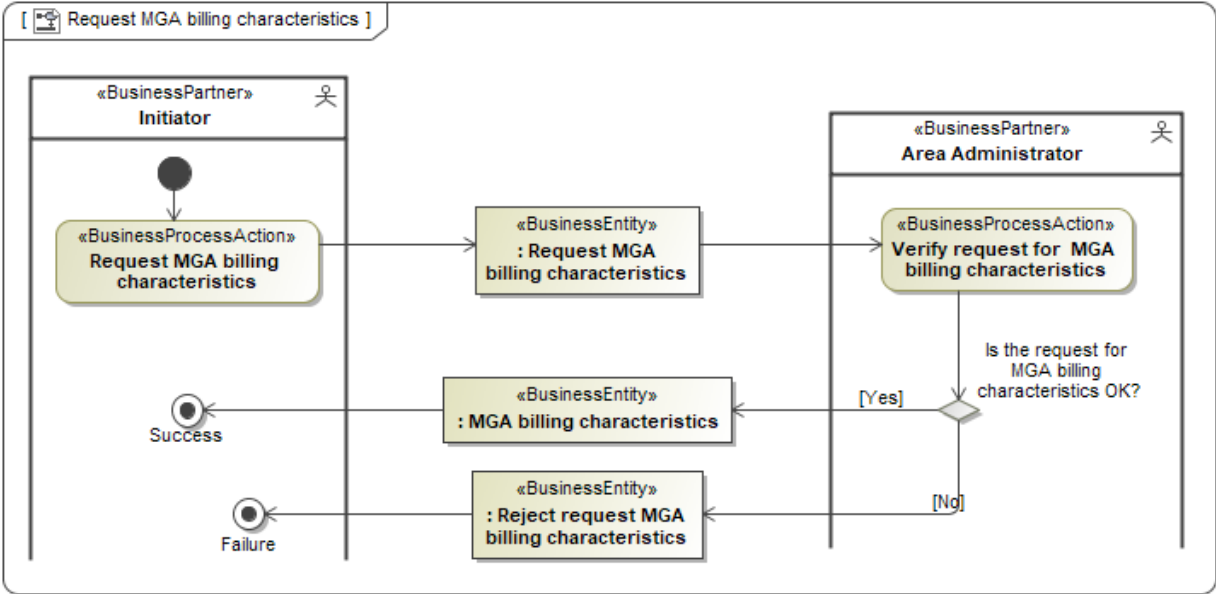
Figure 8 Business Process: Request MGA billing characteristics

1.2.3   Align Accounting Point (AP) characteristics (Business Process UseCase)

In order to align the Accounting Point billing characteristics for the grid billing process, the Accounting Point characteristics (containing the grid billing characteristics) may need to be aligned. The Process Align Accounting Point (AP) characteristics is documented in the ebIX® BRS for Alignment of Accounting Point (AP) characteristics [8].

1.2.4   Determine Accounting Point (AP) quantities and costs (Business Process UseCase)
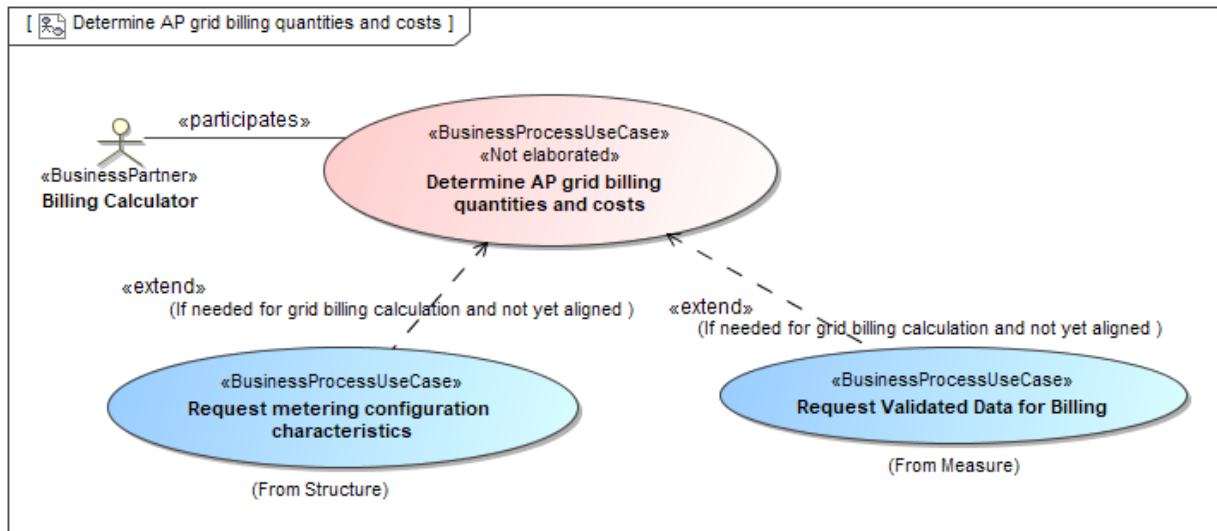
Figure 9 Business Process UseCase: Determine Accounting Point (AP) quantities and costs

1.2.4.1   Description

UseCase description: Determine Accounting Point (AP) grid billing quantities and costs	
definition	In this process, the Billing Calculator determines the quantities of services and energy volumes and calculates the associated grid costs for grid billing of the relevant period, for the Accounting Point[2].
	It is assumed that additional master data to the billing characteristics for the Accounting Point and Meter master data are needed and available for the grid billing calculation. In addition, it is assumed that measured data are available[3]. If not available, the missing information must be requested.
	Quantities for services like capacity can be calculated, estimated or assigned by regulation.

---

[2] Normally the basis for the grid costs will be sent from the Grid Company as debit billing data (setting the attribute "Debit credit type" to "Debit") with a positive amount to the Customer via the Energy Supplier. However sometimes the grid billing data can contain a negative amount meaning the customer is reimbursed. On the other hand, earlier sent grid billing data (referred in the field "Original transaction ID") can be credited to the Customer (as for instance advance bills that are settled once a year) with the same amount. The crediting (setting the attribute "Debit credit type" to "Credit") can be done on a single credit line item or for a whole set of grid billing lines (referred in the field "Original billing line number").

[3] See BRS measure for billing [7]

beginsWhen	When scheduled to do so or triggered by an event (such as after a move or change of supplier).
preCondition	The Accounting Point is set up for grid billing by the Energy Supplier. The MGA billing characteristics and AP billing characteristics are aligned.
endsWhen	When the calculations are validated.
postCondition	The grid billing quantities and costs are determined, validated and ready for submission to the Energy Supplier.
exceptions	It is possible to make corrections by setting the Boolean "Correction indicator" to "TRUE" and adding a "Reason for correction". Earlier sent grid billing data (referred in the field "Original transaction ID") can be corrected, either by: • Sending the new billing line (referring to the "Original billing line number"); • Sending a complete new set of billing lines with all corrected and uncorrected lines (referred in the field "Original billing line number"); • First sending the old set of grid billing data (referring each line to the "Original billing line number") for crediting and thereafter sending the new set of corrected values for debiting.
actions	Not applicable.

1.2.4.2   Request metering configuration characteristics

In case the metering configuration characteristics need to be aligned, the Billing Calculator must run the Request metering configuration characteristics process, documented in the ebIX® BRS for alignment of metering configuration characteristics [9].

1.2.4.3   Request Validated Measured Data for Billing Grid Cost

In case the validated measured data for billing grid cost is missing, the Billing Calculator must run the Request Validated Measured Data for Billing Grid Cost process, documented in the ebIX® BRS for Measure for billing [7].

1.2.5 Align grid billing data (Business Process UseCase)
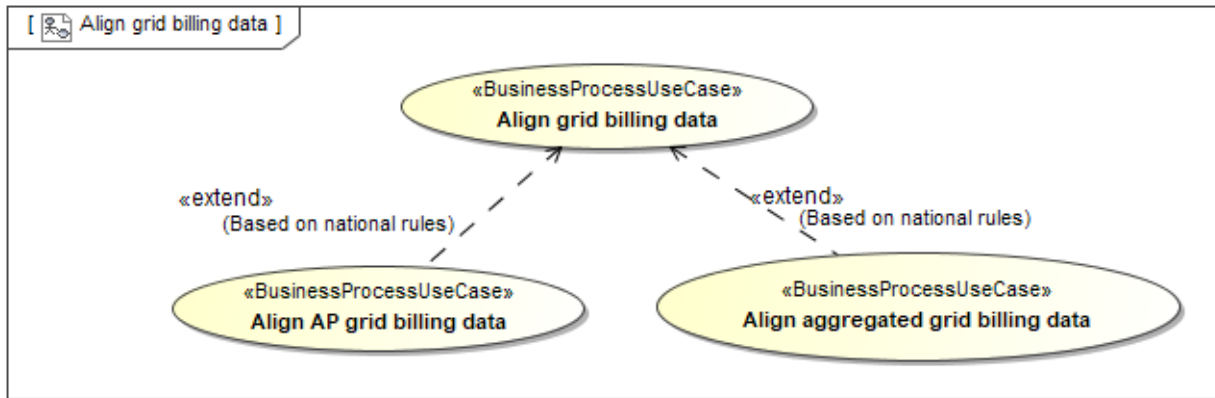
Figure 10 Business Process UseCase: Align grid billing data

1.2.5.1 Description

UseCase description: Align grid billing data	
definition	In this process, grid billing data are notified from the Billing Calculator to the Energy Supplier and the Grid Company (DSO and maybe the TSO). The grid billing data may be notified per Accounting Point or as aggregated values.
	Further, the grid billing data may be notified on a regular basis, when changes have occurred or when requested by the Energy Supplier or the Grid Company.
beginsWhen	When there is a new or updated set of grid billing data ready for distribution by the Billing Calculator or on request by the Energy Supplier or the Grid Company.
preCondition	The Energy Supplier and the Grid Company are known by the Billing Calculator.
endsWhen	When the Energy Supplier and the Grid Company have received the grid billing data.
postCondition	The Energy Supplier has the needed grid billing data and the Grid Company customer information system is aware of the grid billing data for the Energy Supplier.
exceptions	None.
actions	Not relevant at this level.

1.2.5.2 Align Accounting Point (AP) grid billing data (Business Process UseCase)
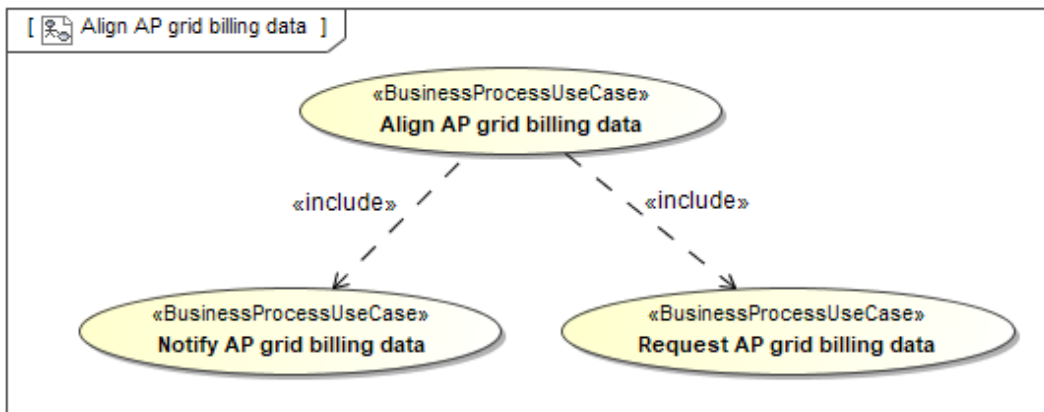
Figure 11 Business Process UseCase: Align Accounting Point grid billing data

1.2.5.2.1 Description

UseCase description: Align Accounting Point (AP) grid billing data	
definition	In this process, Accounting Point (AP) grid billing data, are notified from the Billing Calculator to the Energy Supplier and the Grid Company. The Accounting Point grid billing data is sent per Accounting Point on a regular basis and when changes have occurred. Further, the Accounting Point grid billing data may be requested from the Energy Supplier or the Grid Company.
beginsWhen	When there is a new or updated set of Accounting Point grid billing data ready for distribution by the Billing Calculator or on request by the Energy Supplier or the Grid Company.
preCondition	The Energy Supplier and the Grid Company are known by the Billing Calculator.
endsWhen	When the Energy Supplier and/or the Grid Company have (/has) received the Accounting Point grid billing data.
postCondition	The Energy Supplier has the needed information to invoice the Customer for the grid cost and/or the Grid Company knows what will be billed by the Energy Supplier.
exceptions	None.
actions	Not relevant at this level.

1.2.5.2.2 Notify Accounting Point (AP) grid billing data (Business Process UseCase)

1.2.5.2.2.1 Description

UseCase description: Notify Accounting Point (AP) grid billing data	
definition	In this process, the Billing Calculator sends the grid billing data for grid costs, for the relevant period, for the Accounting Point, to the Energy Supplier and the Grid Company[4].
beginsWhen	When the grid billing calculations are ready for submission.
preCondition	The grid billing calculations are validated, for the relevant period, for the Accounting Point.
endsWhen	When the Energy Supplier and Grid Company have received the grid billing data for grid costs, for the relevant period, for the Accounting Point.
postCondition	The Energy Supplier can do the combined billing for grid and energy costs, for the relevant period, for the Accounting Point. The Grid Company can make an invoice to the Energy Supplier for its grid cost.
exceptions	None.
actions	See 1.2.5.2.2.2

---

[4] The notification to the Grid Company will be an internal process if the Grid Company also is the Billing Calculator.

1.2.5.2.2.2 Business Process
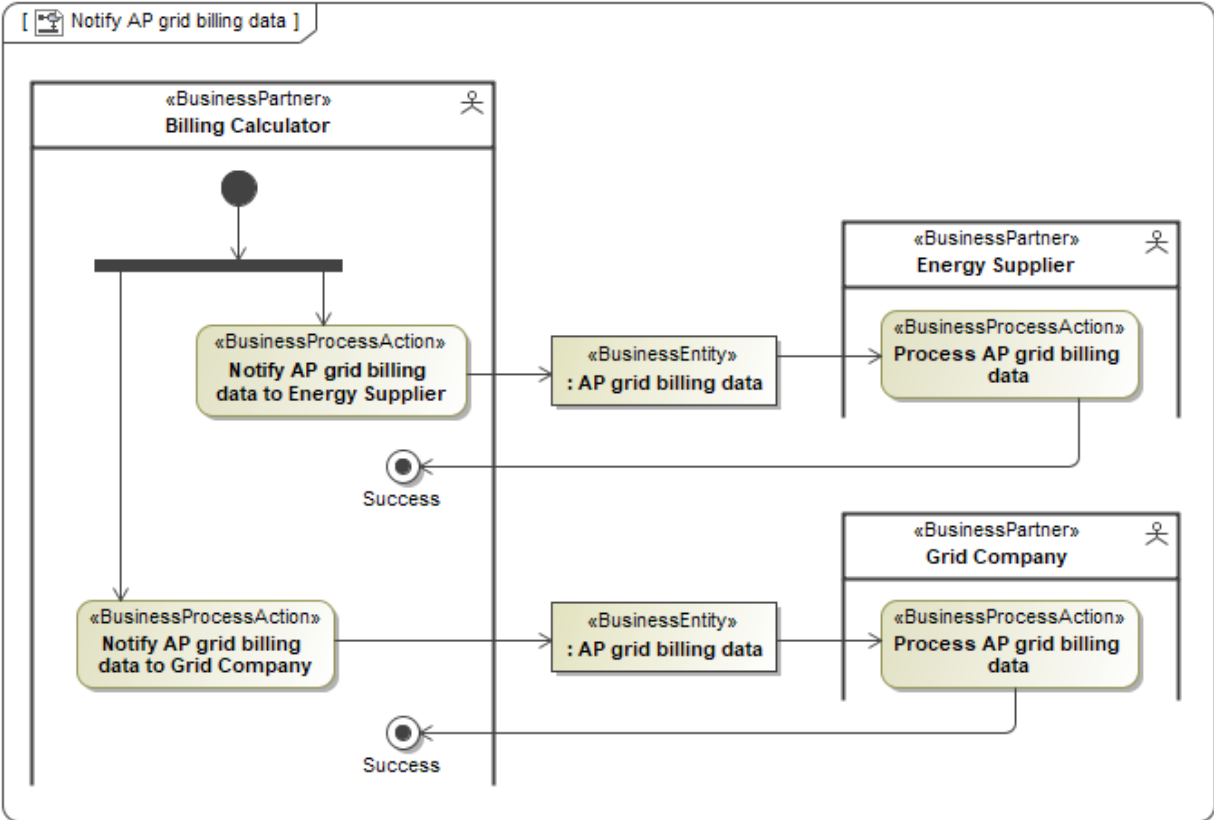
Figure 13 Business Process: Notify Accounting Point (AP) grid billing data from Billing Calculator

