Business Requirements for

Measure

for

Billing

Status: approved

Version: 2.1

Revision: -

Date: August, 2015

C O N T E N T

A. About this document

This document contains ebIX® Business Requirements for the processes regarding the measured data for billing energy and grid cost, both for electricity and for gas.

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 particular business process.

In line with UN/CEFACT Modeling Methodology version 2 (UMM-2) ebIX® defines the business requirements before starting the actual modeling. The requirements have been specified by the ebIX® work group "Exchange Metered Data" and are the basis for the Business Information Model 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 Kees Sparreboom, kees.sparreboom@capgemini.com .

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

A.3. Participants in the project

These Business Requirements as part of the ebIX® Model for the European Energy Market *(see [4])* are made in a project with the members of EMD. For a list of members of EMD see www.ebix.org .

A.4. Main changes since last version

		Old	New	Clarification	Date
Start of updates for Version 2.0.A					
1.	Paragraph on references			The list of references has been limited to references directly relevant for a document containing business requirements	2013-07-02
2.	Various UseCase diagrams		Various include-relations have been replaced by extensions	In order to do justice to the conditionality of processes.	2013-07-02
3.	UseCase "Validate Measurements"		The generic UseCase "Validate Measurements" replaces specific validation processes.	The generic process for "Validate Measurements" is specified in the document Introduction to ebIX® Business Requirements and Business Information Models (www.ebix.org)	2013-07-02
4.	Various activity diagrams		Various forks have been replaced by decision nodes	In order to do justice to the conditionality of processes and in line with the updates for UseCases (see above)	2013-07-02
5.	All activity diagrams have been brought in line with the rules stated in the Introduction			One-way processes have final node in receiving swim lane; two-way processes have final node in triggering (sending) swim lane	2013-07-02

	to ebIX models				
6.	All activity diagrams have been brought in line with the rules stated in the Introduction to ebIX models			In case of optional "Failure" for processes, the upper level processes in which these processes are used will also show the option for "Failure"	2013-07-02
7.	All class diagrams		A table with semantic definitions of classes and properties has been added	To bring model documents for ebIX® CuS and ebIX® EMD in line	2013-07-02
8.	All class diagrams, all classes for "….-additions"		The properties Sector and Reason have been deleted	As a consequence of modeling for web services as one of the implementation options	2013-07-02
9.	Class diagram for "Negative Response …."		The list of error codes has been reviewed and updated		2013-07-02
Start of updates for Version 2.0.B					
10.	All class diagrams		Header and context information has been added	In order to bring this BRS in line with other ebIX® BRS documents	2014-07-09
Start of updates for Version 2.0.B					
11.	References			References have been updated	2015-02-13
12.	UseCase Diagram Request Validated Data for Billing		Description	Remark regarding the option to include proposed data in the request has been removed. Remark	2015-01-13

	Energy			regarding the national option to do so has been kept in.	
13.	UseCase Diagram Request Validated Data for Billing Grid Cost		Description	Remark regarding the option to include proposed data in the request has been removed. Remark regarding the national option to do so has been kept in.	2015-01-13
14.	Class diagram Validated Data for Billing Energy		Class Register Read associated to Register	Class Register Read allows for exchange of the original customer read in order to add this read to the invoice to the customer	2015-01-13
15.	Class diagram Validated Data for Billing Grid Cost		Class Register Read associated to Register	Class Register Read allows for exchange of the original customer read in order to add this read to the invoice to the customer	2015-01-13
16.	Class diagram Validated Data for Billing Energy		Most enumerations	Coded values added for use in the gas sector	2015-01-13
17.	Class diagram Validated Data for Billing Grid Cost		Most enumerations	Coded values added for use in the gas sector	2015-01-13
18.	Class diagram Request Validated Data for Billing Energy		Some enumerations	Coded values added for use in the gas sector	2015-01-13
19.	Class diagram Request Validated Data		Some enumerations	Coded values added for use in the gas sector	2015-01-13

	for Billing Grid Cost				
End of updates for Version 2.1.-					

1. Business Requirements View: Measure for Billing

This BRS regards customer related information (in contrast to other ebIX® BRS's which are mainly Metering Point oriented). Customer privacy protection is supposed to be based on national rules and therefore left by ebIX® to national implementations.

1.1. Measure for Billing (Business Process UseCase)

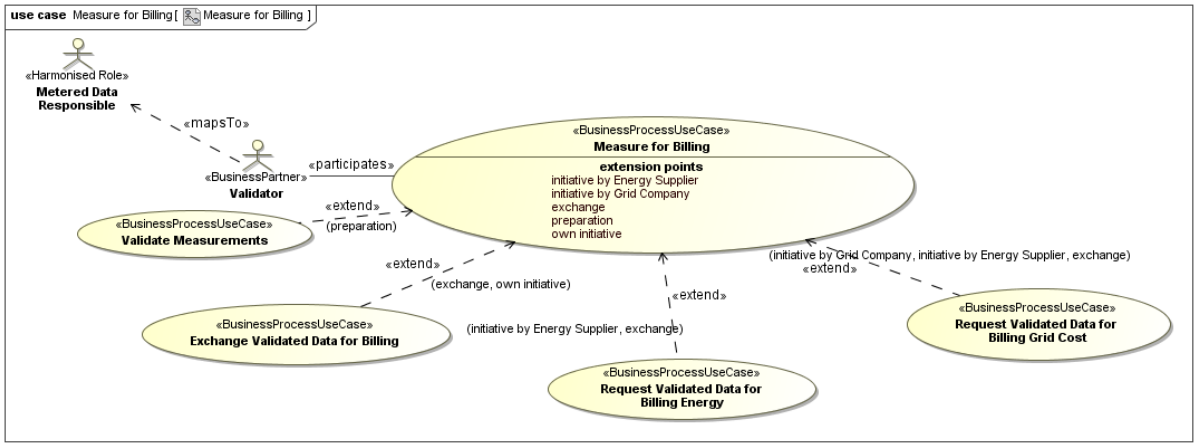

Figure 1 Measure for Billing

1.1.1. Description

UseCase description: Measure for Billing	
definition	Provides validated metered data for the processes of billing energy and billing grid cost.
beginsWhen	The Validator decides to.
preCondition	Collected Data are available for the Validator Partners responsible for the execution of the processes should have access to relevant master data.
endsWhen	The validated data has been made available to the Energy Supplier and/or the Grid Company and/or the Customer.
postCondition	Energy Supplier and/or the Grid Company have received the metered data required for billing their respective products and services. The Customer may have received the validated metered data and the accompanying meter readings from which these data have been derived.
Exceptions	None
actions	*See 1.1.2*

