ENERGISE

EUROPEAN NETWORK FOR RESEARCH, GOOD PRACTICE AND INNOVATION FOR SUSTAINABLE ENERGY

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ENERGISE LIVING LAB EVALUATION AND ASSESSMENT MANUAL

Description: Sustainability Assessment Toolkit (SAT) ENERGISE Living Lab evaluation and assessment manual, including output, outcome and impact indicators and measures, as well as detailed methods for baseline definition, identification of rebound effects and identification of spin-off effects

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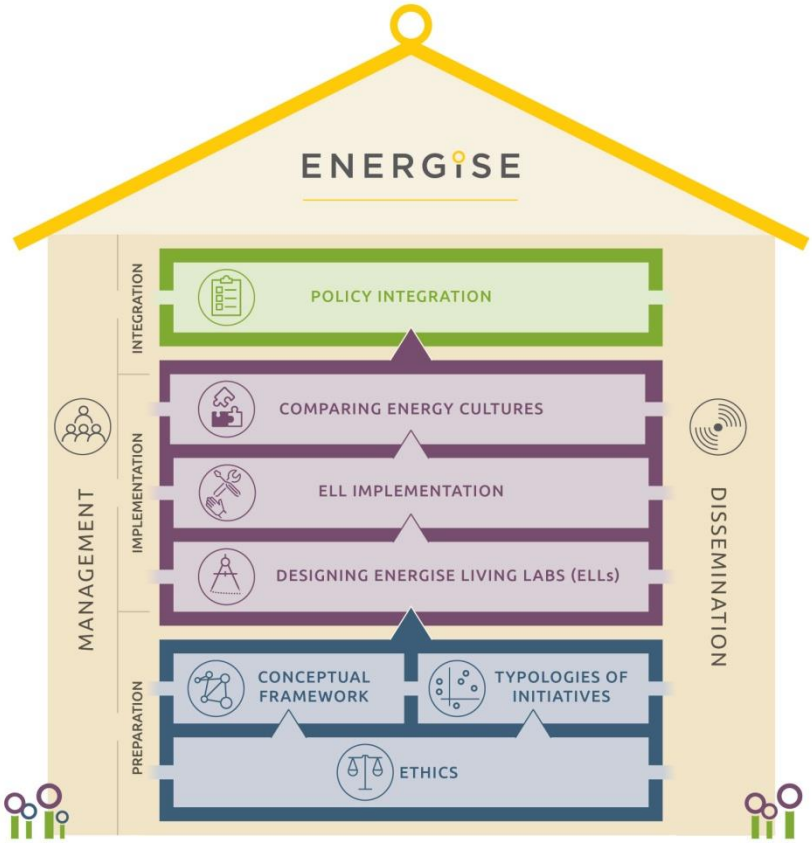
ENERGISE PROJECT

ENERGISE is an innovative pan-European research initiative to achieve a greater scientific understanding of the social and cultural influences on energy consumption. Funded under the EU Horizon 2020 programme for three years (2016-2019), ENERGISE develops, tests and assesses options for a bottom-up transformation of energy use in households and communities across Europe. ENERGISE's primary objectives are to:

- **Develop an innovative framework** to evaluate energy initiatives, taking into account existing social practices and cultures that affect energy consumption.
- **Assess and compare the impact** of European energy consumption reduction initiatives.
- **Advance the use of Living Lab approaches** for researching and transforming energy cultures.
- **Produce new research-led insights** into the role of household routines and changes to those routines towards more sustainable energy.
- **Encourage positive interaction** between actors from society, the policy arena and industry.
- **Effectively transfer** project outputs towards the implementation of the European Energy Union.



EXECUTIVE SUMMARY

This deliverable (D3.5) presents the ENERGISE Living Lab (ELL) evaluation and assessment manual, which is to serve as a Sustainability Assessment Toolkit (SAT) that includes output, outcome and impact indicators, as well as detailed methods for baseline definition and identification of rebound and spin-off effects. It also provides a draft version of evaluation tools to be refined on the basis of the ELL experiences and to be published for use by later projects in ENERGISE D3.6. Because of this, it consists largely of quantitative and standardized measures to be applied before and after the ELLs.

The ELLs are small-scale interventions that aim to engage the households in co-creating and experimenting new energy-related practices. The interventions to be implemented in the ELLs focus on reducing the amount of direct energy used for space heating and washing laundry in homes. Because of the small-scale and co-creative nature of the work, we cannot employ a strict quantitative experimental design. Knowledge about the value of new practices is created together with the households and other stakeholders, and because of this, it is transdisciplinary, action-oriented and hence to some extent context-bound. While collecting data on the value of the ELL approach, we are also providing material for analysis of the influence of diverse European practice cultures. Consequently, it is important to be open for critical tensions in introducing a unified ELL framework in diverse national, geographical and socio-material contexts. This can be accomplished through in-depth qualitative research and continual reflection by consortium members.

Nonetheless, ENERGISE aims to create an approach to changing energy-related practices that is to some extent transferable. This requires common criteria of valuation which are to some extent stable across the ELL process and after it. This document presents a set of quantitative indicators, measured before and after the ELLs, in order to provide a first quantitative analysis of the outcomes of the ELL approach for those policy makers who are not used to utilizing qualitative research. Data collection concerning these indicators also offers a foundation for understanding outcomes across several countries and by several different implementation teams.

ELL outcomes are what is delivered to participants and stakeholders, and they are the main focus of this manual. In order to establish the outcome and potential impact of the ELLs, we need to make a comparison vis-à-vis a baseline, i.e., before and after the active phase of the ELLs in order to assess the changes in outcomes that can be attributed to the ELLs. This deliverable proposes baseline indicators and ways of measuring change, defined as the difference before and after the ELLs in terms of (1) total energy use in the participating households, also including identification of rebound, backfire and spin-off effects, (2) other relevant indicators of social, economic and environmental sustainability, (3) socio-demographic influences on energy use, and (4) levels of acceptability and scalability of the two types of ELLs and their individual elements. Since engaging in the ELLs requires effort from households, this manual proposes automated and simple ways for collecting assessment data in conjunction with the actual ELL implementation stages. This deliverable suggests a way of measuring outcome indicators as part of the overall ELL process, taking into consideration resource constraints of both the ENERGISE consortium members and the participating households.

