ERA-NET SMART GRIDS PLUS

CALLIA ANNUAL REPORT 2018

Section 1: Project details

CALLIA - Open Inter-DSO electricity markets for RES integration
77616
CALLIA
July 1st, 2016
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www.CALLIA.info
ISC Konstanz

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Participating organizations	Name of organization	Country
Lead partner	*ISC Konstanz*	*Germany*
Project partner	*devolo AG*	*Germany*
Project partner	*University of Stuttgart*	*Germany*
Project partner	*Salzburg Research*	*Austria*
Project partner	*Vienna University of Technology*	*Austria*
Project partner	*BlueSky Energy*	*Austria*
Project partner	*Restore*	*Belgium*
Project partner	*VITO*	*Belgium*
Project partner	*Bogazici Electricity Distribution Inc (BEDAS)*	*Turkey*
Project partner	*Pavo Tasarim Uretim Elektronik Tic A.S.*	*Turkey*
Project partner	*Stadtwerke Heidelberg Netze*	*Germany*
Project partner	*TransnetBW*	*Germany*

Project summary
The CALLIA cross-border collaboration between DSOs and TSOs is integrating European power markets deploying both flexibilities across national borders and guaranteeing cross-border marketplaces stability of the European power system.

By streamlining interfaces between the stakeholders DSOs and TSOs market access for flexibility providers are enhanced. Cross-national learning allows harmonized communication paths, protocols, and interfaces. New standards and technologies are developed and applied, putting the existing national demonstration projects on a larger scale. The CALLIA pilot will demonstrate, that flexibility for the integration of renewables will be significantly improved.

Section 2: Progress

On a national/regional level, each project partner will be responsible for the required reporting to their funding agency according to national/regional rules in order to obtain and maintain funding during the lifetime of their portion of the project. Apart from the national/regional project review, the transnational cooperation aspects will be monitored on the ERA-Net Smart Grids Plus level. Any substantial change in an ongoing project must be reported immediately to all national/regional funding agencies involved. Project partners should be aware that changes may have implications on past, present and planned future funding. Chapter 2.3 or 2.4 should be filled in depending on applicability.

Section 2.1: Progress plan

Planned milestones as presented in the full proposal Ch. 8.1			Achieved Milestones		
Milestones	Year	Quarter	Year	Quarter	Comment No. (refers to box below)
M1.1 Decision about the trading strategy	*2016*	*Q4*	*2017*	*Q1*	*1*
M2.2 Decision about the used protocol stack	*2016*	*Q4*	*2017*	*Q1*	*2*
M2.4 CALLIA architecture specified in UML	*2017*	*Q2*	*2017*	*Q2*	
M4.1 Decision on workshop topics and locations	*2017*	*Q2*	*2017*	*Q2*	

Comment on deviations for achieved milestones, expected deviations for coming milestones
1. *Trading strategy has been defined in Q1/2017 – delay due to delayed project start of CALLIA (July 2016 rather than April 2016 as originally planned)*
2. *Milestone was slightly delayed due to the delayed project start; completion at the end of Q1/2017.*

Section 2.2 Work progress

Has the project been according to plan?	*Yes*	

Report the progress and main findings according to the work packages/milestones. References should be made to the Three-layer model (max. 12 000 characters in total (including spaces), excluding figures/illustrations which should be uploaded in section 7). The report should also disclose if the project progress has been according to budget. In the case of deviations, explain the cause for deviations and which consequences it will have for further project development. Which measures have been or will be taken to bring the project back on schedule?

Work package 1 – Requirements analysis, specification of the pilot:

T1.1: Task 1.1 is the initial task of CALLIA and its definitions and results influence the development of the project. In the reporting period, the four main use cases for the project have been defined and designed in detail. “Congestion Management at the DSO level”, “Local balancing”, “Voltage control” and “Loss mitigation”. Roles and responsibilities of each actor have been defined and implementation strategies for products to resolve problems associated with those use cases were discussed. A separate working paper on the outcome was written and is attached. A model for a Smart Market incorporating all potential use cases was developed within a physical meeting in Antwerp in November 2017.