1.1.2. Business Process

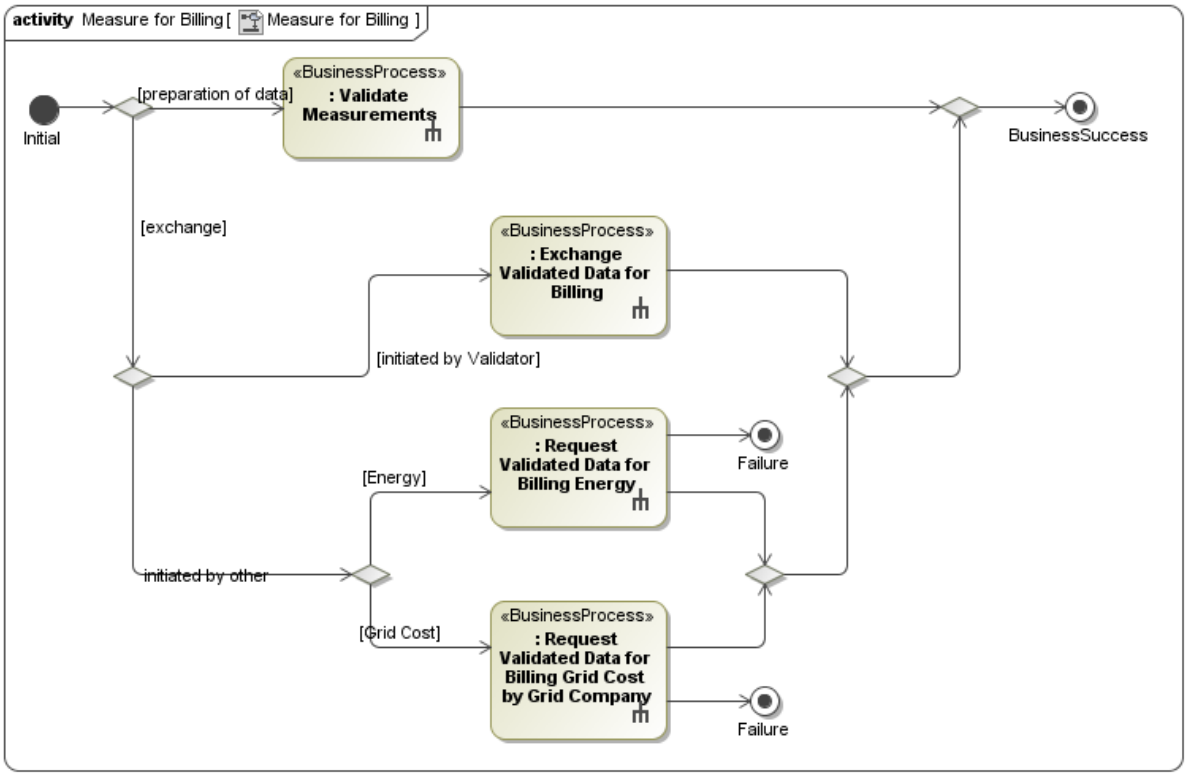

Figure 2 BP Measure for Billing

1.1.3. Validate Measurements (Business Process UseCase)

This process is described in the Introduction to ebIX® Business Requirements and Business Information Models (www.ebix.org), see [4].

1.1.4. Exchange Validated Data for Billing (Business Process UseCase)

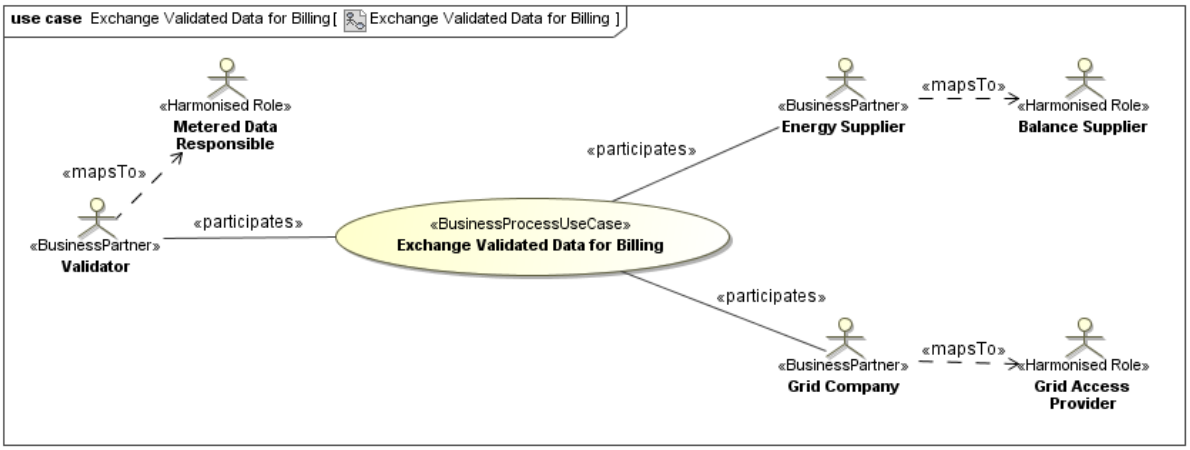

Figure 3 Exchange Validated Data for Billing

1.1.4.1. Description

UseCase description: Exchange Validated Data for Billing	
definition	Validator sends validated data to the Energy Supplier and/or the Grid Company
beginsWhen	The Validator • decides to, or • when the (national) time schedule prescribes him to.
preCondition	The Validator has available: • validated data • master data for the exchange of data
endsWhen	The reception of the validated data has been acknowledged by the Energy Supplier and/or the Grid Company.
postCondition	Validated Data are available for the Energy Supplier and/or the Grid Company.
exceptions	The validated data may also be exchanged directly with the Customer. By lack of (national) rules, this is not modeled.
actions	*See 1.1.4.2*

1.1.4.2. Business Process

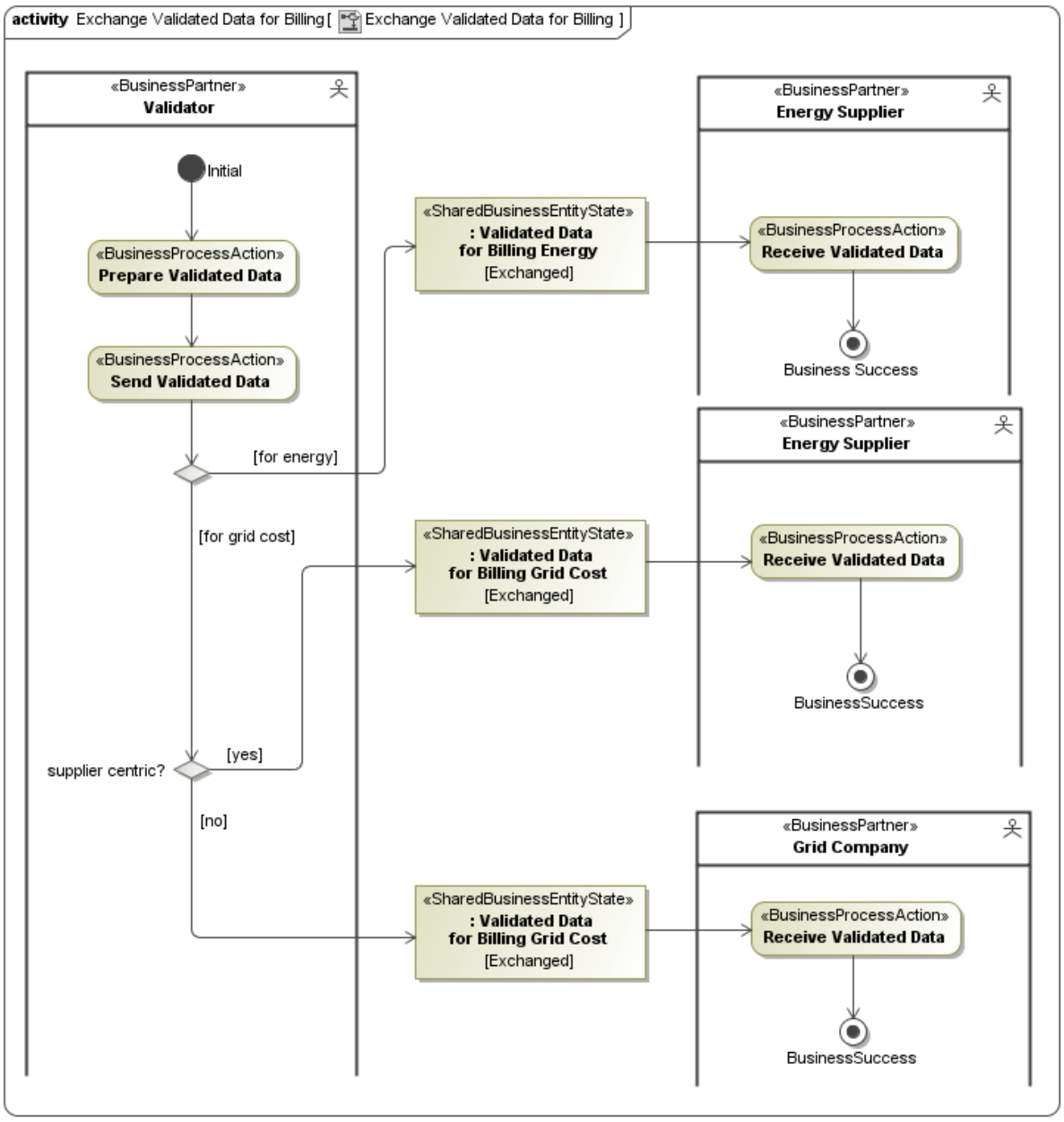

Figure 4 BP Exchange Validated Data for Billing

Remark:
The scenario as described here reflects the options in exchanging measured data for billing. In practical implementations this scenario may be made more efficient. For example in a Supplier centric model (where the Supplier invoices both energy and grid cost) he may be able to work just on the basis of the Validated Data for Billing Grid Cost. In case of different resolutions for billing grid cost and billing energy the most detailed resolution will probably be used then for the measured data. Note that the data set for billing grid cost also covers the specifics of exchange Metering Point, where the data set for billing energy does not.

