Collect energy data

Based on IEC 62559-2 edition 1
Generated from UML Use Case Repository with Modsarus® (EDF R&D Tool)

1. Description of the use case

1. Name of use case

Use case identification		
ID	**Area(s)/Domain(s)/Zone(s)**	**Name of use case**
	Access to data,Market for flexibilities,Operational planning and forecasting,Services related to end customers,Balance management	Collect energy data

2. Version management

Version No.	Date	Name of author(s)	Changes	Approval status
1	2018-04-12	Kalle Kukk (Elering)		
2	2018-07-07	Ricardo Jover (EDF), Eric Suignard (EDF)		
3	2018-07-19	Ricardo Jover (EDF), Eric Suignard (EDF)	"Collect public market data" and "Collect individual market data" scenarios merged into a "Collect market data" scenario, No DEP involved anymore.	
4	2018-08-02	Eric Suignard (EDF)		
5	2018-09-21	Eric Suignard (EDF), Ricardo Jover (EDF)	Remarks from Innogy and Elering.	
6	2018-10-04	Eric Suignard (EDF)	Version post WP5&9 physical meeting in Tallinn	
7	2018-10-17	Eric Suignard (EDF)	Version reviewed by WP5&9 partners	
8	2018-10-30	Eric Suignard (EDF)	Description of Grid data	
9	2019-05-07	Eric Suignard (EDF)	WP6-7-8 demos alignment and miscellaneous changes	
10	2020-06-16	Eric Suignard (EDF)	innogy's and Elering's review	

3. Scope and objectives of use case

Scope and objectives of use case	
Scope	Collection of different types of energy related data from data providers to data hubs
Objective(s)	Collection of data which can be shared.
Related business case(s)	

4. Narrative of Use Case

Narrative of use case
Short description
Collection of different types of meter, market and grid data to be made available through a data exchange platform to interested parties. Users of data exchange platform can receive data directly from data provider (data source) or from a data hub which collects (and stores) data. This use case focuses on data necessary for flexibility trading. See separate use case description for sub-meter data (because the involved systems are different).

Complete description

Summary of use case

- Collect data from certified meters
  Description: Metered Data Operators can collect data from electricity meters at transmission or distribution levels and store them in the Data Hub.

  - Send data collection's request
    Description:

  - Receive request and authenticate user
    Description:

  - Send meter data
    Description:

  - Transmit meter data
    Description:

  - Store meter data
    Description:

- Collect market data
  Description: A Market Operator collects individual data from FSPs. Individual data can be flexibility bids or schedules.
  Market Operator can also generate some market data itself (either public or with restricted access) and store them in the Market Data Hub. Market data can be used for balancing and congestion management.

  - Send market data
    Description:

  - Collect market data
    Description: A Market Operator collects with its Flexibility Platform individual data from FSPs (i.e. bids and schedules).

  - Generate market data
    Description: A Market Operator generates public market data (i.e. flexibility prices and volumes).

  - Store generated market data
    Description: Store generated data in a Market Data Hub.

- Collect grid data
  Description: A System Operator collects and generates, in the Grid Data Hub, grid data related to its grid.
  Grid data can be power grid descriptions or power grid congestion data used for balancing and congestion management.

  - Collect grid data
    Description:

  - Generate grid data
    Description:

  - Store grid data
    Description:

5. Key performance indicators (KPI)
6. Use case conditions

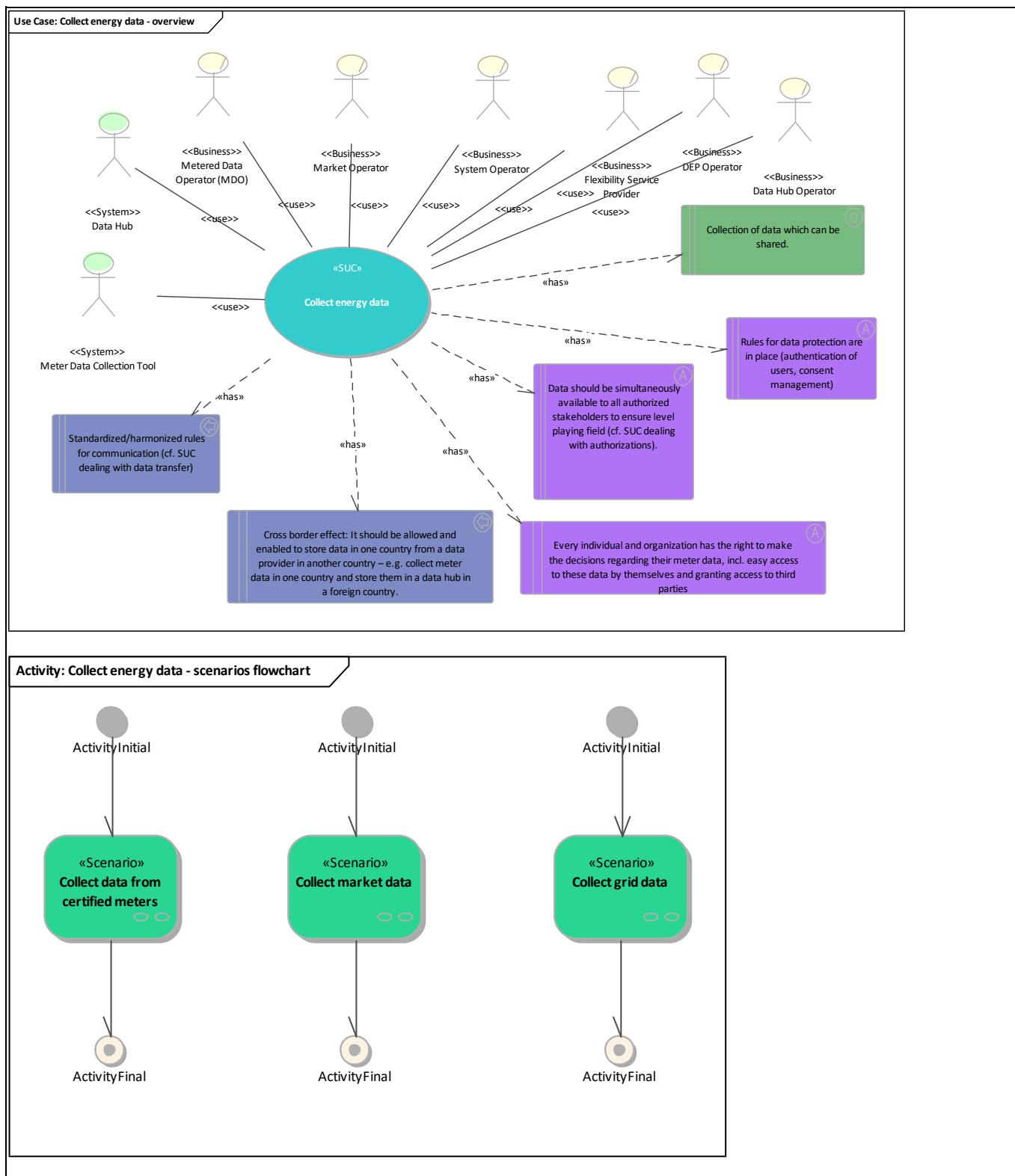| Use case conditions |
|---|
| **Assumptions** |
| 1 Data should be simultaneously available to all authorized stakeholders to ensure level playing field (cf. SUC dealing with authorizations). |
| 2 Every individual and organization has the right to make the decisions regarding their meter data, incl. easy access to these data by themselves and granting access to third parties: Granting access can be representation rights for users (cf. "Authentication" SUC) or authorizations for applications (cf. "Authorization" SUC). |
| 3 Rules for data protection are in place (authentication of users, consent management) |
| **Prerequisites** |
| 1 Cross border effect: It should be allowed and enabled to store data in one country from a data provider in another country – e.g. collect meter data in one country and store them in a data hub in a foreign country. |
| 2 Standardized/harmonized rules for communication (cf. SUC dealing with data transfer) |

7. Further information to the use case for classification/mapping

Classification information
Relation to other use cases
Level of depth
Prioritisation
Generic, regional or national relation
Nature of the use case
SUC
Further keywords for classification

8. General remarks

2. Diagrams of use case

Diagram(s) of use case

Use Case: Collect energy data - overview

<<System>>
Data Hub

<<Business>>
Metered Data
Operator (MDO)

<<Business>>
Market Operator

<<Business>>
System Operator

<<Business>>
Flexibility Service
Provider

<<Business>>
DEP Operator

<<Business>>
Data Hub Operator

<<use>>

<<use>>

<<use>>

<<use>>

<<use>>

<<use>>

«SUC»
Collect energy data

<<System>>
Meter Data Collection Tool

<<use>>

Collection of data which can be shared.

«has»

Rules for data protection are in place (authentication of users, consent management)

«has»

«has»

Data should be simultaneously available to all authorized stakeholders to ensure level playing field (cf. SUC dealing with authorizations).

«has»

Standardized/harmonized rules for communication (cf. SUC dealing with data transfer)

«has»

«has»

Cross border effect: It should be allowed and enabled to store data in one country from a data provider in another country – e.g. collect meter data in one country and store them in a data hub in a foreign country.

Every individual and organization has the right to make the decisions regarding their meter data, incl. easy access to these data by themselves and granting access to third parties

Activity: Collect energy data - scenarios flowchart

Activity Initial

Activity Initial

Activity Initial

«Scenario»
Collect data from certified meters

«Scenario»
Collect market data

«Scenario»
Collect grid data

Activity Final

Activity Final

Activity Final

3. Technical details

1. Actors

Actors

Grouping (e.g. domains, zones)		Group description	
Actor name	Actor type	Actor description	Further information specific to this use case
Data Hub	System	Data Hub is an information system which main functionality is to store and make available measurements (e.g. meter data, operational data) and associated master data. Data Hubs are not necessarily centralized in a country or in a region.	
Metered Data Operator (MDO)	Business	Provide metered data to authorized users in a transparent and non-discriminatory manner	
Meter Data Collection Tool	System	Meter Data Collection Tool is an information system which main functionality is to collect meter readings from electricity meters.	
System Operator	Business	System Operator means a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the distribution or transmission of electricity (cf. ENTSOE-EFET-ebIX harmonized role model 2019). Can be: • A Transmission System Operator (cf. definition in T3.3 deliverable), for frequency control, congestion management and voltage control on transmission network, • A Distribution System Operator (cf. definition in T3.3 deliverable), for congestion management and voltage control on distribution network. NB: In some countries (e.g. Germany and Poland), the high voltage network is part of the distribution grid and in other countries (e. g. France and Italy) the high voltage network is part of the transmission grid. A System Operator can be: • A Primary System Operator, • A Secondary System Operator.	
Market Operator	Business	A market operator is a party that provides a service whereby the offers to sell electricity are matched with bids to buy electricity (cf. ENTSOE-EFET-ebIX harmonized role model 2019). In EU-SysFlex project, a market operator not only trades electricity but also flexibility services. Organize auctions (continuous auctions, discrete auctions, calls for tender) between buyers and sellers of electricity-related products in the markets, and more generally publish the corresponding prices, for assets connected to power grid. Manage/operate the platform for trading (where bids and offers are collected). Clear the market and communicate results. (cf. definition in T3.3 deliverable)	

