UseCases

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

Use Cases U2Demo

Business Use Cases

PT: Current EC Operation

Description of the use case

Name of use case

|  |  |  |
| --- | --- | --- |
| ***Use case identification*** | | |
| ***ID*** | ***Area(s)/Domain(s)/Zone(s)*** | ***Name of use case*** |
|  | Use Cases U2Demo | PT: Current EC Operation |

Version management

Scope and objectives of use case

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| ***Scope and objectives of use case*** | |
| ***Scope*** | The energy community (EC) at the present stage is comprised of five members (this number can increase up to ten members -- all with PV -- but also go beyond this number by including members that do not have production capabilities).   The EC has at its disposal: 1. Flexible loads at the EC member level. Appliances, such as electrical water heaters, ovens, dishwashers, are made flexible with smart plugs  2. PVs at the EC member level - 1.5 kWp installed. The inverter that controls production is commercial so it can be controlled.  3. Batteries (Second-life batteries no longer available -- new batteries will be purchased). These batteries will be at EC member level (behind-the-meter) -- there are no collective assets but batteries can be managed collectively. 4. Renewable Energy Community (REC) management tool: Dashboard for the EC manager that has the following data:   * 15-min data of consumption and production from each member (source: DSO platform) * 1-min data (or other granularity alternatives smaller than 15-min) on voltage, current and power (source: Shellys devices).   This data is sent to a server from which can be extracted with negligible communication delays. The billing process is made through vouchers, to translate the P2P trading into energy sharing possibilities for PT legislation. |
| ***Objective(s)*** | Increase energy literacy  Reduce energy invoice Increase use of renewables  Increase the revenue generated by sharing energy |
| ***Related business case(s)*** | Current Operation of the EC |

Narrative of Use Case

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| ***Narrative of use case*** |
| ***Short description*** |
| This Business use case (BUC) models the current EC in Portugal. In this BUC there are no batteries, only member level appliances can be controlled. There is the possibility of energy sharing. |
| ***Complete description*** |
| The BUC models three different scenarios of the current EC: Scheduling, Operation and Billing and Settlement. The sequence of scenarios models the current capabilities of the EC for scheduling, operation (with EC members’ flexible loads) and for settlement and billing with the possibility of energy sharing.  Summary of use case   * [**01 Scheduling**](#{1E7BBFC0-F164-4ec0-A56D-AF7A542EA72F}) Description: In this scenario, there are two participating roles: EC manager and EC member. This scenario models the scheduling of the flexible loads at the member level based on weather predictions, consumption and production forecasts and the high-level priorities of the EC member.   + 1. Request NWP Data Description: Request Numerical Weather Prediction using an API.   + 2. PV and Consumption Forecast Description: Forecast consumption and production based on historical data.   + 3. Decision Support Methods Description: Guide the EC member on the strategy for optimizing energy resources based on high-level priorities, such as cost savings, green energy and comfort.   + 4. Individual Look-Ahead Energy Resources Scheduling Description: Optimization of energy resources per house considering different objective functions.   + 5. Organize scheduling information from EC members Description: Store scheduling data from EC members. * [**02 Operation**](#{810620C9-10FE-4c04-8FF7-8A34DC54840D}) Description: In this scenario, there are two participating roles: EC manager and EC member. This scenario models the control of flexible loads at the EC member level, the validation of equipment correct operation and the scheduling of performance evaluation, which in case of significant deviation from the expected scheduling requests a new scheduling.   + 1. Measurement System Description: Get information from meters on consumption and production using an API.   + 2. Control Flexible Loads (according to scheduling) Description: Actuation of flexible loads of each EC member according the scheduling previously defined in Scenario 1.   + 3. Process and Store Data Description: Store data concerning the actuation of flexible loads.   + 4. Validation of equipment correct operation Description: Validate the equipment correct operation based on the measurements obtained from meters and the expected control actuation on flexible loads   + 5. Scheduling Performance Evaluation Description: Evaluate deviations between real and forecasted data and the corresponding impact on the previously set scheduling.   + 6. Request New Scheduling Description: Request new scheduling if the deviations between real and forecasted data had a significant impact on the expected scheduling performance. * [**03 Settlement and Billing**](#{66A5DE6B-0DE6-4afd-9621-7F86DDC5E8FC}) Description: In this scenario, there are four participating roles: DSO, EC manager, EC member and Supplier. This scenario models the billing and settlement of the grid fee for energy sharing and also the consumption from the supplier.   + 01. Consolidation of consumption and production measures Description: Consolidate and send the data from meters to the EC manager   + 02. Acknowledge Energy Measurements Description: Receive information on energy measurements and store it in a database.   + 03. Computation of energy sharing coefficients and grid fee Description: Compute the sharing coefficients and grid fee based on the official data received from the DSO   + 04. Acknowledge sharing coefficients and grid fee Description: Acknowledge sharing coefficients and grid fee computed   + 05. Update of consumption and production of EC Members Description: Update consumption and production of EC members based on sharing coefficients   + 06. Pay the DSO the grid fee Description: Pay the grid fee to the DSO for the energy sharing between EC members   + 07. Invoice EC members for grid fee Description: Invoice the EC members the corresponding share of grid fee for the participation in energy sharing   + 08. Acknowledge invoice Description: Receives and acknowledges the invoice for the grid fee   + 09. Pay invoice (in money) to EC manager Description: Pays in money to the EC manager the invoice for grid the fee   + 10. Invoice EC members for consumption Description: Computes the invoice for the EC members regarding electricity consumption from the grid after the energy sharing.   + 11. Acknowledge invoice Description: Receives and acknowledges the invoice   + 12. Pay invoice (in money) to the retailer Description: Pays in money to the retailer the invoice for the electricity consumed from the grid |