1.1.5. Request Validated Data for Billing Energy (Business Process UseCase)

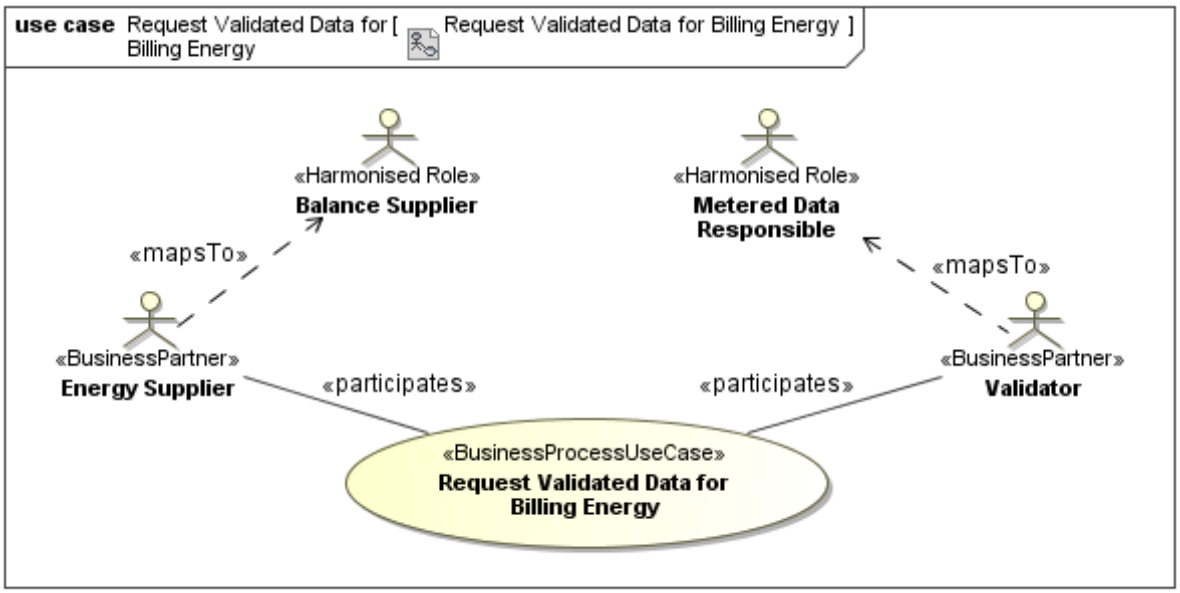

Figure 5 Request Validated Data for Billing Energy

1.1.5.1. Description

UseCase description: Request Validated Data for Billing Energy	
definition	Energy Supplier requests Validated Data from the Validator. The request may contain proposed validated metered data. *Remark: The validated data may also be exchanged directly with the Customer. By lack of (national) rules, this is not modeled.* *Remark: The implementation of a process for requesting and/or proposing validated data (and the conditions under which it works) is up to national decision.*
beginsWhen	Energy Supplier decides to.
preCondition	Relation between Energy Supplier and Validator .
endsWhen	The reception of the validated data or the negative response has been acknowledged by the Energy Supplier.
postCondition	Validated Data or the negative response are available for the Energy Supplier.
exceptions	None
actions	*See 1.1.5.2*

