

SENSIBLE project community engagement both in Évora and Nottingham demonstrator sites

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Abstract: In this study, the authors detail the community engagement strategies applied to the Évora and Nottingham demonstrators under the scope of the project SENSIBLE, taking into account the different phases of the project. Additionally, the first results of the ongoing socio-economic study examining the impact of energy storage are presented, whose results are supporting the community engagement strategies.

1 Introduction

The project SENSIBLE (storage-enabled sustainable energy for buildings and communities) is a Horizon 2020 funded project, which aims to evaluate the integration of small-scale energy storage with renewable energy sources into distribution grids, homes and buildings. The benefits of storage will be evidenced in three demonstrator sites including Évora in Portugal [1], Nottingham in the UK and Nuremberg in Germany, led by EDP, the University of Nottingham (UoN) and Siemens. In Évora, the project is focused on validating the benefits of storage at the distribution grid and final clients' level, likewise in Nottingham at the community level. Unlike the German demonstrator project, which is purely lab based, the Évora and Nottingham demonstrators are implemented under existing real life conditions; consequently, they are reliant on the community engagement process.

In this paper, the community engagement strategies plan designed for the Évora and Nottingham demonstrators are detailed. It is proposed that, for successful implementation, the communities involved need to feel confident about the new technologies they are introduced to and are expected to interact with.

Furthermore, the socio-economic impact before the installation of energy storage within the households in the Nottingham and Évora demonstrators were explored. These results constitute valuable information that was considered during the design of the engagement plans.

2 Évora demonstrator's engagement plan

EDP, as an energy utility, has been implementing numerous projects that impact communities, ranging from simpler ones such as improving substations to a more complex projects such as building new hydropower plants. To help project teams to tackle and manage the impacts on local communities, EDP developed the *EDP+Perto* programme (meaning EDP Closer), a methodology for developing engagement plans suitable for different projects. EDP +Perto aims at defining guidelines for local stakeholder engagement in projects based on coherence, equity and effectiveness, tailored to the specific characteristics of the communities involved. It is intended to promote a reliable and

close relationship between the company and its stakeholders, avoiding obstacles and conflicts due to disagreements or lack of information. EDP+Perto advocates the full involvement of stakeholders throughout the whole project lifecycle, from planning, studies, licensing, construction, exploitation etc. until the decommissioning phase.

Hence, the EDP team responsible for the implementation of the SENSIBLE project is fully committed to follow the EDP+Perto methodology at Évora demonstrator, which is located in Valverde, a small rural village in the countryside of Évora. This village is located within the Nossa Senhora da Tourega Parish, a division of the municipality of Évora. The population of Valverde consists of 450 inhabitants (132 are more than 65 years old and 142 are retired) and there are about 200 buildings, most of them are residential homes. All of them are connected to the low-voltage grid. Fig. 1 summarises the initiatives for the community engagement which were designed according to EDP+Perto and organised by four project phases: project presentation, deployment, demonstration and results dissemination.

2.1 Phase 1 – project presentation

During 2015, the engagement activities were mainly informative aiming at presenting the SENSIBLE project to the key stakeholders: in particular, the inhabitants of Valverde are key actors for the success of the Évora demonstrator, since some of the equipment will be installed at their homes/businesses. Thus, the majority of the engagement actions are tailored for this group of stakeholders in order to assure a transparent and effective communication between the project team members and the inhabitants as well as to make people feel confident about new technologies and about the SENSIBLE project as a whole. Taking into account that Valverde community's engagement is quite challenging, since it is a rural community, a top down approach was followed. First, EDP identified all the stakeholders to be involved (including a critical stakeholder identification).

Then, EDP Distribuição and EDP Labelec met with the local mayor to gather his support for the project and to discuss the best strategies for the engagement of the local community. A first dissemination session was arranged to present the main ideas of the SENSIBLE project to the community. Letters were sent to all inhabitants to invite them to the session. A second session was