Key performance indicators (KPI)

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| ***Key performance indicators*** | | | |
| ***ID*** | ***Name*** | ***Description*** | ***Reference to mentioned use case objectives*** |
| 1 | Energy literacy of the EC members | *Increase the energy literacy >=* *50%* | [Increase energy literacy](#{936D9EDE-4D57-4dc3-9467-73AD5C715E46}) |
| 2 | Energy bill of the EC members | *Reduce energy invoice: >= 10%* | [Reduce energy invoice](#{8DA947EE-E6D9-4416-8AA1-1A49E0E044B6}) |
| 3 | vouchers | *Increase in revenue created from DER >= 25%* | [Reduce energy invoice](#{8DA947EE-E6D9-4416-8AA1-1A49E0E044B6})[Increase the revenue generated by sharing energy](#{A1415206-E009-4e1b-AB80-E11EFCBB78EC}) |
| 4 | Self-consumption | *Increase of collective self-consumption in ECs: >= 15% (at pilot level)* | [Increase use of renewables](#{25AE257A-42A6-4c02-BD1F-24B4E02A8078}) |
| 5 | Use of DERs | *Increase in the use of DERs by active consumers >= 30%* | [Increase use of renewables](#{25AE257A-42A6-4c02-BD1F-24B4E02A8078}) |

Use case conditions

|  |  |
| --- | --- |
| ***Use case conditions*** | |
| ***Assumptions*** | |
| ***Prerequisites*** | |
| 1 | Assumptions:   1. The EC is already formed.To add more members the EC manager needs to contact Direção-Geral de Energia e Geologia (DGEG) 2. There are no storage devices, the only controllable assets are members appliances. All appliances that shall be controlled have to be controllable, for example by installing smart plugs. 3. Fixed electricity price from the retailer for 1 year. 4. Production of the EC is shared among EC members according to sharing coefficients previously defined and agreed by the EC members. 5. The EC manager acts as a passive entity in this path, where it collects and processes data and establishes the link between the EC member, the retailer and DSO. |

Further information to the use case for classification/mapping

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| ***Classification information*** |
| ***Relation to other use cases*** |
|  |
| ***Level of depth*** |
|  |
| ***Prioritisation*** |
|  |
| ***Generic, regional or national relation*** |
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| ***Nature of the use case*** |
| BUC |
| ***Further keywords for classification*** |
| Portuguese regulations, Sharing coefficients, Controllable assets on member level |

General remarks

Diagrams of use case

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| ***Diagram(s) of use case*** |
| BusinessUseCase1 - overview  BusinessUseCase1 - scenarios flowchart |