The modelling of distribution grids in Istanbul and Heidelberg was completed and based upon the use cases and the models, suitable regions for the field test described in work package 3 were identified.

The task is on schedule.

T1.2: New mathematical models for incorporating economic social welfare into the use cases have been defined and a scenario for market clearing was set up. Implementation and testing of the model using CPLEX was carried out and the model for the flexibility trading platform was included.

The task is on schedule.

T1.3: The existing regulatory framework has been reviewed and described with respect to the use cases from Task 1.1. The living document for this task has been revised accordingly.

The task is on schedule.

Work package 2 - Architecture and Algorithms

T2.1: A multi-agent system architecture for trading flexibility within the CALLIA project context has been defined. This system architecture connects RES agents, Flexible Load agents, Storage agents and cluster agents on the one hand, with Aggregator and Trading agents on the other hand. It has been decided, which agents will be required (M 2.3) and which protocols will be used (M 2.2).

The task is successfully completed.

T2.2: In this task, a robust communication stack for the expected smart grid functionality was developed based on different PLC technologies (G3-PLC and BPL by devolo and CENELEC-PLC by Pavotek) and GSM technology (by Pavotek).

A description of current flexibility trading frameworks and protocols has been given in Deliverable 2.2. Accordingly, four frameworks (Traffic light, FLECH, USEF & EcoGrid 2.0) that enable the use of

flexibility from distributed energy resources (DERs) by the distribution system operator (DSO) are described and compared.
Test samples for lab and field testing have been sent to several partners and were tested (ongoing in 2018).

The task is on schedule.

T2.3: The key objective of task 2.3 is to design and implement the upper-layer communication solutions necessary for the CALLIA project. This involves the information and data models used by device, aggregator and trading agents to communicate with each other as well as the communication infrastructure, interfaces and protocols. A Kafka-based communication cascade has been developed and first tests have been conducted in late 2017. Development of data and information model has started and is expected to be completed in early 2018. API implementation has started and is also expected to be completed in the first half of 2018.

The task is on schedule.

T2.4: The key objective of task 2.4 is to define the RES agent, Flexible Load agent, Storage agent and Cluster agent design and agent platform that fits in the overall multi-agent architecture, defined in Task 2.1, and the information and data models, defined in task 2.3. The cluster agent has been defined and implemented. Both storage agent and flexible resource agent have been defined and the implementation of both agents is expected in early 2018. RES (PV) agent design and implementation have started in late 2018, completion is expected for mid-2018.

The task is on schedule.

T2.5: REstore has designed the aggregator and trading platform agents that fit in the overall multi-agent architecture. These agents will receive models/information from the RES/Load/Storage agents and based on this, run an optimization algorithm to decide on the best dispatching strategy (e.g. increasing or shedding local loads, offering flex capacity to neighboring DSOs) related to the products/services and business models defined in task 1.1&1.2. The connection between aggregator platform and trading platform has been designed and tested in late 2017, completion is expected in early 2018.

The task is on schedule.

Work package 3 – Implementation, demonstration, validation pilot:
T3.1: Test power grids for the simulation have been specified and selected grid regions were successfully modelled. Devolo hardware was received, installed and tested within the hardware-in-the-loop system.

The task is on schedule.

T 3.2: Pilot test locations and functionalities were defined both for the Istanbul and the Heidelberg site. The specifics of each site have been determined and hardware and software

solutions for implementation have been selected (completion expected in mid-2018). A larger group of employees both at BEDAŞ and Stadtwerke Heidelberg Netze was familiarized with the ideas and components involved in the CALLIA field test.