1.2.5.2.3 Request Accounting Point (AP) grid billing data (Business Process UseCase)
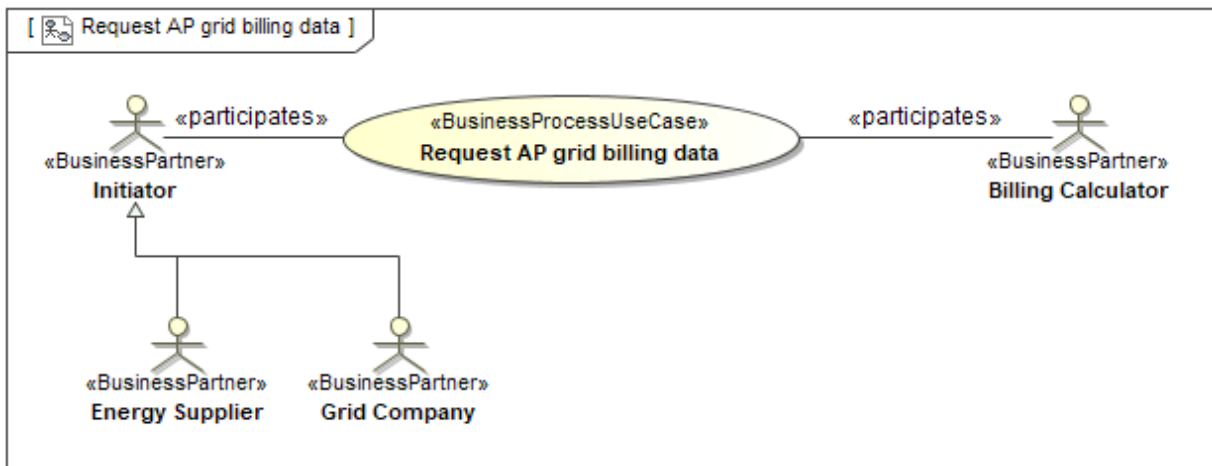
Figure 14 Business Process UseCase: Request Accounting Point grid billing data

1.2.5.2.3.1 Description

UseCase description: Request Accounting Point grid billing data	
definition	In this process, an Initiator, i.e., an Energy Supplier or Grid Company, requests Accounting Point grid billing data for a specific period from the Billing Calculator.
beginsWhen	When the Initiator has a need to align its Accounting Point grid billing data.
preCondition	The requesting Initiator is known by the Billing Calculator and is linked to the Accounting Point at the time the request is valid for.
endsWhen	When the Initiator has received the Accounting Point grid billing data from the Billing Calculator.
postCondition	The Initiator has its Accounting Point grid billing data aligned.
exceptions	The request for Accounting Point grid billing data is rejected.
actions	See 1.2.5.2.3.2

1.2.5.2.3.2 Business Process
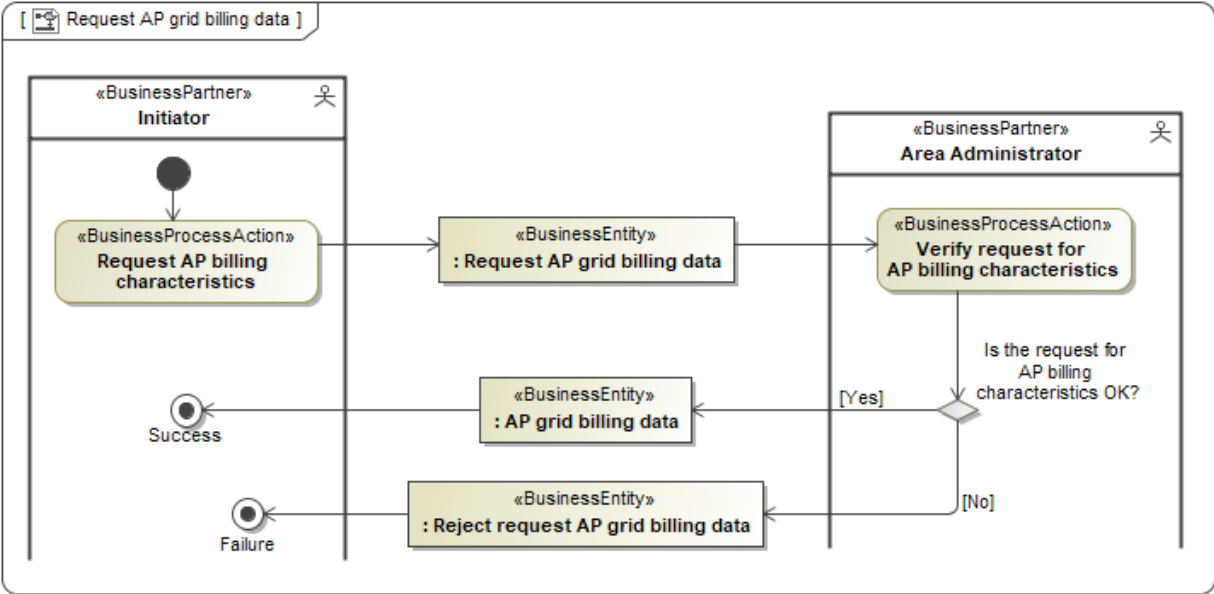
Figure 15 Business Process: Request Accounting Point grid billing data

1.2.5.3   Align aggregated grid billing data (Business Process UseCase)
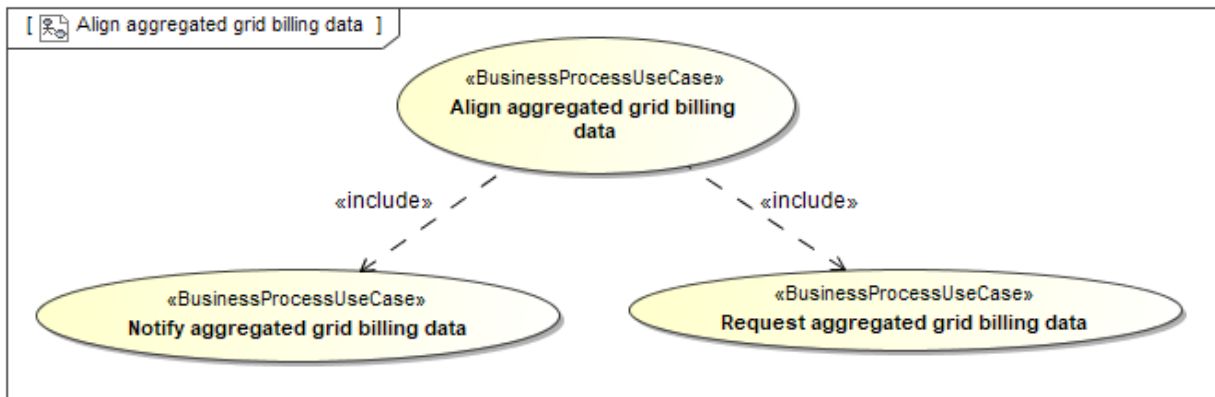
Figure 16 Business Process UseCase: Align aggregated grid billing data

1.2.5.3.1   Description

UseCase description: Align aggregated grid billing data	
definition	In this process, aggregated grid billing data, are notified from the Billing Calculator to the Energy Supplier and the Grid Company (DSO and maybe TSO). The aggregated grid billing data are aggregated based on nationally defined aggregation criteria, such as aggregation by Balance Responsible Party, Energy Supplier, Product, Settlement method and/or Type of Metering Point (production, consumption or combined). Further, the aggregated grid billing data may be requested from the Energy Supplier or the Grid Company.
beginsWhen	When there is a new or updated set of aggregated grid billing data ready for distribution by the Billing Calculator or on request by the Energy Supplier or the Grid Company.
preCondition	The Energy Supplier and the Grid Company are known by the Billing Calculator.
endsWhen	When the Energy Supplier and/or the Grid Company has received the aggregated grid billing data.
postCondition	The Grid Company has the needed information to invoice the Energy Supplier for the grid costs and the Energy Supplier can verify the content of the invoice.
exceptions	None.
actions	None at this level.

1.2.5.3.2   Business Domain View: Notify aggregated grid billing data (Business Process UseCase)
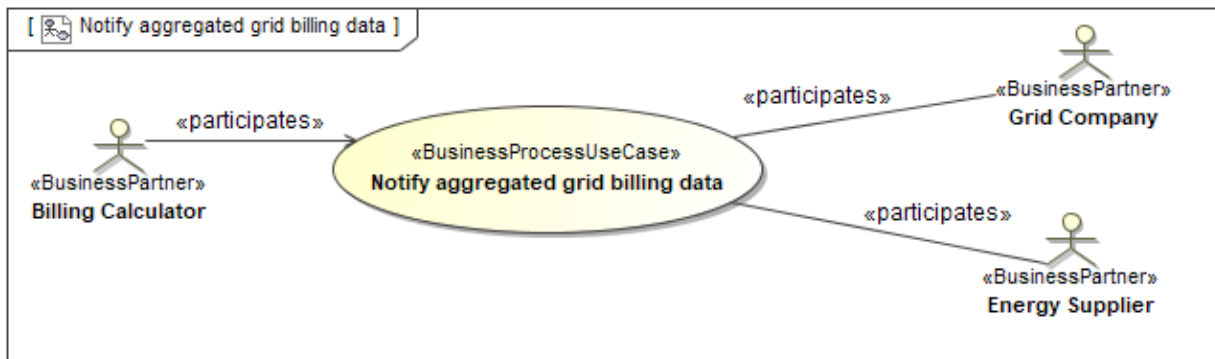
Figure 17 Business Process UseCase: Notify aggregated grid billing data

1.2.5.3.2.1 Description

UseCase description: Notify aggregated grid billing data	
definition	In this process the Billing Calculator notifies the Energy Supplier and the Grid Company (DSO and maybe the TSO) about new or updated aggregated grid billing data.
beginsWhen	When there is a new or updated set of aggregated grid billing data ready for distribution by the Billing Calculator to the Energy Supplier and the Grid Company.
preCondition	The Energy Supplier and the Grid Company are known by the Billing Calculator.
endsWhen	When the Energy Supplier and/or the Grid Company has received the aggregated grid billing data.
postCondition	The Grid Company has the needed information to invoice the Energy Supplier for the grid cost and the Energy Supplier can check what grid costs will be invoiced by the Grid Company.
exceptions	None.
actions	See 1.2.5.3.2.2

1.2.5.3.2.2 Business Process
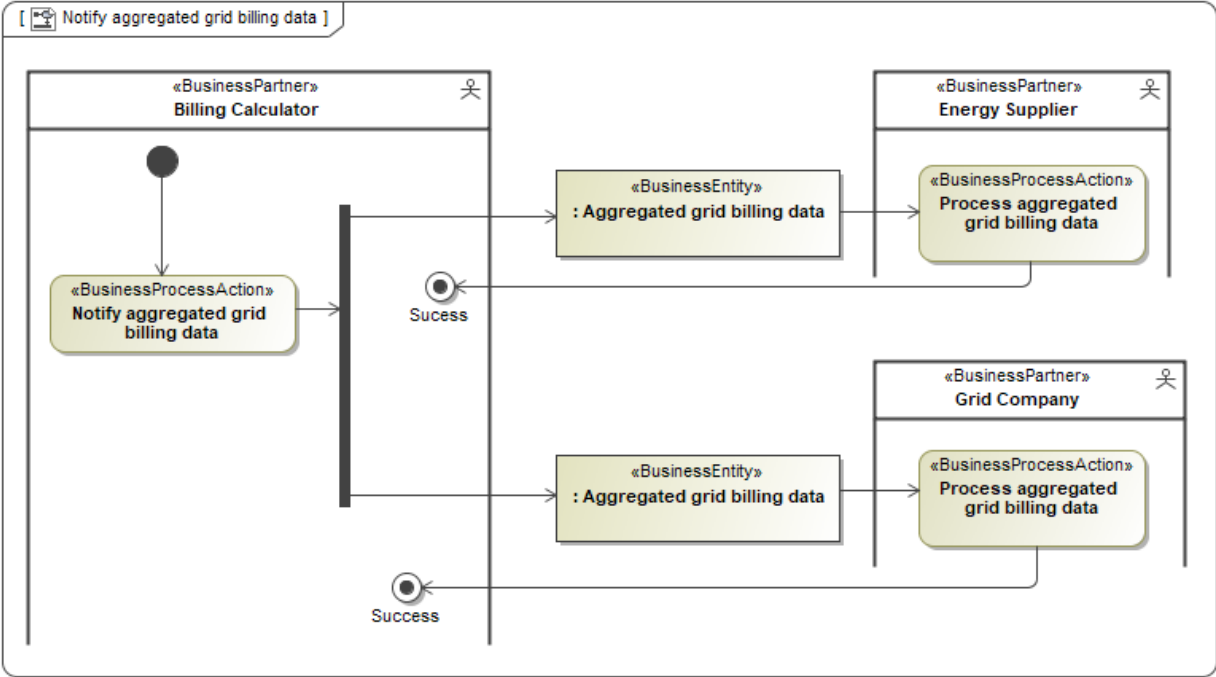
Figure 18 Business Process: Notify aggregated grid billing data

1.2.5.3.3   Request aggregated billing data (Business Process UseCase)
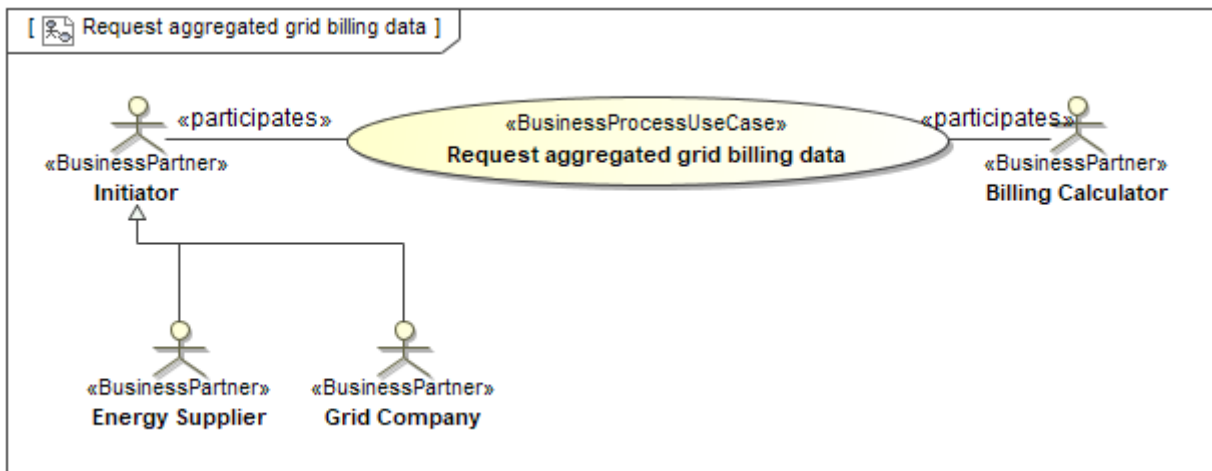
Figure 19 Business Process UseCase: Request aggregated billing data

1.2.5.3.3.1 Description

UseCase description: Request aggregated billing data	
definition	In this process, an Initiator, i.e., an Energy Supplier or Grid Company, requests aggregated grid billing data for a specified period from the Billing Calculator.
beginsWhen	When the Initiator has a need to align its aggregated grid billing data.
preCondition	The requesting Initiator is known by the Billing Calculator.
endsWhen	When the Initiator has received the aggregated grid billing data from the Billing Calculator.
postCondition	The Initiator has its aggregated grid billing data aligned.
exceptions	The request for aggregated grid billing data is rejected.
actions	See 1.2.5.3.3.2