1 INTRODUCTION

ENERGISE Work Package 3 (WP3) is leading the design of ENERGISE Living Labs (ELLs). The objectives of WP3 are to

- **identify interventions** that work across practice cultures and diverse energy infrastructures, considering differences in metering and billing practices, the housing stock, and socio-economic and cultural conditions in EU Member States;
- **design two types of ENERGISE Living Labs** that work across diverse energy cultures and engage various hard-to-reach households and communities;
- **select sites and target groups** for the ELLs that allow for widespread and rapid upscaling of the interventions in the participating countries and beyond; and
- **define indicators of success** and related quantitative and qualitative measures, including baseline analysis, and methods for assessing rebound and spin-off effects.

WP1 has set out the conceptual framework for experimentation with new versions of household practices. WP2 systematically identifies, examines and classifies 1,000+ case studies of sustainable energy consumption initiatives from 30 European countries (EU-28, Switzerland and Norway). WP3 translates these findings into designs for innovative, replicable and scalable Living Labs (implemented in WP4). In this context, the Sustainability Assessment Toolkit (SAT) provides guidelines for evaluation and assessment of ELLs, in a way that also supports data collection for comparative analyses of energy-related household practices and cultures (in WP5). The ELLs also aim to design and test promising solutions for developing common or harmonised measures for improving the implementation of sustainable energy policies across Europe (in WP6).

The aim of this document (D3.5), ENERGISE Living Lab evaluation and assessment manual, is to serve as Sustainability Assessment Toolkit (SAT) that includes output, outcome and impact indicators and measures, as well as detailed methods for baseline definition, identification of rebound effects and identification of spin-off effects. It is a toolkit for evaluation and assessment, rather than research. It also provides a draft version of evaluation tools to be refined on the basis of the ELL experiences and to be published for use by later projects (in D3.6). Because of this, it consists largely of quantitative and standardized measures to be applied before and after the ELLs. However, some of the tools can also provide input for research, whereas others can be applied in conjunction with collecting data for research. For further guidelines for the planning, implementation and monitoring of ELLs, please consult the following deliverables:

- D1.1 Guidelines for ENERGISE good practice, ethics and data collection
- D3.2 ELL Background report
- D3.4 Easy-to-use ENERGISE Living Labs intervention and engagement guidebook
- D4.1 ENERGISE Living Labs Implementation and Monitoring Plans[1]
- D4.2 ENERGISE Online Monitoring Platform

[1] D3.4 and D4.1 are internal deliverables.

2 SUMMARY OF THE ELLs AND ROLE OF THE SUSTAINABILITY ASSESSMENT TOOLKIT

ENERGISE adopts the living lab methodology in order to test novel ways to perform everyday practices together with the households in the real-life surroundings. ENERGISE Living Labs (ELLs) are targeted initiatives to transform energy use in households and communities that address

- individual-level, organisational, institutional and societal (i.e., contextual) influences on household energy-related practices;
- the relationship between routines and ruptures in shaping energy cultures;
- the prevention of rebound and 'backfire' effects in initiatives; and
- policy options for changing the quality and quantity of energy use through individual-level and community-based initiatives to shift unsustainable energy cultures (Laakso et al. 2017).

In addition, ELLs will incorporate and identify

- good practice measures that are relatively context-independent and that are expected to work (more or less) across European energy cultures; and
- highly context-dependent measures for modifying energy use that are likely to work differently in diverse European contexts (Laakso & Heiskanen 2017).

The main aim of ELLs is to promote sustainable energy use while acknowledging the context-dependence of the change initiatives. The process guiding the design of ENERGISE Living Labs can be summarised in seven key features (Laakso et al. 2017).

Designing ENERGISE Living Labs – Seven Key Features

1. Select intervention and engagement methods that are applicable in diverse practice cultures.
2. Combine intervention and engagement methods in effective and engaging ways.
3. Involve hard-to-reach households.
4. Engage and use (local) influencers and their social networks.
5. Strategically select ELL sites and target groups to allow for widespread and rapid upscaling in the participating countries and beyond.
6. Develop easily usable tools and manuals for intervention design, evaluation and public engagement across practice cultures and ensure their widespread dissemination.
7. Engage academics and practitioners in the development of the ELL, with a view to effectively incorporating existing knowledge and lessons learned and to building up a user community for upscaling the ENERGISE results.

ENERGISE will closely and systematically monitor and compare the sustainability outcomes of ELLs by developing, testing and refining a **Sustainability Assessment Toolkit (SAT)** that focuses on

(1) total energy use in the participating households, also including identification of rebound, backfire and spin-off effects;
(2) other relevant indicators of social, economic and environmental sustainability;
(3) socio-demographic influences on energy use; and
(4) perceived acceptability of the new practice variants developed in the two ELLs.[2]

[2] See Annex 1 of the ENERGISE Grant Agreement. Acceptability refers here to the retention and diffusion potential of the new practices tested: do they have potential to change household practice in the long term and to scale up beyond the circle of ELL participants?

On the basis of the SAT, an **Online Monitoring Platform** will be developed for data collection (in WP4). ELLs act as tools for cross-national data collection and energy reduction action across cultural contexts (WP5). Monitoring and comparing the sustainability outcomes of ELLs thus implies a high degree of consistency in sampling and ELL design, without ignoring differences between and within countries regarding energy-relevant practice cultures.

3 EVALUATION AND ASSESSMENT APPROACH

3.1 FOUNDATIONS OF THE APPROACH

The ELLs are small-scale interventions that aim to engage the participating households in co-creating and experimenting new energy-related practices. The interventions to be implemented in ELLs focus on reducing the amount of direct energy used for **space heating** and **washing laundry** at homes[3]. Because of the small-scale and co-creative nature of the work, we cannot employ a strict quantitative experimental design with standardized interventions and randomized control groups. Knowledge about the value of new practices is created together with the households and other stakeholders, and because of this, it is transdisciplinary, action-oriented and hence, by nature, to some extent context-bound (Heiskanen et al. 2018*;* Schäpke et al. 2017). The most important knowledge collected will be qualitative and situated (Rau & Grealis 2017).

