GUIDELINE: LEARNING ABOUT TARGET GROUPS

Abstract

To succeed in implementing new smart grid projects insights in people's needs and expectations, as well as the drivers and barriers they perceive when confronted with smart energy solutions, are crucial. To motivate users to engage with new technology or adopt new services, and thereby becoming smart energy users, you need to provide products and services that fit into the users' context and add values to their everyday life. This guideline provides an overview of methods that can be applied to better understand the socio-demographic profile of target groups and their attitudes, values and behaviour.

What is it?

To enhance the chances for achieving acceptance and adoption of your new smart energy products or services, you should take the needs, attitudes and context of your customers as a starting point. Nowadays, many utilities show interest in their customers and utilities put increasing effort into strengthening the relationship with them. Get to know your users, and let their needs – along with yours – guide you to what services you develop. Whether for recruitment, engagement and communication purposes, or for the design of incentives and pricing schemes that aim to change people's attitude and behaviour – a thorough understanding of people's preferences is crucial. What drives people? What do users actually lack or need? What are their energy-related desires and concerns? How can smart grid products ease their everyday social practices?

The past decade, the interest in understanding people's behaviour and attitudes has grown significantly. Numerous ways and methods to learn about users and target groups have been applied, either based on quantitative or qualitative research. Based on S3C case study research, this guideline provides an overview of commonly used methods and approaches to gain insight to the socio-demographic profile of target groups and their needs, demand and expectations. Furthermore, it describes the features that make these methods successful or might limit their success. All reference cases mentioned in *italics* are taken from S3C Deliverable 3.4.

When to use?

The majority of methods and approaches described in this guideline provide insight in the user experience: their expectations and the drivers and barriers they perceive. Hence, these methods are primarily useful in the first stages of project and/or product development, i.e. in the planning phase or in early stages of implementation.

Several methods are also applicable for evaluative purposes, since they provide insight in the reasons for success or failure of products and services provided in the project. Please refer to Table 1 (on page 4) for detailed information about the applicability of specific methods.

Even when the context is largely known, selecting the most appropriate method(s) remains a challenge. Which method(s) best fit your needs strongly depends on what you already know about your customers, your relationship to them and what you want to achieve:

- Are you looking for a first acquaintance with potential target groups?
- Are you interested in a quick feasibility (due diligence) check for smart energy products or services?
- Are you aiming to obtain detailed in-depth knowledge about a specific user group in order to tailor specific products and services for them?
- Are you striving to involve user groups actively in the design and development process of smart energy products?
- Are you seeking to understand why people use a service or device in a different way than it was intended, or even refrain from buying and/or applying it?
- Do you want to get an understanding of how a smart grid project has actually been experienced by people, in order to change the structure of future projects?

Qualitative or quantitative methods?

- **Quantitative methods** are used to *collect information on measurable aspects* such as socio-demographics, attitudes, electricity use, etc. Quantitative methods are based on data measuring what users do and *how many people* show certain attitudes. Quantitative data can for instance be gathered through surveys.
- **Qualitative methods** aim to *describe how something works* or what problems there might be. Such methods are particularly useful to collect in-depth knowledge about people's behaviour (what drives and motivates them), and can for instance be done through interviews. This approach will tell you *why* people do what they do, or refrain from doing something.

Do's and don'ts

- **Target group research is not a quick fix.** Often, smart grid solutions are not designed to solve the customer's needs, but rather the needs of an energy company. Getting customers actually engaged or having them adopt a product requires in-depth understanding of people's attitudes and behaviour, as well as long-term relations and trust.
- **Seek the best of both worlds.** Given the assets and limitations of quantitative and qualitative research methods, it is best to apply a combined

or integrated approach. When relying on one single data source, you run the risk that certain important nuances are not captured in the analysis.