1.2.5.3.3.2 Business Process
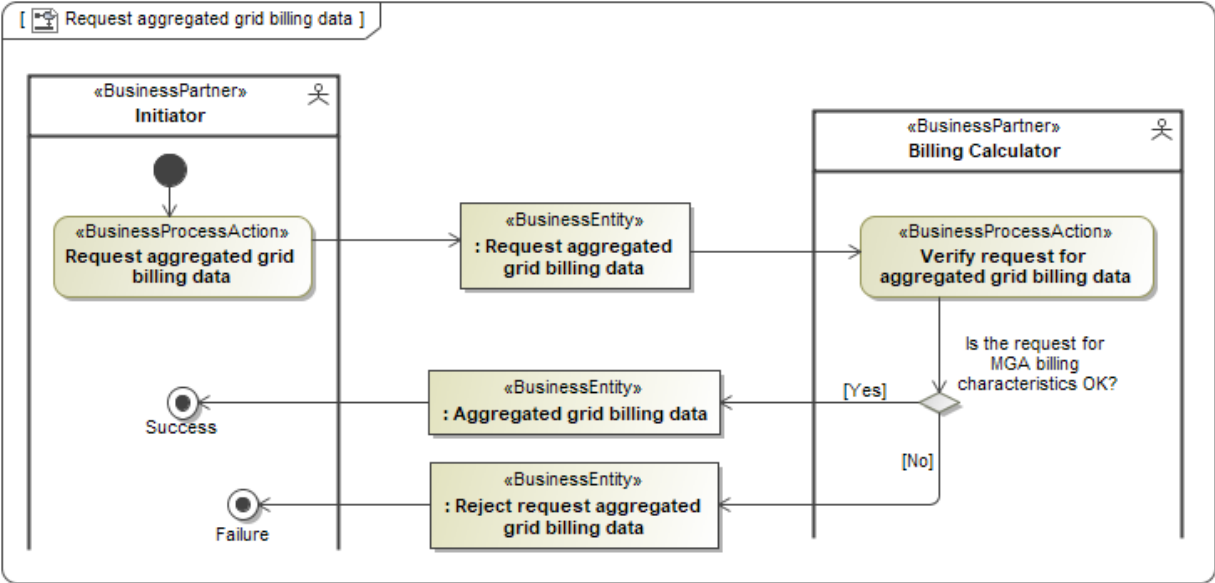
Figure 20 Business Process: Request aggregated grid billing data

2 Business Partner View

2.1 Business Partners for combined grid and supply billing

package Combined grid and supply billing [Business partner Combined grid and supply billing]

«BusinessPartner»
Area Administrator

A party responsible for registering the characteristics of an Area.

«BusinessPartner»
Billing Calculator

A party calculating and determining grid billing volumes and costs, both on an Accounting Point and aggregated level.

«BusinessPartner»
Energy Supplier «mapsTo» «Harmonised Role»
Energy Supplier

An Energy Supplier supplies electricity to or takes electricity from a Party Connected to the Grid at an Accounting Point.

Additional information:
An Accounting Point can only have one Energy Supplier. When additional suppliers are needed, the Energy Supplier delivers/takes the difference between established (e.g. measured or calculated) production/consumption and the (accumulated) contracts with other suppliers.

«BusinessPartner»
Grid Company «mapsTo» «Harmonised Role»
Grid Access Provider

A party responsible for providing access to the grid through an Accounting Point for energy consumption or production by the Party Connected to the Grid. The Grid Access Provider is also responsible for creating and terminating Accounting Points.

«BusinessPartner»
Initiator

A party that is allowed to initiate the request for MGA billing master data.

Figure 21 Business Partners related to combined grid and supply billing

3 Business Entity View

3.1 Short introduction

A general introduction to the Business Entity View can be found in the Introduction to ebIX® Business Requirements and Business Information Models ([www.ebix.org)](www.ebix.org), [4].

3.2   Request update MGA billing characteristics (Class Diagram)

Figure 22 Class diagram: Request update MGA billing characteristics

3.2.1   Element definitions: Request update MGA billing characteristics

Class/attribute	Sector[5]	Description
«Business entity» Request update MGA billing characteristics		The information set sent from the Grid Company to the Area Administrator when requesting update of MGA billing characteristics.
Grid Company ID		The unique identification of the Grid Company, responsible for this MGA.
MGA ID		The unique ID of the Metering Grid Area the update of MGA billing characteristics is requested for.
MGA name		The name of this MGA in free text.
Charge group		A Charge group is a set (one or more) of Charges used for Accounting Points with common characteristics, such as households.
Charge group ID		The unique identification of this Charge group.
Charge		A charge is a fixed price or percentage that is charged for a defined unit of a particular product or service, fee, subscription or similar, e.g., the price for one kWh of active electricity.
Charge ID		The unique identification of the charge.
Charge name		The name of this charge.
Charge description		A textual description of this charge.
Charge type		The indication of type of charge, such as fee, tariff, or subscription.
Charge owner ID		The unique identification of the originator of the charge.
Charge algorithm		A textual description of the algorithm used for calculating the amount for this charge.
Meter Time Frame		A code specifying the tariff time frame for this charge, if applicable.
VAT obliged		Indicator (Boolean) indicating if this charge is VAT obliged or not.
VAT level		The level for VAT percentage for this charge.
Start date		The date when this charge becomes or became valid.
End date		The date from when this charge no longer is valid.
Percentage details		The percentage details of this charge for this Metering Grid Area for this validity period.
Charge percentage		The percentage used to calculate the cost for the charge.
Percentage basis		A textual description of the basis this percentage applies for.

---

[5] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Price detail		The price details of this charge for this Grid Company and/or Metering Grid Area for this validity period.
Price measure unit		The unit of measure used for the price of this charge.
Price Period		The period of time covering the Price observations based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Resolution		The resolution for the observation within the relevant period based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Price currency		The currency the price is expressed in.
Price observation		The price for the observation in question.
Position		The position of this Price observation within the relevant period.
Price		The price for one unit of this charge.
Request update MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Request update MGA billing characteristics Async additions		Information related to this business document, needed when using an asynchronous communication.

3.3   Confirm request update MGA billing characteristics (Class Diagram)

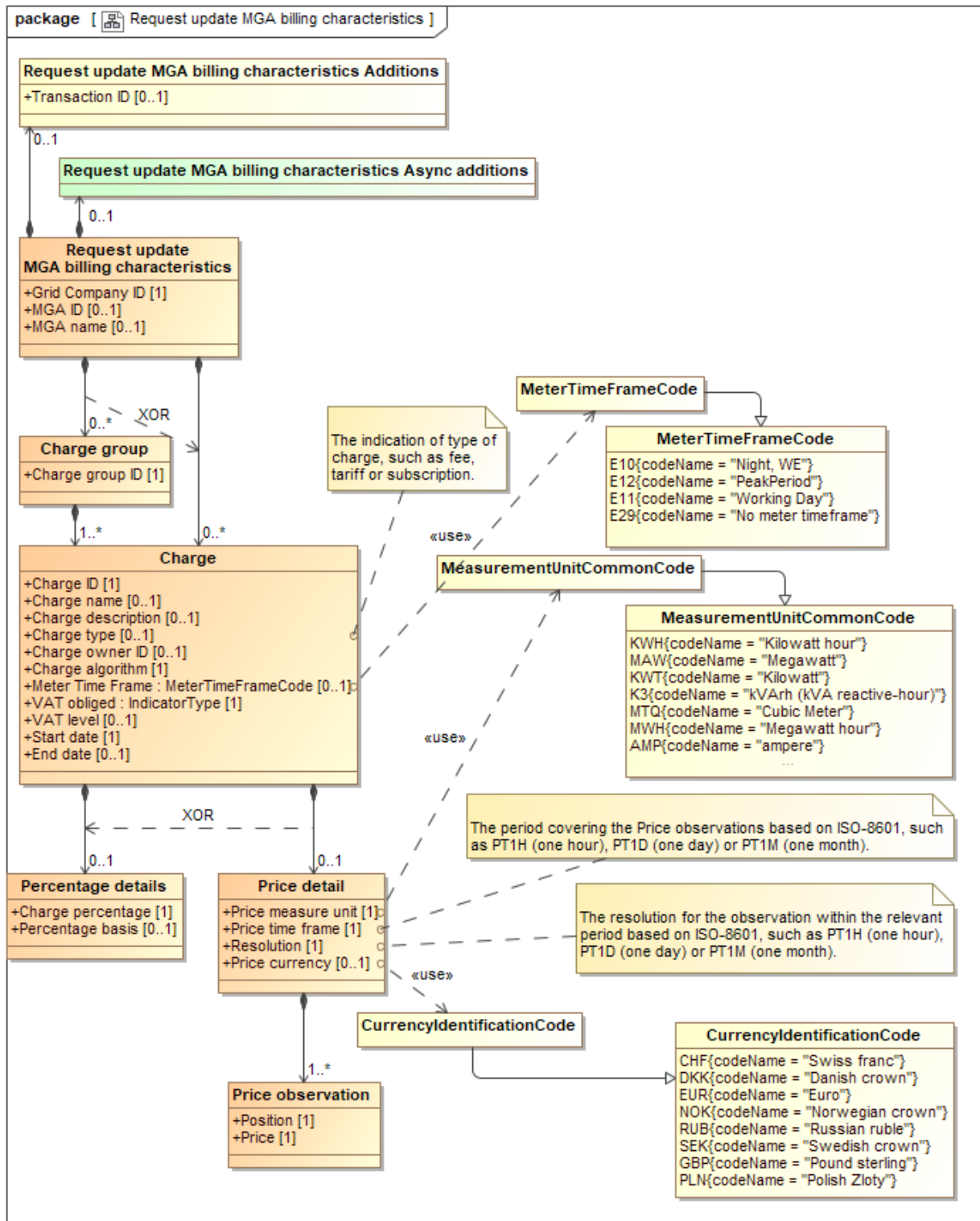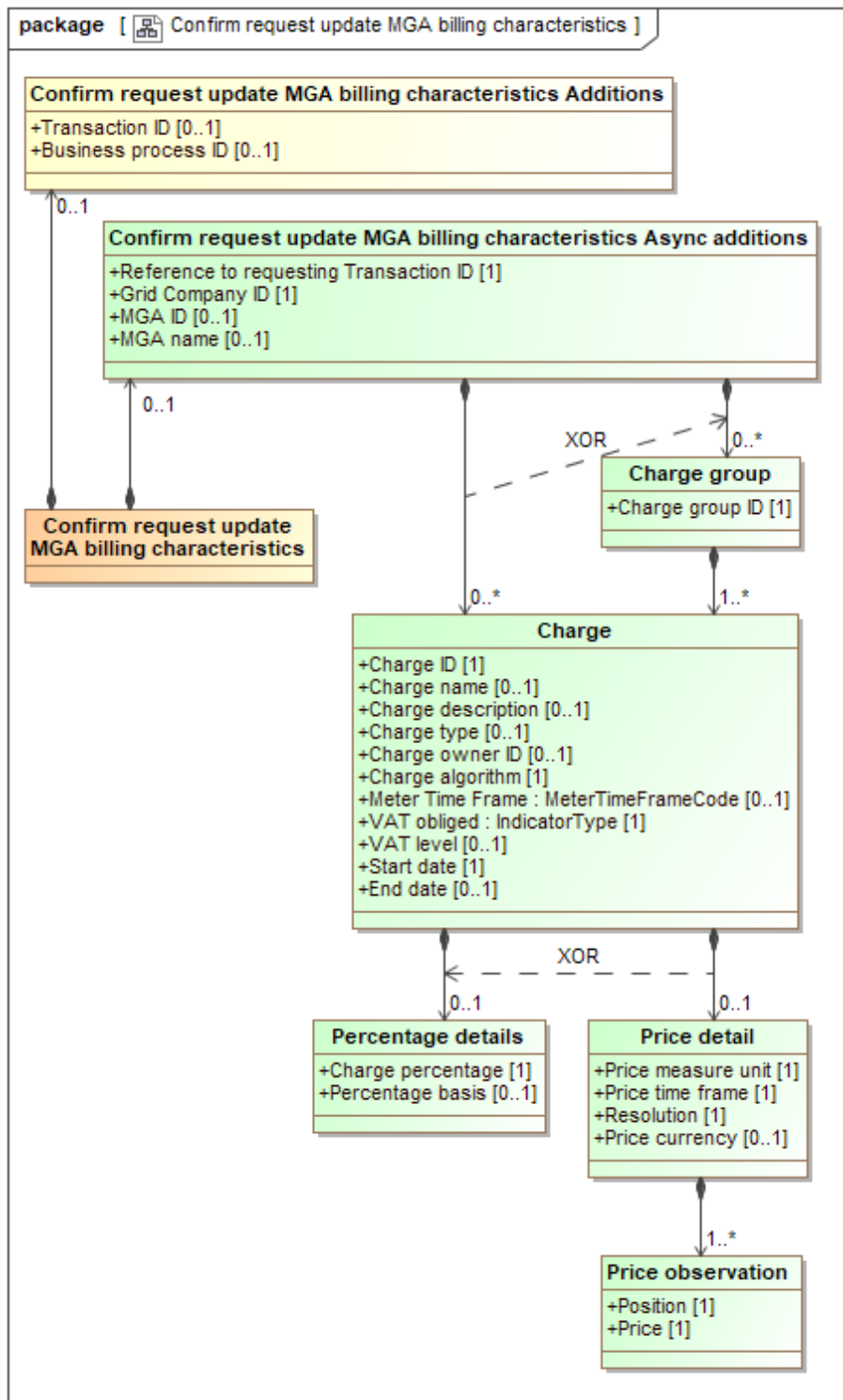**Figure 23 Class diagram:** Confirm request update MGA billing characteristics[6]

3.3.1   Element definitions: Confirm request update MGA billing characteristics

Class/attribute	Sector[7]	Description
«Business entity» Confirm request update MGA billing characteristics		The information set sent from the Area Administrator to the Grid Company when confirming a request for update of MGA billing characteristics.
Confirm request MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Business process ID		The unique identification of the instance of the process that this transaction is a part of.
Confirm request MGA billing characteristics Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request.
Grid Company ID		The unique identification of the Grid Company.
MGA ID		The unique ID of this Metering Grid Area. *Note:* The document may cover all MGAs of a Grid Company. In this case, the MGA ID must be skipped.
MGA name		The name of this MGA in free text.
Charge group		A Charge group is a set (one or more) of Charges used for Accounting Points with common characteristics, such as households.
Charge group ID		The unique identification of this Charge group.
Charge		A charge is a fixed price or percentage that is charged for a defined unit of a particular product or service, fee, subscription or similar, e.g., the price for one kWh of active electricity.
Charge ID		The unique identification of the charge.
Charge name		The name of this charge.
Charge description		A textual description of this charge.
Charge type		The indication of type of charge, such as fee, tariff, or subscription.
Charge owner ID		The unique identification of the originator of the charge.

---

[6]   The attributes and attribute values in the confirmation shall be the same as in the corresponding request, therefore we allow us to only show the updated classes and attributes, hence skipping the coded values in the class diagram above.

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

Charge algorithm		A textual description of the algorithm used for calculating the amount for this charge.
Meter Time Frame		A code specifying the tariff time frame for this charge, if applicable.
VAT obliged		Indicator (Boolean) indicating if this charge is VAT obliged or not.
VAT level		The level for VAT percentage for this charge.
Start date		The confirmed date when this charge becomes or became valid.
End date		The confirmed date from when this charge no longer is valid.
Percentage details		The percentage details of this charge for this Metering Grid Area for this validity period.
Charge percentage		The percentage used to calculate the cost for the charge.
Percentage basis		A textual description of the basis this percentage applies for.
Price detail		The price details of this charge for this Grid Company and/or Metering Grid Area for this validity period.
Price measure unit		The unit of measure used for the price of this charge.
Price time frame		The period of time covering the Price observations based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Resolution		The resolution for the observation within the relevant period based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Price currency		The currency the price is expressed in.
Price observation		The price for the observation in question.
Position		The position of this Price observation within the relevant period.
Price		The price for one unit of this charge.