While collecting data on the value of the ELL approach (the Sustainability Assessment Toolkit, SAT), we are also providing material for analysis of the influence of diverse European practice cultures conducted in WP5. Because of this, it is important to be open for critical moments and tensions in introducing a unified ELL framework in diverse national, geographical and socio-material contexts. This can be accomplished through continual reflection by consortium members throughout the project. This follows the idea of realistic evaluation that the intervention outcomes always depend on both the type of mechanism that is used to transform practices (and thus the researchers as implementers of these chosen methodologies), and the context (Pawson & Tilley 1997). The consortium members are encouraged to pay attention to the different theories of change (also their own ones) in different phases of the ELLs (see also Laakso & Heiskanen 2017).

Nonetheless, ENERGISE aims to create an approach to changing energy-related practices that is to some extent transferable. This requires common criteria of valuation which are to some extent stable across the ELL process (as well as after it) and recognized and hence trusted by those to whom our work is addressed, such as policy makers (Thévenot 2014). Because of this, in addition to the main focus on qualitative analysis, we also need to create a relevant set of quantitative indicators, measured before and after the ELLs, in order to provide proof (and the possibility of criticism) of the worth of the ELL approach for those policy makers who are not used to utilizing qualitative research. Data collection concerning

[3] The ELL interventions are inspired by SECIs from across Europe (D2.3, Jensen et al. 2017), previous practice-based interventions and living labs (see D3.1 and D3.2, Laakso & Heiskanen 2017; Laakso et al. 2017) as well as ideas and feedback from ENERGISE Expert Panel members in two co-creation workshops (D3.3, Matschoss et al. 2018). The interventions have also been developed on the basis of a number of discussions and feedback from the consortium members and a number of local experts in each country. For a more detailed description of the interventions, see D3.4 (Laakso et al. 2018).

these indicators also offers a foundation for understanding outcomes across several countries and by several different implementation teams.

The overall evaluation of ENERGISE is naturally a much more complex issue, which draws on the entirety of research conducted. Most of this is qualitative, interpretive, theoretically informed and grounded in the unique encounters between ENERGISE team members and households as the process of change unfolds. This evaluation manual proposes some qualitative interview schemes and ways of recording qualitative data, which can serve both the evaluation of the ELLs and the wider research purposes of the ENERGISE.

3.2 OUTCOME, OUTPUT AND IMPACT INDICATORS

The aim is to assess the ELLs in terms of outcomes, outputs and impacts (Figure 1)[4]. Following Vedung (1997), project **outputs** are what the ENERGISE project aims to deliver in the ELLs. These are shown in Figure 1 in terms of the number of ELLS organized, the number of participating households, and the number and type of activities delivered in each site. The indicators of such output provide verification that these outputs have been delivered and these steps have been performed (these indicators are addressed in D4.1).

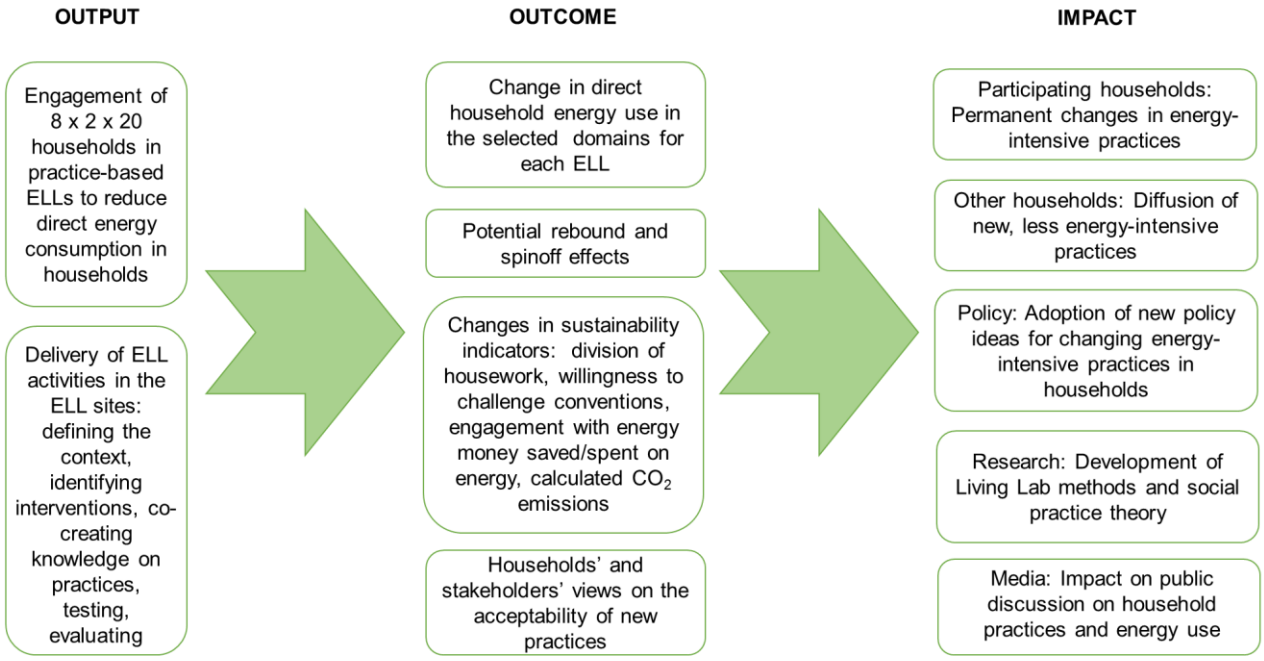


Figure 1. Output, outcome and impact indicators of the ELL evaluation.

Outcomes are what is delivered to participants and stakeholders (Vedung 1997), and they are the main focus of this manual. In the case of the ELLs, these should focus on (1) total energy use in the participating households, also including identification of rebound, backfire and spin-off effects, (2) other relevant indicators of social, economic and environmental sustainability, (3) socio-demographic influences on energy use, and (4) levels of acceptability and scalability of the two types of ELLs and their individual elements. Figure 1 presents relevant outcome indicators:

[4] See Annex 1 to the ENERGISE Grant Agreement.