T 3.3: The first pieces of equipment (smart meters and control units) have been deployed in the field (ongoing in 2018/19). PV modules (Heidelberg) and flexible assets in Turkey (HVAC, heating) are ready to be connected to the CALLIA backend. The task is slightly delayed (about 2-3 months) due to the decision on how to connect flexible assets in Turkey (HVAC systems and electric heaters) physically (final solution in Q1/2018). The same holds for the exact size, functionality and location of the storage batteries which will be deployed in the field test. To minimize the delay for the overall project, a battery test system from BlueSky Energy was sent to VITO to do the implementation of all agents before the actual deployment in the field test. Overall, we still expect that both batteries in Heidelberg and Istanbul will be available for the field test in 2018.

T3.4: not yet started according to schedule

Work package 4: Dissemination, exploitation
Task 4.1:

To make sure that the terms are followed, to avoid disputes and to facilitate business planning, task 4.1 maintains an IP directory throughout the duration of the project.

This document lists all items of knowledge relating to the work of the project, both preexisting know-how and results developed in the project. To ensure protection of the IP the document is making explicit for each item the owners, the nature of the knowledge, its perceived potential for exploitation, the currently agreed status of the item concerning access rights, plans to use the knowledge in exploitation.

An initial version of an IP directory linked to a communication plan has been created during the first half year of the project. This directory and communication plan is updated regularly, distributed to all partners, and discussed at plenary meetings.

The task is on schedule (no changes to 2016, continued as planned).

Task 4.2: ISC Konstanz maintains the project website presenting project objectives, results, status, consortium publications and useful links to the topics related to the project (www.callia.info). It is updated regularly with publications and descriptions of the latest developments. This happens in close collaboration with the regional Smart Grids Platform Baden Württemberg and the ERA-Net Smart Grids Plus Knowledge Community.

Public workshops (see WP4.3) organized by, which are currently planned, will enable communication with stakeholders and other interested parties. The first workshop was held as a special session of the IEEE SmartGridsComm conference in Dresden in October 2017. Several scientific papers written based on CALLIA content were presented. Further workshops are planned for IEEE SGC 2018 in Aalborg/Denmark and Stuttgart in 2019.

The task is on schedule.

Task 4.3: As the CALLIA consortium is open for collaboration with these partners outside the consortium, we have actively discussed with a delegation from the city of Haaren (Germany) which are planning an inter-DSO cooperation project between Germany and the Netherlands. CALLIA has also participated in a trilateral exchange between the German "C/sells"-Project (SINTEG) and the European project "ELECTRA" (Horizon 2020) to learn from each other's approaches and results.

Work package 5: Knowledge Community

Several project partners have already actively contributed to ERA-Net events (see below), either as invited speakers or by providing input to the living documents on expera. Details can be found in the section on the Knowledge Community.

Section 2.3 Annual Workplan

Describe expected developments for the coming year. Which and when are the most important milestones, results, events, publications etc.? How will these results and events contribute to the Knowledge Community and achieve impact with respect to the science community, stakeholders and society? References should be made to the Three-layer model.

Following the structure of section 2.2, we report the expected developments for each work package/task separately:

Work package 1: Requirements analysis, specification of the pilot
Task 1.1:

- Definition of KPIs - KPIs will be defined for different levels (Overall project, simulation, VNBs/field test) and in each layer of the SGAM architecture (completion in early 2018)
- Simulation of selected scenarios (completion in 2018)
- Analysis of results (completion in 2019)
- Evaluation of KPIs (completion in 2019)
- Documentation and reporting (completion in 2019)

Task 1.2:

- Implementation and testing of market clearing (completion in 2018)
- Include grid model as far as possible (extra step, not planned in the proposal; completion in 2019)

Task 1.3:

- Report on existing regulatory framework is continuously revised according to external developments and ongoing modifications (completion in 2019)
- Identifying problems related to the CALLIA framework after field test simulation (completion in Q3/2018)

Work package 2:
Task 2.1:

This task has been completed – no further milestones and achievements to be reached/made in 2018.

