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Recommendations for impact assessment

The Step by Step consortium has formulated operational recommendations for the measurement of effects of a behavioural intervention programme aimed at saving energy. These recommendations are addressed to data analysis scientists, behavioral scientists, managers of behavioural programmes and energy efficiency experts.

1. Ensure collaboration with energy providers before the project start

If planners of energy-focused behavioural change programmes wish to draw conclusions from reliable and objective evidence (not only participants' declarations or estimates based on questionnaires), obtaining data from energy meters is crucial. Step by Step project experiences showed that the collaboration with energy providers is necessary for collecting energy data from households. This collaboration should be confirmed before the project start either by direct engagement of energy companies in the consortium implementing the programme or by already existing collaboration channels (e.g. in Warsaw, the City Hall cooperates with the energy providers in energy planning on a daily basis and regularly acquires data on energy consumption of specific groups of consumers in the city).

2. Take into consideration different legal approaches to data processing consents across countries before the project start

Working with energy data requires concerted effort by programme owners and energy data owners. Step by Step project experiences showed that even when the energy data owner is fully engaged and supports the project implementation, different parties (surprisingly, also in the same EU Member State) may have a different approach to legal requirements concerning informed consent for energy data collection and analyses. For instance, data collection in Step by Step faced the following different positions of energy data owners on consent collection:

1) *Company A:* it is in line with company policy as well as national and EU legislation to collect consents only in electronic format (i.e. tick on the tablet or on the dedicated project website). Furthermore, it is not legal to run opt-out behavioural programmes (required formal resignation, if the participant does not want to share their energy data).
2) *Company B:* paper versions of signed consents from authorised parties are required. Furthermore, the person who issues the consent has to be the same as the signatory of contract for energy acquisition.

The above mentioned different positions by energy operators have significant impact on the programme implementation (participation rates can be negatively affected, additional costs may be

required, project schedule may be affected). Therefore, the consent collection procedure should be particularly well analysed from the risk management perspective.

3. Consider all energy end-uses (electricity, gas, heating, transport) and the related protocols for data collection, processing and analysis

Even though electricity is usually an energy carrier for which data collection is the easiest, it may account for limited amount of overall energy consumption by households. Therefore, it is recommended to adapt the programme intervention to specific energy consumption profile of the targeted country and also plan the related protocols for data collection, processing and analysis accordingly.

4. Plan a separate task to run a pilot campaign (whole programme: from A to Z) to validate all protocols

In order to avoid any unexpected errors in data collection procedures applied at a large scale, it is highly recommended to run a pilot campaign on a small number of participants to verify that at the large scale all tools of data collection are useful and operational and the quality of data showing first results is adequate.

5. Ensure that all households are recruited during the same month

Step by Step project experiences showed that extending the recruitment of participants entails significant challenges for data analysis procedures. Comparing households that entered the program at different points in time adds additional noise to the results. Therefore, it is recommended that all project participants are recruited over the period of one month.

6. Avoid areas with collective energy meters

Collective energy meters are still popular in some areas, which not only makes it impossible to measure energy consumption by individual household, but also it has negative impact on energy saving behaviours. However, if experimental areas with collective energy meters cannot be avoided, it is recommended to ensure installation of individual meters within the programme. Otherwise, it is necessary to exploit other ways to adapt to specific motivations of households in areas with unclear cost allocation.

7. Ensure a big control group – preferably the same size as the treatment group

Running a comprehensive impact study requires recruitment of both treatment and control group with due diligence in terms of randomisation and sample size definition. Therefore, it is recommended to ensure participation of a control group in the programme, preferably of the same size as the treatment group. The treatment and control groups should have similar energy consumption and socio-demographic profiles before the intervention start.

8. To avoid bias, recruit the control group at the end of the project

An interesting option that could be considered is to collect consents for energy data processing after the end of intervention. On one hand, this approach could be an effective countermeasure against the

Hawthorne effect[1]. On the other hand, leaving the collection of data from control group till the very end of the programme duration may create additional risk for the data analysis. Furthermore, this could prevent the programme managers from communicating to participants the programme impact in terms of energy savings based on comparisons between the treatment and control groups.

9. In case manual collection of energy data is necessary, employ IT solutions and plan resources for collecting data monthly

Step by Step project experiences show that manually collected energy data can be of limited size and of limited quality, which may in turn lead to rejection of over 50% of collected observations. Therefore, if manual collection of energy data is necessary, it is recommended to employ specific IT solutions for preliminary data validation (e.g. check whether the subsequent meter readings have a positive trend). The resources for collection of monthly data are also important assets that should be presumed in the intervention planning phase.

10. Cautiously plan resources (time and money) for data collection and processing, writing reports and dissemination and exploitation of results

Behavioural programmes involving substantial number of participants are recommended to actively communicate their results to the target groups. However, this communication needs to be preceded by in-depth data processing and analyses, which may be time-consuming tasks. Therefore, it is highly recommended to see those tasks as sequential processes that can be hardly ran in parallel.

11. Plan a separate task to investigate potential occurrence of rebound effect

During the Step by Step project implementation, it has not been possible to assess the durability of energy savings after the end of the intervention. Therefore, in order to avoid speculation concerning long-term impact of behavioural intervention (e.g. test for occurrence of Jevons paradox, which indicates that increased energy efficiency by itself may not reduce energy use), it is recommended to plan significant amount of time on investigating the potential rebound effect after the end of treatment phase.

12. Plan analysis of energy savings by at least one external and independent scientific organisation

External evaluation of project impact on energy savings by independent agents proved to be an advantage in project implementation. Therefore, it is recommended to assign the task of programme evaluation to external institutions, who are independent from programme owner/manager both in fact (no capital and personal links) and in appearance (perceived by others to be independent).

[1] Also referred to as the observer effect. Hawthorne effect is a type of reactivity in which individuals modify an aspect of their behaviour in response to their awareness of being observed (here: save energy as they know that their energy consumption is being observed).