Innovation Across Borders – Forum VBO-FEB

Innovation Case Preparation Form

WHO

- Quelle(s) entreprise(s) a/ont été impliquée(s) ? (taille, secteur d'activités, …)
- Avec quel(s) partenaire(s) (clusters, centre de R&D, spin-offs, hubs,…)

The EcoGrid EU project consortium consisted of the following partners:

System Operators

- Elia (Transmission System Operator, Belgium)
- Energinet.dk (Transmission System Operator, Belgium)
- Eandis (Distribution System Operator, Belgium)
- Ostkraft (Distribution System Operator, Denmark)
- EDPD (Distribution System Operator, Portugal)

Industrial partners

- SIEMENS
- IBM
- Landis & Gyr (manufacturer of smart meters)

Academic partners

- Technical University of Denmark
- TNO (research institute, the Netherlands)
- ECN (research institute, the Netherlands)
- Austrian Institute of Technology
- Technalia (research institute, Spain)
- University of Tallinn
- Sintef (research institute, Norway)

WHAT

- Quel était l'objectif de l'innovation?
- En quoi consiste précisément l'innovation (application, type d'innovation – produit/process/business model/support services/management, …) ?

The objective of this project was to demonstrate whether residential electricity users could actively participate in the needs of the power system in order to further integrate renewable energy resources into a system that already comprises a high number of renewable energies.

In order to accomplish the objectives of EcoGrid EU, an innovative concept was applied and tested by means of a large-scale demonstration (1,900 participants).

- The concept
  In order to apply the EcoGrid EU concept, a new and simple electricity market model was developed that could be integrated into the existing electricity market.
- The demonstration
  Equipment used for energy efficiency in buildings was tailored to the needs of the demonstration. Smart meters able to measure electricity consumption every five minutes and send these measurements to a server were also developed. Finally, software was created to support the operation of the new electricity market. User-friendly web-based interfaces were also developed in order to provide information to end consumers.

More specifically, the solution involves connecting a house with price signals and letting it respond to these by shifting or shedding its load:

- Day ahead, the spot prices per five minutes are sent to the premises, which prepares and sets its load schedule based on these prices.
- In real time, based on the actual imbalance of the system, the TSO sends a correction (+ or – and per five minutes) to the premises so they can adapt their load.

The ultimate goal was to:

- lower the overall need for balancing power by activating the real-time price-based demand response and thus also lower the curtailment of the existing wind parks;
- calculate and measure the value of flexibility.

IMPACT

- Pour le business/ l'entreprise (acquisition d'un nouveau marché, croissance, réduction des couts, …)
- Sur le marché (clients finaux, intermédiaires)
- Globalement, par rapport à la thématique sociétale

The EcoGrid EU project could have a positive impact and create new business for the following actors:

- EcoGrid EU offered a new tool to help Transmission System Operators integrate renewable forms of energy into the electricity system.
- By providing a solution that could help end users participate in the electricity system via smart technology, a new market could open/mature for the technology providers.
- New business may emerge for actors that would be able to approach end users and help them with smart solutions in order to actively participate and respond to the needs of the system (Demand Response)
- As far as the societal benefits are concerned, EcoGrid EU offers a cheaper solution for integrating renewables into the system by avoiding the use of expensive conventional generation units that support power flexibility.

Some tangible results of the project:

- The technical measurements evaluating the performance in terms of volume (kWh) or evaluating the stability of the market have produced positive results.
- Wind power curtailment was reduced by almost 80%,
- The use of spinning reserves has been reduced by 5.5%. This means that energy payments for spinning reserves would be lower and spinning reserve capacity could also potentially be reduced.
- The financial benefits for residential customers were very low but the enhancement in comfort was high. Indeed, the customers appreciated the ability of the automated systems to automatically obtain the lowest prices for them without affecting their comfort.

CATALYSEURS & OBSTACLES

- Comment se déroule/s'est déroulé le développement du projet (durée, impression générale)
- Qu'est ce qui facilite/a facilité le déroulement du projet (catalyseurs)?
- Quelles sont/ont été les difficultés et défis auxquels faire face (obstacles) ?

- The EcoGrid EU project was planned to last four years. However, due to the fact that such a large-scale demonstration can encounter unexpected technical difficulties, another six months were required. The good organisation and collaboration between the partners was key to the success of the project. The results obtained are expected to be of great value for further research and development activities as well.
- End user participation and considerable interest was one of the driving forces behind the project. The citizens of the Danish island of Bornholm were keen to get informed and participate in this demonstration. Of course the local electricity company (Ostkraft) effectively facilitated communication with its clients. Furthermore, the strong collaboration between the partners and the combination of knowledge and expertise helped to overcome the technical obstacles.
- One of the major difficulties was the size of the demonstration. Trying to apply a new concept and use untested equipment with regard to a group of 1,900 participants proved to be very challenging. The consortium even had to take a step back at some points, test the equipment among a small sample of customers and then continue testing it among the whole group.

Some additional considerations about the start of such a project:

- It was very hard to create the right consortium and especially to get all the concerned parties to agree. An initial trial conducted by Energynet failed to obtain EC approval. For the second trial, they handed the project preparation (and follow up) over to Sintef. Sintef helped to finalise a qualitative project document and obtained the EC approval. The creation of a consortium and preparation of an EC project proposal took more than one year (for the second and successful trial).
- A lot of discussions took place between the vendor parties about IP. These discussions are also one of the reasons for the long time it took to prepare the project.
- As different market models apply to different countries, it was not easy to analyse the replicability of the model.

LESSONS LEARNT

Qu'est-ce qui pourrait/aurait pu être amélioré pour faciliter cette innovation? (seulement remplir si d'application)

- Organisation/management du projet
- Collaboration/partenariat
- Gestion de la propriété intellectuelle
- Lancement de l'innovation sur le marché
- Financement du projet d'innovation (politiques fiscales, disponibilité de capital, subsides à l'investissement, etc.)
- Autres aspects politiques/réglementaires

- The administrative burden could have been lighter. This could make this kind of project more flexible in general.
- Such a large demonstration should take place prior to implementation. This means that the technology should be tested and matured beforehand and integration into the existing markets should be analysed in advance. Maybe a two-step approach could be considered as a solution in the future.
- The European Commission funded half of the EcoGrid EU project. This is quite important for the partners involved to hedge the risk of innovation as it is by definition an activity with unpredictable results. A balance should be maintained between the administrative burden associated with financing and flexibility for steering this kind of project.
- The EC requirement to have different equivalent parties from different countries is a good approach. Not only are the markets different but the needs and solutions appear in different time spans and order due to local situations. It is important to guarantee that every demonstration model can be replicated in other European countries