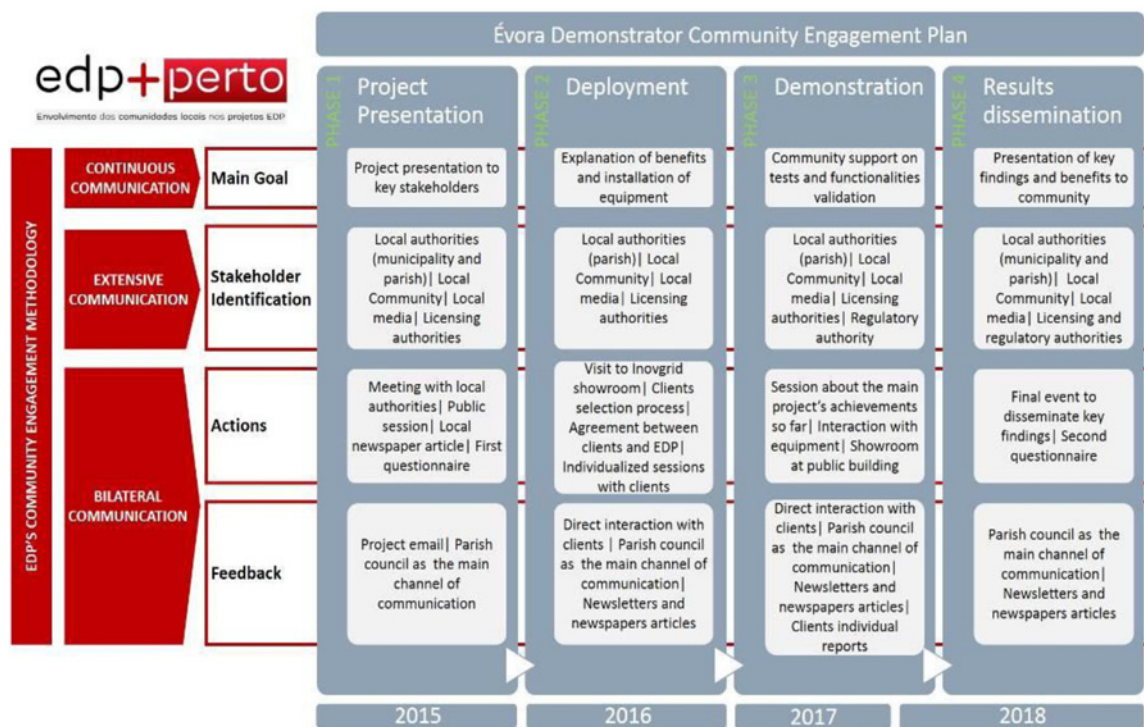


Fig. 1 Évora demonstrator community engagement plan

held three months later to provide a more detailed description of the equipment to be installed at buildings/residential level and to explain briefly the participants' selection process, which was based on two main criteria:

- *Willingness of the participants*: all participants must be told that any involvement in the project is voluntary and they are free to withdraw at any time without prejudice/costs to them. No one would be neither obliged nor forced to participate.
- *Technical ranking*: participants who are located at problematic points of the distribution grid and have no constraints for the installation of equipment at their properties (in terms of space, solar orientation and electrical system) will be better ranked.

In addition, a questionnaire was compiled to access how many households or small business/services were willing to participate in the project.

2.2 Phase 2 – deployment

The second phase kicked off with the third session whose objective was twofold: launch the first socio-economic questionnaire and collect the formal intentions of the inhabitants to participate in the project by receiving at their properties a bundle of different equipment (PV systems, batteries, electric water heater, home energy management systems and smart plugs).

After computing the results of the selection process, a first list of clients was realised with the support of the parish council. A poster was placed in the parish building, along with support information. Moreover, all participants were given a phone call to announce the results. For those clients who were well ranked, technical visits were conducted to their properties in order to validate the existence of constraints to the installation of equipment and to provide more information about the project. All the information was compiled and the final ranking was concluded. Non-selected clients received a formal letter from EDP. The remaining participants were invited to participate in a fourth section, where the agreement for the installation of equipment was explained in detail. An email for the project (sensible@edp.pt) and a phone

number were made available to facilitate the interaction between participants and EDP team.

The deployment of equipment will end in March 2017.

2.3 Phase 3 – demonstration

Although the demonstration phase has not started yet, some activities are already planned. A closer support to the participants and the interaction with the parish are a key as well as a session about the project to keep all the inhabitants of Valverde informed about the project tests and its results. Moreover, a show room in a public building in Valverde is being prepared, whose main objective is to disseminate and observe the technical functionalities of the demonstrator through visualisation tools. Despite some of the contents of the show room are tailored for technical stakeholders, it will be made available more generic information for the community as a whole.

2.4 Phase 4 – results dissemination

The fourth phase related to the final stage of the project comprises mainly the dissemination of the results to all stakeholders.

3 The Nottingham demonstrator engagement plan

The Nottingham demonstrator site is situated in the Meadows, an inner-city community of some 9000 inhabitants located to the south of the city centre [2]. The housing stock in the area is very varied with large areas of social housing, a core of traditional Victorian terraces and more recently a number of modern low-energy developments [3]. The Meadows has a history of economic deprivation and fuel poverty going back many years. Under the coordination of a local regeneration organisation, the Meadows Partnership Trust, a number of community organisations were formed to alleviate these and other community challenges. In particular, Meadows Ozone Energy Services (MOZES), a community energy service company was set up to combat fuel poverty and raise the pride of the area through a joint initiative to

make it one of the first UK inner city low-carbon communities. Initiatives undertaken by MOZES have included developing an area wide energy plan, providing zero interest green loans and giving free energy advice to residents. As part of the drive to establish the Meadows as a low carbon community, it was awarded government funding to carry out a means tested solar PV installation scheme. In all, nearly 100 PV installations have been fitted on domestic properties, three schools and two community buildings. The large number of PV installations in the area combined with the varied housing typologies and tenures, the character of the local grid and the strength of local community organisations has made the Meadows a suitable site for the Nottingham demonstrator.