3.4 Reject request update MGA billing characteristics (Class Diagram)

package [⬢ Reject request update MGA billing characteristics]

Reject request update MGA billing characteristics Additions

+Transaction ID [0..1]

0..1

Reject request update MGA billing characteristics Async additions

+Reference to requesting Transaction ID [1]
+Grid Company ID [1]
+MGA ID [0..1]
+MGA name [0..1]

0..1

Reject request update MGA billing characteristics

1..*

Rejection

+Reason : ResponseReasonDescriptionCode [1]
+Charge ID [0..1]

«use»

ResponseReasonDescriptionCode

ResponseReasonDescriptionCode

E14{codeName = "Other reason"}
E15{codeName = "No corrections"}
E49{codeName = "Metering grid area not identifiable"}
E50{codeName = "Invalid period"}
E86{codeName = "Incorrect value"}
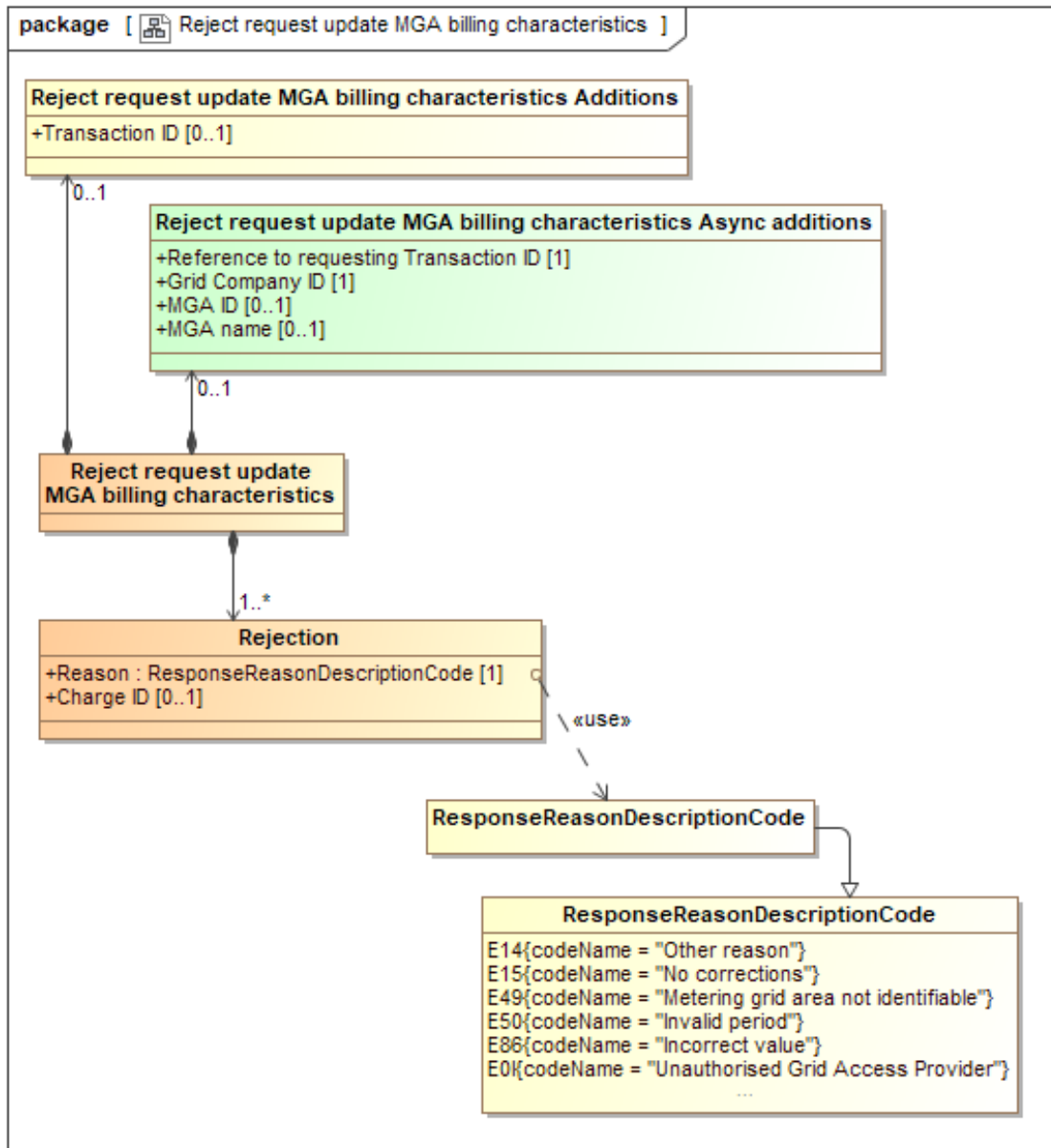E0I{codeName = "Unauthorised Grid Access Provider"}
...

Figure 24 Class diagram: Reject request update MGA billing characteristics

3.4.1   Element definitions: Reject request update MGA billing characteristics

Class/attribute	Sector[8]	Description
«Business entity» Reject request update MGA billing characteristics		The information set sent from the Area Administrator to the Grid Company when rejecting update of MGA billing characteristics.
Rejection		The reason for rejecting this request and optionally the identification of the rejected item.
Reason		A code specifying (one of) the reason(s) for the rejection of the request for update MGA billing characteristics.
Charge ID		The unique identification of the Charge that was requested to update.
Reject request MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Reject request MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Reject request MGA billing characteristics Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request that is rejected.
Grid Company ID		The unique identification of the Grid Company sent in the request for update MGA characteristics
MGA ID		The unique ID of the Metering Grid Area the requested update of MGA billing characteristics is rejected for.
MGA name		The name of the MGA in free text.

---

[8] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

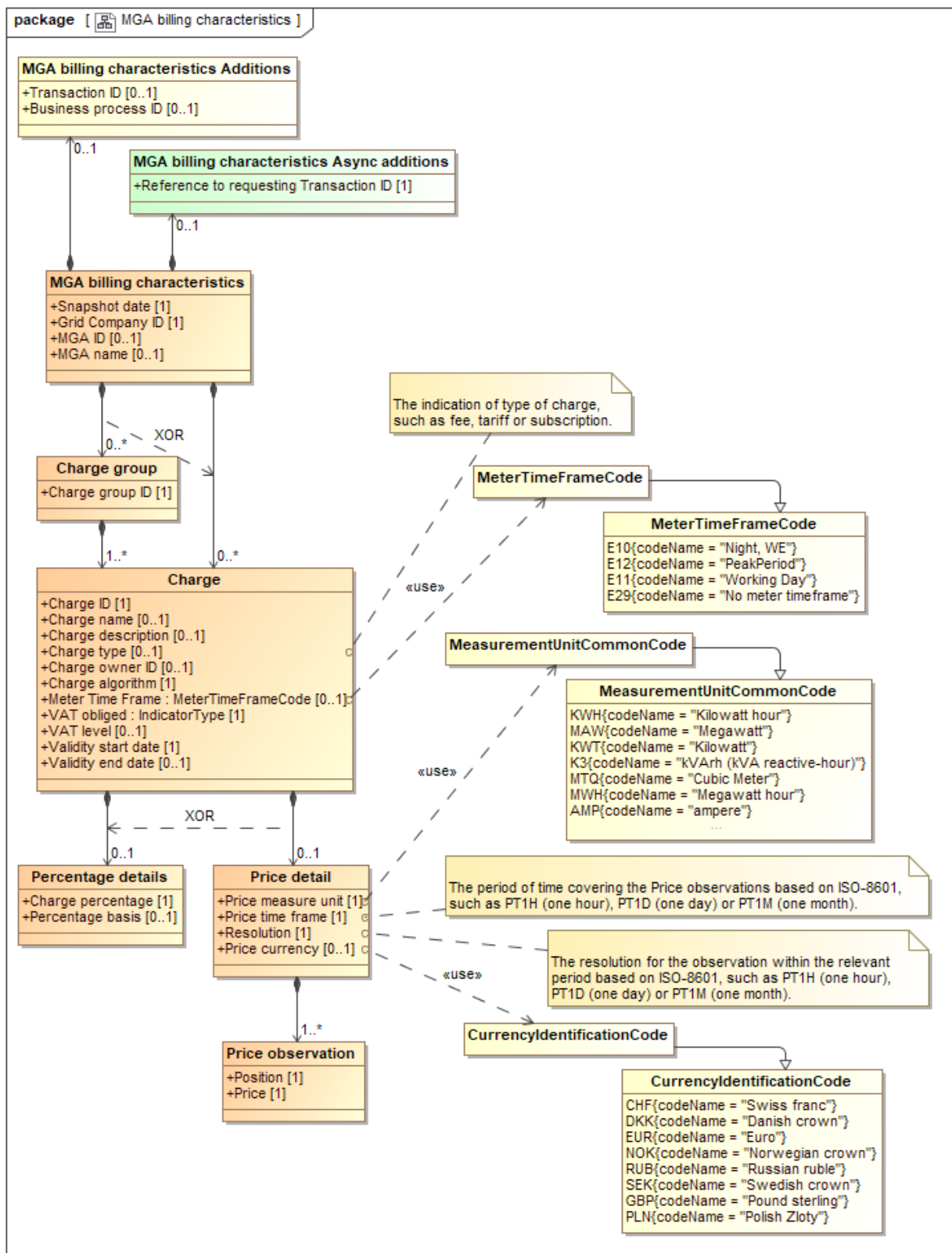## 3.5 MGA billing characteristics (Class Diagram)

Figure 25 Class diagram: MGA billing characteristics

3.5.1 Element definitions: MGA billing characteristics

Class/attribute	Sector[9]	Description
«Business entity» MGA billing characteristics		The information set sent from an Area Administrator to an Energy Supplier and/or a Billing Calculator when notifying MGA billing characteristics or responding to a request for MGA billing characteristics or when notifying MGA billing characteristics.
Snapshot date		The date or date/time when this set of information was derived from the database.
Grid Company ID		The unique identification of the Grid Company responsible for this MGA.
MGA ID		The unique ID of the Metering Grid Area the MGA billing characteristics belong to.
MGA name		The name of the MGA in free text.
Charge group		A Charge group is a set (one or more) of Charges used for Accounting Points with common characteristics, such as households.
Charge group ID		The unique identification of this Charge group.
Charge		The charge identifies the characteristics of a tariff, fee, tax, subscription or similar, charged for one unit of a product or service, e.g., the price for one kWh of active electricity.
Charge ID		The unique identification of the charge.
Charge name		The name of this charge.
Charge description		A textual description of this charge.
Charge type		The indication of type of charge, such as fee, tariff, or subscription.
Charge owner ID		The unique identification of the originator of the charge.
Charge algorithm		A textual description of the algorithm used for calculating the amount for this charge.
Meter Time Frame		A code specifying the tariff time frame for this charge, if applicable.
VAT obliged		Indicator (Boolean) indicating if this charge is VAT obliged or not.
VAT level		The level for VAT percentage for this charge.
Validity start date		The date when this charge value-set becomes or became valid.
Validity end date		The date from when this charge value-set no longer is valid.

---

[9] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Percentage details		The percentage details of this charge for this Metering Grid Area for this validity period.
Charge percentage		The percentage used to calculate the cost for the charge.
Percentage basis		A textual description of the basis this percentage applies for.
Price detail		The price details of this charge for this Grid Company and/or Metering Grid Area for this validity period.
Price measure unit		The unit of measure used for the price of this charge.
Price time frame		The period of time covering the Price observations based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Resolution		The resolution for the observation within the relevant period based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Price currency		The currency the price is expressed in.
Price observation		The price for the observation in question.
Position		The position of this Price observation within the relevant period.
Price		The price for one unit of this charge.
MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Business process ID		The unique identification of the instance of the process that this transaction is a part of.
MGA billing characteristics Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request.

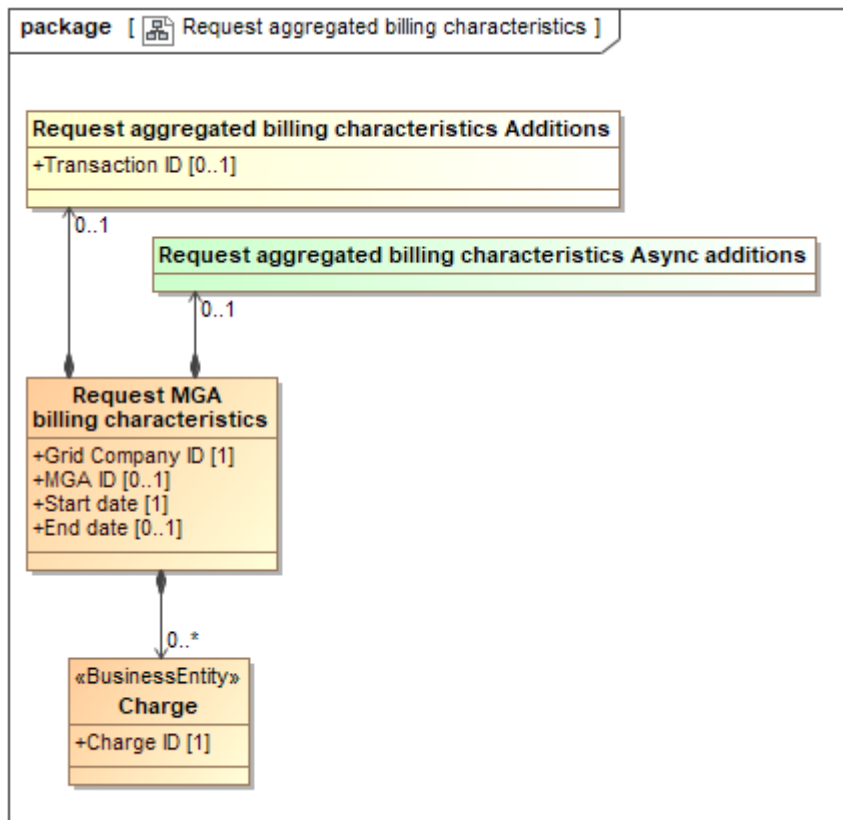## 3.6 Request MGA billing characteristics (Class Diagram)

Figure 26 Class diagram: Request MGA billing characteristics

3.6.1 Element definitions: Request MGA billing characteristics

Class/attribute	Sector [10]	Description
«Business entity» Request MGA billing characteristics		The information set sent from an Initiator (Energy Supplier or Billing Calculator) to the Area Administrator when requesting MGA billing characteristics.
MGA ID		The unique ID of the Metering Grid Area, the MGA billing characteristics is requested for.
Grid Company ID		The unique identification of the Grid Company MGA billing characteristics is requested for.
Start date		The date from when the requested MGA billing characteristics should be valid.
End date		The end date of the interval for requested valid MGA billing characteristics.

[10] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Charge		A charge is a fixed price or percentage that is charged for a defined unit of a particular product or service, fee, subscription or similar, e.g., the price for one kWh of active electricity.
Charge ID		The unique identification of this Charge.
Request MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Request MGA billing characteristics Async additions		Information related to this business document, needed when using an asynchronous communication.

