

FLAIXENERGY

An innovative Energy Flexibility Platform

Objective

Within the project “FLAIXEnergy“, FEN Research Campus contributes to the development and implementation of an energy flexibility platform. The platform merges decentralized producers and renewable energies to virtual power plants, while also connecting industrial consumers as flexibility clusters. The project aims for the derivation and standardization of an initial energy footprint (Fig.1).

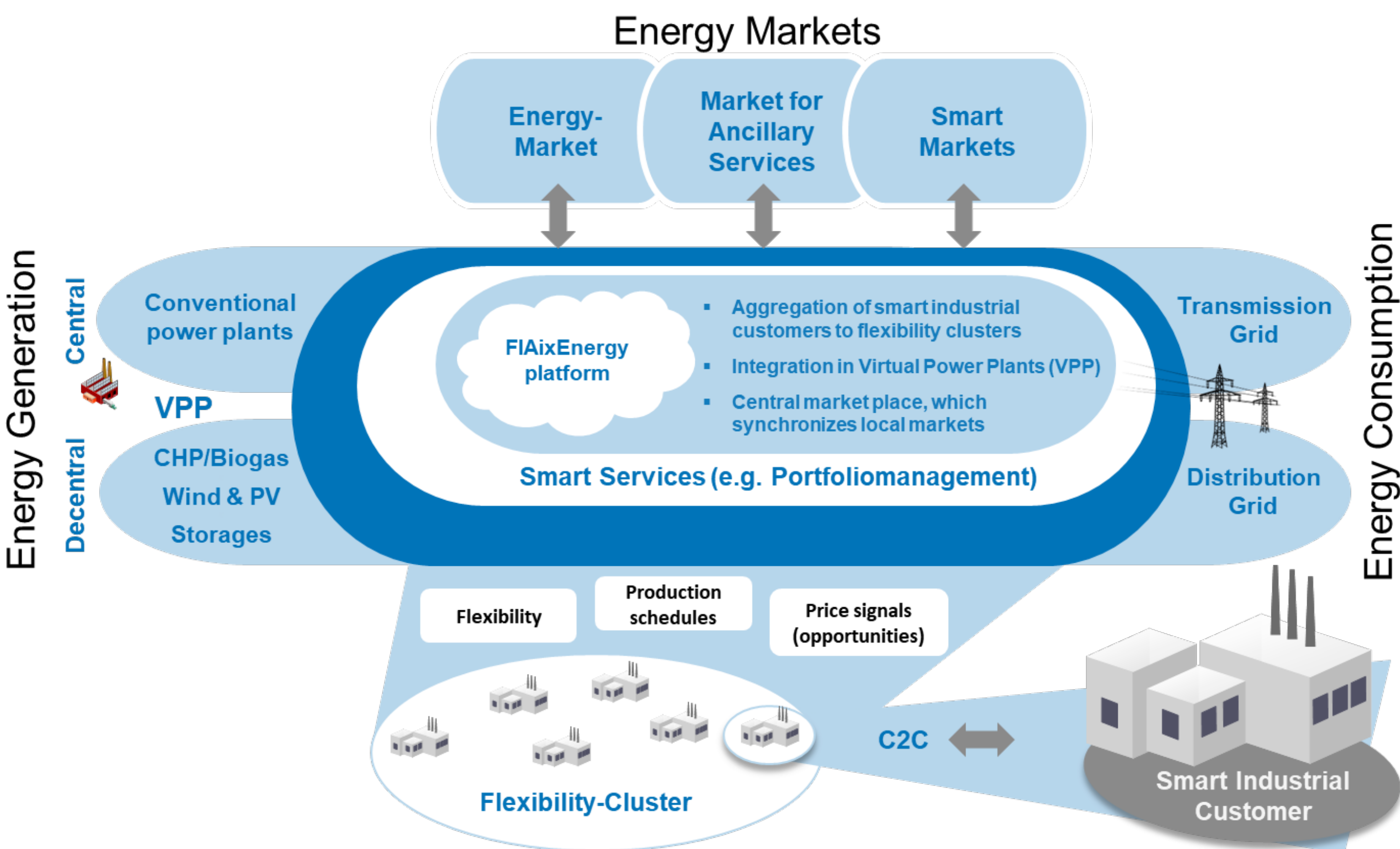


Fig. 1: The Project Setting – A cloud-based optimization platform for regional energy distribution and trading

Project Description

FLAIXEnergy focuses on the development of an innovative flexibility platform for synchronizing and trading the regional energy consumption of industrial consumers by means of decentralized energy production and distribution in the model region of Aachen.

The implementation of regenerative energy sources within industrial production, storage integration as well as smart energy services play an essential role in the context of energy transition. Based on these developments, the combination and coupling of different solutions is of particular importance in the framework of the research project.

Methodology

The project addresses both flexibility potentials in terms of energy demand and distribution as well as energy generation. Energy-intensive industrial loads are aggregated to flexibility clusters, based on the identification of relevant flexibility characteristics and regional specifications carried out by a corresponding description model. Furthermore, FEN Research Campus investigates possible infrastructure measures that are necessary in the context of participating in an energy flexibility platform. Here, an important aspect is to point out recommendations in the given regulatory frame.

DIN SPEC 91366

In the context of the project, FEN Research Campus is also involved in the development of the DIN SPEC 91366 which serves as a reference model for characterizing the energy flexibility of industrial facilities. This specification document systematically shows companies, which aspects have to be considered and investigated in the identification, assessment and utilization of energy flexibility. The reference model supports the communication of energy information and communication, as well as the assessment of energy consumption behavior with regard to energy flexibility, in order to lay the foundations for participation in the Smart Grid. Relevant positioning and planning values in energy and load management or production planning and control are included in this evaluation. Following relevant factors are identified and serve for characterization in this context: organizational-, process-, technical-, cross asset and energy related- factors.

This DIN SPEC is aimed at industrial consumers who are interested in participating in the spot market and reserve energy market. It is also aimed at energy service providers, since energy-relevant industrial companies will be able to implement flexibility options in the future that have a significant influence on power plant and production schedules in accordance with DIN SPEC 91366.

In order to apply the DIN SPEC, a production specialist selects the specifications of the according process or asset. Thus, the model allows a step-by-step evaluation of flexibility features that can be identified in each industrial facility (Fig. 2).

Flexibility Feature	Specification			
Production Type	One Time	Variants	Series	Mass
Continuity of Asset Utilization	Not continuous	discontinuous	Make-to-Stock	Fully continuous
Production Concept	Make-to-Order			Continuous/Batch Prozess
Planning Horizon	Hour	Day	Up to 1 Week	> Week
Interruptability	Possible			Not Possible
Number of Production Stages	Single staged			Multi Stage
Controllability of Technical Assets	Given			Not given
Type of Control	None	Manual		Remote
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Fig. 2: Pre-version of the specification model that allows flexibility identification

Project Partners

- DFA Demonstrationsfabrik Aachen GmbH
- DIN e. V.
- DTG GmbH Development & Technology
- FIR e. V. an der RWTH Aachen
- Flexible Electrical Networks (FEN) Research Campus
- PHOENIX CONTACT GmbH & Co. KG
- PSI Automotive & Industry GmbH, PSI Energy Markets GmbH, PSI Metals GmbH
- QSC AG
- StreetScooter GmbH

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