3.1 Timescale and programme

The SENSIBLE project was designed to run from January 2015 to the end of June 2018. Important criteria of the programme was the identification of the use cases at the beginning and the installation of test kit in situ in enough time to obtain a year of seasonal readings. As the project developed it became clear that the Nottingham demonstrator would have three separate components (Fig. 2). The first would be a domestic component where volunteer residents would have one of four different versions of energy storage technology installed in their home. The second would be a community building (a primary school) with very variable seasonal use but a large array of existing PVs installed. The third a housing development where there is the opportunity to install a private wire network for ten houses. The engagement plan for each component is different, as will be the programme and the results. The most complex was always going to be the domestic component because of the variable demographic, four different house types and the need to match suitable technologies. This concern has been borne out by experience, with placement issues in particular being far more severe than experienced on the earlier PV installation project. The volunteers have been generally faithful throughout the process with only a small number dropping out through concerns about the onerous nature of the project or size of equipment. A number have had to drop out because of the eventual lack of suitability of their properties, but these vacancies have generally been filled from a reserve list to enable the budget to be fully spent. The size of the batteries, where these have been the chosen storage medium (often because of the lack of a water storage heater), the size of the monitoring equipment and the intrusiveness of wiring have been the major issues in obtaining the best cohort of test properties. In order to complete installation in

the domestic properties by March 2017, the process of engaging volunteers was started in June 2015 with the final choices being made in December 2016. The community battery installation at the Community School has been simpler to arrange with a very forward-looking headmaster and that installation will take place on April 2017. The community battery within the development of ten houses, whilst having an enthusiastic developer has been beset by delays brought on by ownership and planning issues and by the economic situation since the Brexit vote. It is still not certain when this project will start on site or when it will be finished for readings to start.

3.2 Engaging the community and other partners

The process of gathering properties for the Nottingham demonstrator started with both general and specific canvassing. Letters were sent to homeowners who had previously received PVs or had shown an interest in energy saving in their homes, explaining the project and telling them there would be further information available. More generally, a public meeting was arranged and a flyer posted to Meadows residents and a mention made in the local magazine, Meadows Matters. The initial public meeting was well attended and a list of interested parties assembled. This was followed up by a further public meeting and a database of potential volunteers assembled with initial information about their properties. Over the period of late 2015 and early 2016, each household on the database had their interest confirmed. This was followed by a visit from a team from MOZES and the UoN to explain the project in more detail, carry out an initial physical survey and complete a questionnaire. From these visits, it was possible to draw up initial target lists of houses to give a reasonable spread of house type, tenure, socio-economic group, ethnicity, storage type suitability and location in relation to the grid. Using initial cost forecasts for the type of equipment required it was also possible to assemble an approximate working budget to ensure affordability before formal offers were made to individual households. Formal offers took the form of a letter detailing the equipment that would install and outline the terms of installation. It was accompanied by a copy of a 'householder agreement' drawn up by MOZES' solicitor to control the relationship between MOZES and UoN with the householder.

The initiation of formal offers enabled householders an opportunity to withdraw at that stage. None did and this was followed by an invitation to tender the installations to suitable contractors. Once the most advantageous tender had been received, the contractor arranged to carry out more detailed surveys of the