Task 2.2:

- Full implementation of communication concept
- Sample testing and optimization (continued from 2017)

Task 2.3:

- Development of data and information model (to be completed in early 2018)
- Complete API implementation (Q2/2018)
- Integration tests

Task 2.4:

- Cluster agent implemented
- PV agent implemented
- Flexible load agent implemented
- Storage agent implemented
- Integration tests into CALLA system architecture completed

Task 2.5:

- Grid model included into trading platform
- Hosting and development of trading platform (continued in 2019)

Work package 3:
Task 3.1:

- Implementation of CALLIA multi-agent architecture completed
- Definition of simulation scenarios available
- RES forecast modelling complete
- Simulations running / evaluation of results (continued in 2019)

Task 3.2:

- Lessons learned from HiL simulations (Task 3.1)
- Deployment of communication infrastructure completed

Task 3.3:

- Installation of storage batteries in Istanbul and Heidelberg completed
- Loads and batteries connected to grid and ICT infrastructure

Task 3.4:

- Test of communication cascade completed
- Use case “Voltage control” tested
- Use case “Congestion management” tested
- Use case “Loss mitigation” tested
- Use case “Local balancing” tested

Work package 4: Dissemination, exploitation
Task 4.1:

- Structured exploitation plan available

Task 4.2:

- Webpage continuously updated to current project status
- Publication plan is monitored and assistance to partners is given

Task 4.3:

- Workshops will be held in Aalborg (2018) and Stuttgart (2019).
- Active exchange with stakeholders and related projects continued

Work package 5: Knowledge Community

Contributions on the use cases for the living documents will be implemented and input for other ERA-Net projects regarding the CALLIA use cases and platforms will be provided. Several partners will continue attending Knowledge Community meetings (both online and real).

The structure of the project very much resembles the three layer model such that work package 1 and task 2.2 are primarily concerned with technology, whereas work package 2, excluding task 2.2 is centred around the “Marketplace layer”. Work package 3 synthesizes the efforts of WP 1 and WP 2, yet adoption in the case of CALLIA only refers to players directly involved in the electricity market (i.e. DSOs, TSOs, aggregators, etc.) and not directly to customers/prosumers.

Section 3: Project budget and accounts

Section 4: Dissemination Activities

In the following tables, only numbers and activities from past years need to be entered.

Dissemination overview	Dissemination activities achieved as of submission date
	2017
Peer reviewed articles, books, book chapters etc. published with or submitted to academic publishers	*0+1*
Non-peer reviewed publications (reports, briefs, books, articles targeting policy-makers, industry or other end users)	*BlueSky Energy: 4000 klicks on HP with CALLIA blog*
Media coverage (opinion pieces or interviews/appearances in all types of mass media)	*An article in VITO's newsletter, one press release at APA (BlueSky Energy); BEDAS*
Events targeting end users organised by the project (such as conferences, side events or workshops)	*0+1*
Presentations targeting end users given by project participants (including participation in panel debates)	*16+X*
In how much conferences / events did your project participate (not organised by project itself)?	*3+2*

The following sections elaborate on the overview above. Totals in the following tables should correspond to the numbers in the overview tables above.

Section 4.1 peer reviewed publications

List of peer reviewed articles, books, book chapters etc. published with or submitted to academic publishers						
Type (article, report, book, compendium, journal)	Author (s)	Title	Published in	Page no.	ISSN/ISBN	Issued/volume/ year
Choose type	*Name of authors*	*Title of publication*	*Name of publication medium*	*number*	*number*	*Date of publication / number of volume*
…	…	…	…	…	…	…

Comments (peer-reviewed publications)
Text

Section 4.2 Non-peer reviewed publications

List of non-peer reviewed publications (reports, briefs, books, articles targeting policy-makers, industry or other end users)			
Type (report, brief, book, article etc.)	Author(s)	Year	Title
Press release	*BlueSky (Callia team at all)*	*2016*	*EU funded project Callia*
…	…	…	…

Comments (non-peer reviewed publications)
Text

Section 4.3: Other dissemination activities

Year	Type (media coverage, events organized by project, presentations and panel debates, participation in third-party events)	Description
2016/12/05	*presentation*	*Presentation on "Callia - Cooperation between transmission and*

		distribution system operators within the future power system"
2017/10/19	*debate*	*Trilateral exchange between the SINTEG project "C/sells", the Horizon 2020 project "ELECTRA" and "CALLIA"*

Section 5: Characteristics related to ERA-Net SG+ objectives

Please fill in the following sections by adding up all activities / results / numbers over the project time until submission date of the report, i.e. please accumulate over the project time and do not only report on the current reporting period.