- **Think outside the box.** To avoid dropouts and fatigue effects, your smart grid project might benefit from a new, innovative and creative setup – something that's not been done before.
- **Start from the customer perspective and create interaction.** Traditional market surveys tend to rely on questionnaires. When developing customer friendly innovative energy products, it is better to begin with an open mind – start listening instead of posing predefined questions.
- **Go beyond self-reporting.** Learning about attitudes and expectations often takes place through surveys and other forms of self-reports, but people tend to answer questions in a manner that would be viewed favorably by others (instead of truthfully). Thus, there might be a tendency to over-report what is considered good behaviour and to under-report undesired behaviour. It is therefore recommended to verify results with qualitative methods.
- **Match methods with learning goals and local context.** Projects that manage to achieve a good understanding of target groups often owe their success to an adequate match with contextual factors (e.g. phrasing of questions, aligning the ambiance during workshops and events with socio-cultural aspects, etc.).
- **Don't re-invent the wheel.** Instead, you should draw upon existing knowledge. Looking into what's already been done will help you to avoid previously made mistakes. Pilot studies, meta-reviews and social scientific theory can provide an understanding of consumer attitudes and behaviour towards smart grids. Consulting other projects or similar companies can be both inspirational and educational. Desk research will help you to avoid previously made mistakes. Pilot studies, meta-reviews and social scientific theory provide an understanding of consumer attitudes and behaviour towards smart grids. Consulting other projects or similar companies can be both inspirational and educational.

What do you need to do?

Most smart grid projects that were investigated in S3C case study research, pursued multiple ways to understand their users or customers, in order to develop and implement products or services tailored and adapted to customer needs. This contributes to a satisfied customer base. This guidelines provides short descriptions of the various methods and approaches that can be applied to learn about your smart grid target group(s), including practical knowledge from S3C research on how the information obtained was applied to improve the respective smart grid projects.

Table 1 provides an overview of all methods described in this guideline, which are further elaborated below. All reference cases mentioned in *italics* are taken from S3C case study research; more information can be found in S3C Deliverable 3.4.

	Quantitative data	Qualitative Data	Getting a general overview	Obtaining in-depth knowledge	Evaluating project experience
Desk research	√	√	√		
Consulting (sister-) projects	√	√	√		
Surveys	√		√		√
Segmentation models	√		√		√
Workshops, focus groups, group interviews		√	√	√	√
Co-creation workshops		√		√	
Individual interviews		√	√	√	√
Web tracking	√			√	√
Cultural probes		√		√	
Home visits		√	√	√	√
Live meetings and events		√	√	√	√
Physical meeting space		√		√	√

Table 1: overview of methods to learn about target groups

Surveys

Perhaps the most straightforward way to obtain information about your users is to conduct surveys. These surveys may touch upon a variety of topics: socio-demographics, living conditions, attitudes towards energy use and smart grids, ownership and use of appliances, electricity consumption and willingness to pay for smart grid technologies. This can be enhanced by including questions about people's willingness to change their energy behaviour. For instance, the *Linear (BE)* made use of the 'Technology Acceptance Model' (Davis, 1989) by inquiring about environmental attitudes and behaviour, energy saving behaviour, heating practices, attitudes towards smart appliances, appliances present in the house and occupation patterns.

When conducting surveys, it is recommended to make use of validated questions (for instance, see the S3C tool Collection of survey questions for smart grid evaluation) and to strive for a high response rate, e.g. through dedicated communication, sending out reminders or by offering small gifts or rewards. Furthermore, it should be taken into consideration how survey data is collected: through online questionnaires (easy and affordable) or by telephone or even face-to-face (expensive but lively to result in higher response).

In some cases, to make optimum use of survey data, it is recommended to conduct repetitive surveys, but be aware of potential fatigue effects that may lead to lower response rates. Often projects apply pre- and post-trial surveys to detect changes in attitudes and energy consumption behaviour. Not all participants might be willing, however, to put in the repeated effort of filling out questionnaires. To prevent and reduce fatigue effects, users in the *PEEM (AT)* project were allowed to fill out surveys during work-time, which resulted in very high response rates. In *EnergiUdsigten (DK)*, the results from questionnaires were coupled with individual interviews in order to obtain more detailed information regarding changes in attitude or behaviour.

Survey data does not necessarily have to be collected through questionnaires. Some projects successfully combine collecting user data through games or web interfaces, such as the online-based *OSCAR (CH)* project in which participants filled in surveys as part of the challenges and assignments they could take up (see example in the boxed text below). The S3C guideline Gamification – making energy fun further elaborates on this topic.

