ERA-NET SMART GRIDS PLUS

CALLIA ANNUAL REPORT 2017

Section 1: Project details

CALLIA - Open Inter-DSO electricity markets for RES integration
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CALLIA
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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*			*1*
M1.2 Decision about the integration of relevant stakeholders on regulation	*2016*	*Q4*	*2016*	*Q4*	
M2.1 Decision about the best suitable communication technology for the smart grid application	*2016*	*Q4*	*2016*	*Q4*	
M2.2 Decision about the used protocol stack	*2016*	*Q4*			*2*
M2.3 Decision about the RES components	*2016*	*Q4*	*2016*	*Q4*	
M2.4 CALLIA architecture specified in UML	*2017*	*Q2*			
M4.1 Decision on workshop topics and locations	*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 is slightly delayed due to the delayed project start; completion expected 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 will influence the development of the project. The objectives of the task can be divided in two main sections, with the first being the definition of local balancing challenges and opportunities, and based on this the definition of new products, services and approaches related to intra-DSO and inter-DSO balancing and trading. The definition of the use cases to be researched within CALLIA are defined by the involved grid operators based on a selection of problems regarding the integration of DER in the distribution grids. It has been particularly challenging to integrate the various perspectives of involved parties stemming from the different roles and the different national set-ups. The Smart Grid Architecture Model (SGAM) has been used as common language to derive a joint, integrated view. Four use cases will be further investigated. The ultimate use cases in each detail will get only clear once they are put into action in later stages of the CALLIA.

Simulation based analysis of the potential of local balancing and intra-DSO and inter-DSO exchange is currently ongoing.
Parts of distribution grids of the involved grid operators are modelled and these will allow the simulation of the use cases defined initially. To reduce computation times and optimize resources, ways to aggregate the information and parts of the grid are defined. The grid models will allow the grid operators to identify the best suitable sections of their distribution grids, to be used for the pilot field tests later in the project.
The results of Task 1.1 will work in parallel and very close to Task 1.2 (Business Cases) and Task 1.3 (Regulatory Frame), its outputs will serve as input for Task 2.1 (CALLIA architecture), Task 2.3 (Trading Information), Task 2.4 (device and platform agents), Task 2.5 (Market Platform), Task 3.1 (HiL simulations) and Task 3.2 (Preparation of Field Tests).

T1.2: Local balancing of an mV grid is investigated. The roles and responsibilities of each actor in the local balancing and trading value chain are elaborated. Flexibility products and balancing services on qualitative/descriptive multi-actor business models are mapped and corresponding quantitative business models to model monetary flows, penalties, incentives and constraints for each of the stakeholders and products/services are derived.
Extensions to existing multi-agent business models to situations where actors from other neighboring mV grids and even from hV grids participate at the local flexibility market are developed.

T1.3: The existing regulatory framework, with a particular focus on Austria, Belgium, Germany and Turkey is described and CALLIA-specific constraints are indicated.
Furthermore, CALLIA-specific constraints are indicated.

Work package 2 - Architecture and Algorithms

T2.1: A multi-agent system architecture for trading flexibility within the CALLIA project context is defined. This system architecture is going to connect RES agents, Flexible Load agents, Storage agents and cluster agents on the one hand, with Aggregator and Trading agents on the other hand.

T2.2: In this task, a robust communication stack for the expected smart grid functionality is developed based on different PLC technologies (G3-PLC and BPL by devolo and CENELEC-PLC by Pavotek) and GSM technology (by Pavotek). These are required for future-oriented applications such as smart metering, grid monitoring and RES/Loads/Storage agents integration in the future Smart Grid. The transport protocols will be TCP/IP or UDP/IP or Web based method and will for example be orientated to the new IEC 61850-8-1 (MMS over http) for the RES control agents and IETF RFC 6120 XMPP for the energy flexibility management.

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.