Relation to ERA-Net SG+			
Which layers of the ERA-Net SG+ model does your project cover?	Technology	Market	
Do you cooperate with other projects to jointly cover all layers? If so, which? Which are the jointly handled subjects? What are the results achieved together?	*Not yet.*		

Technology readiness level (TRL)[1]	
Which TRL level does your project start from?	*3-4*
Which TRL level does your project aim for?	*5-6*

Characteristics of targeted grid	
Structure, voltage level(s), shape and size of grid	*SWH-N:* *110kV – ring network* *20kV – open ring network* *0.4kV – meshed network* *Area- 115 km²*

[1] For a definition of the different TRLs see https://en.wikipedia.org/wiki/Technology_readiness_level

	TransnetBW is the transmission system operator (TSO) in Baden-Württemberg (Germany) and takes a central role in the European integrated grid system. The size of the grid expanse is around 34'600 km². The covered voltage levels are in the very high voltage of 220 kV and 380 kV. The grid of TransnetBW is integrated into the European integrated grid with around 35 horizontal coupling points to other national and international TSOs. There are around 80 transformers in the vertical direction to distribution systems, what leads to a total amount of around 11 million connected end customers.	

Challenges in grid operation	*SWH-N:Voltage maintenance, balance between demand and supply, TSO-DSO communication, efficient and uninterruptable power supply*
	
	TransnetBW:
	- *Transport of electricity from generation to consumption on national and European level*
	- *Secure system operation*
	- *Procurement of ancillary services, especially*
	  ○ *Load frequency control*
	  ○ *Voltage maintenance*
	- *Congestion management and redispatch*
	- Grid expansion, especially HVDC power lines to deal with the arising challenges of energy transition	

Relevant infrastructure	Length of grid (km)	*SWH-N:* *HV: 46.6(Cables), 33.8 (Overhead)* *MV:410.1(Cables)* *LV:* *1166.3(Cables), 108.4(Overhead)* *TransnetBW:* *3'200*
	Substations (number)	*SWH-N:* *110kV/20kV: 8* *TransnetBW:* *125*
	Installed PV capacity (MW)	*SWH-N: 20.61* *TransnetBW:* *5308,17 MW (2015, in distribution grids, no direct connection)*
	Installed wind capacity (MW)	*TransnetBW:* *710,89 MW (2015, in distribution grids, no direct connection)*

	Other installed RES (MW)	*SWH-N: 3.7 TransnetBW: 1105,50 MW (2015, in distribution grids, no direct connection)*
	Installed CHP capacity (MW_{cal})	
	(MW_{el})	*18.8*
	Other installed Distributed Energy Resources (DER) (MW)	

For sections 5.1, 5.2 and 5.3, please enter the relevant activities / results / numbers until date of submission of the report. For your first annual report, please enter indicators where possible; for subsequent submissions, be prepared to provide a more comprehensive dataset. The indicators are related to effects or changes resulting from the activities within your projects, e.g. the number of intelligent metering systems with end consumers installed on your project's initiative. Note that success of your project may be measured against a baseline, i.e. the first number you provide in a report. This may be a reason to report the baseline value of the indicators as soon as possible.