Playful ways to collect survey data about your target group (OSCAR, CH)

The OSCAR (CH) project offers a customer portal called "OSCAR's world for saving energy" to private customers of the Energy supply company BKW Energie AG in Switzerland. Customers are invited to enter their metering data manually into an online platform on a weekly basis and learn about their own consumption and conservation possibilities in a playful manner. By doing so, users collected bonus points that could be exchanged for (discounts on) products like LED lamps and other energy related products. Thus, OSCAR investigated user needs by integrating questionnaires and interview tactics into an overall concept of playful learning and gamification instead of applying them as individual interaction schemes. As a benefit, questionnaires and interviews are generally not perceived as time-consuming or as invasive as regular online surveys or face-to-face interviews. Qualitative as well as quantitative data about the user was gathered directly via the online portal in several manners: users can fill out an online user profile, a round of introduction (including questions about attitudes, practices, etc.). Overall, this project has a strong focus on user motivation.

Segmentation models

In the planning phase, several smart grid projects make use of segmentation models to get a general understanding of the diverging needs, desires and attitudes within their target groups. In *Linear (BE),* customer survey results served as a baseline measure for a customer segmentation model based on Davis' model (1989). Segmentation data enables you to take specific characteristics of target groups into account when designing a project or product, by discounting these factors in the development of incentives, devices and pricing schemes as well as in communication, recruitment and feedback strategies. For detailed information about

how to select and apply segmentation models, please have a look at the guideline [Using segmentation to better target user groups](#).

Workshops, focus groups and group interviews

Although surveys are an efficient way to collect rather generic information about target groups, close interaction is required to gathering in-depth knowledge about attitudes, preferences and behavioural routines. As opposed to surveys, workshop participants are more likely to reveal aspects such as drivers, motivations and concerns that may not (yet) have been identified from the project management perspective. Workshops and focus groups can be applied for various purposes:

- **To obtain detailed insight in user motivations and concerns.** *Texel Cloud Power (NL)* held a focus group prior to the recruitment campaign to better understanding of the motivations, concerns and expectations of residents. With this knowledge in mind, they managed to fine-tune the recruitment strategy.

- **To explore feasibility of products and services under development.** The *InovCity (PT)* project organized a series of focus groups with a group of clients whom identified, discussed and voted different energy related services that were under study for possible implementation in the project. In *KIBERnet (SI)* feasibility consultations were held with industrial participants. Getting insight in the technological process and operation margins, made it possible to identify the loads that could be shifted.

- **To perform a needs assessment.** In *Jouw Energie Moment (NL)* focus groups gave insight in the conditions under which people would be willing to participate in the project. First, they do not want to engage in such a project on their own, but they need to feel that others join as well. Secondly, although it is not necessary to save any money, it should definitely not cost them compared to not participating. And lastly they wanted the technology to be reliable and not cause too much inconvenience.

- **To align stakeholders.** To bring down communication gaps and to strategically align relevant stakeholders, multi-stakeholder workshops can be organized. Prior to the field trial, the *InovCity (PT)* project organized workshops to establish direct contact between users, local officials, communication experts, IT-experts and project marketing and customer service staff. Such workshops facilitate informal information exchange, allowing users to address any concerns directly to the responsible parties, and they provide insight in the various perspectives of involved stakeholders.

- **To facilitate co-creation or co-design.** More information on this topic can be found in our guideline [Co-creation – collaborating to develop smart energy solutions](#).

Individual interviews

Interviews with individual users are also an effective way to dig deeper in the personal experience of users. Such interviews are preferably held face-to-face, either by using a semi-structured interview protocol, or by conducting an in-depth interview guided by open questions. Similar to workshops and focus groups, there are various means to apply individual interviews in a project or the development process of a product. For instance, phone interviews are primarily useful for evaluation purposes. The project *To Follow the Electricity Price (SE)* conducted phone interviews with users who decided not to participate in a follow-up project. These users had seen the project as an opportunity to earn money and at the same time do something good for the environment, but it turned out there had been a general lack of information and understanding about the project; they did not understand the offer and could thus not estimate their personal savings.

Getting feedback on feedback information (Jouw Energie Moment, NL)

In the Dutch project *Jouw Energie Moment (NL)*, individual interviews were organized with a number of users in order to gain understanding on how feedback information presented on several design prototypes of the in-house display was understood by them. The project management chose to work with individuals – although it was a more time-consuming method –to make sure that also the voices of more insecure and self-conscious users, such as elderly people, were heard. The interview results turned out to be very useful to improve the design of the feedback interface.