Flexibility Service Provider	Business	Can be a Distribution Network Flexibility Provider or a Transmission Network Flexibility Provider (cf. definitions in T3.3 deliverable). Similar to Flexibility Aggregator. Can be both aggregator and individual consumer/generator. Type of Energy Service Provider.	
Data Hub Operator	Business	Data hub operator owns and operates an information system which main functionality is to store and make available electricity (also gas, heat) metering data and associated master data. Can be : • Grid Data Hub Operator in the sphere of a System Operator • Market Data Hub Operator in the sphere of a Market Operator • Meter Data Hub Operator in the sphere of a Metered Data Operator • Sub-meter Data Hub Operator in the sphere of an Energy Service Provider	
DEP Operator	Business	Data exchange platform operator owns and operates a communication system which basic functionality is data transfer.	

2. References

4. Step by step analysis of use case

1. Overview of scenarios

| Scenario conditions						
No.	Scenario name	Scenario description	Primary actor	Triggering event	Pre-condition	Post-condition
1	Collect data from certified meters	Metered Data Operators can collect data from electricity meters at transmission or distribution levels and store them in the Data Hub.				
2	Collect market data	A Market Operator collects individual data from FSPs. Individual data can be flexibility bids or schedules. Market Operator can also generate some market data itself (either public or with restricted access) and store them in the Market Data Hub. Market data can be used for balancing and congestion management.				
3	Collect grid data	A System Operator collects and generates, in the Grid Data Hub, grid data related to its grid. Grid data can be power grid descriptions or power grid congestion data used for balancing and congestion management.				

2. Steps - Scenarios
▪ **Collect data from certified meters**

Metered Data Operators can collect data from electricity meters at transmission or distribution levels and store them in the Data Hub.

Requirement list (refer to "Requirement" section for more information)	
Requirement R-ID	**Requirement name**
Cat1.Req1	DC-REQ1.1
Cat1.Req2	DC-REQ1.2
Cat1.Req3	DC-REQ1.3

