

# SEAS

Smart Energy Aware System

## Impact highlights

- 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.
- The DAPM architecture has been chosen by ENGIE as the reference architecture for the company's overall service platform. The market potential using the service platform including the applications (cumulative from 2017 to 2020) is approx. \$70 billion for the geographical regions where the ENGIE competence already exists.
- Empower has incorporated dynamic microgrid strategies into its future roadmap and has enabled interaction of flexible energy resources with the Enerim EMS solution used to prototype future interactions in the SEAS project. The Enerim CIS solution that builds on SEAS knowledge in connectivity, is gaining ground as the premier new energy customer information management and billing solution. It is deployed now to enable upcoming datahub enabled retail markets in Finland with over 45% of the national distribution metering points being managed by it in the next years.
- Asema's IT solutions now use the Smart API to coordinate and share information between resourcing and planning systems used by cities. Coordination between departments and organisations can now be made much more effortlessly and automatically. For instance cities can combine the routes and tasks of people managing infrastructure.
- A public repository in W3C and alignment with standards supported by M2M, ETSI & AIOTI

The SEAS project is at the heart of the energy transition. The project set out to enable interworking of energy, ICT and automation systems at consumption sites, introducing dynamic and intricate ICT-based solutions to control, monitor and estimate energy consumption. It also explored business models and solutions to enable energy market participants to incorporate micro-grid environments and active customers. The SEAS revolution: more cost-effective, more environmentally friendly and more customer focused energy streams through efficient interaction between providers and prosumers ... everywhere.

## Project results

The objective of SEAS was to model energy related IT systems so that meaningful, efficient and expandable information exchange can be standardised between market players in a field traditionally riddled by a lack of system interoperability. This work resulted in three main outcomes:

1. The Smart Energy API Standard, a semantic information model, which serves as a means for energy IT systems to connect intelligently to each other and transparently to users.
2. The Smart API software development kit (SDK), which makes it possible for system manufacturers, IT integrators and the like to apply this Smart Energy API Standard in an out-of-the-box fashion.
3. The Smart API Services reference framework, which is the reference design model for compatible IT systems and a highly innovative, future-proof open architecture that allows for interoperability, innovation and different kinds of business models based on an advanced dynamic ontology dedicated to the smart energy grid.

The scope and breadth of the project is evident from 120 use cases classified in six main categories along with 30 ontologies for the energy domain. In addition to two demonstrator scenarios defined on autonomous buildings and microgrids, 16 pilots in four different countries and distributed data platforms were installed, supplemented with a Microgrid Context Awareness Framework, including algorithms.

## Exploitation

ENGIE introduced the DAPM (data access point manager), a dedicated middleware & appstore for city areas, open to third party applications and data. This new “City as a Service” model breaks down not only the energy silos but also other verticals in a first step towards interoperability. Data management thus operates horizontally across domains – transport, water, heating, lighting, even weather information and traffic regulation, bringing urban management to a higher level. DAPM has already been taken up by Aubagne (for public lighting) and is being considered in Rennes, Dijon, Marseille, Saint-Nazaire in France and Barcelona in Spain. A partnership for prototyping has already been signed between ENGIE &

Intel who will provide dedicated chipsets, cybersecurity and artificial intelligence solutions for large-scale industrialisation.

Asema Electronics markets the Smart API SDK and its specification. Furthermore, Asema IoT Central is a software that embeds the functionality of the Smart API into a development platform that can be used by organisations who want to implement their own energy and mobility IoT solutions. Asema IoT Central is used in smart cities for smart waste management, smart lighting, vehicle sharing, smart charging, and building management offering one holistic view to all city data across various departments and organisations within the city.

The Empower Enerim EMS – Energy Management System builds on the SEAS results. It is an energy domain network and market process orchestration system that allows balancing of the network with market and control functionalities. Enerim EMS enables energy companies and energy intensive communities or industrial customers to manage their energy assets and market positions more efficiently.

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| <b>SEAS</b>   | <b>PARTNERS</b>                          | <i>France</i> | UBIANT                 | ○                   | Planet Media                        | ○             |                           |
| <b>PROJECT LEADER</b>   | <i>Belgium</i>                           | ARMINES       | ○                      | ○                   | Universidad Politécnica de Valencia | ○             |                           |
| Philippe Bourguignon, ENGIE   | SOLTECH                                  | ○             | BeNomad                | ○                   | University of Girona                | ○             |                           |
|   | <i>Finland</i>                           | CEA           | ○                      | <i>Portugal</i>     |                                     |               |                           |
|   | Asema Electronics                        | Clipsol       | ○                      | Evoleo Technologies | ○                                   |               |                           |
|   | EKE-Finance                              | ○             | CNR                    | ISEP/IPP-GECAD      | ○                                   | <i>Turkey</i> |                           |
|   | Empower IM Oy                            | ●             | ECOMETERING            | ○                   | Virtual Power Solutions             | ○             | Defne                     |
|   | Foreca Oy                                | ○             | ENGIE                  | ●                   |                                     | ○             | Enerjisa Baskent Elektrik |
| <b>PROJECT START</b>  | Fortum                                   | ●             | GAC Group              | ●                   | <i>Romania</i>                      | ○             | Innova IT Solutions       |
| February 2014   | VTT Technical Research Centre of Finland | ○             | ICAM                   | ○                   | ECRO SRL                            | ○             | LNL Technology            |
|   |  |               | ITRON                  | ●                   | Siveco Romania                      | ●             | SimBT Inc                 |
| <b>PROJECT WEBSITE</b>  |  |               | Institut Mines-Télécom | ○                   | <i>Spain</i>                        |               |                           |
| <a href="https://www.the-smart-energy.com">https://www.the-smart-energy.com</a> |  |               | Kerlink                | ○                   | Answare                             | ○             |                           |