1.1.5.2. Business Process

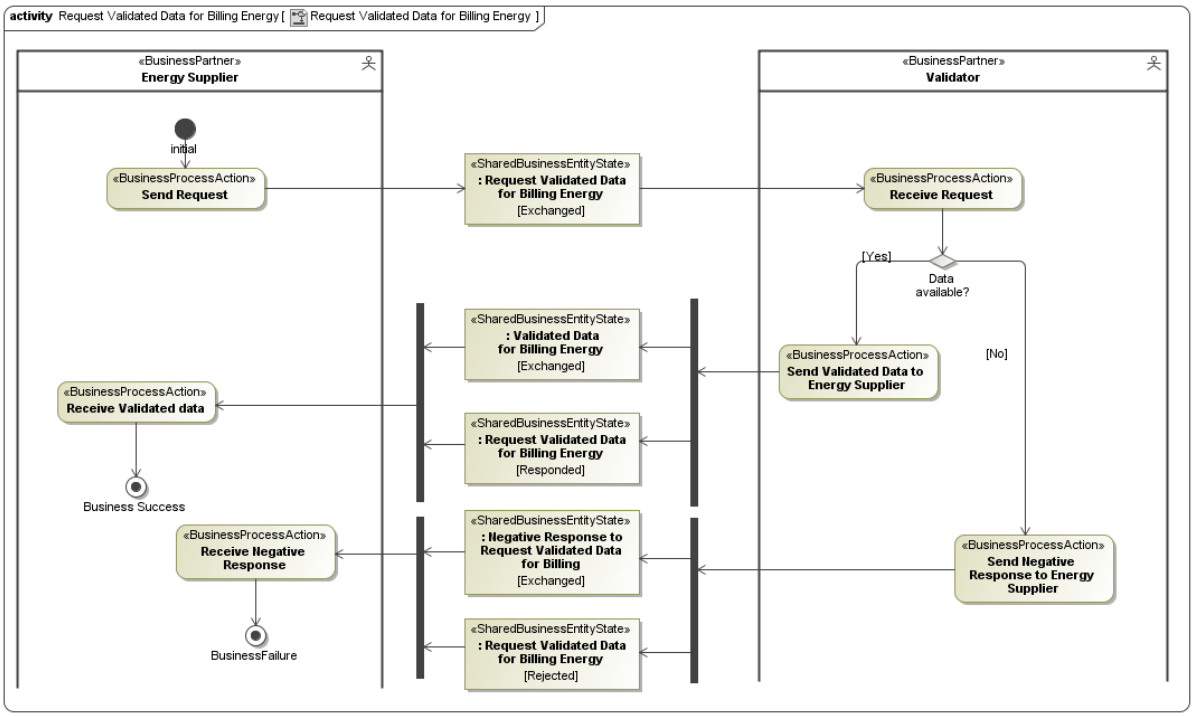

Figure 6 BP Request Validated Data for Billing Energy

1.1.6. Request Validated Data for Billing Grid Cost (Business Process UseCase)

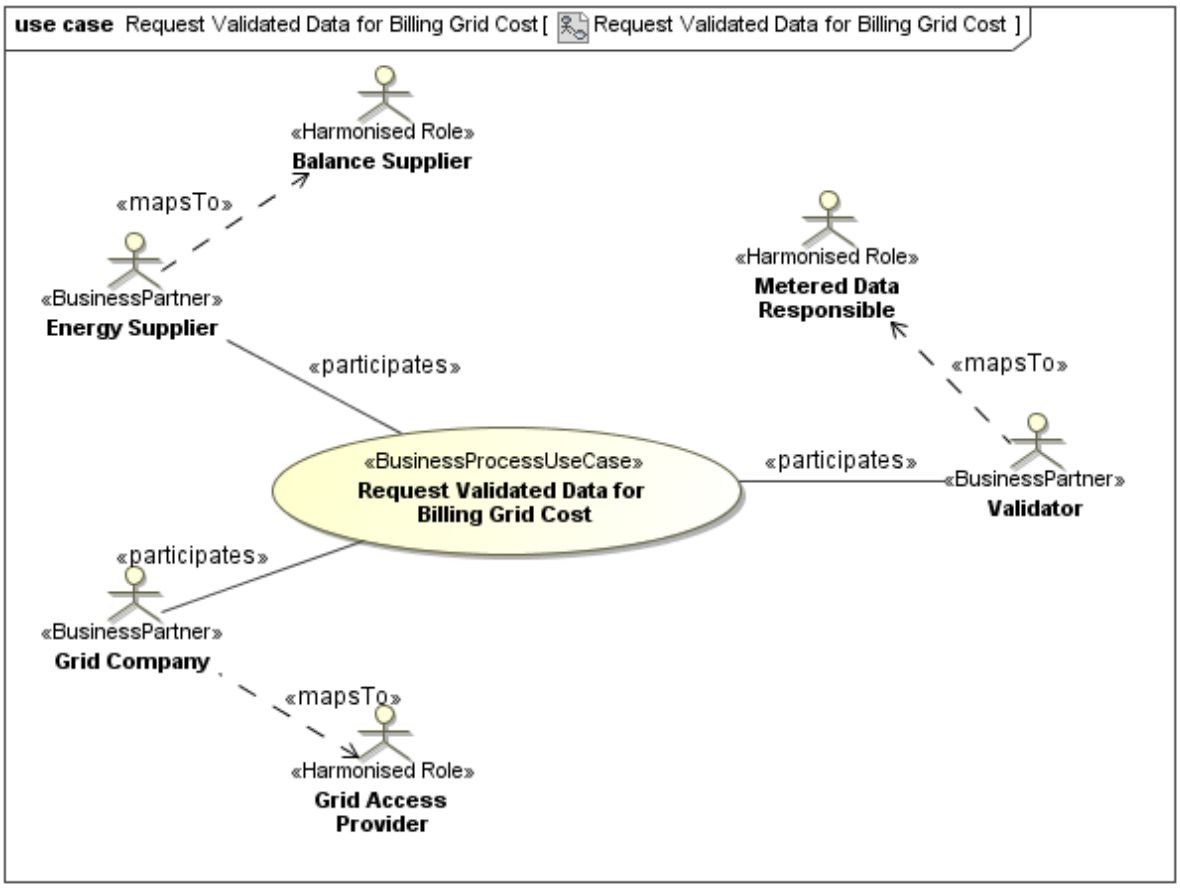

Figure 7 Request Validated Data for Billing Grid Cost

1.1.6.1. Description

UseCase description: Request Validated Data for Billing Grid Cost	
definition	Energy Supplier or Grid Company requests Validated Data from the Validator. The request may contain proposed validated metered data. *Remark: The validated data may also be exchanged directly with the Customer. By lack of (national) rules, this is not modeled.* *Remark: Request for Validated Data for Billing Grid Cost as sent by the Energy Supplier is possible in Austria, Germany and Switzerland.* *Remark: The implementation of a process for requesting and/or proposing validated data (and the conditions under which it works) is up to national decision.*
beginsWhen	Energy Supplier or Grid Company decides to.
preCondition	Relation between Energy Supplier or Grid Company and Validator .

endsWhen	The reception of the validated data has been acknowledged by the Energy Supplier or Grid Company.
postCondition	Validated Data are available for the Energy Supplier or Grid Company.
exceptions	None
actions	*See 1.1.6.2* and 1.1.6.3