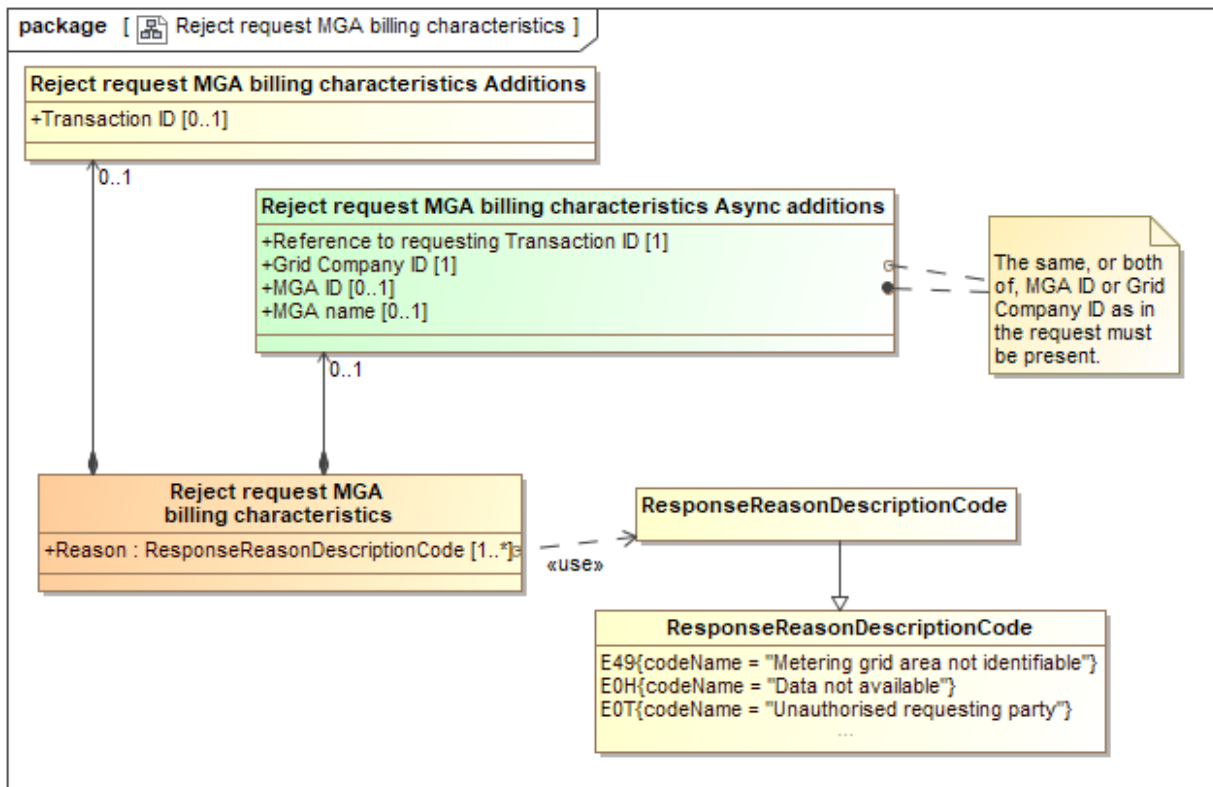### 3.7   Reject request MGA billing characteristics (Class Diagram)

Figure 27 Class diagram: Reject request MGA billing characteristics

3.7.1   Element definitions: Reject request MGA billing characteristics

Class/attribute	Sector[11]	Description
«Business entity» Reject request MGA billing characteristics		The information set sent from the Area Administrator to the Energy Supplier and/or the Billing Calculator when rejecting MGA billing characteristics.
Reason		A code specifying (one of) the reason(s) for the rejection of the request for update MGA billing characteristics.
Reject request MGA billing characteristics Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Reject request MGA billing characteristics Async additions		Information related to this business document, needed when using an asynchronous communication.

---

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

	Reference to requesting Transaction ID		The Transaction ID from the request that is rejected.
	Grid Company ID		The unique identification of the Grid Company the MGA billing characteristics was requested for.
	MGA ID		The unique ID of the Metering Grid Area the requested MGA billing characteristics is rejected for.
	MGA name		The name of this MGA in free text.

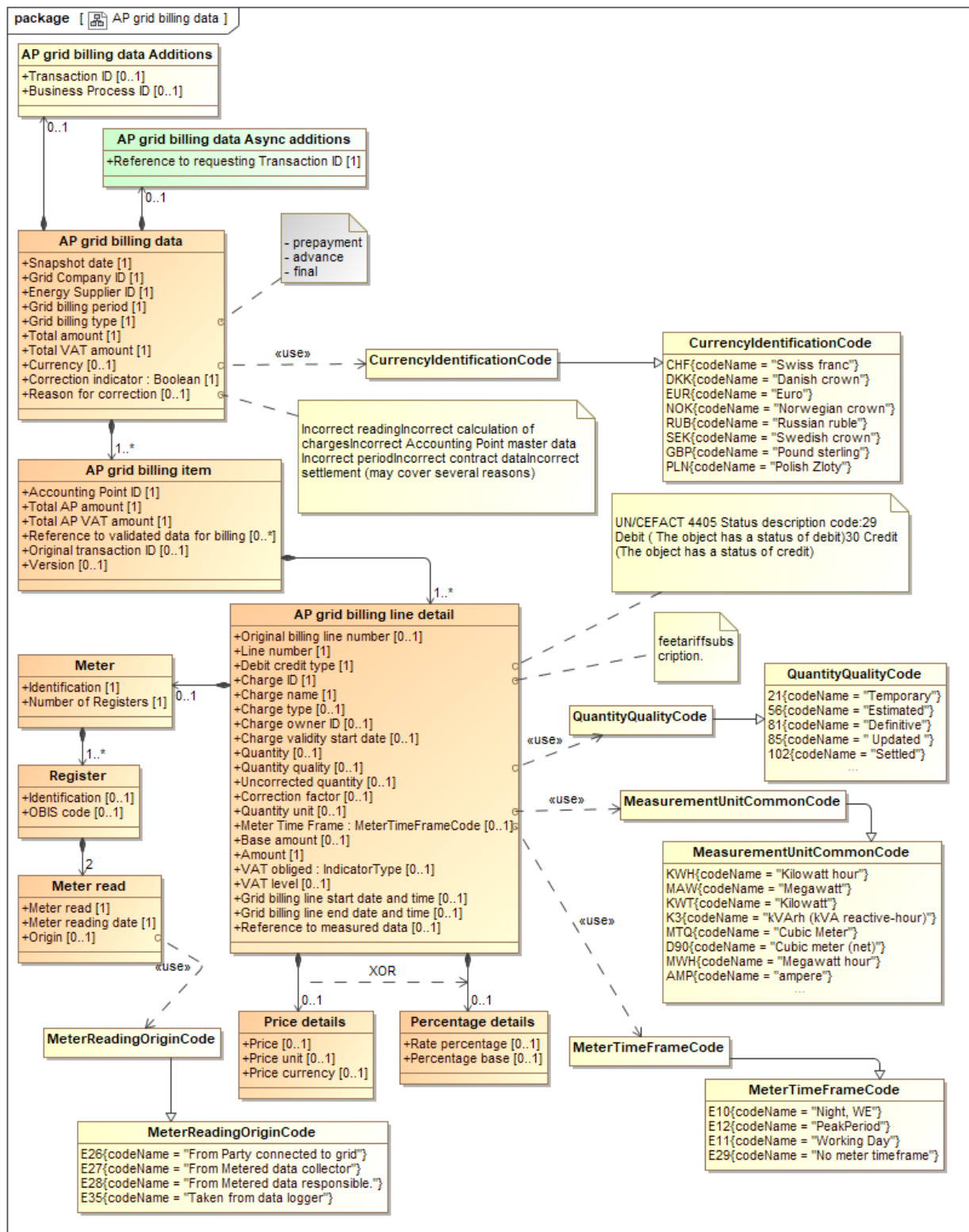## 3.8 Accounting Point (AP) grid billing data (Class Diagram)

Figure 28 Class diagram: AP grid billing data from Billing Calculator

3.8.1 Element definitions: AP grid billing data

Class/attribute	Sector 12	Description
«Business entity» AP grid billing data		The information set sent from the Billing Calculator to the Energy Supplier and Grid Company to be used for billing of grid costs for an Accounting Point.
Snapshot date		The date or date/time when this set of information was derived from the database.
Grid Company ID		The unique identification of the Grid Company responsible for the AP grid billing data.
Energy Supplier ID		The unique identification of the Energy Supplier that should bill this AP grid billing data are send to.
Grid billing Period		The period for which this AP grid billing information is valid.
Grid billing type		The type of bill, such as prepayment, advance or final.
Total amount		A total sum of the amounts in the underlying Accounting Points.
Total VAT amount		Total VAT amount from the underlying Accounting Points. *Note:* The Total VAT amount must be a sum of underlying (calculated) VAT amounts and not a re-calculation.
Currency		The currency in which prices and amounts are expressed.
Correction indicator		An indication of this is a correction of a previous sent AP grid billing data from Billing Calculator document, i.e., TRUE if this is a correction.
Reason for correction		A code indicating the main reason for the correction.
«Business entity» AP grid billing item		The Accounting Point related details of the AP grid billing information for this period.
Accounting Point ID		The unique ID of the Accounting Point grid billing data are sent.
Total AP amount		A total sum of the amounts in the underlying AP grid billing data for this Accounting Point.
Total AP VAT amount		Total VAT amount from the underlying billing lines for this Accounting Point.
Reference to Validated Data for Billing		Reference to the measured data for this Accounting Point and period that are the basis for the calculations of this AP grid billing data.

---

12 It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Original transaction ID		Reference to the transaction ID where the corrected or credited billing data for this Accounting Point was originally sent. **Note:** Only used for AP grid billing data that are corrected or credited.
Version		Version number for this Accounting Point grid billing item, to be used when sending updates of the Accounting Point grid billing item.
«Business entity» AP Grid billing line detail		The details of this grid billing line for this Accounting Point for this grid billing period.
Original billing line number		Reference to the original billing line number which is corrected or credited. **Note:** Only used for billing lines that are corrected or credited.
Line Number		Line number for this AP grid billing line detail.
Debit credit type		A code indicating debit or credit.
Charge ID		The unique identification of the charge that is billed in this line.
Charge Name		A textual description of this charge.
Charge type		The indication of type of charge, such as fee, tariff, or subscription.
Charge owner ID		The unique identification of the originator of the charge.
Charge validity date		The start day for the validity of the charge.
Quantity		The number of units of which the charge of this AP grid billing line is based.
Quantity quality		An indication of the quality, completeness and/or correctness of the Quantity.
Uncorrected quantity		The measured quantity before correction.
Correction factor		The total of all corrections to calculate the billable quantity from the Uncorrected quantity.
Quantity unit		The unit which this quantity is expressed in.
Meter Time Frame		A code specifying the tariff time frame for this quantity.
Base amount		The monetary amount on which the calculation of the amount of this AP grid billing line is based.
Amount		The calculated cost from the quantity or base amount, based on the price or the charge percentage, without VAT.
VAT Obliged		Indicator (Boolean) indicating if this charge is VAT obliged or not.
VAT level		The level for VAT percentage for this charge.

Grid billing line start date and time		The start date and time for the calculation of the Amount in the AP grid billing line detail.
Grid billing line end date and time		The end date and time for the calculation of the Amount in the AP grid billing line detail.
Reference to measured data		Reference to measured data as basis for the quantity in this AP grid billing line.
Price details		The price details of this billing line for this Accounting Point for this billing period.
Price		The price for one unit of this charge.
Price unit		The unit for which the price for this charge is expressed in.
Price currency		The currency the price is expressed in.
Percentage details		The percentage details of this billing line for this Accounting Point for this billing period.
Charge percentage		The charge expressed as a percentage of its base.
Percentage base		A textual description of the basis this percentage applies for.
Meter		The Meter at the Accounting Point where the Quantity has been measured.
Identification		The unique identification of the Meter.
Number of registers		Number of relevant Registers in the Meter for the measurement of the quantity.
Register		One of the relevant Registers in this Meter for measurement of the quantity.
Identification		The unique identification of the Register within this Meter.
OBIS code		A coded string to indicate the function of this Register.
Meter read		Meter read(s) related to the quantity in this AP grid billing line.
Meter read		The meter read at the meter reading date.
Meter reading date		The date the meter read was read.
Origin		A code indicating where the meter read comes from.
AP grid billing data Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Business process ID		The unique identification of the instance of the process that this transaction is a part of.
AP grid billing data Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request.

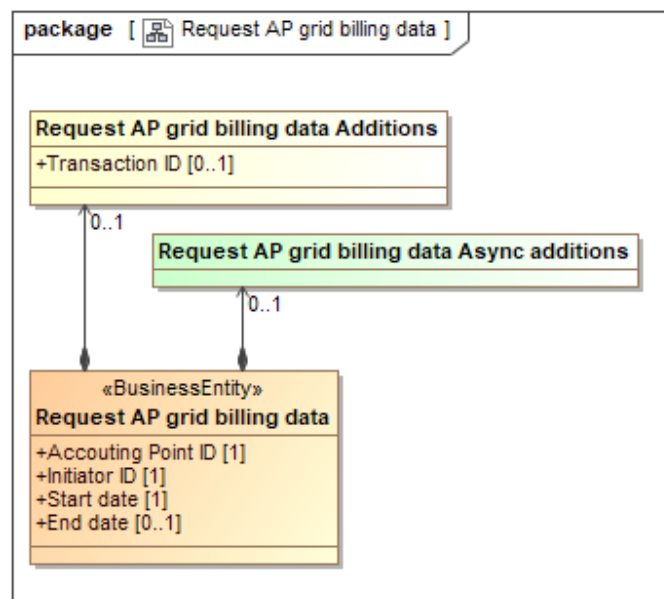## 3.9   Request Accounting Point (AP) grid billing data (Class Diagram)

Figure 29 Class diagram: Request AP grid billing data

3.9.1   Element definitions: Request AP grid billing data

Class/attribute	Sector [13]	Description
«Business entity» Request AP grid billing data		The information set sent from an Initiator to the Billing Calculator when requesting Accounting Point grid billing data.
Accounting Point ID		The unique ID of the Accounting Point the Accounting Point grid billing data is requested for.
Initiator ID		The unique identification of the Initiator that requests Accounting Point grid billing data.
Start date		The date from when the requested Accounting Point grid billing data shall be valid.
End date		The end date of the period for when the requested Accounting Point grid billing data shall be valid.
Request AP grid billing data Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Request AP grid billing data Async additions		Information related to this business document, needed when using an asynchronous communication.

---

[13] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

3.10 Reject request Accounting Point (AP) grid billing data (Class Diagram)
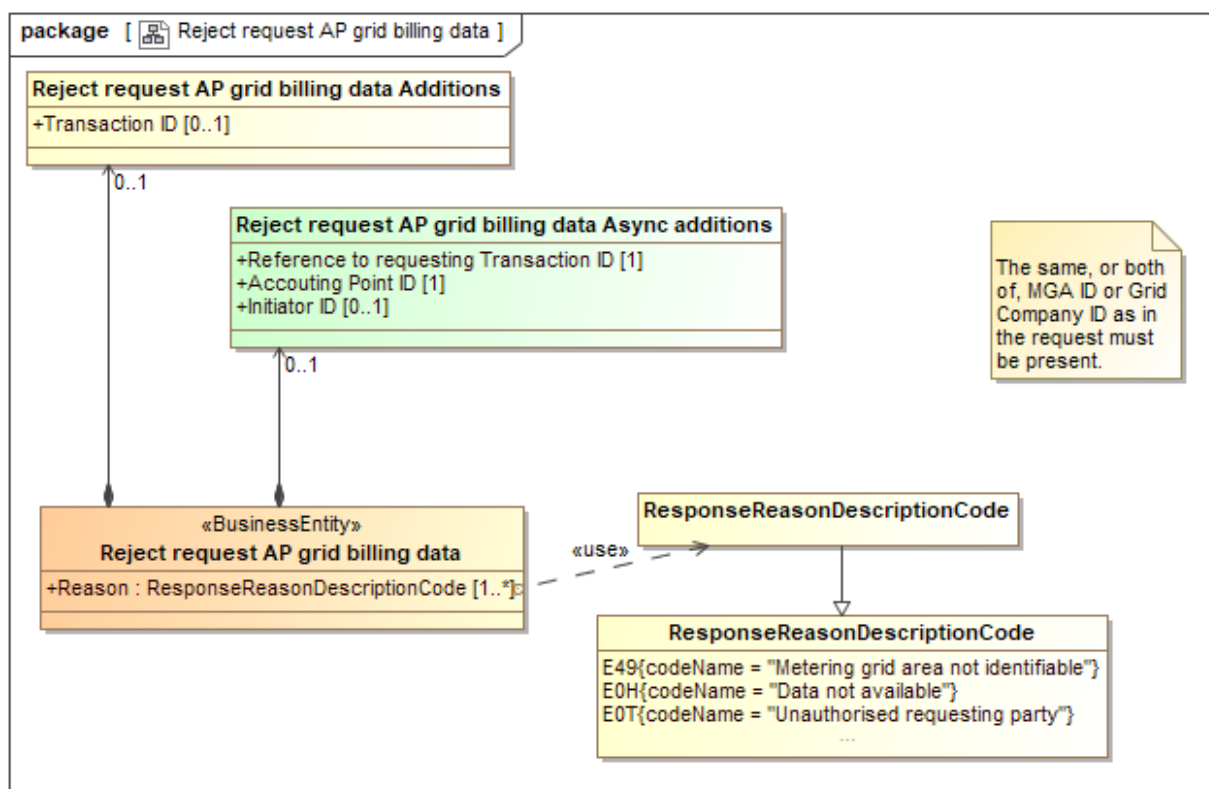

Figure 30 Class diagram: Reject request AP grid billing data

3.10.1 Element definitions: Reject request AP grid billing data

Class/attribute	Sector 14	Description
«Business entity» Reject request AP grid billing data		The information set sent from the Billing Calculator when rejecting a request for Accounting Point grid billing data.
Reason		A code specifying (one of) the reason(s) for the rejection of the request for Accounting Point grid billing data.
Request AP grid billing data Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Request AP grid billing data Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request that is rejected.

