

# Smart energy

– a new



# A new challenge accepted!

## Insights into the new ITEA key challenge and the 2021 customer workshop

From 3 June to 24 June 2021, ITEA organised its 7<sup>th</sup> international customer workshop, and this year the focus was on Smart energy. Before sharing some of the highlights of this event, let us explain why Smart energy has been chosen as a new challenge for ITEA 4.

### Smart energy as a new challenge for ITEA 4

Energy is everywhere in our life. As soon as we want to move, to transform, to heat or to process something, we need energy. Energy is at the heart of every economic activity and the availability of energy has always been a concern for humankind. Energy is also a very large industrial sector, representing around 5% of the total world gross domestic product and employing around 60 million people. It is expected that this number will grow in the future with the development of the green energies (a European Commission study forecasts that moving to a greener economy may lead to net effect of 18 million extra jobs).

The energy sector is currently undertaking important transformations. First, due to the global warming problem, there is a strong move towards the carbon-free production of energy. There is an urgent need to find alternatives to fossil energies (coal, oil, gas) that emit greenhouse gas, which are responsible for the increase of the average global temperature. The development of renewable energy sources is a key trend that has a strong impact on the energy sector. Second, especially in Europe, there is a move towards a more competitive market with some new regulations to open the market to new players. Again, we see this trend exerting a powerful impact on the organisation of the energy sector that is being transformed from a market dominated by national operators to a more competitive field. Third, both the need to move towards a greener economy and the will of organisations and citizens to use energy in an accountable way has created a trend towards better control of the energy usage. The continuous introduction of a carbon cost in the economy governed by new regulations (e.g. carbon trading) is a strong incentive, especially for large industrial sectors. In addition, we see the rise of the notion of sustainable development in society and economy. Consequently, everyone wants to be accountable for the energy he or she uses, and we see the emergence of the new notion of "value per energy unit" in our society.

Software is an important technology for the transformation of the energy sector. Of course, it cannot be the solution to all the challenges, but software is clearly an enabler that will help to tackle the problems in moving towards a greener and efficient energy sector. Software can be a good means to manage the complexity coming from the new energy sources or the emergence of more players by allowing the interactions of many players in more heterogeneous contexts. It can also help to introduce more automation in the complex challenge to balance the production and demand of energy. It can introduce new

optimisation capability in most of the energy systems that will lead to greater efficiency. It can transform the new data sources that are collected into valuable information that will help the energy players. All in all, software innovation is a key technology for the evolution of the energy sector.

For all these reasons - importance of the energy sector for the economy and society, strong ongoing transformations, potential of software to enable this transformation - ITEA 4 has decided to add 'Smart energy' as a new smart challenge to the seven existing ones.

### Smart energy customer workshop

The 2021 international customer workshop attracted a high level of interest as the first ITEA event aimed at bringing together several energy stakeholders – some new to ITEA – and discussing how this new challenge could be impacted by potential ITEA projects.

This event gathered around twenty major players in the energy sector representing the energy value chain – energy providers, Transmission System Operators (TSO), Distribution System Operators (DSO) and large energy users – and around twenty solution providers – large companies and SMEs – of the energy sector.

The event was organised over three weeks with a kick-off session to set up the objectives and to present the way to work together in an online environment. Afterwards, four 'Challenges sessions' were organised dedicated to the presentation of the needs and pain points of the energy sector players. Next, there was some brainstorming to generate ideas for potential collaborative research projects that could solve some of the challenges expressed during the previous phase. Included in this online brainstorming were live sessions gathering people interested in an idea proposed by a participant. Finally, the customer workshop was concluded by a Closing session that presented the summary of the exchanges and a keynote on how to address the energy challenges together. This format was designed to allow for the flexible participation of the attendees and to maximise the interaction despite the absence of physical meetings.

The four sessions on the challenges were organised around a central topic that was of common interest for all the participants of the session. The subjects covered were:

- > 'New usages' to discuss how to benefit from the energy sector transformations – more flexible grids, the development of electric vehicles, the development of simulation – to create new business;
- > 'Flexibility' to address the relationship between the electricity markets players, congestion management,

new businesses, new forecasting tools and the trends for IT systems to support the electricity grid;

- > 'Optimisation of the energy usage' to share experience on the best practices to optimise the usage of energy and to discuss how to improve energy efficiency in industrial sectors such as automotive, the forging industry, manufacturing plants, telecom and cloud;
- > 'Multi-energy' to analyse the impact of renewable energy sources – wind energy and photovoltaic energy – and the evolution towards a more complex and distributed energy system.

After all these sessions, the workshop produced some interesting ideas that may give birth to future ITEA research projects. Some of the ideas were focused on new opportunities generated by the availability of data, the control and the simulation of complex and heterogenous systems or the facilitation of transactions between the energy value chain partners.

In addition to the emergence of these solid ideas and of some collaborations, the workshop has helped to establish progress towards a shared vision of the research priorities to address the important transformation underway in the energy sector. The participants have developed new connections that will be important as no single player can tackle the current energy challenges alone. In conclusion, this workshop was very valuable in initiating ITEA's activity in this new Smart energy challenge.

A full report of the Smart energy customer workshop can be downloaded from the ITEA Call 2021 Project idea tool (login required).

