



EU INNOVATE

**SUSTAINABLE INNOVATION IN ACTION:
THE CASE STUDY “SNAPSHOT” SERIES**

SMART DOMO GRID

Better Energy Management of Smart Domestic Appliances



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 613194

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July 2017

About EU-InnovatE

Between 2014 and 2016, the EU-InnovatE project investigated the potential of citizen innovation and sustainable entrepreneurship to achieve sustainable lifestyles in Europe by 2050. The following is one of a series of case study “snapshots” illustrating how new enterprises are being created by passionate, visionary individuals to benefit society at large.

The Case of Smart Domo Grid: Better Energy Management for Smart Domestic Appliances

As a trial, a group of homes in Italy have been equipped with next-generation smart domestic appliances that can be controlled and monitored online by a tablet-based app. The trial determined how people respond to the innovative technology on a daily basis, and how well they manage their use of electricity.

The Smart Domo Grid project identified 20 households in Bresica, Italy which possessed good Internet connections and were drawing some of their electricity from domestic photovoltaic (solar) panels. In 2014, a home-based trial was carried out for a year that integrated smart domestic appliances (washing machines, dishwashers and refrigerators), solar panels and mains electricity supplies in a wi-fi enabled network that could be controlled using a tablet-based energy management app. The app was designed to help users monitor their energy consumption and cost, and to determine when to take advantage of renewable energy.

Collaborative Innovation in Practice

A consortium of organisations was involved in the project. Italian energy supplier A2A SpA took the lead, while appliances were supplied by Whirlpool Europe. One of Italy’s leading universities, MIP Politecnico di Milano, provided technical support and equipment.

Users actively scheduled convenient times to run appliances when energy costs were at their lowest, taking into account A2A’s prevailing energy tariffs and electricity generated by domestic solar panels. One of the principal aims of the trial was for families to optimise energy consumption. As a condition of their involvement, users undertook to complete questionnaires, face-to-face interviews and receive home visits.

A2A gathered data which helped it estimate energy patterns which are likely to occur once smart systems become widespread in the future and, for example, anticipate power demands from the grid when solar panel capacity is exceeded. Whirlpool trained the families in the use of the system and appliances. The company benefitted from the project by gathering data about how consumers respond to the smart features built into the appliances. In addition to providing technical assistance for the network, MIP tested a prototype accumulator (energy storage

system) that was installed at each trial home, which helped users to balance and optimise power consumption.

Preliminary visits by electricians to the homes ensured the ideal technical conditions were established prior to the trial. Whirlpool installed appliances and trained family members in the use of the tablet-based app to control the appliances and manage energy consumption.

Once the preliminary arrangements were completed, the trial took place in three phases:

1/ Feedback on the app's graphical interface was gathered from users as they operated the appliances. This determined how well the tablet interacted with the appliances and how users reacted to information about prevailing energy tariffs and solar energy availability.

2/ A2A monitored the interaction of the grid and photovoltaic energy production and carried out tests to simulate grid overload. This helped to establish how well the app overcame energy shortfalls. Additionally, the response of users to advice provided by the app was monitored and recorded.

3/ Prototype accumulators were installed in the grid to improve efficiency of photovoltaic and grid usage by storing energy for overloads.

Summary of User-Driven Innovation

- Families involved in the trials provided usage data to A2A and Whirlpool. Data reflected their efforts to manage and effectively balance use of photovoltaic and mains electricity.
- Users provided feedback on the app's interface and data on the extent to which they heeded information about optimising the use of mains or renewable energy.
- Everyday use of smart appliances gave the manufacturer field data that assisted in the development of appliances prior to a wider market launch.
- Participating families were encouraged by their experience of managing the Smart Domo Grid to maintain more broadly a sustainable lifestyle.

Influence on Core Business

Home-based field trials provided A2A with feedback on families' everyday management of mains and renewable energy, which in turn influenced decisions about efficient distribution of electricity and its infrastructure investments. Installation of smart appliances by Whirlpool provided insights about users' control and use of the new technologies as part of the company's preparation for wide-scale introduction to the European consumer market. In parallel, MIP was able to test the effectiveness of its prototype accumulator before full production of the device commenced.

Cross-Sector Relevance: Top Three Insights

- Field trials conducted with users of new technologies can provide feedback to fine-tune advanced systems and minimise difficulties or problems that might arise during the initial stages of an innovative product or service launch.

- A consortium of organisations working together can provide complementary skills and experiences which could not be provided by one organisation on its own.
- Innovative and sustainable technologies can benefit from feedback from users who will, ultimately, be responsible for achieving the desired sustainable outcomes.

To Learn More About the Case...

Please contact the lead investigators from the EU-InnovatE research team:

Sarah Behnam, MIP Politecnico di Milano – sarah.behnam@gmail.com

Raffaella Cagliano, MIP Politecnico di Milano – cagliano.raffaella@polimi.it

Further Information

A2A Group: www.a2a.eu/gruppo/cms/a2a/en

Whirlpool: www.whirlpool.com

MIP Politecnico di Milano: www.polimi.it/en