---

14 It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Accounting Point ID		The unique ID of the Accounting Point the grid billing data was requested for.
Initiator ID		The unique identification of the Initiator of the request for Accounting Point grid billing data that is rejected.

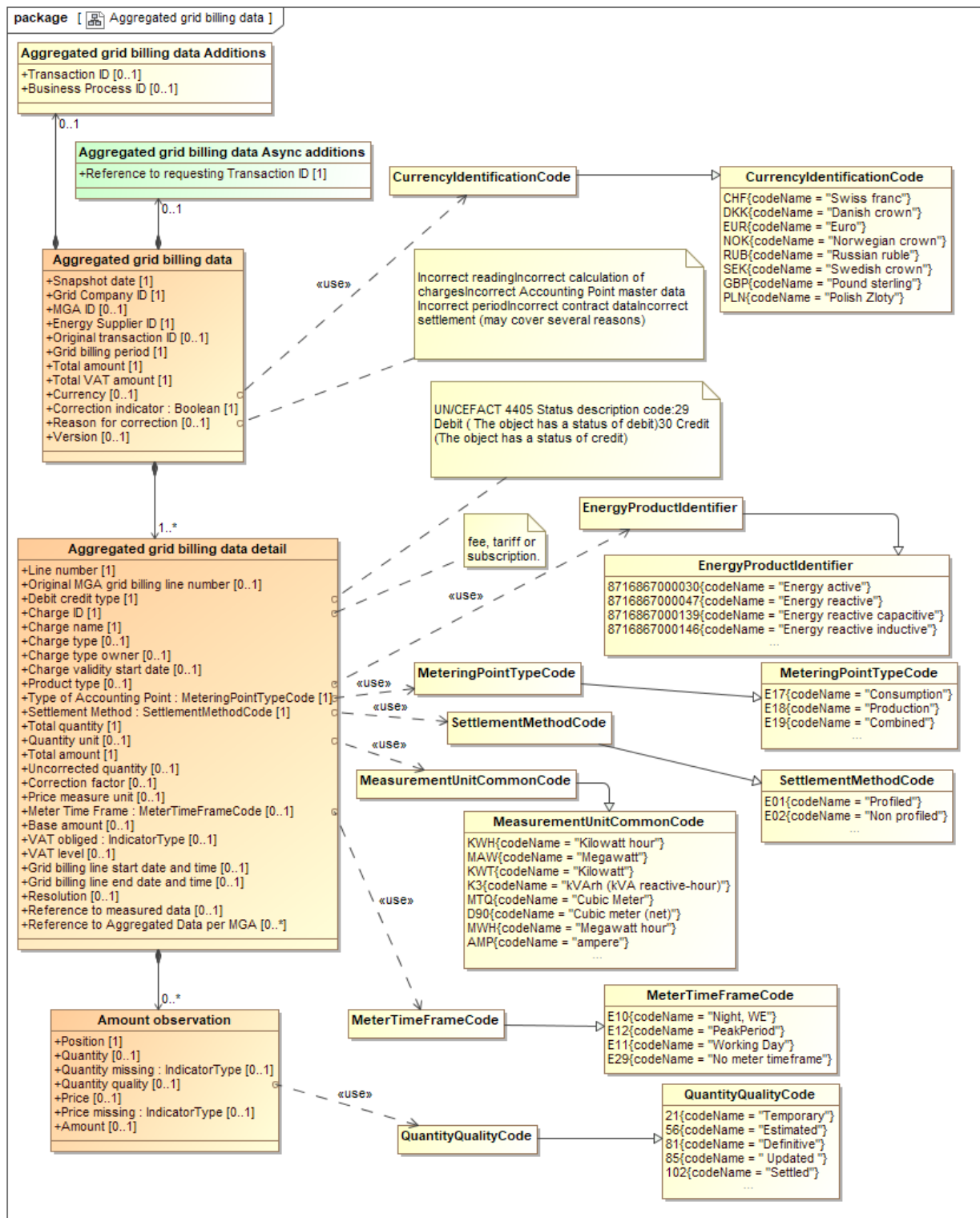## 3.11 Aggregated grid billing data (Class Diagram)

Figure 31 Class diagram: Aggregated grid billing data from Billing Calculator

3.11.1 Element definitions: Aggregated grid billing data

Class/attribute	Sector [15]	Description
«Business entity» Aggregated grid billing data		The information set sent from the Billing Calculator to the Energy Supplier and Grid Company when billing aggregated grid costs.
Snapshot date		The date or date/time when this set of information was derived from the database.
Grid Company ID		The unique identification of the Grid Company responsible for the aggregated grid billing data.
MGA ID		The unique identification of the MGA
Energy Supplier ID		The unique identification of the Energy Supplier the aggregated grid billing data is sent to.
Balance Responsible Party		The unique identification of the Energy Supplier's Balance Responsible Party for this set of aggregated grid billing data.
Original transaction ID		Reference to the transaction ID where the corrected or credited aggregated grid billing data for this Accounting Point was originally sent. **Note:** • Only used for aggregated grid billing data that are corrected or credited.
Grid billing Period		The period for which the aggregated grid billing information is valid.
Total amount		A total sum of the amounts in the underlying Accounting Points.
Total VAT amount		Total VAT amount from the underlying Accounting Points.
Currency		The currency in which prices and amounts are expressed.
Correction indicator		An indication of this is a correction of a previous sent aggregated grid billing data from Billing Calculator document, i.e., TRUE if this is a correction.
Reason for correction		A code indicating the main reason for the correction.
Version		Version number for this aggregated grid billing data item, to be used when sending updates of the aggregated grid billing data item.

---

[15] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

«Business entity» Aggregated grid billing line detail		The aggregated grid billing data details for this set of aggregation criteria and billing period.
Line number		Line number for this aggregated grid billing line detail.
Original aggregated grid billing line number		Reference to the original aggregated grid billing line number which is corrected or credited.
Debit credit type		A code indicating debit or credit.
Charge ID		The unique identification of the charge that is billed in this line.
Charge name		A textual description of this charge.
Charge type		The type of charge, such as fee, tariff, or subscription.
Charge type owner		The unique identification of the charge type owner, such as the Grid Company or TSO.
Charge validity start date		The start day for the validity of the charge.
Type of Accounting Point		A code specifying the direction of the active energy flow in this Metering Point, such as consumption, production or combined.
Settlement Method		A code specifying how the energy volumes are treated for settlement for this Metering Point, such as profiled or non-profiled.
Total quantity		The quantity of which the amount for this charge of this aggregated grid billing line is based.
Quantity unit		The unit which this quantity is expressed in.
Total amount		The total amount for this Charge.
Uncorrected quantity		The measured quantity before correction.
Correction factor		The total of all corrections to calculate the billable quantity from the Uncorrected quantity.
Price measure unit		The unit for which the price for this charge is expressed in.
Meter Time Frame		A code specifying the tariff time frame for this quantity.
Base amount		The monetary amount on which the calculation of the amount of this aggregated grid billing line is based.
Amount		The calculated cost from the quantity or base amount, based on the price or the charge percentage, without VAT.
VAT Obliged		Indicator (Boolean) indicating if this charge is VAT obliged or not.
VAT level		The level for VAT percentage for this charge.
Grid billing line start date and time		The start date and time for the calculation of the Amount in the aggregated grid billing line detail.
Grid billing line end date and time		The end date and time for the calculation of the Amount in the aggregated grid billing line detail.

Resolution		The resolution for the observation within the relevant period based on ISO-8601, such as PT1H (one hour), P1D (one day) or P1M (one month).
Reference to measured data		Reference to measured data as basis for the quantity in this aggregated grid billing line.
Reference to Aggregated Data per MGA		Reference to the aggregated measured data and period that are the basis for the calculations of this aggregated grid billing data.
Amount observation		The amount details of this aggregated grid billing line for this billing period.
Position		The ordinal position of this observation.
Quantity		The number of units of which the charge of this price detail is based.
Quantity missing		Indicator (Boolean) indicating whether the quantity of this observation is missing.
Quantity quality		An indication of the quality, completeness and/or correctness of the Quantity.
Price		The price for one unit of this charge.
Price missing		Indicator (Boolean) indicating whether the price of this observation is missing.
Amount		The calculated cost from the quantity or base amount, based on the price without VAT.
Aggregated grid billing data Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.
Business process ID		The unique identification of the instance of the process that this transaction is a part of.
Aggregated grid billing data Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request.

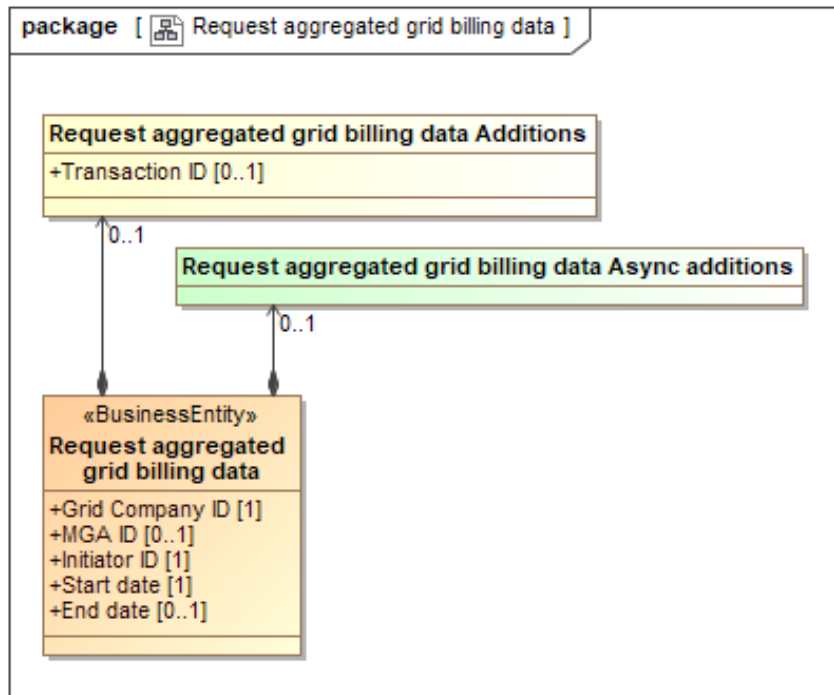## 3.12 Request aggregated grid billing data (Class Diagram)

Figure 32 Class diagram: Request aggregated grid billing data

3.12.1 Element definitions: Request aggregated grid billing data

Class/attribute	Sector [16]	Description
«Business entity» Request aggregated grid billing data		The information set sent from an Initiator to the Billing Calculator when requesting aggregated grid billing data.
Grid Company ID		The unique ID of the Grid Company, the aggregated grid billing data is requested for.
MGA ID		The unique ID of the MGA the aggregated grid billing data is requested for.
Initiator ID		The unique identification of the Initiator that requests aggregated grid billing data.
Start date		The date from when the requested aggregated grid billing data shall be valid.
End date		The end date of the period for when aggregated grid billing data are requested.
Request aggregated grid billing data Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.

---

[16] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Transaction ID		The unique identification of this set of information.
Request aggregated grid billing data Async additions		Information related to this business document, needed when using an asynchronous communication.

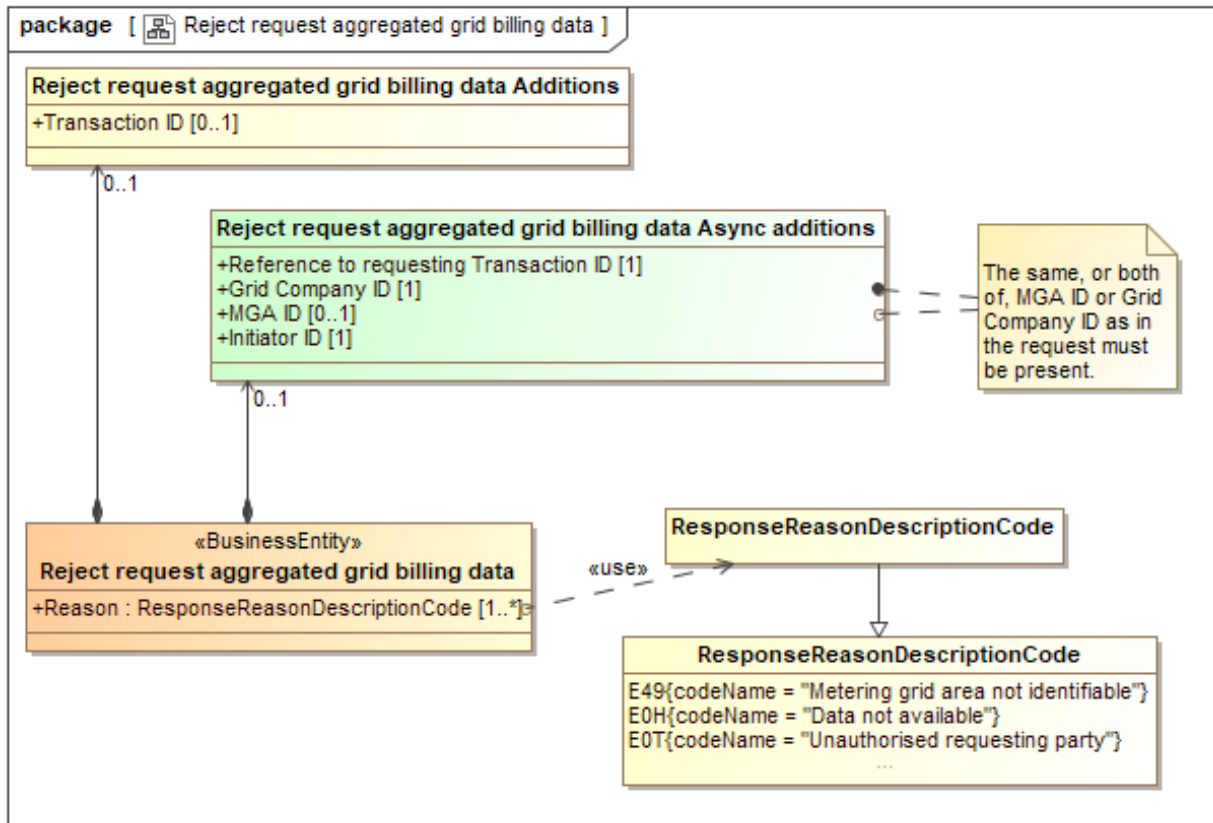## 3.13 Reject request aggregated grid billing data (Class Diagram)

Figure 33 Class diagram: Reject request aggregated grid billing data

3.13.1 Element definitions: Reject request aggregated grid billing data

Class/attribute	Sector [17]	Description
«Business entity» Reject request aggregated grid billing data		The information set sent from an Initiator to the Billing Calculator when requesting aggregated grid billing data.
Reason		A code specifying (one of) the reason(s) for the rejection of the request for aggregated grid billing data.
Request aggregated AP grid billing data Additions		Information related to this business document, needed for technical reasons or to be agreed on a national level.
Transaction ID		The unique identification of this set of information.

---

[17] It is assumed that Metering Grid Areas are uniquely dedicated to either electricity or to gas.

Request aggregated grid billing data Async additions		Information related to this business document, needed when using an asynchronous communication.
Reference to requesting Transaction ID		The Transaction ID from the request that is rejected.
Grid Company ID		The unique ID of the Grid Company, the aggregated grid billing data was requested for.
MGA ID		The unique ID of the MGA the aggregated grid billing data was requested for.
Initiator ID		The unique identification of the Initiator of the rejected request for aggregated grid billing data.

Appendix A.   Header and Context information for the class diagrams

A.1.   Header and Context Information attributes definitions

Class/attribute	Sector[18]	Description
Header and Context Information		The set of information specifying the information to be added to this payload 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 Responsible Role, responsible for the process/this exchange.