1.1.6.2. Business Process

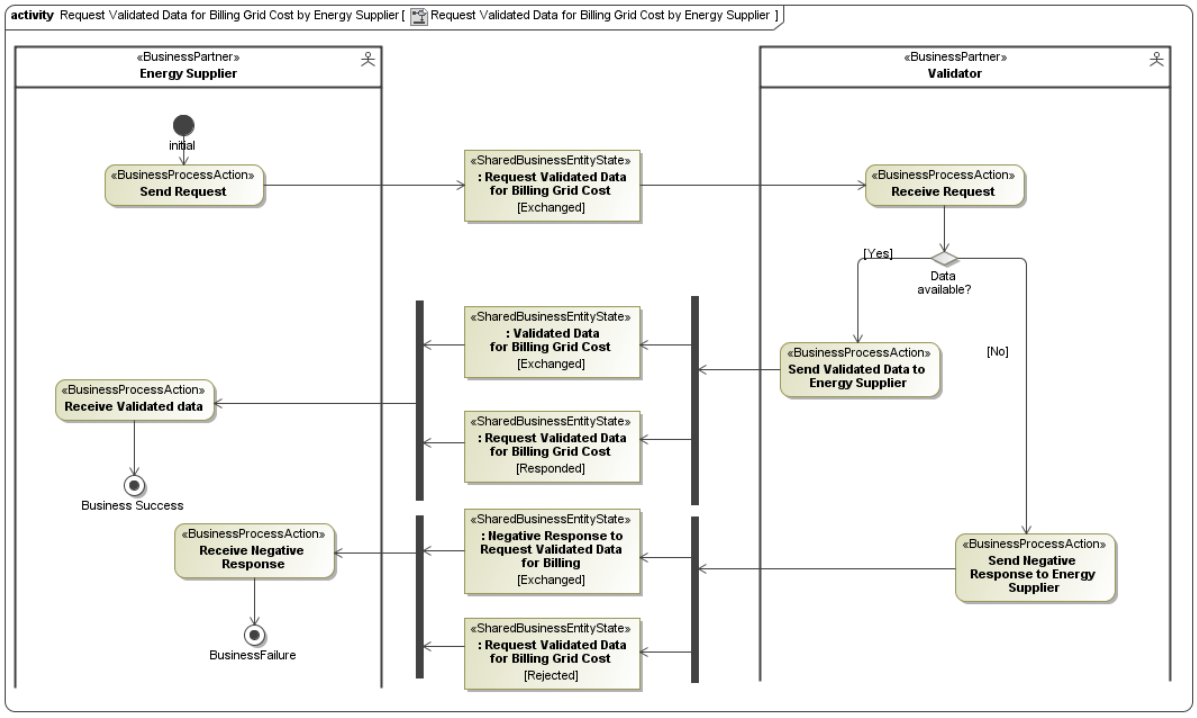

Figure 8 BP Request Validated Data for Billing Grid Cost by Energy Supplier

1.1.6.3. Business Process

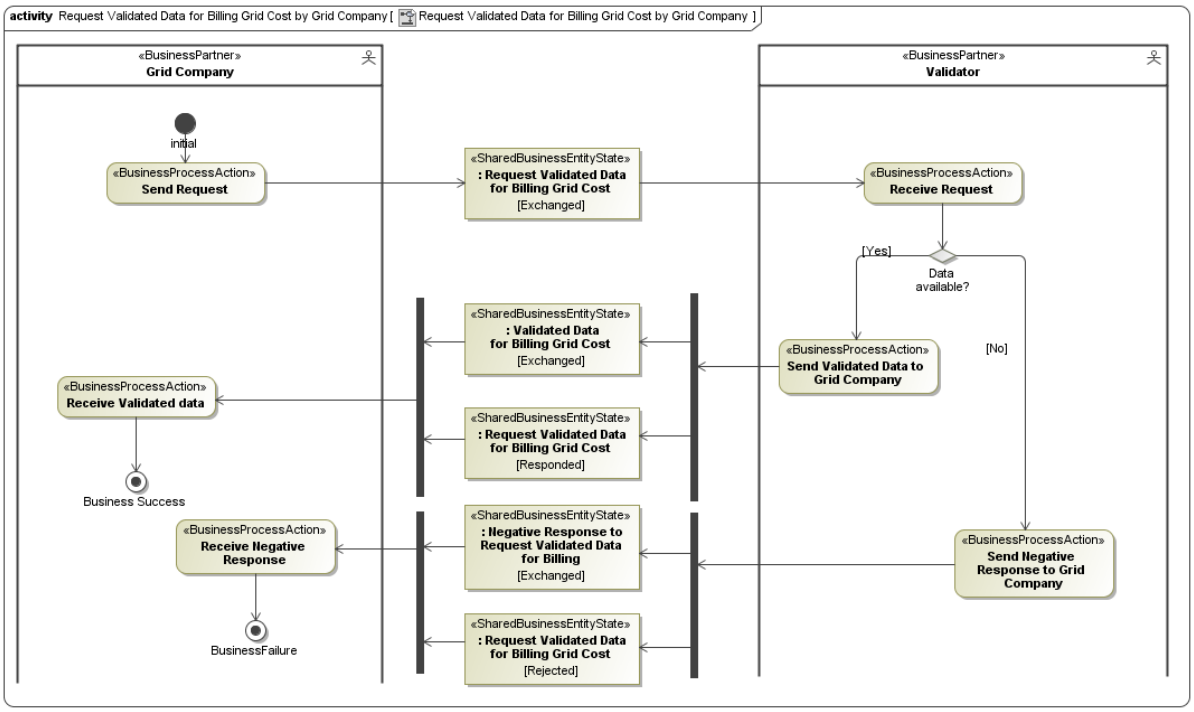

Figure 9 BP Request Validated Data for Billing Grid Cost by Grid Company

1.2. Business Partner View

1.2.1. Business Partners for Measure for Billing

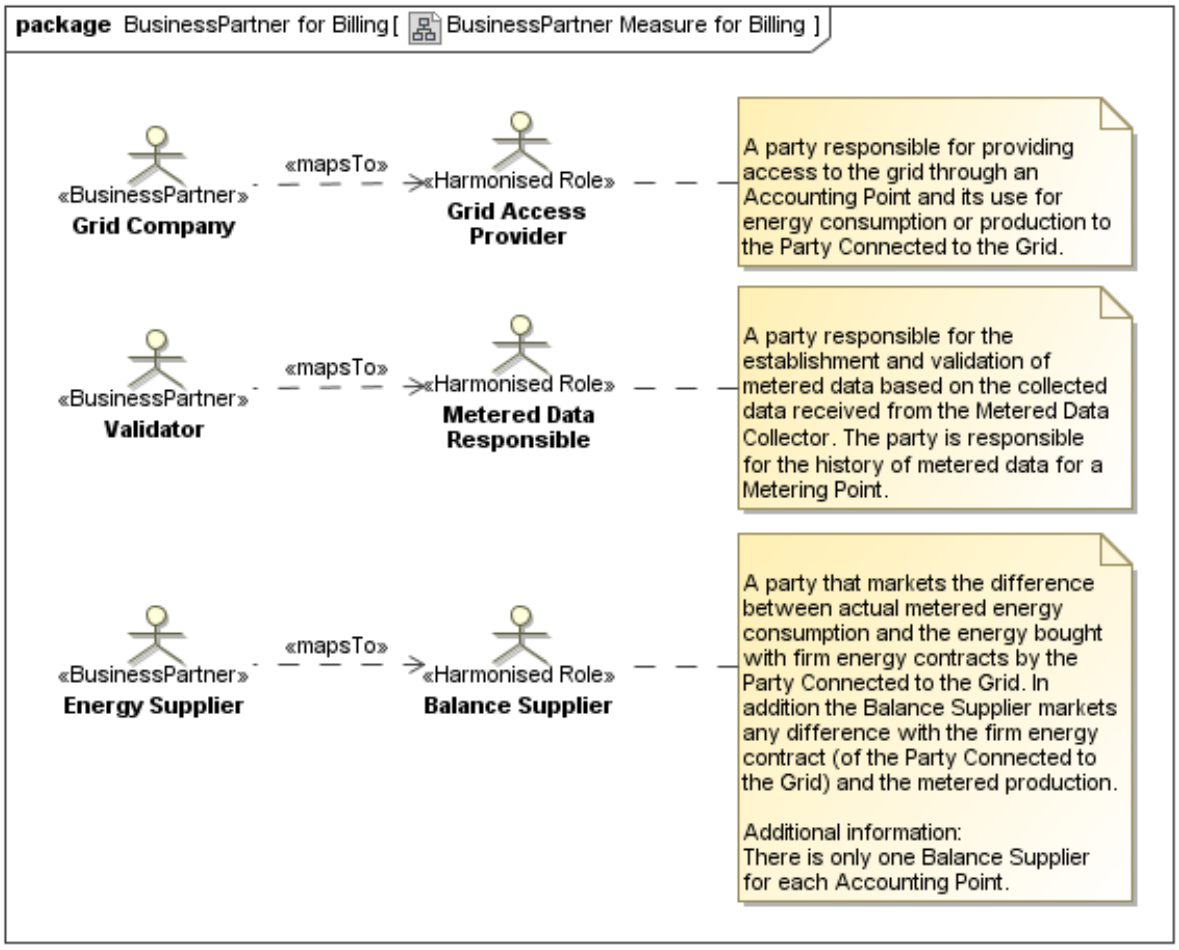

Figure 10 Business Partners for Measure for Billing

1.3. Business Entity View

In the business entity view the principles as described in the Introduction to ebIX® Business Requirements and Business Information Models (www.ebix.org) [4] are used. See paragraph 1.2.1.1.3 of that document.

1.3.1. Validated Data for Billing Energy (Class Diagram)

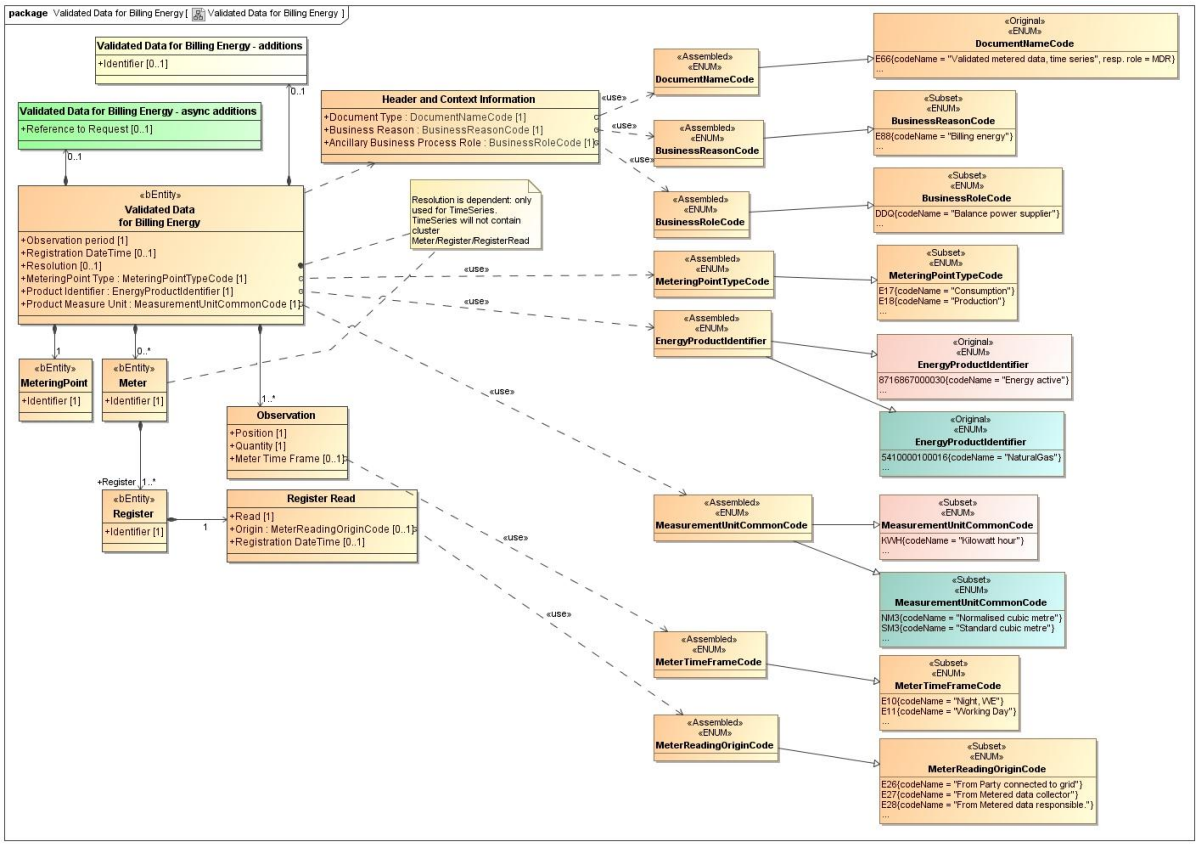

Figure 11 Validated Data for Billing Energy

Remarks:

- *This specification may be used in case of billing energy based on detail period pricing (as for instance in case of pricing based on exchange prices). But it may also be used for periodic volumes derived from meter reading (e.g. periodic billing household customer).*
- *Validated Data for Billing Energy: the registration date/time reflects the moment of registration of the time series into the database of the Metered Data Responsible after validation; this information can be used for "versioning" the metered data.*
- *Register Read: the registration date/time reflects the moment of registration of the register reading as added to this by the Metered Data Collector or as defined by national rules; this information is used as a timestamp for data collection.*
- *In some countries the supplier may also charge for power (i.e. Estonia). When this proves to be the case in several countries, these products will be added to the list of products measured.*

Element definitions, Validated Data for Billing Energy	
«Business entity» Validated Data for Billing Energy	The information set sent by a Validator responsible for the validation of measured data for a Metering Point in order to enable the billing of energy for this Metering Point.
Observation Period	A specific period of time describing the duration of this set of validated data.
Registration Date/Time	The date time of the validation (and storage in the database) of this set of validated data.
Resolution	The resolution of this set of validated data expressed as a duration between the start and end of subsequent observations within this set of validated data. Resolution is dependent: only used when validated data is exchanged as timeseries.
MeteringPoint Type	A code specifying the direction of the active energy flow in this Metering Point, such as consumption, production or combined.
Product Identifier	A code specifying the energy product for the quantity in this time series.
Product Measure Unit	The unit of measure used for the quantity in this time series/set of measured data.
«Business entity» Metering Point	An entity where energy products are measured or computed.
Identifier	The unique identification of the Metering Point to which the validated data are attributed.
«Business entity» Meter	A physical device containing one or more registers. Meter (and subsequently Register and Register Read) is dependent: not used when validated data is exchanged as timeseries.
Identifier	The unique identification of the Meter that contains the register that has been read.
«Business entity» Register	A physical or logical counter measuring energy products.
Identifier	The unique identification of the Register that has been read.
Register Read	A read from the register and its characteristics. This read is at the basis of the validated data in Observation.
Read	The character string as read from the register for this observation.
Origin	A code specifying the origin of this meter read
Registration DateTime	The timestamp for the meter read (e.g. by the customer) at the basis of these measured data.

Observation	One validated value. This value may be a part of a set of validated data.
Position	The ordinal position of this observation in this set of validated data.
Quantity	The validated quantity of energy for this observation.
Meter Time Frame	A code specifying the Meter Time Frame for the quantity in question.
Validated Data for Billing Energy - additions	Additional information, related to Validated Data for Billing Energy, the use of which may be agreed on a national level. This is however not used when specifying the payload in the ebIX® model.
Identifier	The unique identification of this set of information as given by the Validator.
Validated Data for Billing Energy - async additions	Additional information, related to Validated Data for Billing Energy, needed when using asynchronous communication. This is however not used when specifying the payload in the ebIX® model, but is used when specifying the document in the ebIX® model.
Reference to Request	Information about the request for this set of validated data which uniquely identifies it.
Header and Context Information	The set of information specifying the information to be added to this payload "Validated Data for Billing Energy" 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 role taking part in this exchange together with the role responsible for the process/this exchange.

1.3.1.1. Validated Data for Billing Energy (State Diagram)

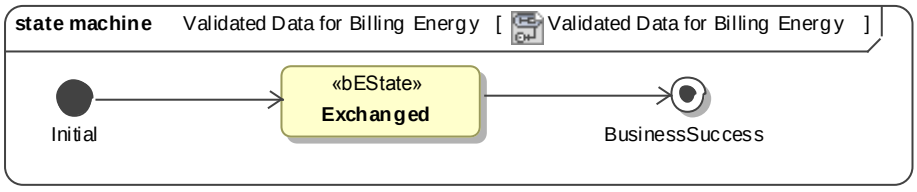

Figure 12 SD Validated Data for Billing Energy

1.3.2. Validated Data for Billing Grid Cost (Class Diagram)

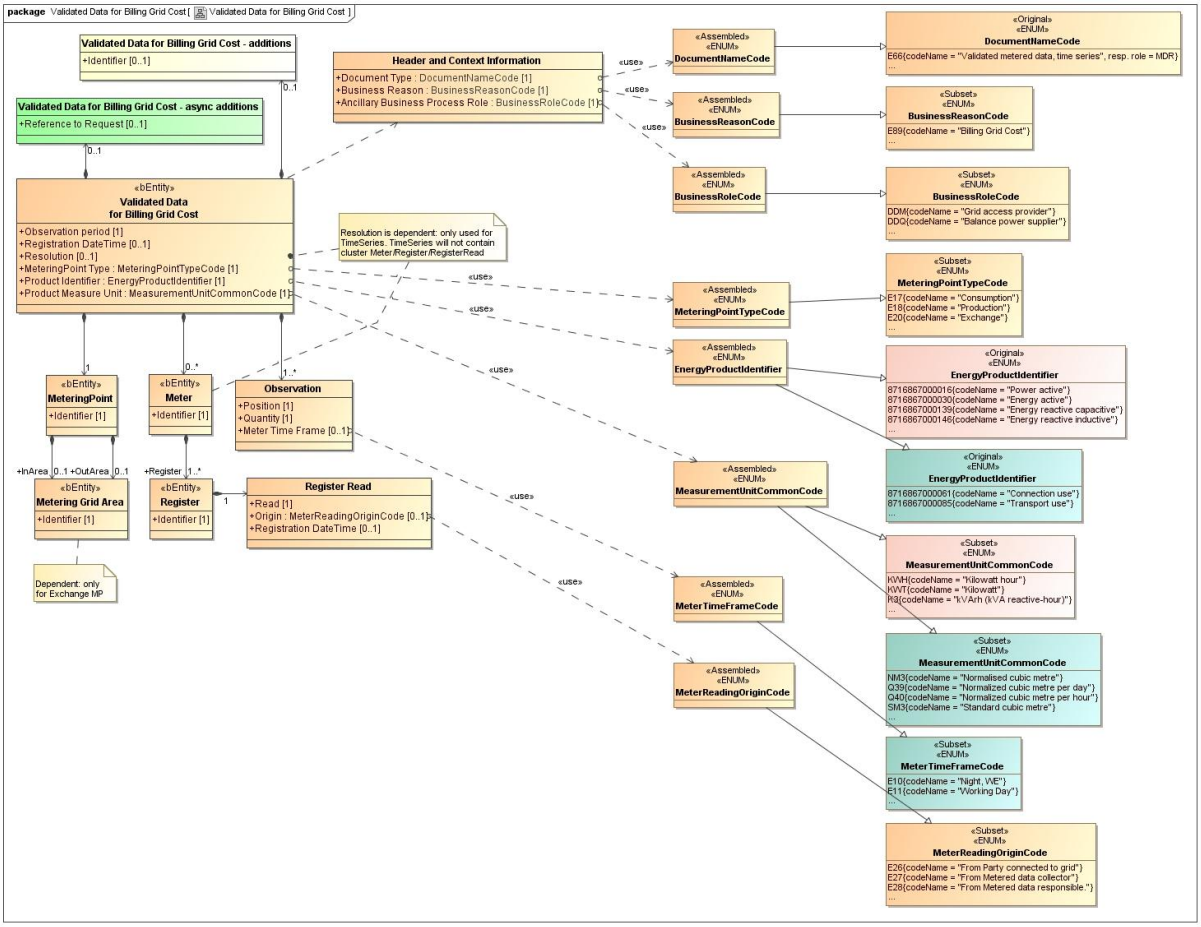

Figure 13 Validated Data for Billing Grid Cost

Element definitions, Validated Data for Billing Grid Cost	
«Business entity» Validated Data for Billing Grid Cost	The information set sent by a Validator responsible for the validation of measured data for a Metering Point in order to enable the billing of grid cost for this Metering Point.
Observation Period	A specific period of time describing the duration of this set of validated data.
Registration Date/Time	The date time of the validation (and storage in the database) of this set of validated data.
Resolution	The resolution of this set of validated data expressed as a duration between the start and end of subsequent observations within this set of validated data. Resolution is dependent: only used when validated data is exchanged as timeseries.
MeteringPoint Type	A code specifying the direction of the active energy flow in this Metering Point, such as consumption, production or combined.