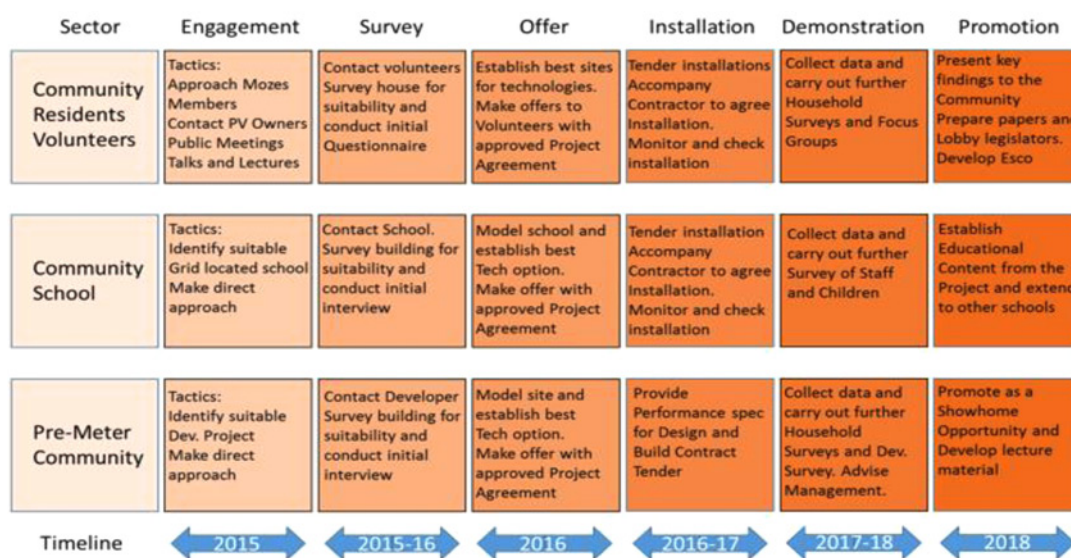


Fig. 2 Nottingham demonstrator community engagement plan

volunteer houses and for this they took around actual full size templates of the batteries, inverters and monitoring boxes, which in the event turned out to be much bigger than originally envisaged. This resulted in some houses being found unsuitable and others on the waiting list taking their place thus extending the survey process. During this process, the location of all of the equipment was discussed in detail with the householder and the arrangement agreed was passed back to MOZES.

The MOZES team had been given individual groups of volunteers to mentor and monitor and each team member now approached their allotted volunteers to get them to sign the householder agreement, which had been endorsed with the equipment they would receive and its locations.

The process of installation will now begin in January 2017 with two trial installations used to obtain general approval from the distribution network operator and to iron out any further installation issues. The bulk of the installations are expected to take place in February 2017.

Following the installation of the equipment the MOZES team will check on each volunteer to establish if they are happy with the installation and receive any immediate feedback. At the end of the project the intention is to collect much more detailed feedback about the entire process, to present the findings of the project to the community and open up some 'show home' sites where people can see the equipment in-situ.

4 Socio-economic study

As part of the community engagement process, an initial questionnaire was distributed to residents in both the Évora and Nottingham Demonstration sites who had registered interest in taking part in the SENSIBLE project. The main objectives of the questionnaire were to investigate the socio-economic and occupancy characteristics of the households and to examine attitudes to community energy and energy storage. In both cases, community involvement was conducted under strict ethical guidelines.

In Nottingham, the results of the questionnaire indicated that respondents believed that shared energy initiatives could help to improve energy efficiency, infrastructure resilience, and social cohesion and reduce energy cost for individual households. In addition, about half of the respondents were concerned about not being able to pay future energy bills. Almost all of the respondents revealed that they would like the opportunity to manage their own energy use and would be willing to share excess electricity with members of their community. In addition, most respondents believe that centralised energy storage within communities and in households can improve energy efficiency.

In Évora demonstrator, the results reveal that half of respondents believe that their property is not energy efficient and they argue they have no conditions to invest in high cost measures to make their properties more energy efficient. In addition, the majority of respondents are concerned about energy prices. Regarding the

demand side manage schemes triggered by distribution system operators (DSO), the majority of respondents understand the importance to change their energy demand according to DSO needs and, in fact, the majority of clients are available to provide flexibility for helping DSO to manage the grid if there is any type of incentive. Currently, no one from Évora demo has PV panels; nonetheless, the greatest majority would be happy to have PV panels and energy storage. In Évora, the main reason to join SENSIBLE is related to the potential of energy savings.

A further questionnaire has been planned by UoN for distribution to households once the equipment has been up and running for a few months. Once this is completed and put into full working order, the volunteer residents will be invited to fill out a second questionnaire prepared by UoN. The main objective of this will be to collect data that showcase the socio-economic impacts of the installed energy storage equipment in the community and households. Already, based on previous efforts carried out through MOZES in Nottingham, there have been indications that the provision of energy storage has the potential to reduce fuel poverty.

5 Ethical issues

When conducting any study or project, which implicates collecting data about individuals, it is essential that full consideration is given to ethical issues and that steps are taken to ensure the participants' well-being throughout the study or project.

For the Évora demonstrator the ethical issues can be grouped into three critical aspects: (i) informed clients: participants should be entirely informed about the project; (ii) no discrimination: it is against the EDP procedures to discriminate against anyone namely because of his/her energy retailer; (iii) data confidentiality: EDP must ensure that all data collected throughout the project, either consumption data, billing data or other sensitive information, is kept confidential and codified, even after the project ends.

6 Acknowledgments

This work was being carried out as a part of the SENSIBLE project (storage enabled sustainable energy for buildings and communities – www.h2020-project-sensible.eu) that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 645963.

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