A.2.   Request update MGA billing characteristics
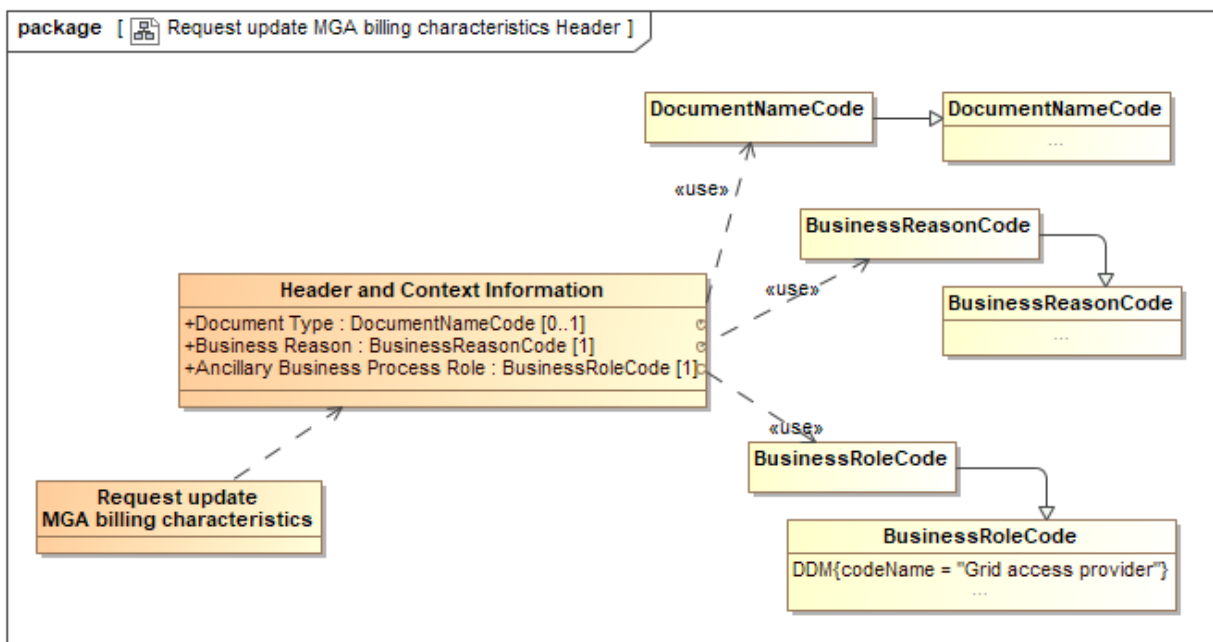
Figure 34 Class diagram: Header and Context information: Request update MGA billing characteristics

---

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

A.3. Confirm request update MGA billing characteristics
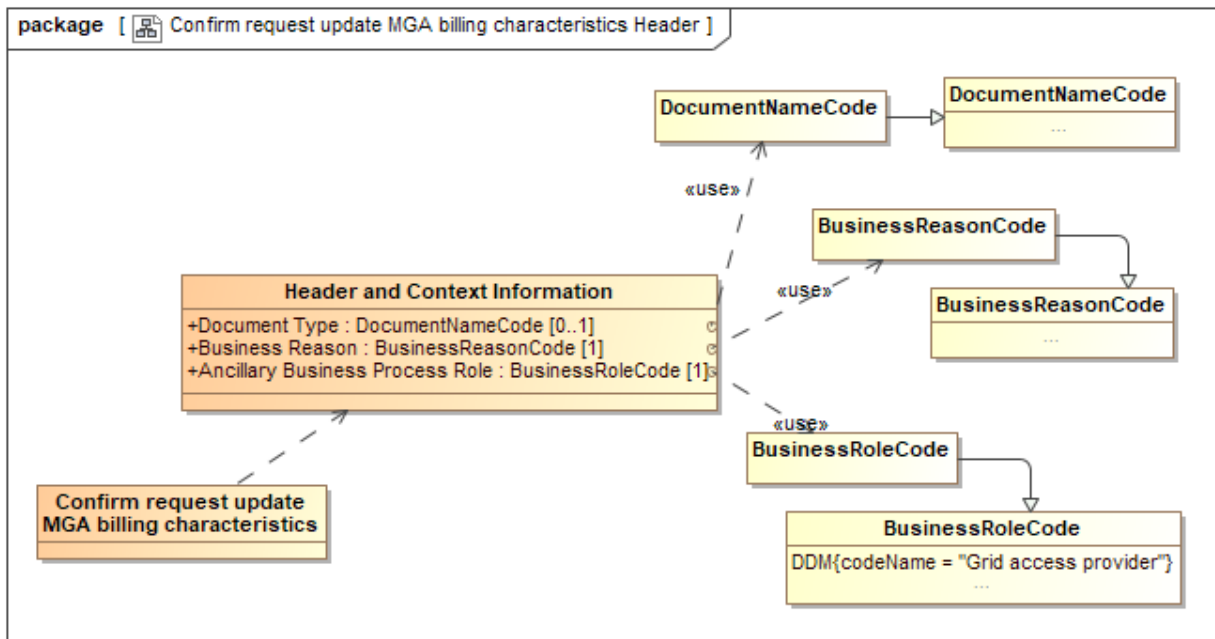
Figure 35 Class diagram: Header and Context information: Confirm request update MGA billing characteristics

A.4. Reject request update MGA billing characteristics
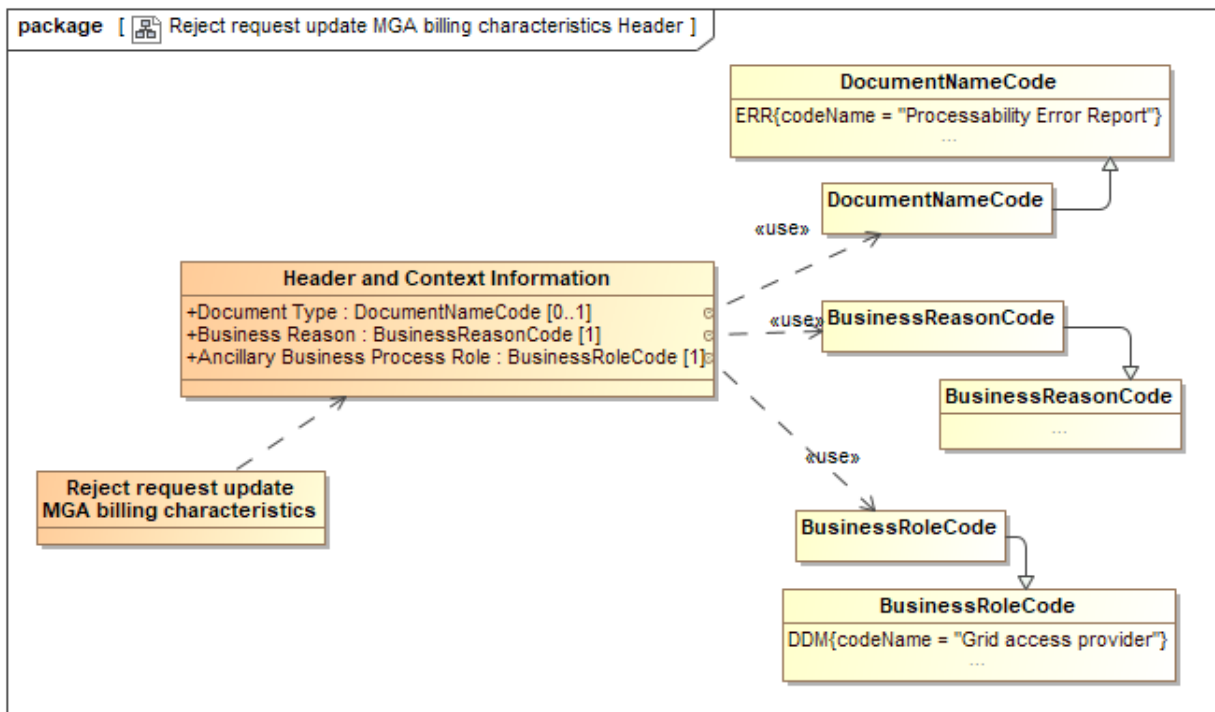
Figure 36 Class diagram: Header and Context information: Reject request update MGA billing characteristics
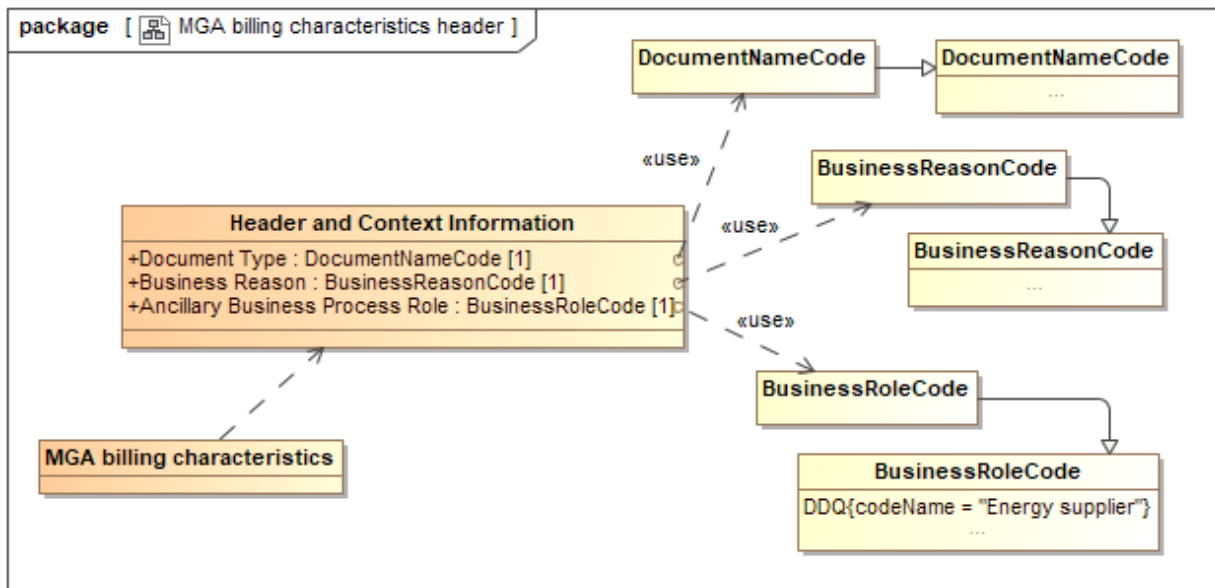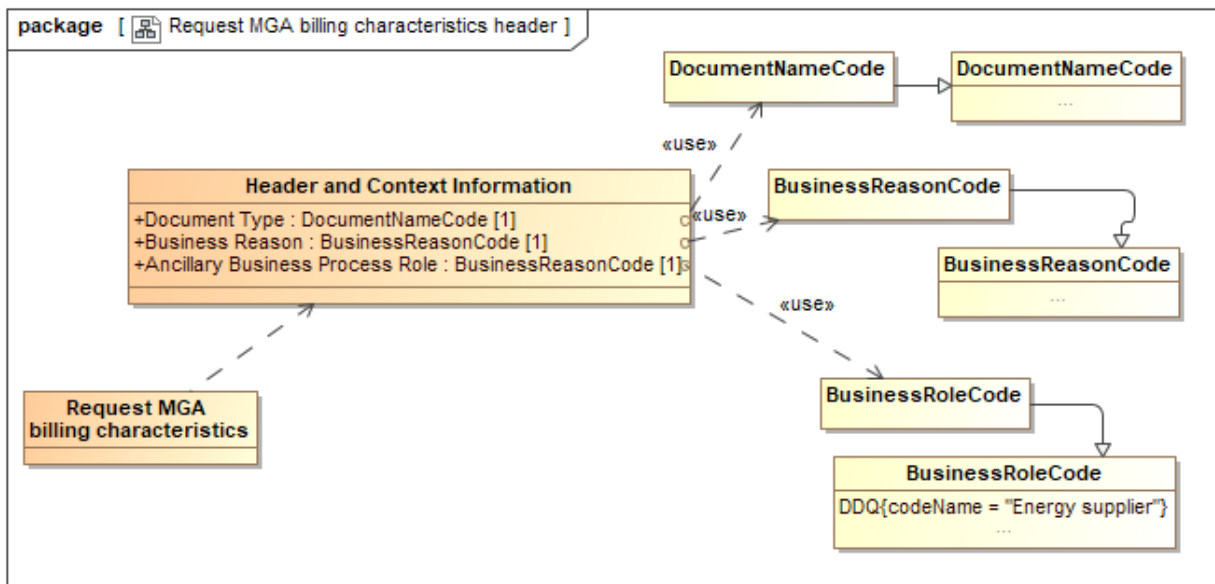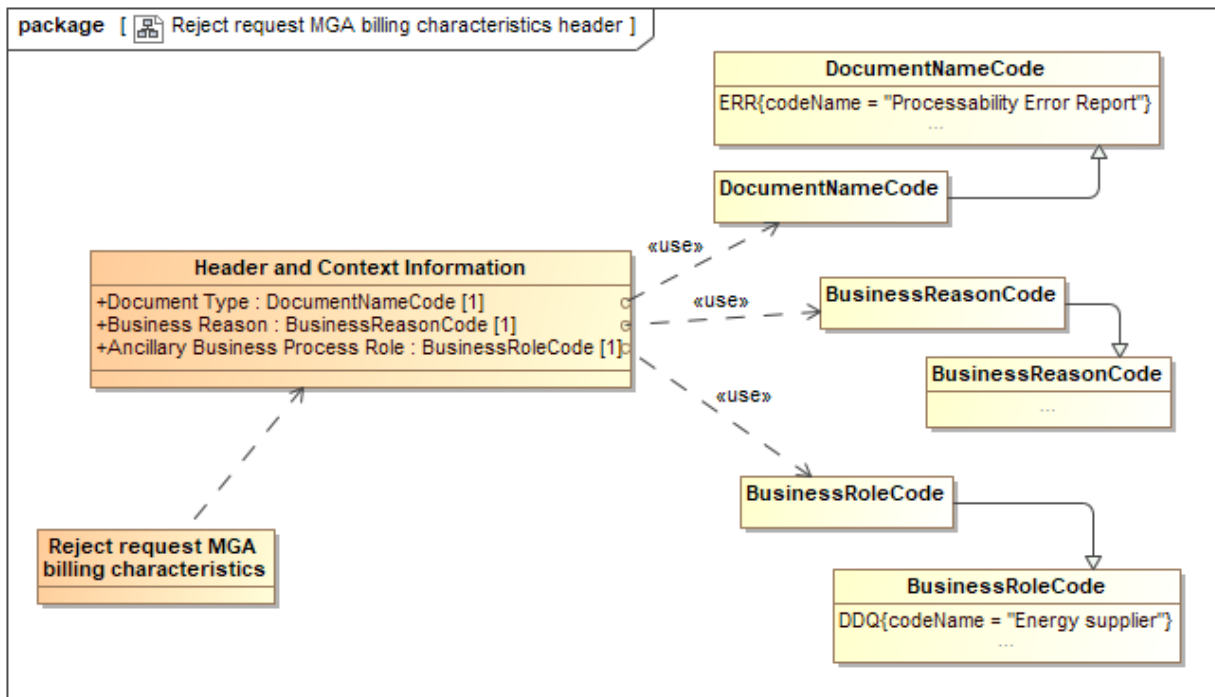
A.5. MGA billing characteristics

Figure 37 Class diagram: Header and Context information: MGA billing characteristics

A.6. Request MGA billing characteristics

Figure 38 Class diagram: Header and Context information: Request MGA billing characteristics

A.7. Reject request MGA billing characteristics

Figure 39 Class diagram: Header and Context information: Reject request MGA billing characteristics