Section 5.1: Technology layer

Is your project involved in the automation of grid control and/or operation?		Yes	
Activities	*Deployment of control units for RE generation units*		
Results	*Partially deployed.*		
Indicator	Number of intelligent metering systems with end consumers	*427*	
	Number of measurement units in the grid (e. g. PMU) monitoring grid parameters		
	Number of on-load tap-changers (OLTC)		
Does your project investigate the demand for flexibilities for the stable operation of the grid?		Yes	
Activities	*Investigate the roles of DSOs and aggregators on a European level to resolve grid problems, such as (local) congestion, loss mitigation and voltage control*		
Results	*Use cases with detailed descriptions of the scenarios including in- and outputs have been defined, system architecture has been developed and first hardware tests for real assets in the grid have been conducted*		
Is your project involved in increasing flexibility (in generation, storage and/or consumption) in the grid system?		Yes	
Activities	*ICT will be deployed to allow direct control of loads and generators both in Germany (Heidelberg) and Turkey (Istanbul)*		

	(ongoing, completion in 2018); Market models for activating flexibilities across Europe have been developed		
Results	*Communication technology has been reviewed, tested and decided upon, aggregator and market platforms have been developed*		
Indicator	Controllable decentral generators (MW)	*Number*	
	Controllable consumption loads (MW)	*Number*	
	Installed stationary storage (MW)	*Number*	
	Available mobile storage (MW)	*Number*	
	Installed Power-to-Heat facilities (MW_{el})	*Number*	
	installed Power-to-Gas facilities (MW_{el})	*Number*	
Does your project promote the integration of distributed and renewable energy sources?		Yes	
Activities	*Improved transnational DSO cooperation and new models for TSO-DSO interactions will allow to increase the amount of RE connected to the grid at DSO level*		
Results	*Grid simulations have been executed; locations in Germany (Heidelberg) and Turkey (Istanbul) are selected; storage batteries (Heidelberg and Istanbul) and photovoltaic panels (Heidelberg) will be integrated in 2018, also HVAC and electric heaters (Istanbul).*		
Indicator	Percentage of locally produced electricity related to overall consumption from the involved grid over the year (%)	*Number*	
	Percentage of installed generation capacity related to maximum grid load (%)	*Number*	
Is your project involved in applying (smart) measures for grid-stabilisation (e.g. smart management, forecasting, cross-network communication, innovative grid services)?		Yes	
Activities	*Development of new products at the aggregator level for solving grid problems at the DSO level (congestion, loss mitigation, voltage control)*		
Results	*Products for congestion management, voltage control, loss mitigation and local balancing have been developed. Testing will follow in 2018/19.*		
Is your project involved in increasing interoperability of technology from multiple suppliers?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of standardisation processes to which project contributes	*Number*	
Is your project involved in reducing energy consumption?			No
Activities	*Text*		

Results	*Text*		
Indicator	Number of end users involved in energy reduction activities	*Number*	
Is your project explicitly targeting efficiency within individual energy networks?		Yes	
Activities	*CALLIA is targeting the improved integration of RE into distribution grids and is developing tools and products for solving local grid problems in a market-based approach.*		
Results	*Development of tools and products has been completed, testing is in progress until the end of the project in 2019.*		
Indicator	Number of curtailment activities (in the distribution grid)	*Number*	
	Number of re-dispatch activities (in the transmission grid)	*Number*	
Is your project explicitly targeting reduced CO_2 emissions related to energy generation, transmission, distribution and consumption?			No, only implicit
Activities	*Through the improved integration of RES into the energy system, higher shares of RE can be taken up by power grids due to smart markets managing supply and demand.*		
Results	*Concept and system architecture have been developed, testing in 2018 will lead to insights from real grids in Turkey and Germany.*		
Is your project involved in improvement of energy efficiency in homes/districts/other private and public entities?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of Energy Management Systems installed with consumers	*Number*	
Is your project involved in building up (ICT) platforms for services/markets?		Yes	
Activities	*Aggregator platform and trading platform for new products (grid services) have been developed and will be tested in 2018.*		
Results	*Development has been completed, integration and communication tests are currently ongoing.*		
Is your project involved in in enhancing the security of (ICT) systems and platforms?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of potential risks dealt with in practice	*Number*	
	Number of potential risks dealt with in security or resilience concept	*Number*	