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. These agents contain local forecasting and modelling functionally to provide upstream information to the Aggregator agent, as well as local control functionality to respond to downstream requests coming from the Aggregator agents. Task 2.4 includes the implementation of these agents according to the design defined in this task.

T2.5: REstore is currently designing the aggregator and trading platform agents that fit in the overall multi-agent architecture and Information and Data models. 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. These algorithms are defined and simulated Task 1.2. In task 2.5 they are ported to an operational agent platform and environment.

Work package 3 – Implementation, demonstration, validation pilot:

T3.1: The University of Stuttgart currently designs a hybrid simulation-hardware-based testbed, which will be used to test selected algorithms discussed in CALLIA project. The goal is to investigate the operational features as well as stability of solutions developed in the project, that should be in the further step implemented into the real power system in the scope of the field test. The testbed is based on the Hardware-in-the-Loop concept and allows to integrate interaction of real hardware components within a numerical simulation.
The hybrid simulation will offer a possibility to join the parts of the project, where the hardware solutions will be developed separately, before the implementation in the real system. Hardware components are provided by the responsible project partners for tests with the hybrid simulation environment. The investigated scenarios are defined taking into account the feasibility and technical limitations of the simulation infrastructure. The obtained results should be considered as a background for preparing specifications of the field tests and should allow identifying the possible risks.

T 3.2, T3.3 & 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.

Task 4.2: ISC Konstanz has launched and 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. Against initially discussed plans the website is only presented in English as it was felt that the additional value of creating individual language versions for all partner countries would be minor compared to the required efforts.
Public workshops (see WP4.3) organized by, which are currently planned, will enable communication with stakeholders and other interested parties. . The first workshop will either be as a side event to the IEEE conference in Dresden and/or as a joint event with GEODE in Brussels both scheduled for autumn 2017. The website facilitates the publication of results, visualization of press releases and announcement of events like the workshops.

Task 4.3: CALLIA goes beyond purely economic, ecologic and technological aspects, by actively engaging in stakeholder discussions, involving policy makers and networking organizations in workshops and with active contributions to the standardization bodies (VDE, OVE). The communication activities aim to discuss non-confidential results obtained within the project with stakeholders for this project, to benefit the whole community.
Major stakeholders for the CALLIA project are DSOs and TSOs outside the project that can benefit from the CALLIA results. Therefore, the CALLIA consortium is open for collaboration with these partners outside the consortium. Already, letters of intent have been collected from some major stakeholders for the project, such as Fronius (to provide equipment and feedback on the project) and UEDAS (to provide communication infrastructure installation, data and support on the pilot execution). For the regulatory framework, it will be imperative to receive feedback from stakeholders in the political and regulatory framework on all levels throughout Europe (from regional stakeholders like (larger) prosumers, regional, national and European legislators).

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.

In the first six months, the project has been evolving according to budget. Some of the tasks are slightly behind schedule as CALLIA's start was delayed from April 1st, 2016 to July 1st, 2016. By the end of Q2/2017 we expect to be in full accordance with the planned schedule. To do so, the project schedule has been revised and adapted at the Kick-Off meeting.

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:

- Glossary with clear and unified definitions of key concepts to be used within CALLIA (e.g. "local balancing", "flexibility", "inter-DSO" and "intra-DSO exchange").
- Definition of the products and services that will be researched within CALLIA, defined as: congestion management, local management of balance energy, loss mitigation and voltage control.
- Detailed distribution grid models based on the information provided by the DSOs, to be used within grid simulations and within Hardware-in-the-Loop simulations.
- Evaluation of the potential use of flexibilities inside the grids defined by the participating DSOs for local balance and inter-DSO and intra-DSO exchange (to be completed in 2018)
- Selection of locations for the field tests, including a list of the usable flexible units (loads, generators, storage, etc.) with their technical characteristics (to be completed in 2018)

Task 1.2:

- Social Welfare_ mathematical models specified
- Flex Market – modeling flexibility unit battery
- Flex Market – Flex Trading Platform Model
- Flex Market - Flex products designed
- specification for implementation and validation of the business models are completed
- pilot field studies are prepared (ongoing in 2018)

Task 1.3:

- Hurdles in the existing regulatory framework (European in general, German and Turkish in particular) that prevents the realization of the proposed business models are identified
- Report on existing regulatory framework is continuously revised according to external developments and ongoing modifications

Work package 2:
Task 2.1:

The following project milestones will be reached in 2017:

- Decision about the used protocol stack (M 2.2)

- Decision about the RES components (M 2.3)
- CALLIA architecture specified in UML (M 2.4)

Task 2.2:

- Providing of the principal technical limits of each relevant communication technology (almost complete, just refinement in 2017)
- Providing of the final technical specification of the chosen communication technologies (almost complete, refinement in 2017)
- Providing first product samples for lab and field testing (preparation for the field test)

Task 2.3:

- Protocol stack has been developed and documented
- Generic and asset specific data and information models are completed and documented

Task 2.4:

- Design of a flexible resource agent
- Design of a cluster agent
- Implementation of a cluster agent
- Implementation generic flexible resource agent

Task 2.5:

- Requirements of aggregator and trading platform agents specified
- Implementation and engineering of trading platform started (completion in 2018)

Work package 3:
Task 3.1:

- Specification of the test grids
- Modelling of the selected grid regions complete
- Installation of hardware for HiL simulations (to be completed in 2018)

Task 3.2:

- Defining the pilot test location and functionality
- Defining the HW&SW systems which will be used
- Defining the specifics of demonstration site of Germany and Turkey
- Training Organization for the employees for getting more acquitted with the test site's specifics

Task 3.3:

- Deployment of equipment (ongoing in 2018/19)
- Establishment of communication channels (ongoing in 2018/19)

Task 3.4:

Task will only start in 2018

Work package 4: Dissemination, exploitation
Task 4.1:

- Background and foreground IP directories completed
- Definition of methods on how the knowledge can be exploited

Task 4.2:

- Webpage completely updated to current project status
- Publication plan is monitored and assistance to partners is given (ongoing in 2018/19)
- First networking event is organized

Task 4.3:

- Milestone 4.1 will be reached: Decision on workshop topics and locations

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 2016
Peer reviewed articles, books, book chapters etc. published with or submitted to academic publishers	*number*
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)*
Events targeting end users organised by the project (such as conferences, side events or workshops)	*number*
Presentations targeting end users given by project participants (including participation in panel debates)	*16*
In how much conferences / events did your project participate (not organised by project itself)?	*3*

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"
…	…	…

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* *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*

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

	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	*Not yet 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*		
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); Market models for activating flexibilities across Europe will be developed*		
Results	*Communication technology has been reviewed and decided upon, aggregator and market platforms are being 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 are currently being executed; locations in Germany (Heidelberg) and Turkey (Istanbul) are selected;*		
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	*Development is not yet finished*		
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 is currently in progress.*		
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	*Text*		
Results	*Text*		
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) are being developed*		
Results	*Development has started (specification & coordination) and is 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 to solve regional grid problems – congestion management, loss mitigation, voltage control - at the DSO level across Europe; new products related to trading will be developed*		
Results	*Specification and design of use cases is complete; implementation in progress*		
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 boxes for flexibilities in the German and Turkish distribution grid*		
Results	*Prototypes are running in the lab and will be tested in the existing distribution grids in 2017*		
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 ongoing*		
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 2035" scenario for Europe will be investigated*		
Results	*Market models are being developed and adapted to the existing regulatory framework ("Market 2020" scenario); for the "Market 2035" scenario a more conceptual approach is being 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 currently ongoing; aggregators, platform operators, DSOs and a TSO are actively involved*		

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", Knowldge 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 and voltage control at the DSO level are under development*
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.