(1) In terms of total energy use, we will focus on changes in energy use in the two selected consumption domains before and after the intervention. The change represents the outcome in terms of energy use, but we also assess the implications of such changes for total residential energy use in the participating households.
(2) In terms of potential rebound and spinoff effects, we will focus on (a) direct rebound, which in our case is included in the total energy use in the two selected domains (i.e., space heating and washing laundry), and assessed qualitatively and (b) two categories of indirect rebound, focusing on how households are likely to spend any money saved on energy and any potential time savings accruing through the adoption of new energy-related practices. In terms of spinoff effects, we will investigate (c) spill-over effects, i.e., reported or observed changes in other practices and (d) any new social learning processes or innovations arising from the ELLs.[5]
(3) As other indicators of sustainability, we have selected the following rough but (to some extent) measurable indicators: (a) environmental sustainability: changes in calculated CO_2 emissions from direct energy use; (b) conventions: changes in households' and communities' propensity and ability to challenge established conventions that have until now led to increasing energy use; (c) gender equity: changes in households' total effort and division of labour for household work; (d) household finances: changes in money saved/spent on energy; and (e) engagement with energy: changes in households' capabilities to actively and adaptively manage their energy use and their empowerment to speak up about energy also outside the home.
(4) Acceptability and scalability: this will be measured only after the ELLs and will include an overall assessment by households and stakeholders of how acceptable the new energy-related practices are for the households involved, other households, and stakeholders engaging in energy-related interventions (and in terms of infrastructural and institutionalised social and material possibilities).

Impacts are more difficult to assess, since the ultimate impacts of the project depend on several other factors, such contextual factors, including other potential concurrent initiatives and change processes (Vedung 1997). Nonetheless, we aim to assess (1) long-term changes in energy-intensive household practices with follow-up interviews about three months after the ELLs are concluded. Moreover, we use these interviews to investigate (2) the potential for diffusion of the practices in the participating households' immediate social circles, and complement this with other qualitative data (interviews with local stakeholders participating in the project).

Finally, in relation to ENERGISE WP6 and overall communication and dissemination, data are collected that shed light on the relevance of the ELLs to the transformation of energy-intensive practices and energy demand reduction in households through potential policy impacts and impacts on the public debate. Throughout the evaluation it is important to bear in mind that targeting practices within 20 households in each ELL does not yet change practices-as-entities, and that the potential and prerequisites for wider change can only be estimated indirectly through the experiences of participating households and other stakeholders involved. Change in energy-related practices on a large scale (practices-as-entities) depends on larger systems of provision (energy, housing, daily goods, public

[5] Examples of such social learning processes might be if the ELLs, for example, help energy service providers to better understand the needs of energy end-users, help build new links between parties that have not interacted before, help place practice-based living labs on the agenda of parties that have not previously engaged with them, or help to establish permanent structures like self-help networks, social movements, associations, intersectional working groups or new enterprises (MECHanisms 2017).

services), public policies (not only energy-related), shared cultural conventions and urban infrastructures (Shove 2014).

4 SUSTAINABILITY ASSESSMENT TOOLKIT

4.1 ASSESSING CHANGE: COMPARISON TO BASELINE AND ASSESSMENT AS PART OF THE CHANGE PROCESS

In order to establish the outcome and potential impact of the ELLs, we need to make a comparison vis-à-vis a baseline. Ideally, this baseline describes what the situation would have been *without the project*. In reality, baselines often describe the situation *before the project* (see MECHanisms 2009), allowing us to make a comparison between before and after the active phase of the ELLs in order to assess the changes in outcomes that can be attributed to the ELLs. There is always room for criticisms in such assessments, since several contextual factors can also cause changes over the duration of the ELLs, but the comparison of a final assessment to a baseline is the best approximation we can produce on the outcomes of the ELLs.

Since the ELLs are collaborative and transdisciplinary, we are not trying to isolate the participating households from the assessment. To the contrary, we try to engage them as far as possible in assessing the changes produced by the ELLs. We do not want to place too onerous a burden in terms of assessment on the households, either. This suggests the use of automation as far as possible for collecting assessment data. Moreover, it strongly suggests finding a comfortable flow and pacing of data collection vis-à-vis the actual ELL implementation stages (see Figure 2, which shows the evaluation steps described in this document (D3.5) in relation to the implementation steps of the ELLs in ELL intervention and engagement guidebook (D3.4, Laakso et al. 2018)).