Is your project involved in reduction of resource and land use in connection to energy generation, transmission, distribution and consumption?			No
Activities	*Text*		
Results	*Text*		
Does your project research grid investment demand (cost-benefit analysis)?			No
Activities	*Text*		
Results	*Text*		
Is your project involved in cross energy carriers and heat grid management?			No
Activities	*Text*		
Results	*Text*		

Section 5.2: Market layer

Is your project involved in increasing the amount of net-works with integrated information services?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of new, ICT based products and services for energy sector	*Number*	
Is your project involved in the trading of (regional) grid services (business / remuneration models, market barriers)?		Yes	
Activities	*Development of use cases and products to solve regional grid problems – congestion management, loss mitigation, voltage control, local balancing - at the DSO level across Europe*		
Results	*Development of use cases is complete, implementation in 2018/19*		
Is your project involved in the reduction of costs for energy services (without reduction of quality)?			No
Activities	*Text*		
Results	*Text*		
Is your project involved in bringing flexibilities to the market?		Yes	
Activities	*Deployment of control units for flexibilities in the German and Turkish distribution grid*		
Results	*Prototypes are tested in field and lab; full scale deployment for the field test in 2018*		
Indicator	Flexibilities remunerated for grid stabilization (MWh)	*Number*	

	Flexibilities used in energy trading (arbitrage) (MWh)	*Number*	
	Flexibilities traded on reserve markets (MWh)	*Number*	
Is your project involved in the definition of new market players (e.g. prosumers, aggregators, user service providers etc.) and roles?		Yes	
Activities	*Development of a market platform for aggregators to offer contracted flexibilities to European DSOs and TSOs*		
Results	*Specification and design of the platform is almost complete*		
Is your project involved in reducing (regulatory) barriers and improving market access for new (cross-domain) energy services?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of changes triggered in regulation or legislation	*Number*	
Is your project involved in the creation of new market models and market places?		Yes	
Activities	*Development of a market platform for aggregators to offer contracted flexibilities to European DSOs and TSOs; in this framework different scenarios will be explored; different time windows will be in the focus – a "Market 2020" and a "Market 2030" scenario for Europe is investigated*		
Results	*Market models have been developed and adapted to the existing regulatory framework ("Market 2020" scenario); for the "Market 2035" scenario a more fundamental approach was developed*		
Does your project do economic impact assessment of new technologies?			No
Activities	*Text*		
Results	*Text*		
Is your project involved in defining functions and roles in the future energy system?		Yes	
Activities	*The roles of aggregators, platform operators, DSOs and TSOs in a European grid with significantly increased RE generation and flexibility are investigated and (re)defined.*		
Results	*Scenario development (see above) is completed; aggregators, platform operators, DSOs and a TSO are actively involved; the results will be described in a detailed report*		

Section 5.3: Adoption Layer

Is your project involved in implementing or investigating customer segmentation?		No

Activities	*Text*		
Results	*Text*		
Is your project involved in implementing or investigating means to activate industrial / commercial customers or consumers / prosumers?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of tools or mechanisms tested to activate customers / consumers	*Number*	
Is your project involved in implementing or investigating means to involve citizen groups or companies in energy efficiency activities (including virtual groups)?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of tools or mechanisms tested to involve citizen groups	*Number*	
	Number of tools or mechanisms tested to involve companies	*Number*	
Is your project involved in investigating which types of consumer groups are most probable to use new energy services?			No
Activities	*Text*		
Results	*Text*		
Is your project involved in implementing co-creation of products and services (with residential or company customers)?			No
Activities	*Text*		
Results	*Text*		
Indicator	Number of end users involved in co-creation of products and services	*Number*	
Is your project involved in implementing new means of training and qualification in the field of Smart Grids?			No
Activities	*Text*		
Results	*Text*		
Indicator	Hours for which training and qualification material has been developed	*Number*	
Is your project investigating the acceptance of innovative (smart) technology by energy industry / the broad public?			No
Activities	*Text*		

Results	*Text*		
Is your project investigating the acceptance of network infrastructures by the broad public?			No
Activities	*Text*		
Results	*Text*		
Does your project research social impacts (e.g. energy poverty)?			No
Activities	*Text*		
Results	*Text*		

Section 6: Contribution to the Knowledge Community

Please fill the following table by adding up over the project time until submission date of the report, i.e. please accumulate over the project time and not only report on the current reporting period.