Technical details

Actors

|  |  |  |  |
| --- | --- | --- | --- |
| ***Actors*** | | | |
| ***Grouping (e.g. domains, zones)*** | | ***Group description*** | |
|  | |  | |
| ***Actor name*** | ***Actor type*** | ***Actor description*** | ***Further information specific to this use case*** |
| EC Manager | Business | The EC manager has a versatile role in the ECs.  In the case of the Italian and Belgian pilot, the EC manager collects the data needed for forecasting algorithms and calculates the forecast. Additionally, the EC manager creates a schedule for the flexible assets and gives advice to the EC members to guide their energy consumption behavior.  In the Italian pilot, the flexible assets are under the governance of each EC member. In this case, the EC manager schedules these assets and gives the result as an advice to the members.  In the Belgian pilot, the EC manager has control over the flexible assets, creates the schedule and controls the assets.  In both governance models, the EC manager monitors the operation, decides on possible rescheduling and sends the measurements to the EC members for monitoring purpose.  In the Italian pilot, the EC manager has control over the bank account of the community and acknowledges the incentives received for sharing energy.  In the Dutch pilot, the EC manager is responsible for settling the bill with the supplier and for the internal billing process. Additionally, the EC manager is active in the communication of the load profile of the EC to the DSO and in the process of offering flexibility services to the DSO. In the Portuguese pilot, the EC manager can take a more passive or more active role in the EC, depending on which entity makes the scheduling for the batteries. If the EC manager optimizes the scheduling of the batteries, then it is an active entity which considers community goals and participation in flexibility or in mFRR in the optimization. Otherwise, it plays a passive role, collecting and processes data only. This role is also responsible, in the Portuguese pilot, for exchanging money from energy sharing for Municipality vouchers to be distributed among EC members. |  |
| EC Member | Business | The EC member is an entity in the community which can act as a prosumer or a consumer. Depending on the governance model of the EC, the EC member has an active role and can control the own assets or has a passive role in which the EC member does not control these assets. |  |
| DSO | Business | Distribution System Operators (DSO) are responsible for distribution and management of energy, starting at the TSO substations to the points of consumption.  The DSO plays an integral role in the management of energy communities. In the pilots in Italy, Belgium and Portugal, the DSO provides the official measurements of the consumption and injection data of EC members. Depending on country specific regulations and the configuration of the EC, the measurements are used in an internal billing process or for the billing process through a supplier.  In the Dutch pilot, the DSO does not provide the official measurements, but they are collected by a measurement company. The DSO then receives the data and drafts a bill for the grid usage of the EC. In the Italian pilot, the meter data is sent to the GSE, to compute the incentive for the shared energy, and to the suppliers of each EC Member, for the individual billing process.  In the Belgian pilot, the DSO computes the credit points for shared energy and shares the measurements with the suppliers and with Klimaan for the internal billing process.   Apart from consolidating the consumption and injection data, the DSO plays an important role in the flexibility market in the Netherlands, Italy and Portugal. The DSO evaluates the grid load and places flexibility requests, both on the DA flexibility market and on the ID flexibility market. In the Netherlands the flexibility market is managed through the platform GOPACS, in Italy and Portugal through Piclo Flex. |  |
| Supplier | Business | The supplier is the intermediate party between the wholesale electricity market and the consumer. The supplier receives the official measurements of consumption and production and drafts a bill accordingly.  In the Dutch pilot, the supplier has a relation to a wholeseller who is a Balance Responsible Party (BRP). The daily profile of the EC is thus sent to the supplier and deviations from this profile are bought/sold against the unbalance market price. |  |

References

Step by step analysis of use case

Overview of scenarios

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***Scenario conditions*** | | | | | | |
| ***No.*** | ***Scenario name*** | ***Scenario description*** | ***Primary actor*** | ***Triggering event*** | ***Pre-condition*** | ***Post-condition*** |
| 1 | 01 Scheduling | In this scenario, there are two participating roles: EC manager and EC member. This scenario models the scheduling of the flexible loads at the member level based on weather predictions, consumption and production forecasts and the high-level priorities of the EC member. |  |  |  |  |
| 2 | 02 Operation | In this scenario, there are two participating roles: EC manager and EC member. This scenario models the control of flexible loads at the EC member level, the validation of equipment correct operation and the scheduling of performance evaluation, which in case of significant deviation from the expected scheduling requests a new scheduling. |  |  |  |  |
| 3 | 03 Settlement and Billing | In this scenario, there are four participating roles: DSO, EC manager, EC member and Supplier. This scenario models the billing and settlement of the grid fee for energy sharing and also the consumption from the supplier. |  |  |  |  |

Steps - Scenarios

01 Scheduling

In this scenario, there are two participating roles: EC manager and EC member. This scenario models the scheduling of the flexible loads at the member level based on weather predictions, consumption and production forecasts and the high-level priorities of the EC member.

