

management operates on a horizontal level across domains – transport, water, heating, lighting, even weather information and traffic regulation, bringing urban management to a higher level. With open access and reuse of technology bricks central to the SEAS platform approach, cities can even benefit from proven initiatives taken elsewhere, with a city in one country ‘cherry-picking’ the best of the innovation from a city in another country and so on, in a virtuous circle. SEAS therefore becomes not only an enabler of innovation but also a “business connector”, promoting the digital transformation of smart cities, back up with a public repository in W3C and aligned with M2M, ETSI & AIOTI standards.

Consortium member CNR has tackled the question of how to synchronise periods of electricity consumption with intermittent production from renewable energy sources and is experimenting with a smart management solution for charging the electric vehicles of its fleet and those of the technical services of its partner, Grand Lyon Metropole. GECAD, the Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development at Porto Polytechnic, has developed a hybrid software and hardware simulation platform to simulate scenarios composed by physical devices

(consumption and PV generation), located in real buildings and complemented by software agents able to represent multiple entities (consumers, generators, electric vehicles, microgrids, buildings, etc.). Telecom Bretagne (Institut Mines-Télécom) has produced a dynamic and fast solution, able to adapt to real production, based on machine learning, that provides the energy management distribution system operator with a tool to generate an hourly-based PV production estimation (the interval depending on the weather forecast interval).

Asema IoT Central is a software that embeds the full functionality of the Smart API into a development platform that can be used by organizations who want to implement their own energy and mobility IoT solutions.

The Smart API SDK and the specification is maintained by the consortium member Asema Electronics. Parties interested in becoming a part of the energy network can download the free software from www.smart-api.io and acquire support in software integration from Asema Electronics.

In terms of revenues, exploitation short-term (2017) is expected to be €2 million, with medium-term exploitation (2018) anticipated to be €25 million and long-term revenues (2019 to 2021) as much as €600 million.

MAJOR PROJECT OUTCOMES

Dissemination

- Defining a Distributed Architecture for Smart Energy Aware Systems, Guillaume Habault, Jani Hursti, Jean-Marie Bonnin
- CSD&M 2016 in Dec 2016, Guillaume Habault

Exploitation (so far)

- SmartAPI Reference Architecture Model (S-RAM), a design reference for manufacturers; shows how to plug their products into a global network in a way that enables coordination and control
- Smart Energy API Standard (SEAS), a data definition for software engineering on how energy systems should communicate
- SmartAPI Software Development Kit (SDK), an open source software development toolkit to easily engineer compatible systems
- Asema S series relays. Measure and control actual physical devices, make the actual changes to the network, accessible through SEAS standard
- Asema M series power meters. IoT power measurement units accessible through SEAS standard
- Asema E series gateways, for edge i.e. in field level semantic connectivity; connect physical devices into the network
- Engie DAPM data hub, for cloud i.e. network level connectivity to connect third party IT systems and algorithms
- Empower EMS management system. Energy domain network orchestration system to balance the network
- BeNomad route planner. Converts kilometers to kilowatts, calculates the power consumption of an electric vehicle on real routes.

ITEA is the EUREKA Cluster programme supporting innovative, industry-driven, pre-competitive R&D projects in the area of Software-intensive Systems & Services (SiSS). ITEA stimulates projects in an open community of large industry, SMEs, universities, research institutes and user organisations. As ITEA is a EUREKA Cluster, the community is founded in Europe based on the EUREKA principles and is open to participants worldwide.

SEAS 12004

Partners

Belgium

SOLTECH

Finland

Asema Electronics

EKE-Finance

Empower IM Oy

Foreca Oy

Fortum

VTT Technical Research Centre of Finland Ltd.

France

ARMINES

BeNomad

CEA LIST

CEA LITEN

Clipsol

CNR

ECOMETERING

ENGIE-ENGIE/CRIGEN

GAC Group

ICAM

Institut Mines-Télécom

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Kerlink

UBIANT

Portugal

Evoleo Technologies

ISEP/IPP-GECAD

ISA Energy Efficiency-Virtual Power Solutions, S.A.

Romania

ECRO SRL

Siveco Romania S.A.

Spain

ABADA

Answare

Ingeniería y Control Electrónico, S.A.

PLANET MEDIA

Universidad Politécnica de Valencia

University of Girona

Turkey

Defne

Enerjisa Baskent Elektrik

Innova IT Solutions Inc

LNL Elektrik Elektronik Bilisim ve

Danismanlik Ltd. Sti.

SimBT Inc.

Project start

February 2014

Project end

December 2016

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