A.8. AP grid billing data
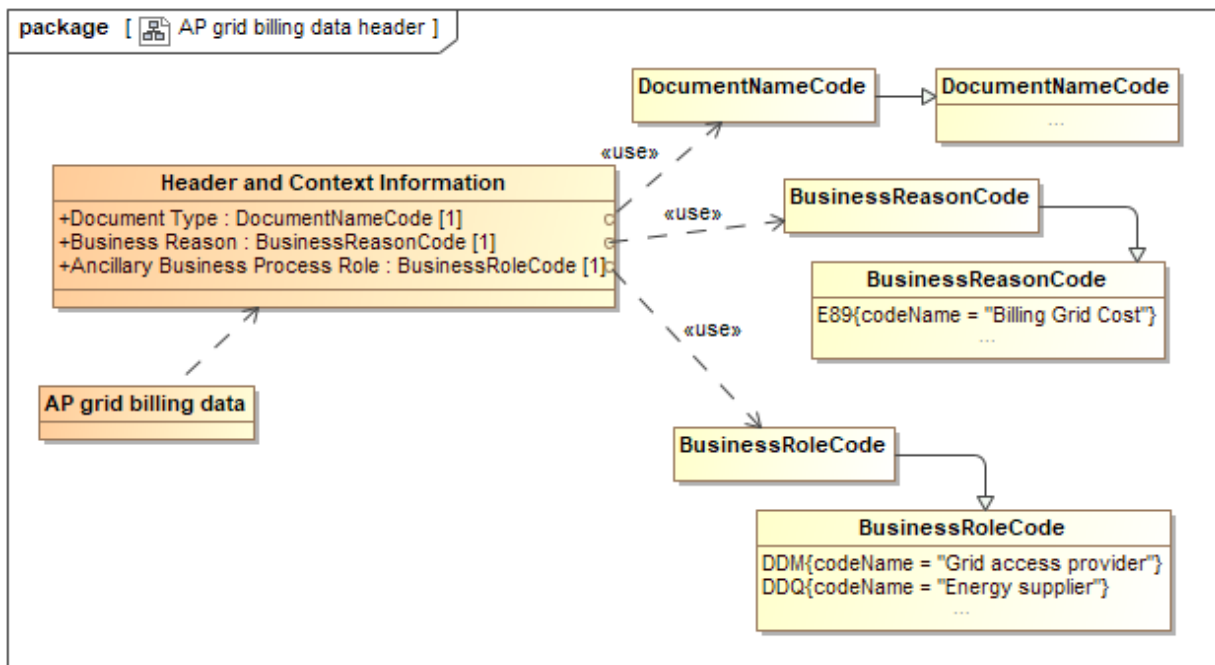
Figure 40 Class diagram: Header and Context information: AP grid billing data

A.9. Request AP grid billing data
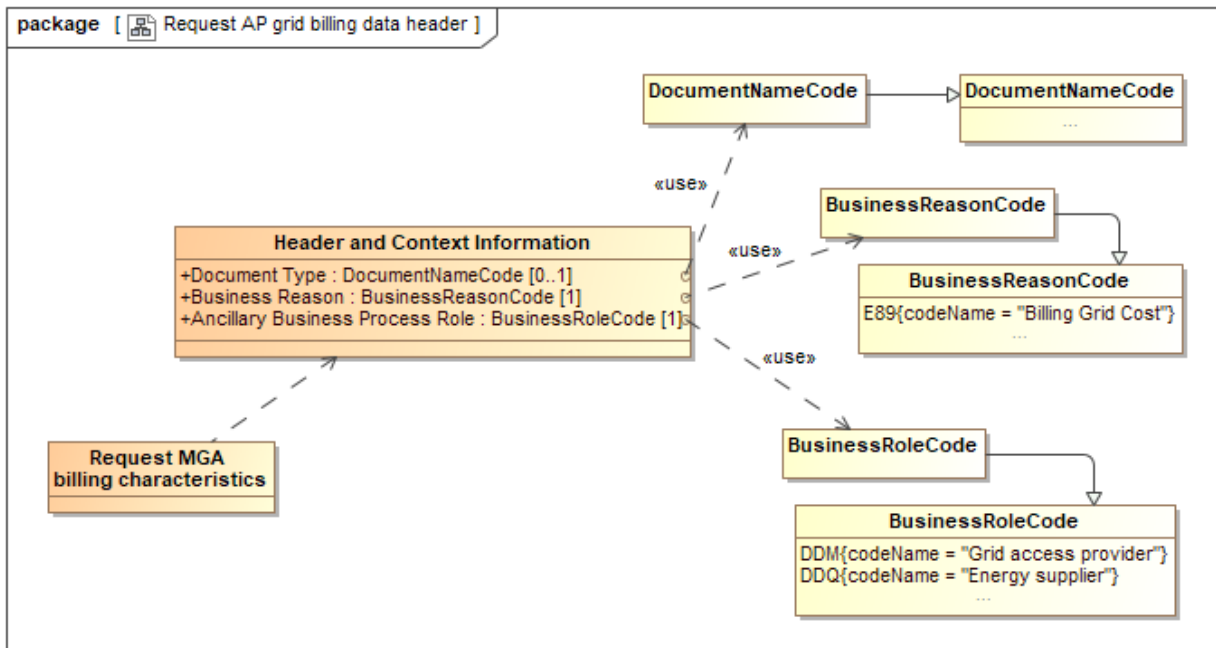
Figure 41 Class diagram: Header and Context information: Request AP grid billing data
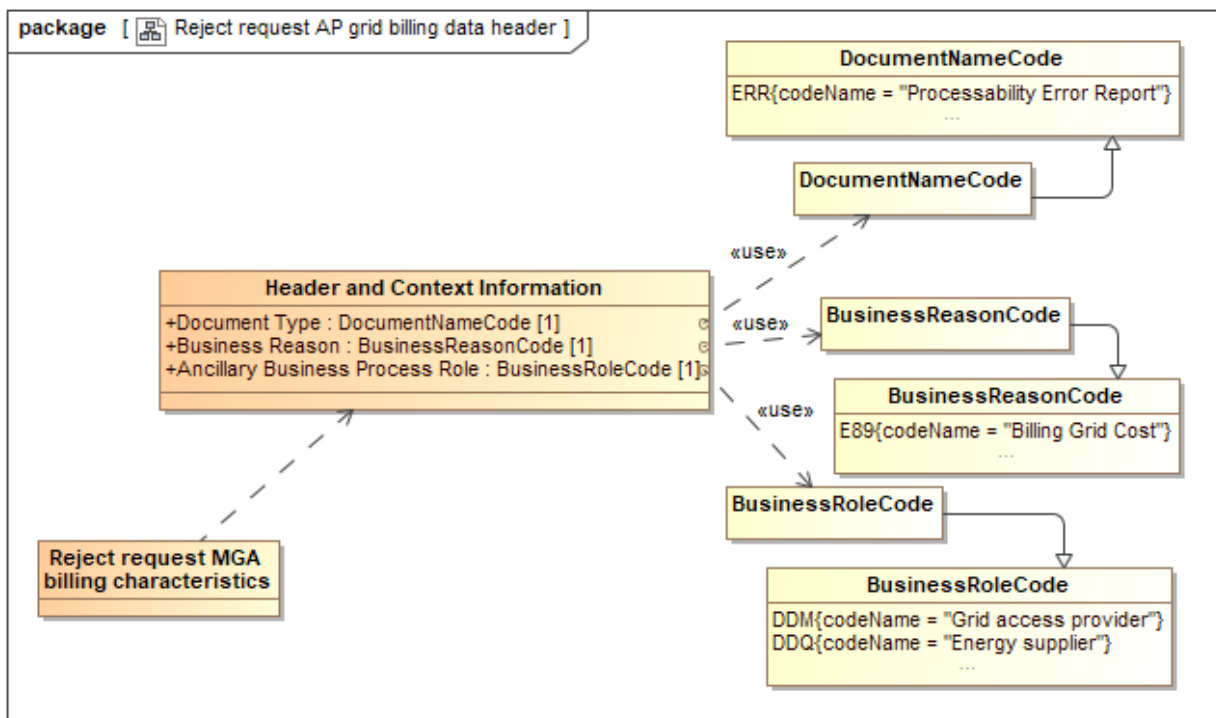
A.10. Reject Request AP grid billing data

Figure 42 Class diagram: Header and Context information: Reject Request AP grid billing data
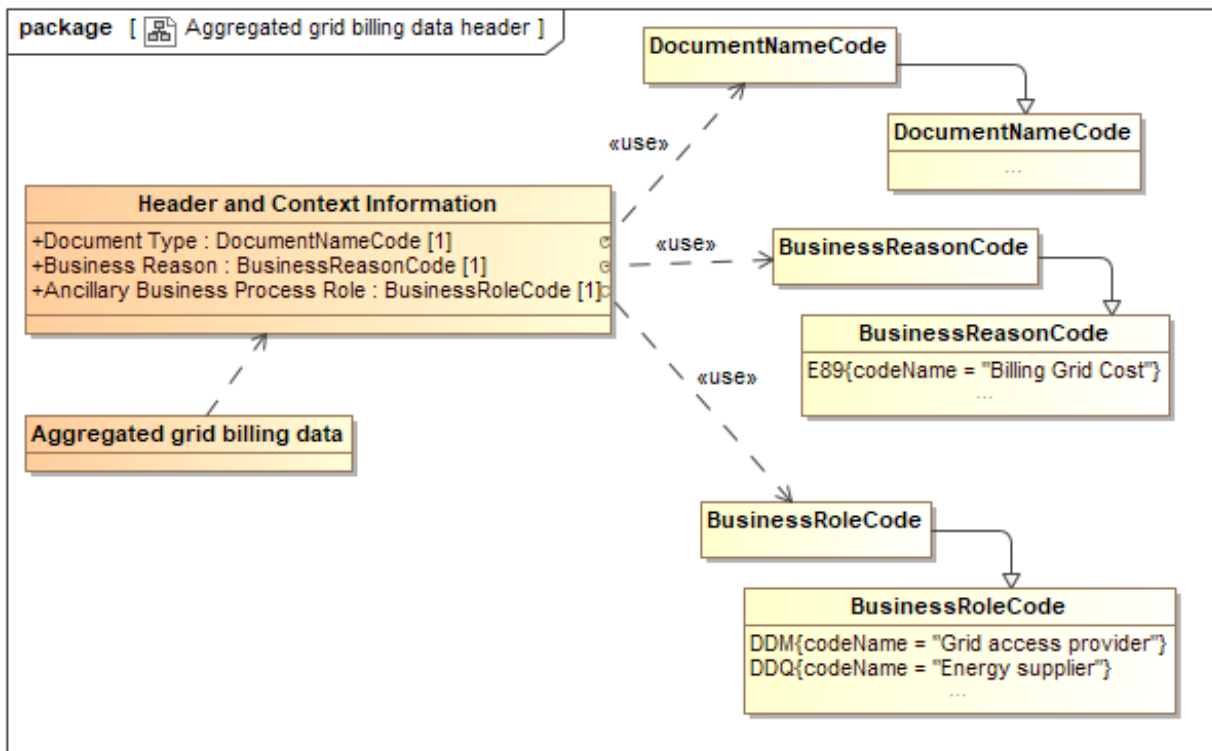
A.11. Aggregated grid billing data

Figure 43 Class diagram: Header and Context information: Aggregated grid billing data

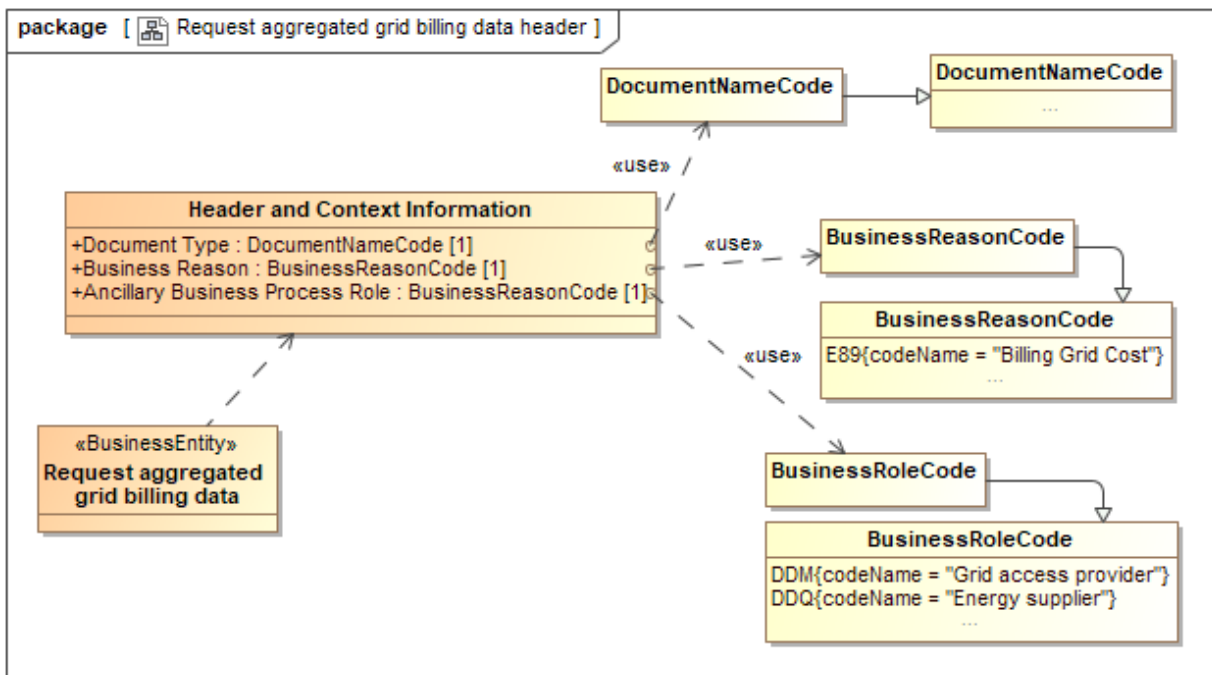## A.12. Request aggregated grid billing data

Figure 44 Class diagram: Header and Context information: Request aggregated grid billing data

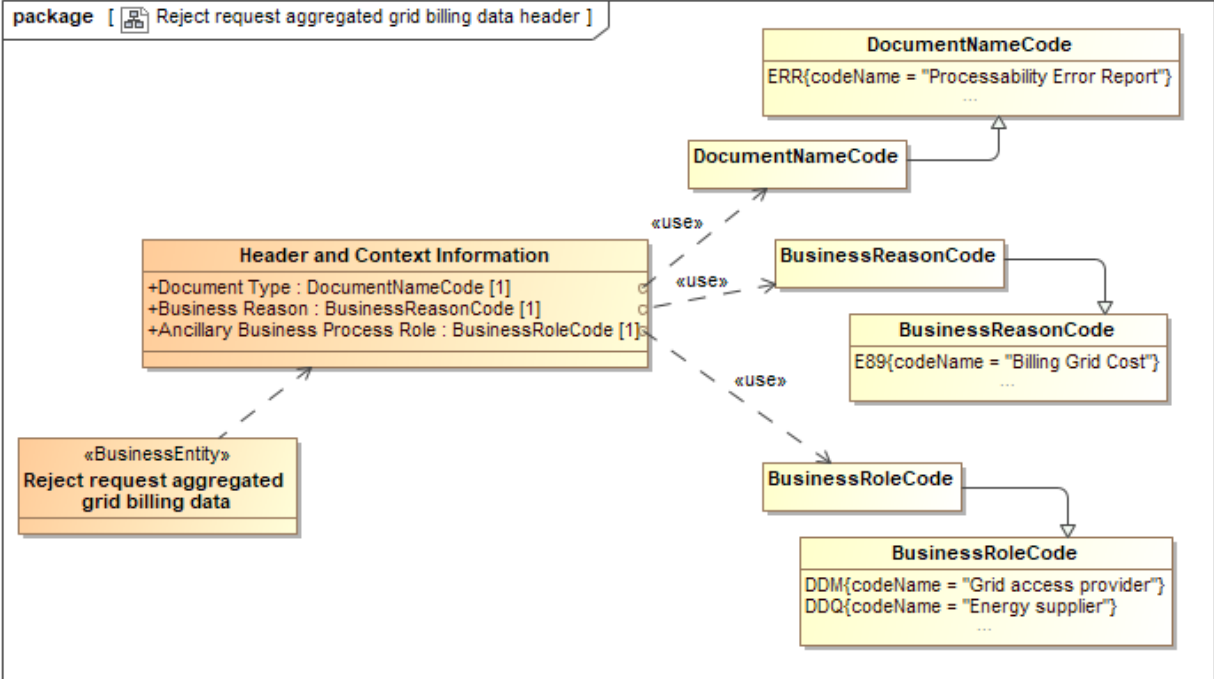## A.13. Reject Request aggregated grid billing data

Figure 45 Class diagram: Header and Context information: Reject Request aggregated grid billing data