Product Identifier	A code specifying the energy product for the quantity in this time series.
Product Measure Unit	The unit of measure used for the quantity in this time series/set of measured data.
«Business entity» Metering Point	An entity where energy products are measured or computed.
Identifier	The unique identification of the Metering Point to which the validated data are attributed.
«Business entity» Metering Grid Area, In Area	A physical area where consumption, production and exchange can be metered and from which energy flows towards the Metering Point. Metering Grid Area, In Area is dependent: only used when MeteringPoint Type is Exchange.
Identifier	The unique identification of this Metering Grid Area.
«Business entity» Metering Grid Area, Out Area	A physical area where consumption, production and exchange can be metered and to which energy flows from the Metering Point. Metering Grid Area, Out Area is dependent: only used when MeteringPoint Type is Exchange.
Identifier	The unique identification of this Metering Grid Area.
«Business entity» Meter	A physical device containing one or more registers. Meter (and subsequently Register and Register Read) is dependent: not used when validated data is exchanged as timeseries.
Identifier	The unique identification of the Meter that contains the register that has been read.
«Business entity» Register	A physical or logical counter measuring energy products.
Identifier	The unique identification of the Register that has been read.
Register Read	A read from the register and its characteristics. This read is at the basis of the validated data in Observation.
Read	The character string as read from the register for this observation.
Origin	A code specifying the origin of this meter read
Registration DateTime	The timestamp for the meter read (e.g. by the customer) at the basis of these measured data.
Observation	One validated value. This value may be a part of a set of validated data.
Position	The ordinal position of this observation in this set of validated data.

Quantity	The validated quantity of energy for this observation.
Meter Time Frame	A code specifying the Meter Time Frame for the quantity in question. *Not used in gas sector*
Validated Data for Billing Grid Cost - additions	Additional information, related to Validated Data for Billing Grid Cost, the use of which may be agreed on a national level. This is however not used when specifying the payload in the ebIX® model.
Identifier	The unique identification of this set of information as given by the Validator.
Validated Data for Billing Grid Cost - async additions	Additional information, related to Validated Data for Billing Grid Cost, needed when using asynchronous communication. This is however not used when specifying the payload in the ebIX® model, but is used when specifying the document in the ebIX® model.
Reference to Request	Information about the request for this set of validated data which uniquely identifies it.
Header and Context Information	The set of information specifying the information to be added to this payload "Validated Data for Billing Grid Cost" 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 role taking part in this exchange together with the role responsible for the process/this exchange.

1.3.2.1. Validated Data for Billing Grid Cost (State Diagram)

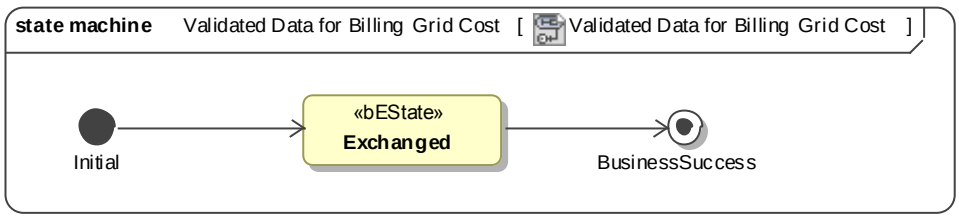

Figure 14 SD Validated Data for Billing Grid Cost

1.3.3. Request Validated Data for Billing Energy (Class Diagram)

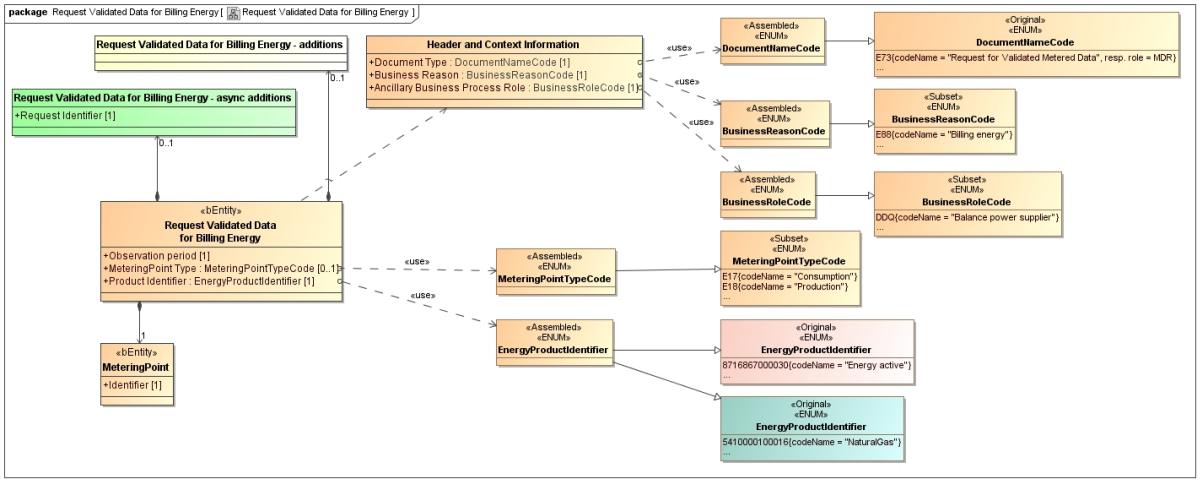

Figure 15 Request Validated Data for Billing Energy

Element definitions, Request Validated Data for Billing Energy	
«Business entity» Request Validated Data for Billing Energy	The information set to be sent by the Energy Supplier responsible for the supply at the Metering Point when requesting validated measured data.
Observation Period	A specific period of time describing the duration of the requested set of validated data.
MeteringPoint Type	A code specifying the direction of the active energy flow in this Metering Point, such as consumption, production or combined.
Product Identifier	A code specifying the energy product for the quantity in this time series.
«Business entity» Metering Point	An entity where energy products are measured or computed.
Identifier	The unique identification of the Metering Point to which the validated data are attributed.
Request Validated Data for Billing Energy Additions	Additional information, related to Request Validated Data for Billing Energy the use of which may be agreed on a national level. This is however not used when specifying the payload in the ebIX® model.
none	
Request Validated Data for Billing Energy Async Additions	Additional information, related to Request Validated Data for Billing Energy, needed when using asynchronous communication. This is however not used when specifying the payload in the ebIX® model, but is used when specifying the document in the ebIX® model.
Request Identifier	The unique identification of this request as given by the Energy Supplier.

Header and Context Information	The set of information specifying the information to be added to this payload “Request Validated Data for Billing Energy” 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 role taking part in this exchange together with the role responsible for the process/this exchange.