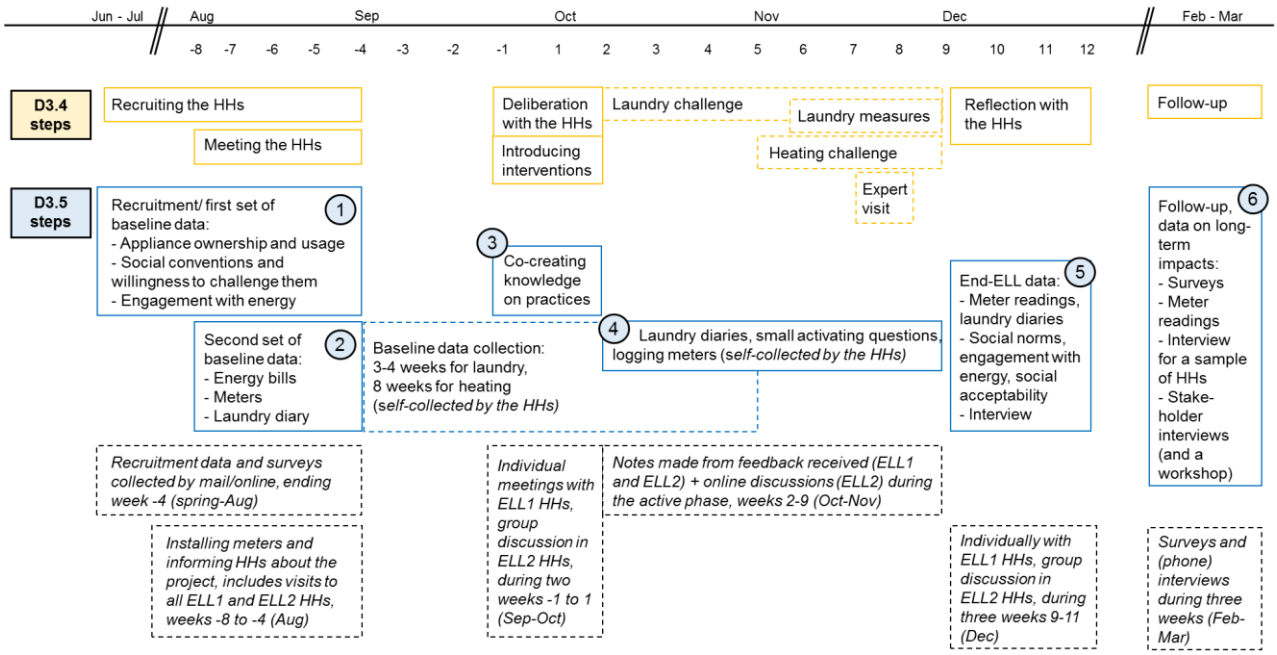


Figure 2. Key connections between implementation steps in D3.4 and steps for monitoring and evaluation D3.5.

The various needs of the ENERGISE project place relatively heavy demands on data collection, in terms of time and effort required by households, as well as in terms of time and effort required by the ENERGISE consortium partners and implementation partners. Because of this, we suggest concentrating assessment data collection at seven points in time (see also Figure 3).

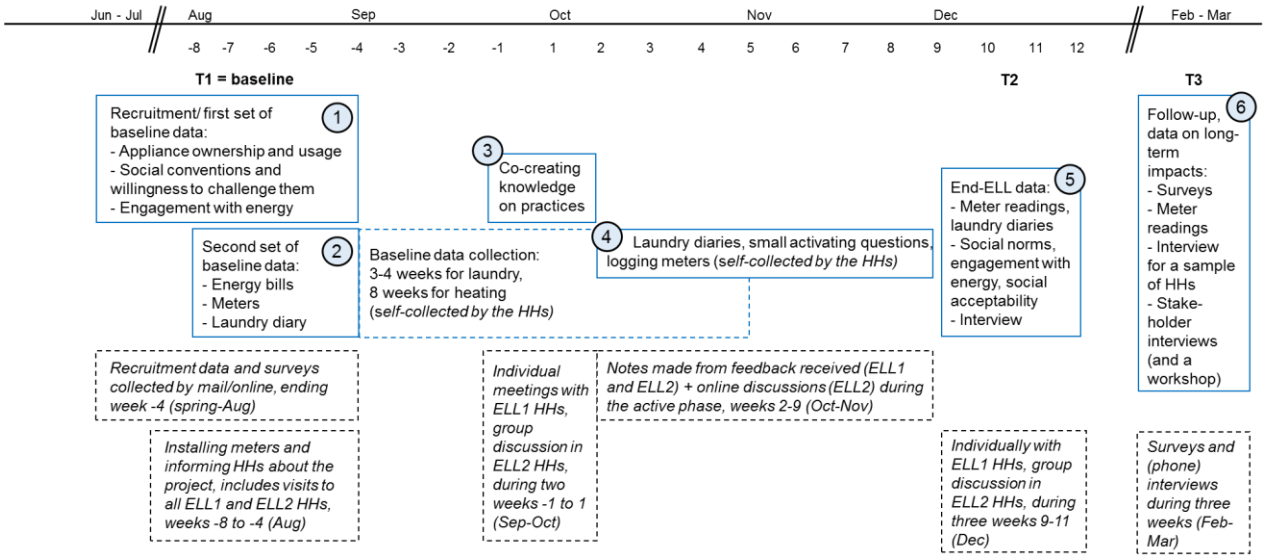


Figure 3. Framework for assessing change in the ELLs and timing of evaluation steps (note that ex-ante screening is not presented in figure).[6]

(0) For the practices and measures to be used in the ELLs, an **ex-ante screening** is conducted for the entire ELL design, collectively by the entire consortium, well before the start of the monitoring period (not indicated in Figure 2). This sustainability assessment screening serves to identify whether the measures proposed to households are relevant from the perspective of the ENERGISE sustainability indicators and whether they may entail any unexpected or perverse effects. After performing this screening, proposed measures can be improved or completely revised if necessary (to be done before week -8, i.e., before the beginning of August).

(1) Defining **contextual factors**[7] and recruiting **households** (to be completed before week -4, i.e., by the end of August). This is the point where we:

a. Identify whether the context is suitable for our ELLs, and in particular, whether it is suitable for testing measures for intervening in selected consumption domains (i.e., e.g., to what extent the socio-material context supports householders' active engagement with space heating systems).
b. Ensure the participation of a diverse mix of households, including hard-to-reach groups and representing various household compositions and age groups.

[6] This is an overall plan that attempts to accommodate for several contradictory requirements. This plan needs to be adjusted by partners according to their capabilities and will be further discussed in WP4.

[7] This work has already started as the ENERGISE partners have described the broader demographic aspects of each country, as well as market trends, trends in energy initiatives and visions for energy supply and consumption for WP2.

c. Assess the conditions for organising a separate ELL1 focusing on individual households and a separate ELL2 focusing on households as part of a community and interacting with one another during the ELL.
d. Collect the **first set of data for a baseline assessment** of households' practices, appliance ownership and usage, social conventions and willingness to challenge them, and engagement with energy.

(2) Collection of **the second set of baseline data** through household visits (in early September). Here we retrieve energy bills (or approval to obtain meter data), install meters and hand out and explain the laundry diary. With these in place, we are able to develop a three to four weeks baseline of laundering and up to eight weeks baseline heating practices (to be completed before the ELL interventions start, i.e., by week -1, the end of September, for laundry and by week 5, the end of October, for heating).

(3) Household **visits** (individual ELLs, i.e., ELL1) and **group discussions** (community ELLs, i.e., ELL2). These are primarily ruptures, i.e., part of the active phase of the ELLs. However, they also serve to co-create knowledge about household practices: these discussions are digitally recorded to provide qualitative data for the interviews (to be conducted in weeks -1 to 1, i.e., within a two-week period in September-October).