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| Scenario1 - activities flowchart |

Scenario step by step analysis

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Scenario*** | | | | | | | | |
| ***Scenario name*** | | 01 Scheduling | | | | | | |
| ***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 |  | 1. Request NWP Data | Request Numerical Weather Prediction using an API. |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) |  |  |  |
| 1.2 |  | 2. PV and Consumption Forecast | Forecast consumption and production based on historical data. |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) | [Info1-PT current EC Operation: Forecasts](#{D130C4B4-58B5-4f63-8425-7CDF264F5051}) |  |
| 1.3 |  | 3. Decision Support Methods | Guide the EC member on the strategy for optimizing energy resources based on high-level priorities, such as cost savings, green energy and comfort. |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 1.4 |  | 4. Individual Look-Ahead Energy Resources Scheduling | Optimization of energy resources per house considering different objective functions. |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) | [Info2-PT current EC Operation: House Resources Scheduling](#{6C601E5E-B604-4eae-A167-A575D5F09080}) |  |
| 1.5 |  | 5. Organize scheduling information from EC members | Store scheduling data from EC members. |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) |  |  |  |

* 1.2. 2. PV and Consumption Forecast

Business section: 01 Scheduling/2. PV and Consumption Forecast  
Forecast consumption and production based on historical data.   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT current EC Operation: Forecasts](#{D130C4B4-58B5-4f63-8425-7CDF264F5051}) | InfoInstance |  |

* 1.4. 4. Individual Look-Ahead Energy Resources Scheduling

Business section: 01 Scheduling/4. Individual Look-Ahead Energy Resources Scheduling  
Optimization of energy resources per house considering different objective functions.   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT current EC Operation: House Resources Scheduling](#{6C601E5E-B604-4eae-A167-A575D5F09080}) | InfoInstance |  |

02 Operation

In this scenario, there are two participating roles: EC manager and EC member. This scenario models the control of flexible loads at the EC member level, the validation of equipment correct operation and the scheduling of performance evaluation, which in case of significant deviation from the expected scheduling requests a new scheduling.

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| Scenario1 - activities flowchart |

Scenario step by step analysis

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Scenario*** | | | | | | | | |
| ***Scenario name*** | | 02 Operation | | | | | | |
| ***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 |  | 1. Measurement System | Get information from meters on consumption and production using an API. |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) | [Info3-PT Current EC Operation: House Measurements](#{4B19696E-0CFF-44c4-9394-E5FE7A0E9A2A}) |  |
| 2.2 |  | 2. Control Flexible Loads (according to scheduling) | Actuation of flexible loads of each EC member according the scheduling previously defined in Scenario 1. |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 2.3 |  | 3. Process and Store Data | Store data concerning the actuation of flexible loads. |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) |  |  |  |
| 2.4 |  | 4. Validation of equipment correct operation | Validate the equipment correct operation based on the measurements obtained from meters and the expected control actuation on flexible loads |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 2.5 |  | 5. Scheduling Performance Evaluation | Evaluate deviations between real and forecasted data and the corresponding impact on the previously set scheduling. |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 2.6 |  | 6. Request New Scheduling | Request new scheduling if the deviations between real and forecasted data had a significant impact on the expected scheduling performance. |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |

* 2.1. 1. Measurement System

Business section: 02 Operation/1. Measurement System  
Get information from meters on consumption and production using an API.   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT Current EC Operation: House Measurements](#{4B19696E-0CFF-44c4-9394-E5FE7A0E9A2A}) | InfoInstance |  |

03 Settlement and Billing

In this scenario, there are four participating roles: DSO, EC manager, EC member and Supplier. This scenario models the billing and settlement of the grid fee for energy sharing and also the consumption from the supplier.