1.3.3.1. Request Validated Data for Billing Energy (State Diagram)

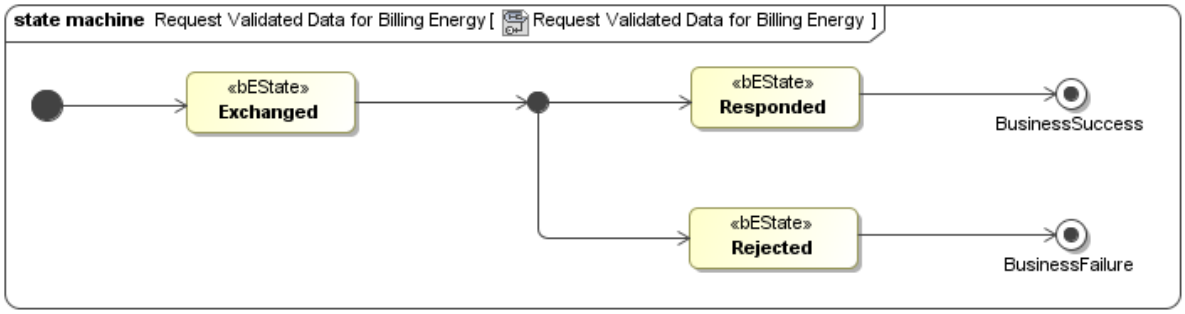

Figure 16 SD Request Validated Data for Billing Energy

1.3.4. Request Validated Data for Billing Grid Cost (Class Diagram)

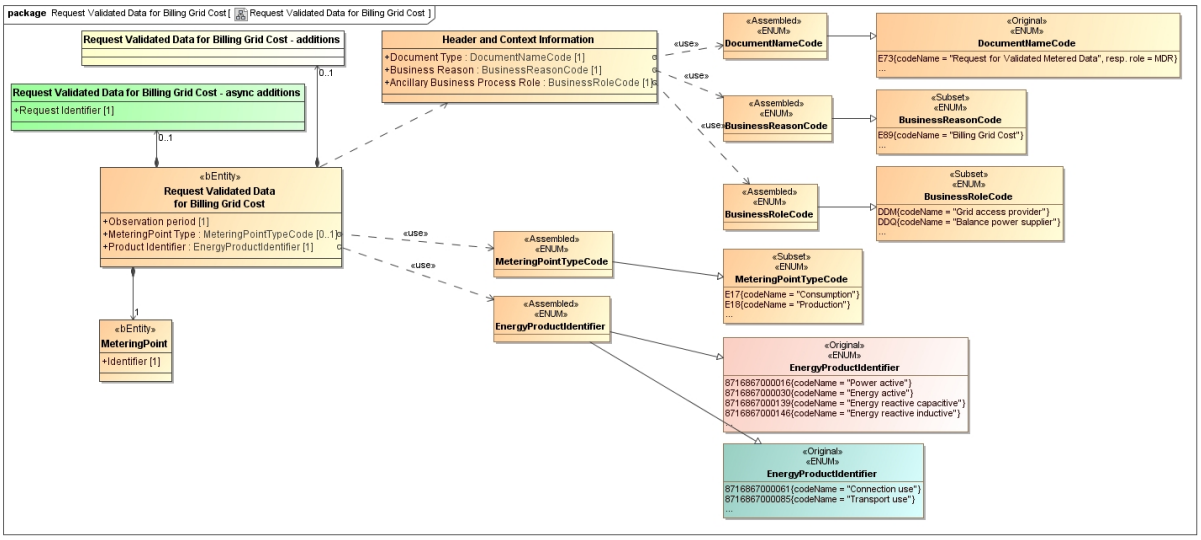

Figure 17 Request Validated Data for Billing Grid Cost

Element definitions, Request Validated Data for Billing Grid Cost	
«Business entity» Request Validated Data for Billing Grid Cost	The information set to be sent by the Energy Supplier responsible for the supply at the Metering Point when requesting validated measured data.

Observation Period	A specific period of time describing the duration of the requested set of validated data.
MeteringPoint Type	A code specifying the direction of the active energy flow in this Metering Point, such as consumption, production or combined.
Product Identifier	A code specifying the energy product for the quantity in this time series.
«Business entity» Metering Point	An entity where energy products are measured or computed.
Identifier	The unique identification of the Metering Point to which the validated data are attributed.
Request Validated Data for Billing Grid Cost Additions	Additional information, related to Request Validated Data for Billing Grid Cost the use of which may be agreed on a national level. This is however not used when specifying the payload in the ebIX® model.
none	
Request Validated Data for Billing Grid Cost Async Additions	Additional information, related to Request Validated Data for Billing Grid Cost, needed when using asynchronous communication. This is however not used when specifying the payload in the ebIX® model, but is used when specifying the document in the ebIX® model.
Request Identifier	The unique identification of this request as given by the Energy Supplier.
Header and Context Information	The set of information specifying the information to be added to this payload “Request Validated Data for Billing Grid Cost” 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 role taking part in this exchange together with the role responsible for the process/this exchange.

1.3.4.1. Request Validated Data for Billing Grid Cost (State Diagram)

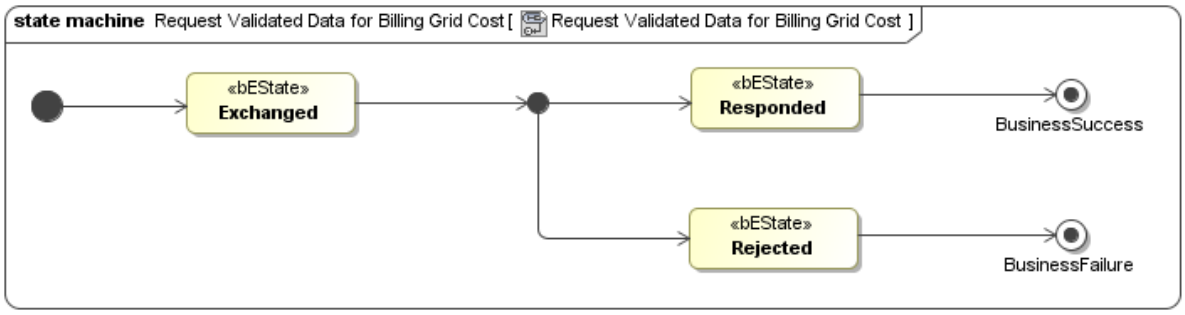

Figure 18 SD Request Validated Data for Billing Grid Cost

1.3.5. Negative Response to Request Validated Data for Billing (Class Diagram)

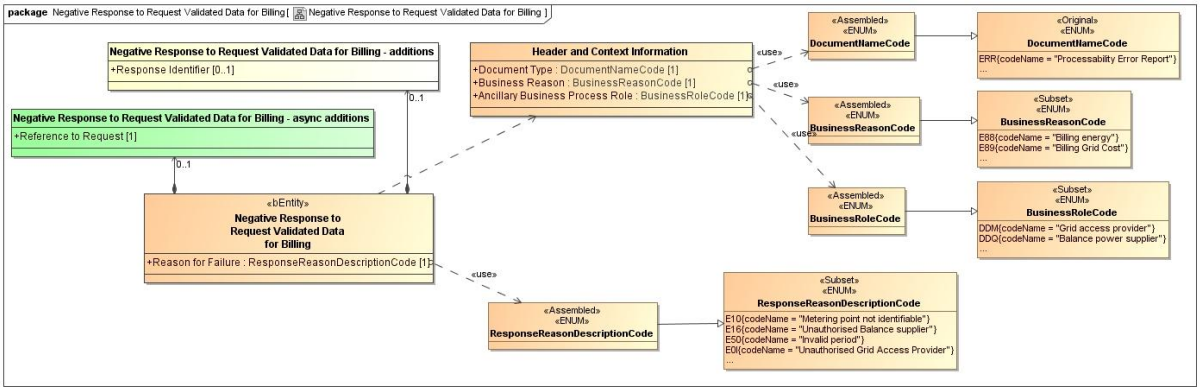

Figure 19 Negative Response to Request Validated Data for Billing

Element definitions, Negative Response to Request Validated Data for Billing	
«Business entity» Negative Response to Request Validated Data for Billing	The information set to be sent by the Energy Supplier responsible for the supply at the Metering Point when requesting validated measured data.
Reason for Failure	A code specifying the reason for the rejection of the Requested Validated Data for Billing.
Negative Response to Request Validated Data for Billing Cost Additions	Additional information, related to Request Validated Data for Billing Grid Cost the use of which may be agreed on a national level. This is however not used when specifying the payload in the ebIX® model.
Response Identifier	The unique identification of this negative response.
Negative Response to Request Validated Data for Billing Async Additions	Additional information, related to Request Validated Data for Billing Grid Cost, needed when using asynchronous communication. This is however not used when specifying the payload in the ebIX® model, but is used when specifying the document in the ebIX® model.

Reference to Request	The unique identification of the rejected request as given by the Energy Supplier, Customer or Grid Company when acting as the requesting business partner.
Header and Context Information	The set of information specifying the information to be added to this payload “Negative Response to Request Validated Data for Billing” 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 role taking part in this exchange together with the role responsible for the process/this exchange.

1.3.5.1. Negative Response to Request Validated Data for Billing (State Diagram)

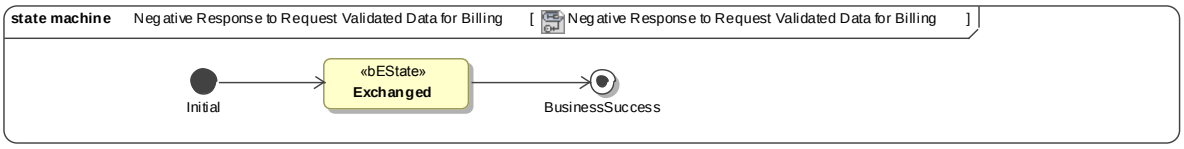

Figure 20 SD Negative Response to Request Validated Data for Billing