(4) **During** the ELLs, most of the data are collected automatically. Logging meters record temperatures and electricity usage for laundry. Households receive a paper copy of a laundry diary, a weekly survey asking for summaries of this information, and they also receive regular questions (like how they are doing, about their thermostat settings or to read a meter). These data are recorded in the Online Monitoring Platform, and accumulate to provide an overall record (e.g. a graph) of how the ELL progresses over the eight weeks of the active phase (ideally, weeks 1-9).

(5) Data collection **at the end** of the ELL includes collecting a second set of data points on social conventions and willingness to challenge them, engagement with energy, as well as energy meter readings. Paper versions of laundry diaries are collected. Additionally, we collect data through a self-assessment of the division of household work and potential changes in stress levels, and administer a questionnaire on acceptability and potential spillover effects. These data are preceded by a short open-ended interview (or group discussions in ELL2) focusing on changes in daily practices and spinoff effects (including any unexpected lessons learned) (weeks 9-12, i.e., during a three-week period in early December).

(6) The **follow-up** surveys, to be conducted three months after the end of the ELLs (in weeks 22-25, February-March 2019) will focus on the more long-term effects. We will ask households about any long-term changes to energy-intensive practices, potential rebound effects, diffusion of these practices in their social networks, and potential spinoffs such as further innovations in practice or householders' engagement in social movements. There is also an opportunity to conduct more in-depth interviews with a sample of households at this stage. Additionally, interviews with local stakeholders engaged in the project can be used to assess acceptability and potential for scaling up.

It is recognised that there is likely to be attrition in participation rates over the duration of the entire ELLs, in particular, over the follow-up period. This is unavoidable, though attrition can perhaps be mitigated by keeping in touch with the households during the follow-up

period (see also D3.4). Nonetheless, sample sizes, in particular for quantitative data, need to be considered critically at period T3.

Concerning the unit of analysis, it is important to be aware of the fact that we have different units of analysis in different data collection steps:

- energy usage data pertain to the household as a whole;
- questionnaires would usually have one respondent representing the household;
- interviews are ideally conducted with the entire household as a group, if available; and
- group discussions in ELL2 are conducted with the entire group, and thus findings cannot necessarily be connected to an individual or a household.

This creates some complications for connecting different observations to each other. We need hence to be aware of these issues when reporting on the findings. In the following, the term “ELL participants” is used to denote participating households and household members, whether they participate as individuals, as entire households, or as part of groups in ELL2.

It is also important to recognise that part of the ELL evaluation occurs in combination with ELL implementation. Hence, some of the evaluation steps, such as the interviews and even some of the questionnaires, can also function as “ruptures”, i.e., means to change household practices. This is another aspect of the evaluation that needs to be taken into account when reporting on the results.

4.2 SUSTAINABILITY ASSESSMENT TOOLS AND TEMPLATES

4.2.1 EX-ANTE SCREENING TOOL

Potential measures to be tested in the ELLs need to be well considered and justified. This can be done by considering the potential scale and likelihood of the impacts of each measure in relations to each ENERGISE sustainability indicator, with estimates and justifications derived from the literature, as well as consideration of what steps, if any, need to be taken to improve the design. Annex 1 presents such a tool and demonstrates its use with the example of the “laundry challenge”, in which households refrain from laundering for a certain period of time (see Laakso et al. 2017).

4.2.2 CONTEXT AND RECRUITMENT DATA COLLECTION TEMPLATE

The relevant background information for households includes socioeconomic and demographic factors such as household size, life stage, education, income level and home ownership status. The domain and site specific background information include e.g. building type, heating system and energy source(s), availability of energy bills, and ownership of laundry appliances. Other background information include information on community involvement, as well as previous engagement in energy initiatives. From a practical perspective, this is also the most appropriate stage to collect data on social conventions and engagement with energy.

In terms of total energy use and related carbon emission reductions due to ELLs, we need to be able to collect household energy use data both before and after the active phase of ELLs. This, in turn, requires that the participating households have access to this data (e.g.

meters, billing information or online monitoring) or that the ENERGISE consortium can provide such access. In some countries, it is also possible for households to allow third parties to access their online energy data. In all cases, households must agree to consent to the collection and storage of energy and other personal data, naturally with assurances of anonymity and appropriate data management practices. Data management practices are outlined in section 4.4.

A template for collecting data on context and the households to be recruited is provided in Annex 2. The template consists of the following sections:

(1) Background information
(2) Social conventions (indicated as SC items)
(3) Engagement with energy (indicated as EE items)

The social conventions items relate to the fact that ELLs aim to challenge escalating expectations concerning thermal comfort and cleanliness. The primary venue for assessing this is via the interviews concerning daily practices. However, since ENERGISE also aims to produce a Sustainability Assessment Toolkit (SAT) that can be used after the project, it is important to at least try to allow future users to quantify any changes in participants' capacity to challenge conventions.

Most of the sociological research on conventions does not investigate individual differences or short-term changes, but rather, investigates conventions on a broad historical and societal level (e.g. Shove 2003; Woersdorfer 2010). Quantitative measures that work on the individual level (and which can be thus used to assess changes among the ELL participants) have to be drawn from other research on social norms.[8] It is unlikely that our eight-week ELLs would make a difference for these measures, which are about the respondents' perceptions of conventions in their social environment (i.e., more descriptive than injunctive, see Schultz et al. 2007). However, we have added an item that aims to measure participants' propensity to challenge these norms, and we expect to see some difference on this item. The proposal is not to repeat the entire questionnaire at the end of the ELLs, but use the questionnaires filled in at the start as stimulus for asking the last question (capacity to challenge norms, triggered by changes in institutionalised and materialised ways of doing practices) again at the end of the testing period.

Engagement with energy items aim to capture the ELL participants' level of engagement with energy before and after the ELLs, and hence enable analysis of potential spill-over effects from the ELL activities. These items pertain to how aware participants are of their overall energy use and the extent to which their households have adopted adaptive and active practices in energy use. These items are drawn or modified from the EnergyNeighbourhoods energy audit. Additionally, in order to capture issues of households' empowerment in energy issues, items pertaining to engagement with energy outside the home are included.

