



Project Profile

SPEAR

Smart Prognosis of Energy with Allocation of Resources

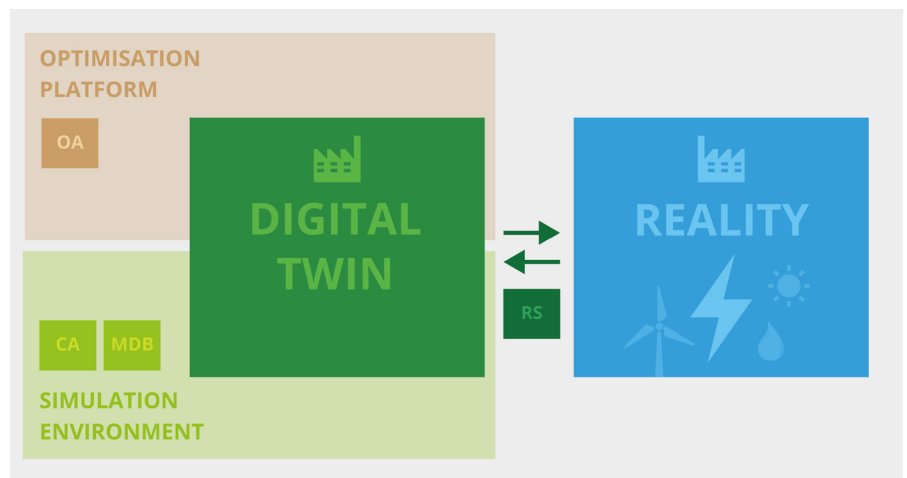
The ITEA project SPEAR aims to develop a flexible optimisation platform that helps to improve a broad spectrum of industrial production processes in terms of energy-related aspects, with a focus on optimising the energy consumption of both existing and new production plants.

ADDRESSING THE CHALLENGE

Nowadays, energy optimisation in industrial plants tends to be performed upon the purchase of a certain product, such as low energy-consuming machines that are bought in order to reduce costs. However, there is no subsequent analysis of the impact of such purchases. SPEAR tries to change that by creating a flexible optimisation platform, which aims to improve the energy profile of industrial production processes.

PROPOSED SOLUTIONS

The platform proposed by SPEAR will optimise the energy consumption of existing and new production plants, and support both virtual commissioning and operating production systems. The platform will implement appropriate algorithms to create an accurate prognosis of the expected energy consumption and will come in two versions, namely as a local application and as a cloud-based service. SPEAR's main innovation will be the mirroring of the production plant's energy consumption by simulating extended behaviour models on low-cost hardware. To make this work, SPEAR makes use of the "Digital Twin" metaphor. Digital representations of real components and their related behaviour will be extended by a corresponding energy model which represents a holistic description of all the different characteristics, e. g. geometric, kinematic or dynamic information. Digital twins will further be used for embedded