Cultural probes

A cultural probe is a means to gather data about people's lives, their values and thoughts (contextual inquiries) to inspire ideas in a design process. For instance, users can be asked to document their energy routines by keeping a diary, making drawings or taking photographs. This data can be applied to test whether designated products and services provide added value for users. Although this may be a resource-intensive way to gain information, it can provide valuable qualitative information on how smart energy services relate to people's everyday social practices. Since more and more people nowadays carry a fairly good camera in their smartphone, and it tends to become common practice to sharing one's everyday experiences through social media, the potential of cultural probe approaches seems to be increasing. The *BeAware (FI/IT/SE)* project invited users to perform tasks on the feedback device and film this. This resulted in very insightful and detailed information about how users actually interact with the feedback device and information. A similar approach was applied in the Swedish *Hus 14: OfficeWise* project – see example in the box below.

Contextual inquiry through culture probes (Hus 14: OfficeWise, SE)

Culture probes were used in the *Hus 14: OfficeWise (SE)* project: office workers were asked to document their working day by use of a mobile camera, texts and drawings based on some given questions. Questions were for example: 'What does your working day look

like?'; 'How is identity communicated at the workplace?'; 'How are issues concerning energy use communicated?'. This manner of gathering information has the advantage of receiving 'real time' feedback from participants, and is non-intrusive because e.g., a mobile phone is used frequently and easy to use for (most) participants. It does not interfere with the daily lives and routines of the participants, and it's relatively easy to fill in the required information. In the OfficeWise project the results from the culture probes were used to identify suitable contexts for providing energy feedback in the office environment (the individual office room as the 'private sphere' and the coffee room as a space for social interaction, providing opportunities for work related reflections with co-workers and creative thinking in an informal setting). They further supplied inspiration in the design of the visualization tools. For example, the energy consuming appliances mentioned and photographed in the culture probes were reproduced in images on the ambient visualization in the coffee room.

Home visits

A very resource-intensive and somewhat intrusive but also quite effective way to get acquainted with users and to gain insight in their daily routines is to conduct home visits. The *CLNR (UK)* project did home visits in which they set up interviews in a semi-structured way: first they interviewed users about their energy use and attitudes, then they would make a tour through the premises together to focus on the energy practices of the household or SME, followed by another interview about flexibility and peak consumption. This provided the project management a deeper understanding of the user's needs and wants. *3e-Houses (DE/ES/UK)* held door-to-door visits in addition to distributing leaflets and newsletters and displaying posters in common areas of apartment buildings. This approach was chosen because of the high illiteracy rate among targeted social housing residents. It created an informative personal atmosphere, which apparently enhanced the users' confidence in the project.

Web tracking

User behaviour in smart grids, e.g. regarding the use of feedback information can also be monitored by web tracking, or tracking the use of energy displays etc. Collecting this kind of information usually requires the approval of the user. In *Jouw Energie Moment (NL)* this was done on a very detailed level, by analyzing which pages users look at most often. Here, an interesting finding was that many people frequently visited the non-energy information on the display, e.g. the weather forecast. Once they interacted with the display, they also checked their energy feedback. It also became clear that many users developed a routine to checking the display on set times, for instance before they go to bed. In *MOMA (DE)*, tracking the use of the web portal was considered very useful by the social research team in charge of the project's customer and participation evaluation. They utilized information about the most used features on a display – e.g. the time that users have spent at specific sites – to find out which areas and topics needed to be explained in-depth.

Live meetings

Another way to get more insight into the social practices and perspectives of users, which also allows the project management to get some pointers as to what they need to focus on, is to organize information events and meetings. Such events allow users to meet and talk to project staff, and to ask questions about the project and its implications to the management. In this way, the points of concern that are brought up are not guided by questions originating from the project side, but instead are those things that the participants really worry about. For instance, if questions are asked about privacy issues and data collection, it becomes clear that this is a topic of concern, which may require additional communication efforts or dialogues.

Furthermore, a physical meeting space can be set up to create continuous, open and informal interaction with users. In such a meeting space, participants can walk in to ask questions and to receive further information about the project at any time. In *EcoGrid (DK)*, a test site called VillaSmart was launched and *InovCity (PT)* created an exhibition shop to put the project infrastructure (i.e. home energy systems and in-house displays) on display.

Further reading
- Uyterlinde, M. et al. (2014). *S3C D3.4: Report on case analyses, success factors and best practices.*
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13(3),* 319-340.

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