

CHALLENGES OF THE POWER INDUSTRY IN EUROPE

This publication reflects only the interviewee's views and the European Commission, or its delegated Agency INEA is not responsible for any use that may be made of the information it contains



Interview with Christoph Gutschi, Senior Project Manager, cyberGRID

You have been leading Virtual Power Plant (VPP) implementations in the European power industry and managing research projects for cyberGRID since 2012. What challenges is the industry now facing?

Decarbonisation, the biggest challenge for our generation, is greatly affecting the power supply industry. We need to integrate renewables and migrate the transmission and distribution infrastructure from centralised generation to distributed generation. However, this requires redimensioning many parts of the distribution and the transmission grid. To meet these requirements, our society could face high costs. The main challenge for the renewables business with an impact on the entire power industry is this: from an investor's perspective short-term amortization is important. In contrast to this, assets in the power industry typically have a long-term life time.

“VPPs can collect flexibility and provide it to the national or the interconnected European electricity system, a function that serves the constantly growing renewable generation”

How can VPPs offer solutions to these challenges?

From a technical perspective, VPPs can collect unused or not properly used flexibility and provide it to the national or the interconnected European electricity system, a function that indeed serves the constantly growing renewable generation. It is very difficult to plan in short or long term; more flexibility will be needed to bridge the gaps of the renewable generation. From an economic point of view, VPPs are directly addressing the dilemma of investors' need for short-term payback versus the long-term planning in the power industry; a VPP can thus lead to a short payback time of one or two years for new flexibility projects. This is good news for new investments and their required KPIs, even in the power industry.

“The power supply industry is a very conservative business. What is really needed is a culture of taking risk, a new culture of entrepreneurship”

What is your personal take on encouraging new business models for the future of the energy sector in Europe?

The power supply industry is a very conservative business. The reason is two-fold. Investments are made in long-term assets, such as power plants; in addition, there is a culture of high security of supplies. Electricity is crucial for our society and national economy, so failing to support it would entail a lower GDP. Consequently, high security of supply leads to conservatism in the power industry. “Do not take any risk” is a mentality not only on the technical side. It has also swept over to the business side, affecting business models. New business models in the electricity industry are not met with great appetite for risk, at least not for institutional investments. So what is really needed is a culture of taking risk, a new culture of entrepreneurship.

InteGrid, an EU funded project cyberGRID is a member of, aims to bridge the gap between citizens and technology in the Smart Grids arena. Can you elaborate on the gaps identified?

First, there is a need to increase intelligence in the distribution system. The analysis done for the project proposal showed the necessity to find new tools to make the distribution grid smarter and increase the information of DSOs on the real-time status of the grid; in many European countries the DSO could use some more real-time operational information on the ongoing activities in the grid. Second, regarding the VPP we found that the main need is high-performance and multi-purpose communication between several partners, which requires new gateways. This could be addressed through a grid market hub, a communication hub managed by a grid operator. Third, many European citizens believe that the energy transition will not work if it only comes from the technical side. We need to encourage individuals to participate in the transition and become more aware of how they use electricity. Representing a crucial component of InteGrid, such strategies and tools for consumer engagement are mainly being investigated in the Scandinavian pilot, where the project partners explore new ways to engage customers.

How does InteGrid aspire to bridge the gaps?

Through the project's pilots, the technical solutions for new flexibility and through new tools for grid operators like optimised power flow tools. Moreover, one of our partners is developing a traffic light system so that the grid operator can have an influence on flexibility exploitation in the near future. This would facilitate exploitation of flexibilities connected to weaker parts of the grid where in the conventional case the grid operator would not permit the use of flexibility in case its use was uncertain at any time. By means of this traffic light system it is much easier for the DSO to approve using flexibility at regional level; in this case the DSO has the possibility to send a red light, which means 'Stop using this flexibility' in order to reduce the stress on the grid.

“cyberGRID's strength is its ability to support partners regarding system harmonisation, to develop a deeper understanding of the market point of view, and to provide technical solutions”

Are there any efforts from cyberGRID to reinforce relationships between project partners in order to achieve common goals and evaluate current solutions provided?

InteGrid benefits from cyberGRID's experience in the VPP business in several European countries; our knowledge has helped the demo leaders to plan their demonstrators accordingly. We also help partners understand issues between different countries, issues that they had not been aware of. There are three completely different systems in terms of regulatory schemes, and cyberGRID has experience in all three markets. We can thus support our partners and explain to them the link between grid operation, market operation and enable them to consider the barriers arising from regulation. cyberGRID's strength is its ability to support partners regarding system harmonisation, to develop a deeper understanding of the market point of view, and to provide technical solutions. DSOs will not automatically understand the challenges aggregators are facing; this is where cyberGRID plays a key role.

Which InteGrid work packages is cyberGRID's expertise linked to?

Our work focuses on Work Package (WP) 2, dedicated to technical developments of the solutions, mainly solutions for VPPs but also interfaces to the grid market hub and interfaces to solutions from other partners. For instance, we developed APIs to communicate with forecasting systems provided by other partners. We are also partnering in WP3 and WP4, which focus on real-life demonstrators in Portugal and Slovenia.

How does cyberGRID's ICT solution, cyberNOC, allow customers to maximise asset utilisation and share in the economic benefits by offering flexibility?

The new developments in InteGrid are related to integration with the grid market hub. The VPP can receive a traffic light via the grid market hub from the DSO or even directly. This enables the VPP to recalculate available flexibilities on a level of each grid node. So the VPP is not only virtual! For the first time it can support grid planning and grid operation by integration of the traffic light system. Concerning the grid market hub, new developments in the project mainly relate to interfacing with other partners and to supporting new flexibilities from other sources like waste water treatment plants. In this project, a method to integrate waste water treatment plants into VPPs was developed and will be tested in the following months. This is interesting from a replicability perspective because there are thousands of waste water treatment plants across Europe. All these can provide a certain amount of flexibilities and it is important to get these into VPPs, as they can be a cheap source of flexibility. Regarding cyberNOC there is another novelty: in the scope of InteGrid we developed algorithms to support batteries as a source of flexibility for VPPs; the battery has a different focus, but its remaining capacity can be used as a VPP.

“Perceptions of the market differ a lot among European regions. We need to develop solutions to match with all of them”

The project was kicked off in Lisbon in January of 2017. Which challenges have you faced so far and how have you tried to tackle them?

The Iberian system, implemented in Portugal and Spain, differs from the rest of Europe due to geography and different rules applied. In the second demo we are operating in Slovenia where the organisation of the market is quite similar to Austria or Germany. We found out that perceptions of the market differ a lot among European regions. We need to develop solutions to match with all of them. For instance, in Portugal the entire distribution is operated by one company, EDP Distribuição, which, by the way, is also the coordinator of InteGrid. On the other hand, Slovenia, a much smaller country has 5 DSOs. This has a huge impact on regulation, on unbundling rules and on the development of the market. In Portugal, it is currently not possible yet to launch an aggregation business like it could be done in Slovenia. In addition, technical development is different in Slovenia; Portugal and the Nordic countries have a lot more experience in smart solutions operating inside their grids compared to Central or Southern European DSOs. This highlights the challenge but also the main benefit arising from European R&D projects: We are learning a lot from each other, and we are taking the notions from the lab and pushing technological readiness to overcome tomorrow's challenges.