Activity: Scenario1 - activities flowchart
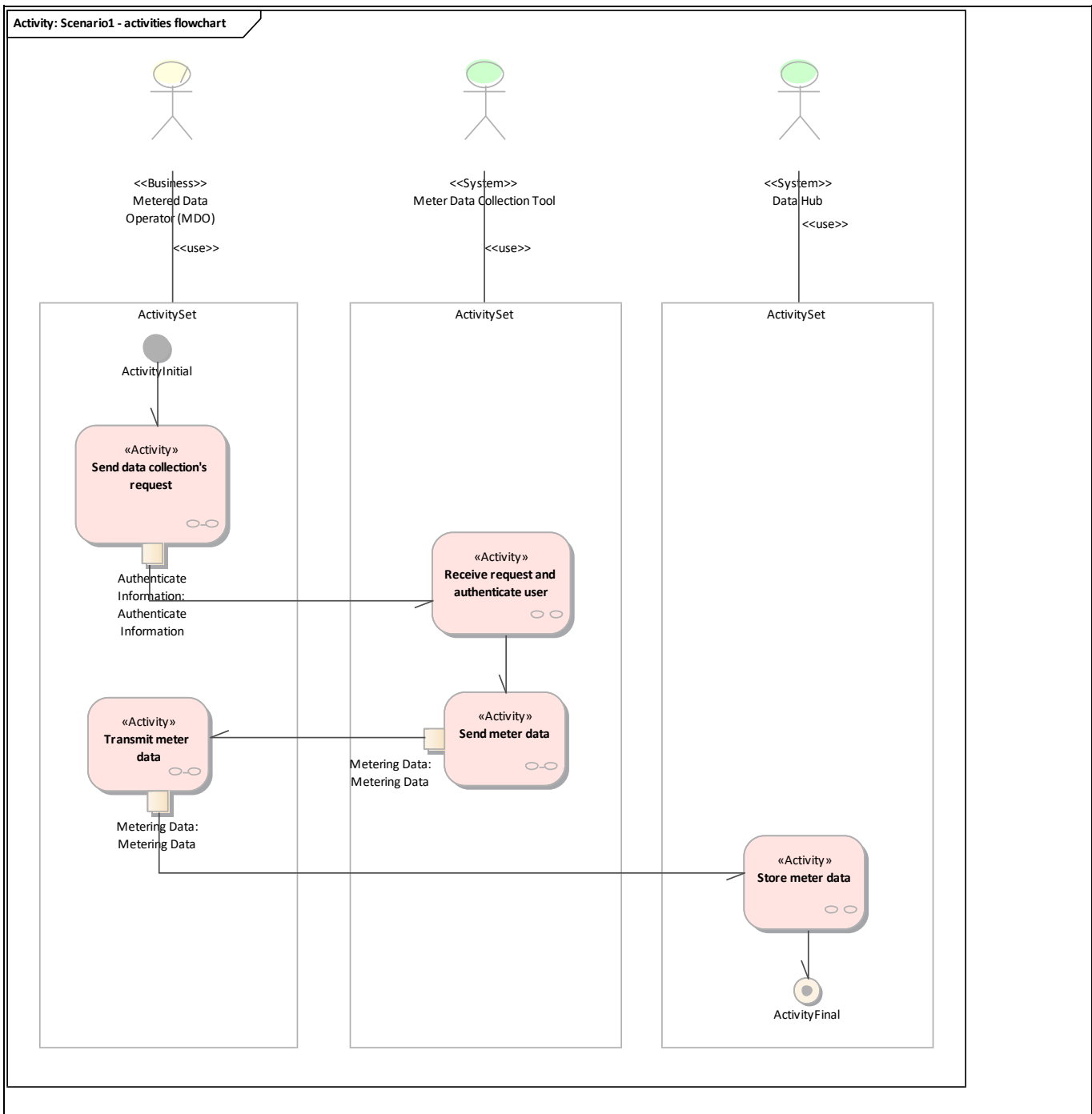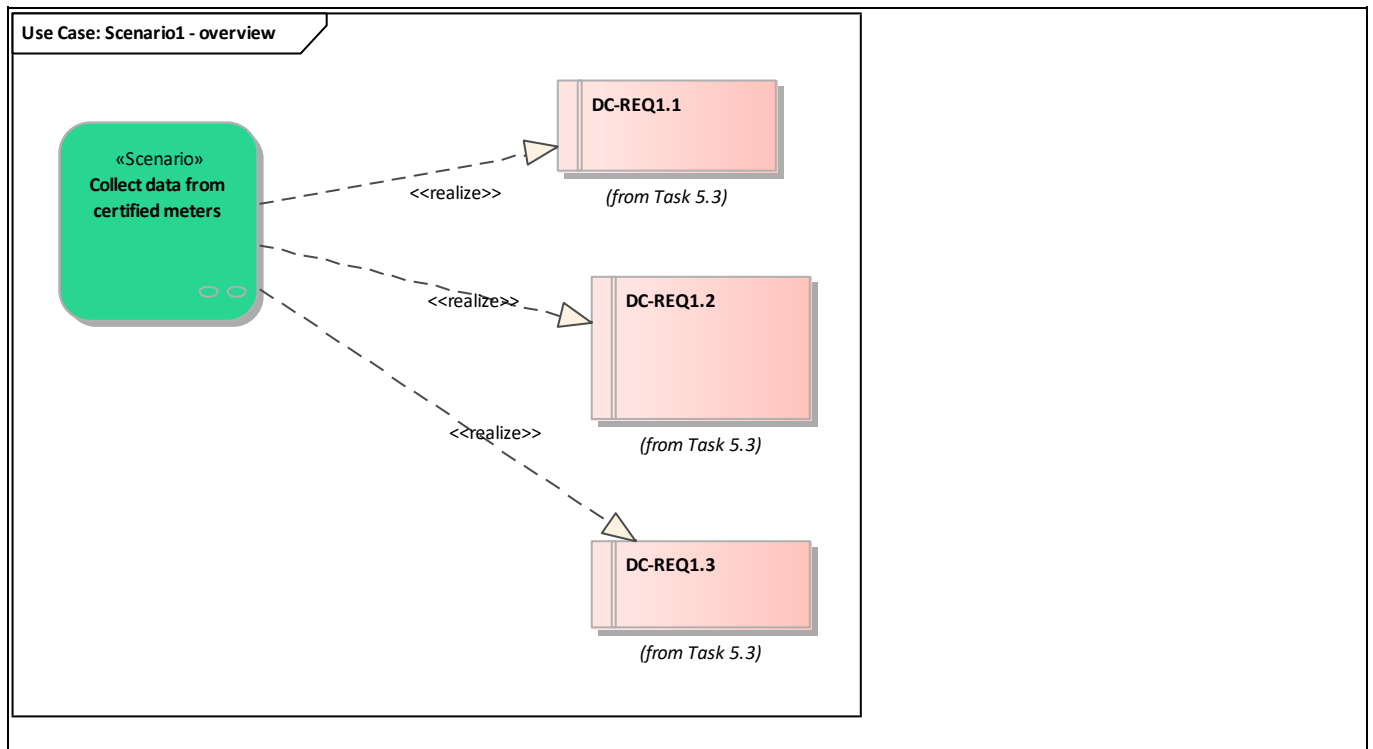
Scenario step by step analysis

Scenario								
Scenario name	Collect data from certified meters							
Step No	**Event**	**Name of process/activity**	**Description of process/activity**	**Service**	**Information producer (actor)**	**Information receiver (actor)**	**Information exchanged (IDs)**	**Requirement, R-IDs**
1.1		Send data collection's request			Metered Data Operator (MDO)	Meter Data Collection Tool	Info1-Authenticate Information	
1.2		Receive request and authenticate user			Meter Data Collection Tool			
1.3		Send meter data			Meter Data Collection Tool	Metered Data Operator (MDO)	Info2-Metering Data	
1.4		Transmit meter data			Metered Data Operator (MDO)	Data Hub	Info2-Metering Data	
1.5		Store meter data			Data Hub			

