# CALLIA

Open Inter-DSO electricity markets for RES integration

> CALLIA demonstrates direct and automated cooperation between grid operators on the national and transnational level for a better integration of local flexibility.

CALLIA deepens inter-and intra DSO cooperation through local market clearing algorithms for deploying more flexibility at all voltage levels. This mechanism considers TSO system-level markets, thereby guaranteeing stability of the European power system with increasing penetration of RES and electrical energy storage systems.
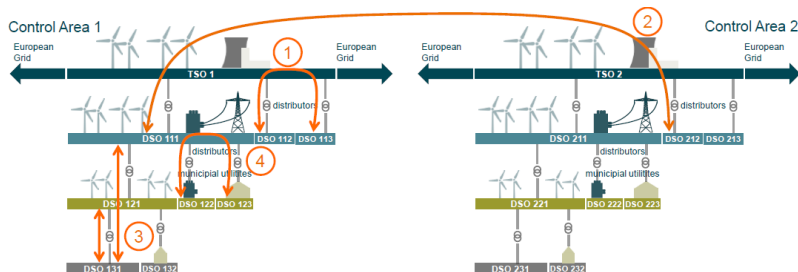
Schematic representation of different forms of grid operator cooperation
©TransnetBW GmbH

By streamlining interfaces between DSOs and TSOs, market access for flexibility providers is enhanced. New standards and technologies are developed and applied, bringing the existing national demonstration projects to the next level. The CALLIA pilots in Heidelberg and Istanbul will demonstrate that local flexibility including energy storage will improve the integration of renewables without jeopardizing grid integrity.

DSO: Distribution System Operator, TSO: Transmission System Operator, RES: Renewable Energy System, PLC: Power Line Communication

Project Duration
01.07.2016 – 31.03.2019

Project Budget
Total Budget: € 4.891.805,-
Total Funding: € 3.314.847,-

Project Coordinator
ISC Konstanz (GER)

Project Partners
- BlueSky Energy (AUT)
- BEDAŞ (TUR)
- devolo AG (GER)
- ISC Konstanz (GER)
- Pavotek (TUR)
- REstore (BEL)
- Salzburg Research (AUT)
- Stadtwerke Heidelberg Netze GmbH (GER)
- TransnetBW (GER)
- University of Stuttgart – IEH & IFK (GER)
- Vienna University of Technology (AUT)
- VITO (BEL)

Project Website
www.callia.info

Contact
Dr. Kristian Peter, ISC Konstanz
+49 7531 36 18 365
kristian.peter@isc-konstanz.de

Dr. Ole Langniß,
Dr. Langniß – Energie & Analyse
+49 711 25 19 10
ole.langniss@energieanalyse.net

ERA-Net Smart Grids Plus | From local trials towards a European Knowledge Community

Main Objectives

- CALLIA aims to develop a **full scheme for fostering inter-DSO interactions in an automated fashion**. Use cases include congestion management, local balancing, voltage control and loss mitigation within distribution grids. **Coordination between DSOs and TSOs** as well as between DSOs will be established **based on social welfare optimizing market principles**.

- Innovative IP-based communication technologies based on powerline communication (PLC) have been developed. They ensure successful network operation not only in a smart metering scenario but also in **connecting (local) markets to specific flexibility assets** located primarily in distribution grids to achieve a resilient and optimum use of those assets. Hardware to monitor and control assets according to the CALLIA architecture have also been developed by the hardware partners of CALLIA.

Main Results

Technology development: Within the newly designed CALLIA architecture, software agents for establishing markets with local clearing algorithms, clustering flexibility and for controlling loads, such as batteries, are developed. Communication hardware, such as G3-PLC and GSM based meters and control boxes will be developed and adapted to the Turkish grid. To demonstrate the feasibility of the approach, a field test with flexibility based in Heidelberg and Istanbul will be carried out within CALLIA. It will include testing the interplay of all stakeholders and components and serve as a blueprint for a transnational integration and control of renewables, storage systems and flexible loads in distribution grids.

Market Integration: CALLIA elaborates the roles and responsibilities of each actor in the local balancing and trading value chain. Flexibility products and balancing services are mapped on qualitative/descriptive multi-actor business models. The partners will derive corresponding quantitative business models to model monetary flows, penalties, incentives and constraints for each of the stakeholders and products/services. They will also research and evaluate new aggregation and trading algorithms and strategies using optimization techniques, game theoretical methods, and econometric approaches.

Stakeholder Integration: CALLIA will demonstrate the seamless integration of flexible loads, storage systems and RES into European grids with a particular focus on TSO-DSO and DSO-DSO interaction. The newly developed products will enable grid operators, aggregators and prosumers to solve problems locally, if technically and economically feasible. CALLIA goes beyond purely economic, ecologic and technological aspects, by actively engaging in stakeholder discussions and involving policy makers and networking organisations in the project's communication and dissemination plans.

From Local Trials towards a
European Knowledge Community

http://www.eranet-smartgridsplus.eu

ISC International Solar Energy Research Center Konstanz

Dr. Langniß
ENERGIE & ANALYSE

devolo

stadtwerke heidelberg
netze

TRANSNET BW

BLUESKY ENERGY

REstore

BOĞAZİÇİ ELEKTRİK DAĞITIM

PAVOTEK

Universität Stuttgart

salzburgresearch

TU WIEN
TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

vito