Which national and European organisations, authorities, companies etc. are taking part in your project? How are they involved?	*ISC is a board member in http://www.eurec.be/en/ -Several partners are member of the SGBW e.V. association (Smart Grids Baden-Württemberg)*	
To which ERA-Net SG+ Living document (in Expera) did you contribute? (specify number of chapters / questions you contributed to)	System Architecture and Modelling	*Numbers of LD questions*
	Storage and Cross Energy Carrier Synergies	*2*
	Regulatory and Market Development	*Numbers of LD questions*
	Consumer and Citizen Involvement	*Numbers of LD questions*
	Standards and Interoperability	*Numbers of LD questions*
	Scalability and Replicability	*Numbers of LD questions*
What were your key contributions to the Living Documents?	*Actual use and scenarios of batteries eg. energy storage. Future options (grid supporting topics)*	
Who in your project consortium participated in any of the ERA-Net SG+ Working Groups? (Specify dates and locations)	*Dr. Langniß – Energie & Analyse (ISC Konstanz): KO Meeting, Split, Croatia – 16/17 June, 2016 – Invited talk (Dr. Thomas Brenner) Salzburg Research:* *- Grid+Storage Meeting, (25.02.2016, Vienna, Austria)* *- ERANet Knowledge Community Kick-off (15.06.2016, Split, Croatia)* *Virtual Architectural Group Meeting (15.12.2016, online)* *TU Wien: Meeting of the Working Groups "System Architecture and Implementation Modelling" and "Interoperability and Standardisation", Knowledge Community of ERA-Net Smart Grids Plus Webex Online conference; Dec 15, 2016; 9 a.m.* *BlueSky Energy: Webex: Dec. 14th 2016 9.00 – 11.00am*	

In which standardisation organisations are members of your project consortium represented?	*indirectly: ENTSO-E, VDE*
To the development of which standards did the project contribute and how?	*None yet*
To which roadmap(s) has the project contributed?	*None yet*
In which national Smart Grids projects or programmes have you and your partners been involved in the past?	*C/sells, CoSSMic, BW Plus Smart Grids und Speicher, E-Energy, Business Models including Batteries for Smart Grids (BiB4SGrid); FFG #849958, LINEAR, Battery integration for Smart Grids ETP Upper Austria Spin.Off*
On the results of which Smart Grids projects or programmes conducted by project partners does your ERA-Net SG+ project build?	*H2020 ELECTRA, evolvDSO, SmartNet, REnnovates*
Which spin-off projects have been started or will soon start using or replicating project solutions from your project? When?	*C/sells (large area Smart Grids demonstration project with around € 100 million overall budget – located in South Germany) – central issues investigated in CALLIA will be reflected within C/sells (especially DSO & aggregator roles, new market models and DSO/TSO interactions)*
Which products and services have been (further) developed within the project or been newly developed? What do they achieve?	*Products for loss mitigation, congestion management, local balancing and voltage control at the DSO level have been developed. They all streamline the processes between grid operators and flexibility providers to enable grids to cope with a more fluctuating and diverse structure of consumption and generation while maintaining high security of supply.*
How many tentative patents have been prepared in your project?	*0*
How does your project guarantee scalability and replicability of the results?	*CALLIA is addressing a very complex situation – grid structure and the roles of DSOs in Turkey and Germany are widely different; also the amount of RE present in the system – if the concepts prove to work in this environment, the solution will be scalable to entire Europe.*

Which collaborations with new partners or other ERA-Net SG+ projects developed due to participation in the ERA-Net SG+ Knowledge Community?	*None yet.*

Section 7: Document upload

In this section you have the possibility to upload documents. You should refer to the uploaded documents during the reporting.