[8] Where possible, we have drawn on existing validated measures and scales of social norms (Arild et al. 2003; Freeburg et al. 2010; Niva et al. 2014). In other cases, suitable questionnaire items were not available, but have been developed on the basis of qualitative research (Gram-Hanssen 2011; Munro & Madigan 1999; Strengers 2008) or questionnaire items developed for other than strictly social-norm related purposes (OECD 2011; Stevenson et al. 2009; Urban and Ščasný 2012; Walker et al. 2011), but still offering some comparative data, as well.

4.2.3 ENERGY USE DATA COLLECTION TOOL

The collection of energy use data is a compromise. It balances between what is possible, given the complex and diverse conditions concerning household energy use in the participating eight European countries and the combination of urban and rural households, and the desire to gain data on total household energy use and potential changes in household energy use owning to experimentation with new practices. There are several problems in the reliability of data and calculations concerning household energy use and the impact of ELLs on energy use. However, this is usually the case when collecting large and heterogeneous datasets dealing with households' energy use and e.g. attempting to disaggregate total energy use to various end-uses (e.g. Larsen & Nesbakken 2004).

We propose a three-layered approach to collecting data on energy use, with (1) a more general approach to collecting data on total energy use, as well as a (2) more detailed, domain-specific approach for collecting data on the selected domain with which households experiment (i.e., space heating or washing laundry), as well as (3) a method for calculating nominal energy savings from measures taken (Figure 4).

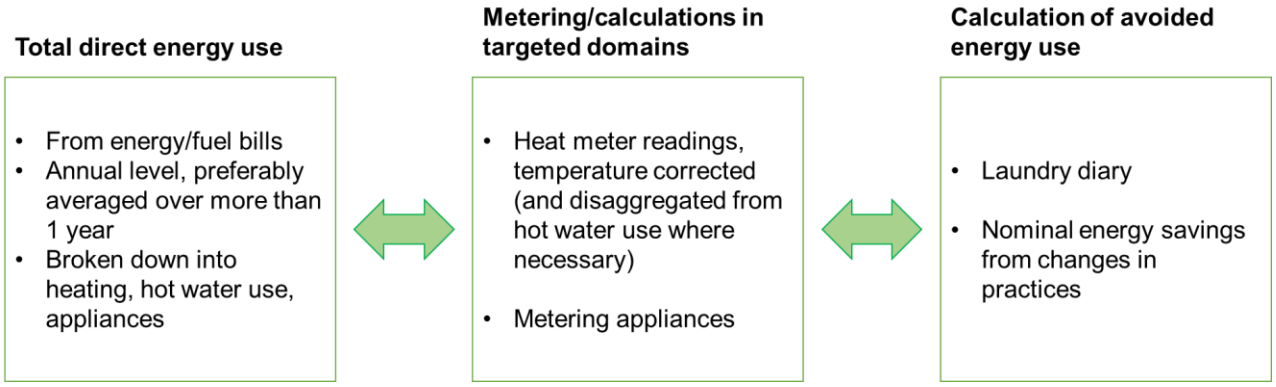


Figure 4. Approaches for calculating energy use in the ELLs.

For obtaining data on total direct energy use in the home, energy meter readings and/or fuel bills provide the main source of data. It is imperative that energy bills or meter readings are available for all households, and for all types of energy consumed (gas or other fuels, electricity, district heat). The energy use data are also used to calculate outcomes in terms of household finances (hence energy cost/unit needs to be recorded) and impacts on CO_2 emissions (which are calculated using national CO_2 coefficients for energy sources).

Additional data are needed for calculating or estimating the influence of the ELL measures in the selected consumption domains. For energy used for space heating, the following approaches are recommended:

- All households are equipped with logging indoor thermometers when visiting them for the first time.[9] Time series panel data on the average indoor temperatures of the household are recorded over an eight-week baseline period, the four-week ELL heating challenge period and the three-month follow-up period. Meters are read before the start of the challenge, after the challenge at the end of the ELL, and where possible

[9] Ideally, we would install thermometers that support several sensors, to measure temperatures in several rooms.

(if needed, by the household), in connection with the follow-up survey/ interview (3 months after the end of the ELLs).

- For space heating it is recommended to have billing or metering data specific to space heating. Annex 2 presents a tool for calculating temperature-adjusted energy use for space heating before and after the ELL. Meters are read before and after the challenge period, at the end of the whole intervention period, and where possible (if needed, by the household), in connection with the follow-up survey/interview (3 months after the ELL active phase). Where necessary, space heat metering and domestic hot water are disaggregated.

- If heat metering data are not available, we can produce a rough estimate of the influence of indoor temperature reductions on total energy demand by
  - using a national estimate of heat demand reduction for each degree of indoor temperature reduction; and
  - calculating the share of space heating of total energy demand (if available) based on national averages by dwelling type (see Annex 3).

Laundry appliances are metered using a logging electricity meter (one meter per appliance). Meters are read before the start of the challenge, after the challenge at the end of the ELL period, and where possible (if necessary, by the households), in connection with the follow-up survey/interview (3 months after the ELL active phase). Additionally, we propose to use a laundry diary. Data indicated in Table 1 are collected from all households for the pre-, during and post-ELL phases.

Table 1. Example of a laundry diary.

Date	Time	HH Member[10]	Full load	Half load	Less than half load	Temp (C°)	Eco cycle	Duration of washing/ drying cycle* (mins)	Meter reading (kwh)	Comment
01.12	15:00	T.M	x			40		90	0.000	
03.12	18:00	T.M	x			60		120	1.24	Guest bedclothes
05.12	16:00	S.M		x		40		90	2.75	

* We would also record the make and model number of the household's washing machine and dryer (where applicable).
** We might also include reports of usage of eco-functions (if any) and usage of other appliances, such as dryers or irons.[11]

Laundry diaries are distributed on paper. Additionally, weekly (automated) surveys are sent to households asking for the main results from the diaries (number of washes and temperatures, meter readings, use of other laundry-related appliances, any comments). This is to ensure data retrieval in case some of the diaries are lost. Additionally, households can be asked about indoor temperatures, their experiences of indoor temperatures, and sent some tips on how to keep up or extend their new energy saving practices (an example is presented in Annex 4, see also D3.4).