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| Scenario1 - activities flowchart |

Scenario step by step analysis

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Scenario*** | | | | | | | | |
| ***Scenario name*** | | 03 Settlement and Billing | | | | | | |
| ***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 |  | 01. Consolidation of consumption and production measures | Consolidate and send the data from meters to the EC manager |  | [DSO](#{B9728693-DE6D-4ab7-B4C4-B0B1C1CF0779}) | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) | [Info4-PT Current EC Operation: Metering data](#{7D08E585-2DC8-46ec-BF88-FB50207F4266}) |  |
| 3.2 |  | 02. Acknowledge Energy Measurements | Receive information on energy measurements and store it in a database. |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) |  |  |  |
| 3.3 |  | 03. Computation of energy sharing coefficients and grid fee | Compute the sharing coefficients and grid fee based on the official data received from the DSO |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) |  |  |  |
| 3.4 |  | 04. Acknowledge sharing coefficients and grid fee | Acknowledge sharing coefficients and grid fee computed |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) | [DSO](#{B9728693-DE6D-4ab7-B4C4-B0B1C1CF0779}) | [Info5-PT current EC Operation: Energy Sharing Information](#{8E10C3CD-3F0B-4903-BB8B-EC6CD3EE0254}) |  |
| 3.5 |  | 05. Update of consumption and production of EC Members | Update consumption and production of EC members based on sharing coefficients |  | [DSO](#{B9728693-DE6D-4ab7-B4C4-B0B1C1CF0779}) | [Supplier](#{34C5B059-CA4B-46ba-AAB9-51DBA945F605}) | [Info6-PT current EC Operation: Invoice Preliminary Information](#{CB92BC98-FF33-4fb5-98CE-2A4A9EEA48FB}) |  |
| 3.6 |  | 06. Pay the DSO the grid fee | Pay the grid fee to the DSO for the energy sharing between EC members |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) |  |  |  |
| 3.7 |  | 07. Invoice EC members for grid fee | Invoice the EC members the corresponding share of grid fee for the participation in energy sharing |  | [EC Manager](#{BF6EE37F-C53B-469a-B171-2699A1A42E7F}) | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) | [Info7-PT current EC Operation: Invoice Grid Fee](#{6362159D-A6ED-45af-8431-F5D598FB3962}) |  |
| 3.8 |  | 08. Acknowledge invoice | Receives and acknowledges the invoice for the grid fee |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 3.9 |  | 09. Pay invoice (in money) to EC manager | Pays in money to the EC manager the invoice for grid the fee |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 3.10 |  | 10. Invoice EC members for consumption | Computes the invoice for the EC members regarding electricity consumption from the grid after the energy sharing. |  | [Supplier](#{34C5B059-CA4B-46ba-AAB9-51DBA945F605}) | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) | [Info8-PT current EC Operation: Invoice Retailer consumption](#{0D4A0ABC-2D71-4a3f-BCED-CB7F2C439E4C}) |  |
| 3.11 |  | 11. Acknowledge invoice | Receives and acknowledges the invoice |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |
| 3.12 |  | 12. Pay invoice (in money) to the retailer | Pays in money to the retailer the invoice for the electricity consumed from the grid |  | [EC Member](#{D236E56F-8F7A-436e-917A-37A096594B02}) |  |  |  |

* 3.1. 01. Consolidation of consumption and production measures

Business section: 03 Settlement and Billing/01. Consolidation of consumption and production measures  
Consolidate and send the data from meters to the EC manager   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT Current EC Operation: Metering data](#{7D08E585-2DC8-46ec-BF88-FB50207F4266}) | InfoInstance |  |

* 3.4. 04. Acknowledge sharing coefficients and grid fee

Business section: 03 Settlement and Billing/04. Acknowledge sharing coefficients and grid fee  
Acknowledge sharing coefficients and grid fee computed   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT current EC Operation: Energy Sharing Information](#{8E10C3CD-3F0B-4903-BB8B-EC6CD3EE0254}) | InfoInstance |  |

* 3.5. 05. Update of consumption and production of EC Members

Business section: 03 Settlement and Billing/05. Update of consumption and production of EC Members  
Update consumption and production of EC members based on sharing coefficients   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT current EC Operation: Invoice Preliminary Information](#{CB92BC98-FF33-4fb5-98CE-2A4A9EEA48FB}) | InfoInstance |  |

* 3.7. 07. Invoice EC members for grid fee

Business section: 03 Settlement and Billing/07. Invoice EC members for grid fee  
Invoice the EC members the corresponding share of grid fee for the participation in energy sharing   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT current EC Operation: Invoice Grid Fee](#{6362159D-A6ED-45af-8431-F5D598FB3962}) | InfoInstance |  |