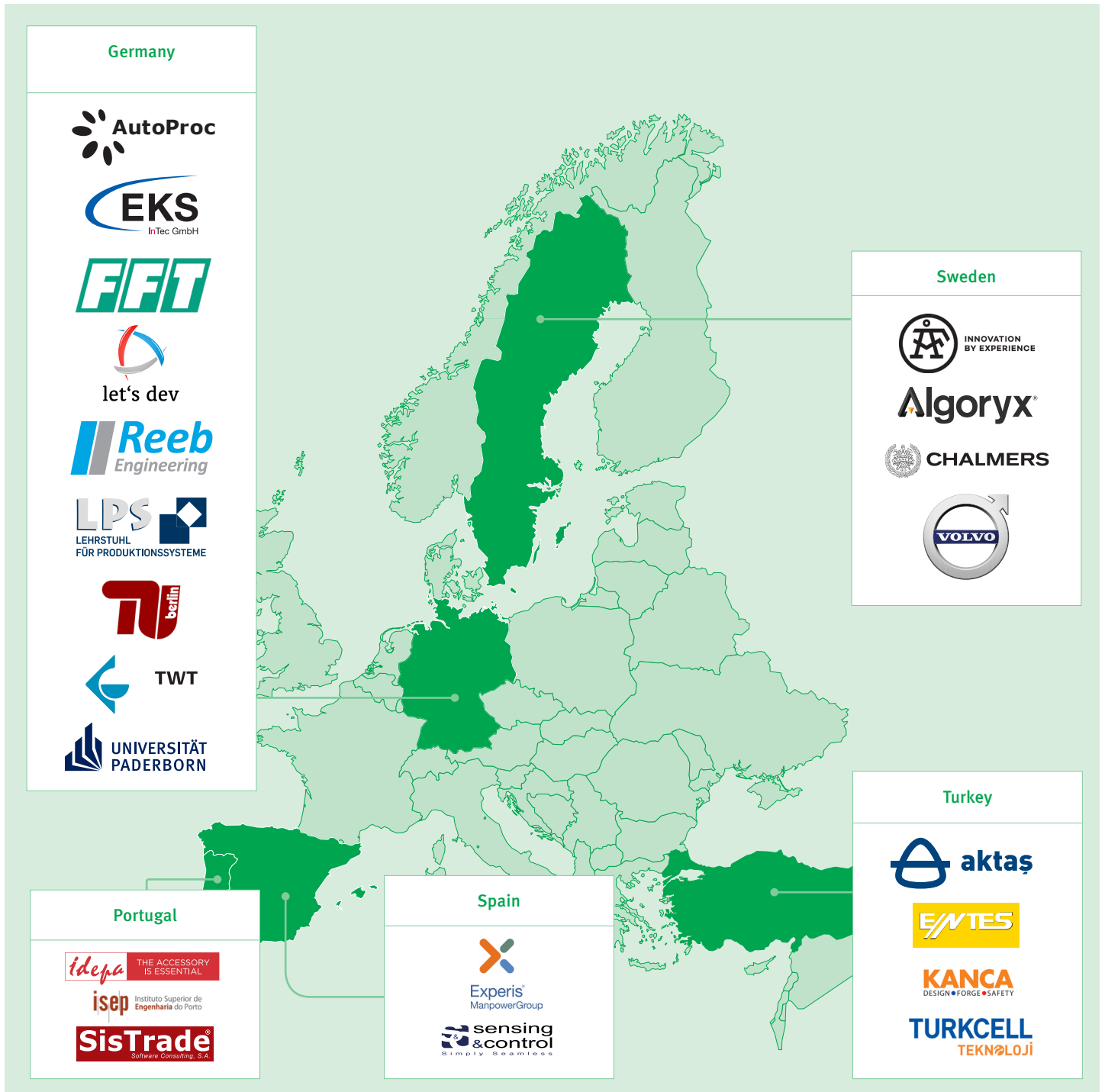
RS Reality-Simulation Connector OA Optimisation Algorithms CA Configuration Assistant MDB Model Database

Projected results of SPEAR

hardware-in-the-loop (HIL) simulations running concurrently in parallel with the real plant, effectively making the digital twin a digital shadow of the real plant. Such highly flexible and cost-efficient approaches are the focus of SPEAR whereby accurate simulation of the production processes optimises the planning and performance of the production system. The development of a software wizard will simplify and accelerate this construction process. The software-neutral models will allow dynamic behaviour to be defined as well as physical data and meta-information of components, plants and lines.

PROJECTED RESULTS AND IMPACT

Accurate estimates of energy consumption will help industrial customers to get cost-effective energy tariffs and enable energy-consuming processes to be assigned to cheaper timeslots where more energy is available. Furthermore, energy providers will be able to manage and balance their grid more easily, reducing the amount of energy purchased (saving costs) and helping industrial customers to cut their effective emissions. In addition, SPEAR will help the Smart industry paradigm to gain momentum.

**Project start**

September 2017

Project leader

Anton Strahilov, EKS InTec

Project websitewww.spear-project.eu**Project end**

September 2020

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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.