- ### 1.1. Send data collection's request

  Business section: Collect data from certified meters /Send data collection's request

  Information sent:

Business object	Instance name	Instance description
Authenticate Information	Authenticate Information	

- ## 1.3. Send meter data

  ### Business section: Collect data from certified meters /Send meter data

  Information sent:

Business object	Instance name	Instance description
Metering Data	Metering Data	

- ## 1.4. Transmit meter data

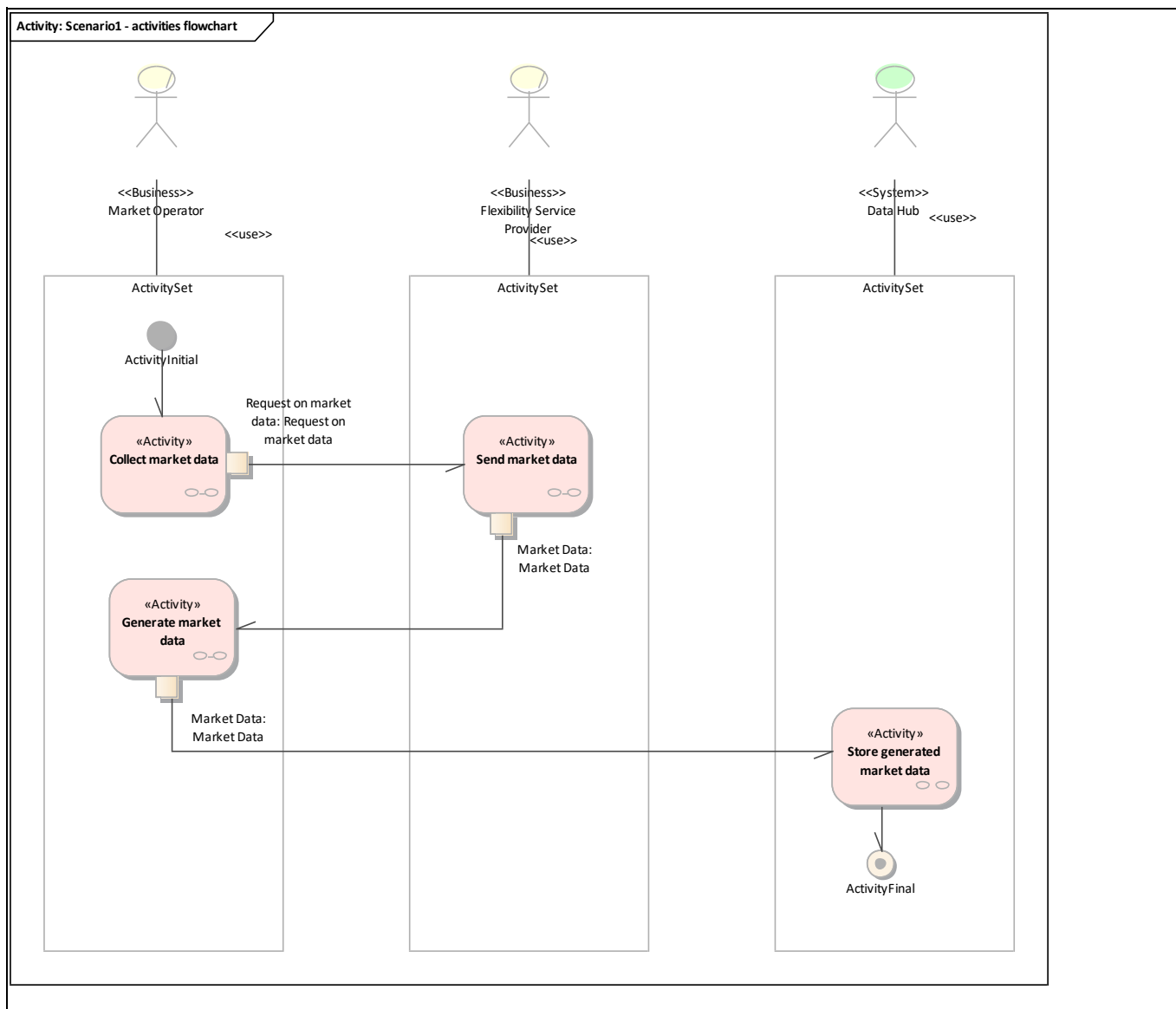 ### Business section: Collect data from certified meters /Transmit meter data
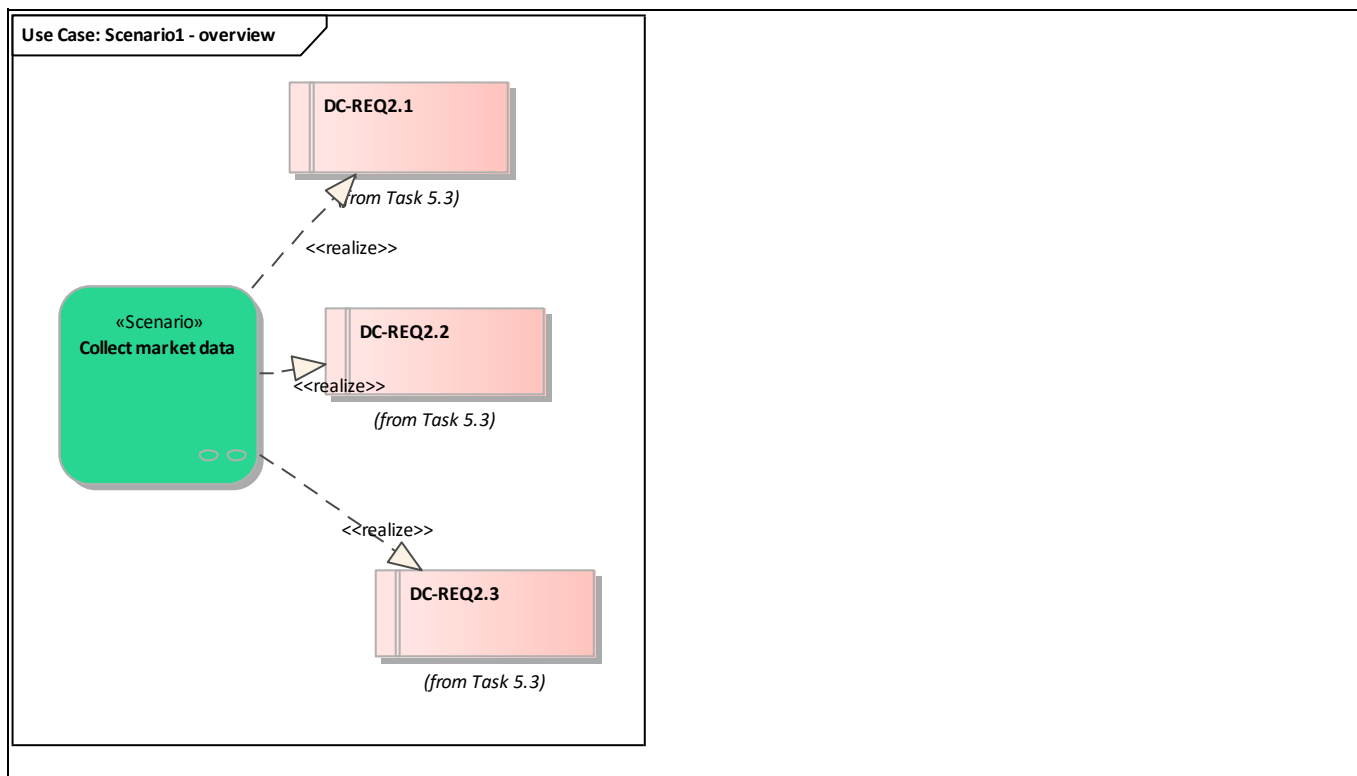
  Information sent:

Business object	Instance name	Instance description
Metering Data	Metering Data	

- ### Collect market data

A Market Operator collects individual data from FSPs. Individual data can be flexibility bids or schedules. Market Operator can also generate some market data itself (either public or with restricted access) and store them in the Market Data Hub. Market data can be used for balancing and congestion management.

Requirement list (refer to "Requirement" section for more information)	
Requirement R-ID	Requirement name
Cat1.Req4	DC-REQ2.1
Cat1.Req5	DC-REQ2.2
Cat1.Req6	DC-REQ2.3

Activity: Scenario1 - activities flowchart

<<Business>>
Market Operator

<<Business>>
Flexibility Service
Provider

<<System>>
Data Hub

<<use>>

<<use>>

<<use>>

ActivitySet

ActivitySet

ActivitySet

ActivityInitial

Request on market
data: Request on
market data

«Activity»
Collect market data

«Activity»
Send market data

Market Data:
Market Data

«Activity»
**Generate market
data**

Market Data:
Market Data

«Activity»
**Store generated
market data**

ActivityFinal

Use Case: Scenario1 - overview

Scenario step by step analysis

Scenario								
Scenario name	Collect market data							
Step No	**Event**	**Name of process/activity**	**Description of process/activity**	**Service**	**Information producer (actor)**	**Information receiver (actor)**	**Information exchanged (IDs)**	**Requirement, R-IDs**
2.1		Send market data			Flexibility Service Provider	Market Operator	Info3-Market Data	
2.2		Collect market data	A Market Operator collects with its Flexibility Platform individual data from FSPs (i.e. bids and schedules).		Market Operator	Flexibility Service Provider	Info4-Request on market data	
2.3		Generate market data	A Market Operator generates public market data (i.e. flexibility prices and volumes).		Market Operator	Data Hub	Info3-Market Data	
2.4		Store generated market data	Store generated data in a Market Data Hub.		Data Hub			

5. 2.1. Send market data

Business section: Collect market data /Send market data

Information sent:

Business object	Instance name	Instance description
Market Data	Market Data	

6. ## 2.2. Collect market data

Business section: Collect market data /Collect market data
A Market Operator collects with its Flexibility Platform individual data from FSPs (i.e. bids and schedules).
Information sent:

Business object	Instance name	Instance description
Request on market data	Request on market data	