* 3.10. 10. Invoice EC members for consumption

Business section: 03 Settlement and Billing/10. Invoice EC members for consumption  
Computes the invoice for the EC members regarding electricity consumption from the grid after the energy sharing.   
Information sent:

|  |  |  |
| --- | --- | --- |
| ***Business object*** | ***Instance name*** | ***Instance description*** |
| [PT current EC Operation: Invoice Retailer consumption](#{0D4A0ABC-2D71-4a3f-BCED-CB7F2C439E4C}) | InfoInstance |  |

Information exchanged

|  |  |  |  |
| --- | --- | --- | --- |
| ***Information exchanged*** | | | |
| ***Information exchanged, ID*** | ***Name of information*** | ***Description of information exchanged*** | ***Requirement, R-IDs*** |
| Info1 | PT current EC Operation: Forecasts | * EC Member ID * Time Stamp * Time-series for the next 24 hours in 15 min steps:   - PV production (kWh) - Consumption (kWh) |  |
| Info2 | PT current EC Operation: House Resources Scheduling | * EC Member ID * Time Stamp * Time-series for the next 24 hours   - PV production per 15-min (kWh) - Consumption per 15-min (kWh) |  |
| Info3 | PT Current EC Operation: House Measurements | * EC Member ID * Timestamp * PV:   - S\_AC (VA) - S\_AC\_L1 (VA) - S\_AC\_L2 (VA) - S\_AC\_L3 (VA) - P\_AC (W) - P\_AC\_L1 (W) - P\_AC\_L2 (W) - P\_AC\_L3 (W) - Q\_AC (VAr) - Q\_AC\_L1 (VAr) - Q\_AC\_L2 (VAr) - Q\_AC\_L3 (VAr) - PF\_L1 (Real) - PF\_L2 (Real) - PF\_L3 (Real) - U\_AC\_L1 (V) - U\_AC\_L2 (V) - U\_AC\_L3 (V) - I\_AC\_L1 (A) - I\_AC\_L2 (A) - I\_AC\_L3 (A) - Ump\_DC\_St1 (V) - Imp\_DC\_St1 (A) - P\_DC\_St1 (W) - Ump\_DC\_St2 (V) - Imp\_DC\_St2 (A) - P\_DC\_St2 (W) - P\_DC (W) - f (Hz) - Temperature (ºC) - Inverter State (Integer)   * House   - S\_Imp (VA) - S\_Imp\_L1 (VA) - S\_Imp\_L2 (VA) - S\_Imp\_L3 (VA) - S\_Exp (VA) - S\_Exp\_L1 (VA) - S\_Exp\_L2 (VA) - S\_Exp\_L3 (VA) - P\_Imp (W) - P\_Imp\_L1 (W) - P\_Imp\_L2 (W) - P\_Imp\_L3 (W) - P\_Exp (W) - P\_Exp\_L1 (W) - P\_Exp\_L2 (W) - P\_Exp\_L3 (W) - Q\_Imp (VAr) - Q\_Imp\_L1 (VAr) - Q\_Imp\_L2 (VAr) - Q\_Imp\_L3 (VAr) - Q\_Exp (VAr) - Q\_Exp\_L1 (VAr) - Q\_Exp\_L2 (VAr) - Q\_Exp\_L3 (VAr) - PF\_L1 (Real) - PF\_L2 (Real) - PF\_L3 (Real) - U\_L1 (V) - U\_L2 (V) - U\_L3 (V) - I\_L1 (A) - I\_L2 (A) - I\_L3 (A) - f (Hz) |  |
| Info4 | PT Current EC Operation: Metering data | * EC Member ID * Time series of the whole month in 15 min intervals   - Consumption (kWh)  - Production (kWh) |  |
| Info5 | PT current EC Operation: Energy Sharing Information | * EC Member ID * Sharing coefficients for each EC member (% and kWh) * Grid fee for the total energy shared (€) |  |
| Info6 | PT current EC Operation: Invoice Preliminary Information | * EC Member ID * Time series of the whole month in 15 min intervals   - Consumption updated (kWh) |  |
| Info7 | PT current EC Operation: Invoice Grid Fee | * EC Member ID (who participated in energy sharing) * Participation in energy sharing (% and kWh) * Total amount to pay for grid usage (€) |  |
| Info8 | PT current EC Operation: Invoice Retailer consumption | * EC Member ID * Time series of the whole month in 15 min. intervals   - Consumption updated (kWh) - Consumption price (€/kWh)   * Total amount to pay (€) |  |

Requirements (optional)

Common terms and definitions

Custom information (optional)