7. ## 2.3. Generate market data

Business section: Collect market data /Generate market data
A Market Operator generates public market data (i.e. flexibility prices and volumes).
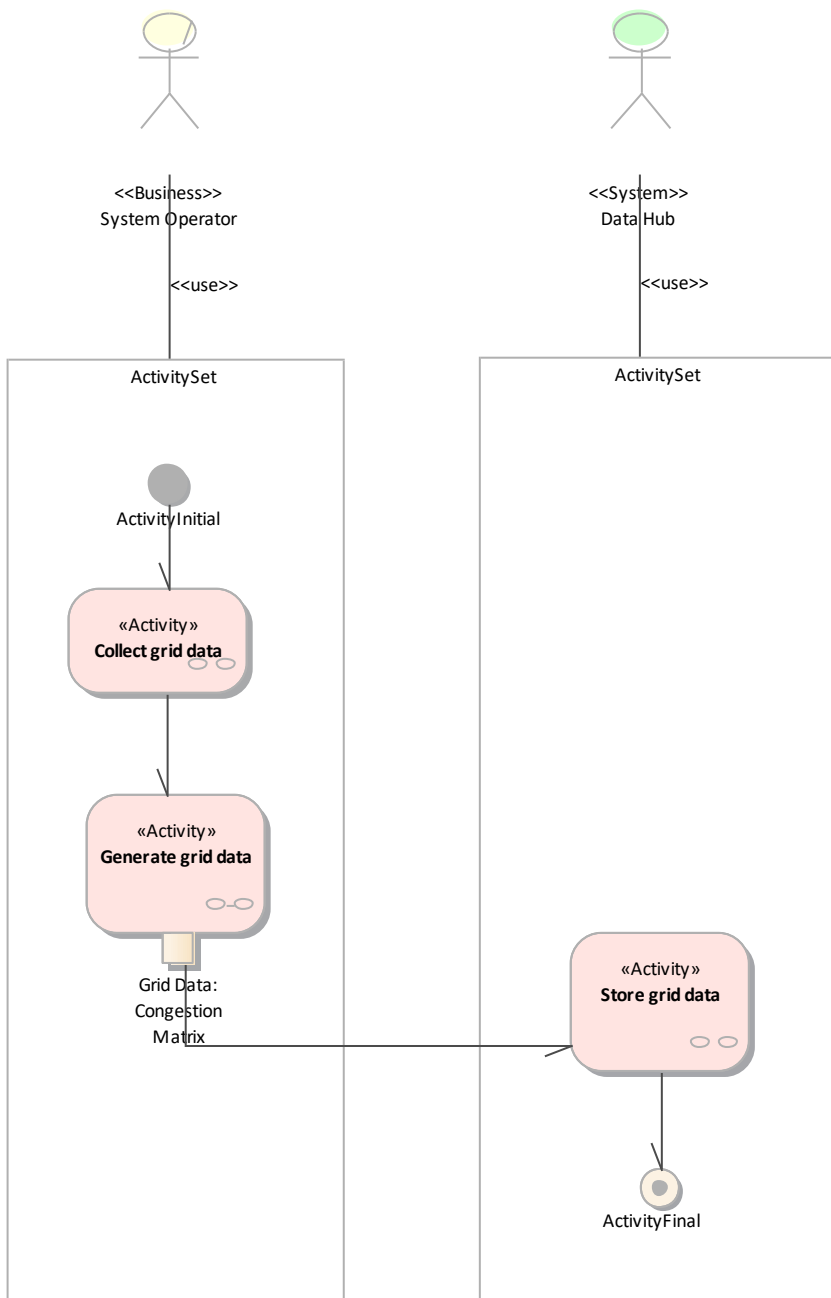Information sent:

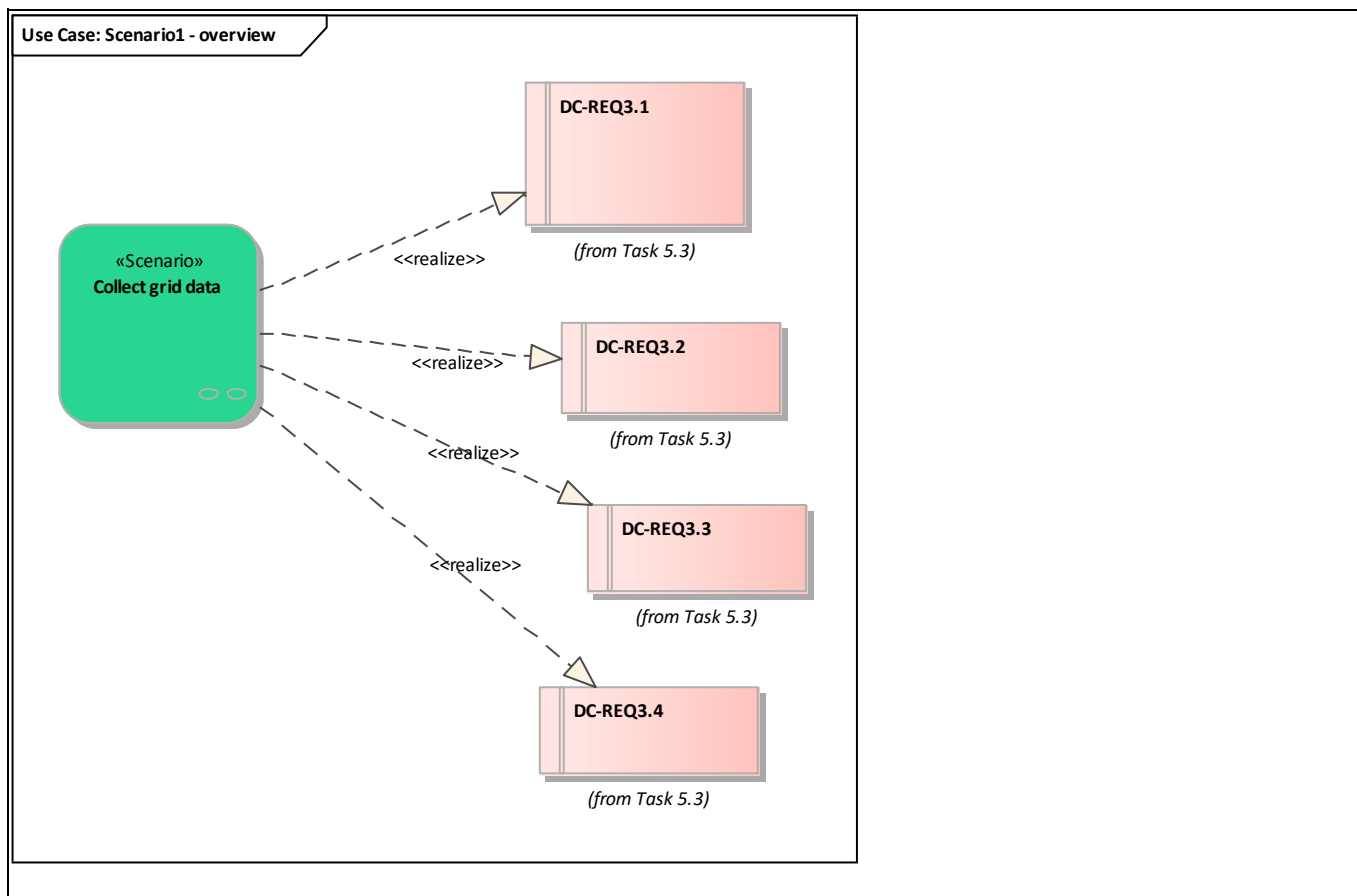| Business object	Instance name	Instance description
Market Data	Market Data	

- ▪ **Collect grid data**

A System Operator collects and generates, in the Grid Data Hub, grid data related to its grid.
Grid data can be power grid descriptions or power grid congestion data used for balancing and congestion management.

Requirement list (refer to "Requirement" section for more information)	
Requirement R-ID	Requirement name
Cat1.Req7	DC-REQ3.1
Cat1.Req8	DC-REQ3.2
Cat1.Req9	DC-REQ3.3
Cat1.Req10	DC-REQ3.4

Activity: Scenario1 - activities flowchart

<<Business>>
System Operator

<<System>>
Data Hub

<<use>>

<<use>>

ActivitySet

ActivitySet

ActivityInitial

«Activity»
Collect grid data

«Activity»
Generate grid data

Grid Data:
Congestion
Matrix

«Activity»
Store grid data

ActivityFinal

Use Case: Scenario1 - overview

Scenario step by step analysis

Scenario								
Scenario name	Collect grid data							
Step No	**Event**	**Name of process/activity**	**Description of process/activity**	**Service**	**Information producer (actor)**	**Information receiver (actor)**	**Information exchanged (IDs)**	**Requirement, R-IDs**
3.1		Collect grid data			System Operator			
3.2		Generate grid data			System Operator	Data Hub	Info5-Congestion Matrix	
3.3		Store grid data			Data Hub			

- ## 3.2. Generate grid data

Business section: Collect grid data /Generate grid data

Information sent:

Business object	Instance name	Instance description
Congestion Matrix	Grid Data	Necessary for flexibility services from their respective grids (DSO / TSO). Grid data can be power grid descriptions or power grid congestion data used for congestion management

5. Information exchanged

Information exchanged, ID	Name of information	Description of information exchanged	Requirement, R-IDs
Information exchanged			
Info1	Authenticate Information		
Info2	Metering Data		
Info3	Market Data		
Info4	Request on market data		
Info5	Congestion Matrix	Congestion matrices are provided by System Operators and stored in Flexibility Platforms. It consists in a matrix based on grid models. Flexibility bids are inserted into the matrix, in order to check whether congestions would occur.	

6. Requirements (optional)

Requirements (optional)		
Categories ID	*Category name for requirements*	*Category description*
Cat1	Task 5.3	Requirements integrated from Task 5.3.
Requirement R-ID	*Requirement name*	*Requirement description*
Req1	DC-REQ1.1	Get near-real-time data (up to 1 hour) from meters
Req2	DC-REQ1.2	Get historical data (monthly) from conventional meters
Req3	DC-REQ1.3	Store data in a meter data hub
Req4	DC-REQ2.1	Get near-real-time (up to 1 hour) data from market
Req5	DC-REQ2.2	Get historical data from market
Req6	DC-REQ2.3	Store data in a market data hub
Req7	DC-REQ3.1	Get very-near-real-time (up to 1 minute) data from grid
Req8	DC-REQ3.2	Get near-real-time (up to 1 hour) data from grid
Req9	DC-REQ3.3	Get historical data from grid
Req10	DC-REQ3.4	Store data in a grid data hub

7. Common terms and definitions

8. Custom information (optional)