In selected cases (where electricity meters cannot be installed, or for control purposes), the laundry diary can be used to calculate estimated savings based on nominal reductions

[10] This could also be female HH member/male HH member/child to aid processing (initials can be difficult to interpret).
[11] Ironing consumes about 1 kWh/hour, i.e., three times more than a 30 degree wash. Most people do not do a lot of ironing, but some do.

in energy use obtained by changes in practices. The procedure for this can be exemplified for changes in laundering practices (Table 2):

(1) Calculate power consumption of the laundry machine (and potential tumble dryer/drying cabinet) during the mapping period, before the active ELL phase.
(2) Collect four-week diary data on typical laundering practices (frequency, temperatures, loads, etc.)
(3) Monitor changes in laundering practices over the seven-week testing period
(4) Calculate 'avoided' consumption due to the changes in practices

Table 2. Example of calculating avoided energy use for laundry practices (w = week).

Tempe-rature °C	Mapping period, number of washes				kWh/ cycle	total/ week	ELL testing phase, number of washes							total/ week	Avoided consum-ption
	W 1	W2	W3	W4			W1	W2	W3	W4	W5	W6	W7		
30	4	3	3	4	0,3	1,05	3	2	2	3	2	3	2	0,71	
40	5	6	5	6	0,5	2,75								0	
60	0	1	0	1	1,3	0,65		1						0,08	
90	0	0	0	1	1,9	0,475								0	
						4,925								**0,79**	**4,1**

4.2.4 INTERVIEW SCHEME FOR THE LAUNCH OF THE TESTING PHASE

Households are met three times during the ELLs: twice before the interventions and once after them (see data collection points 2, 3 and 5; Figure 5). In addition, a sample of the households will be interviewed during the follow-up. The first meeting (point 2) focuses on providing information on the project to the participants and on collecting the baseline data (see sections 4.2.2 and 4.2.3). Meters are installed and households' ability to receive surveys from the Online Monitoring Tool is ensured. Deliberation (point 3) and reflection (point 5) meetings are replaced by group discussions in ELL2 (see also D3.4).

Especially the deliberation meetings (point 3) with households are primarily "ruptures" in household routines and an attempt to gain the commitment of households to test the proposed measures. Producing this rupture, however, presents the need and the opportunity to understand household practices. On-site interviews and group discussions, coupled with observations of the household context (where possible), serve as an opportunity to co-create knowledge on household practices together with the households, and thus provide important qualitative data for evaluation and research. All interviews are tape-recorded and notes are made by the ELL partners in each country.

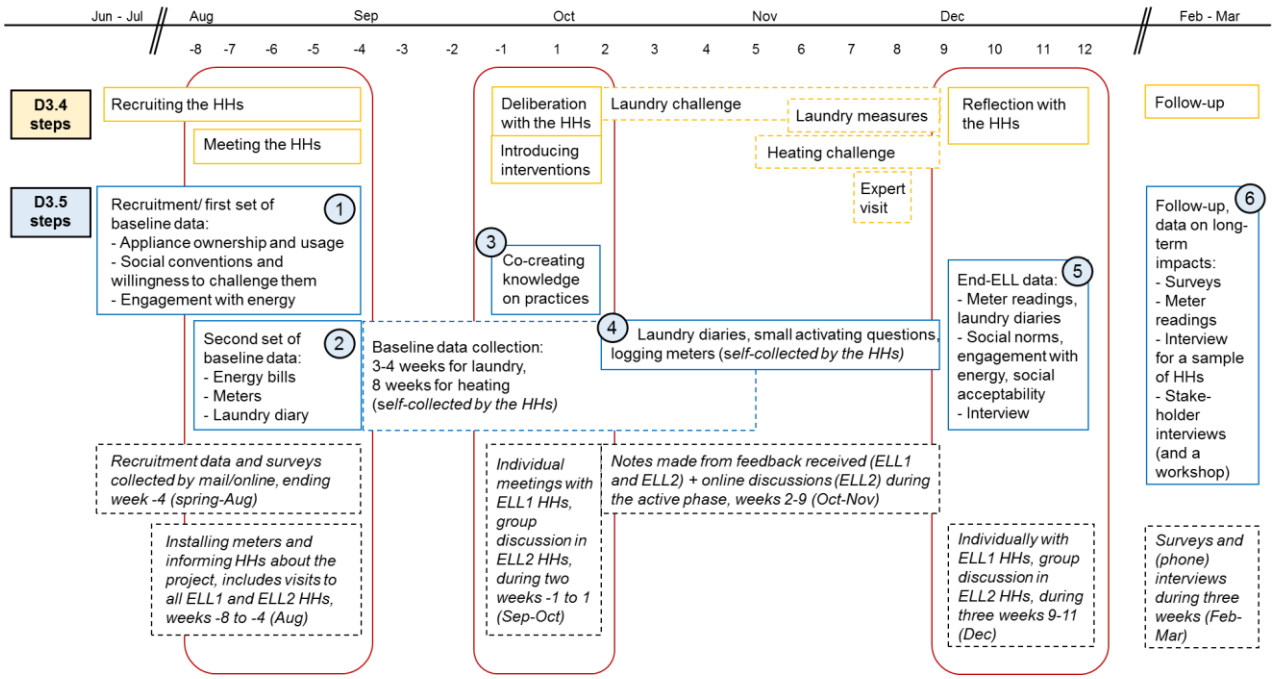


Figure 5. Meetings with the households

The aim of the deliberation meeting (which is also a launch event for the interventions) is to deliberately discuss, expose and learn about the practices that lead to energy use. Together with households, we map the most energy intensive practices (with the support of the information gained beforehand) as well as underlying social norms and conventions, required skills and material components, and rules and regulations, with a special focus on the practices under study but also acknowledging the other energy-relevant practices and their interlinkages. From a practice perspective, and when ambitions about reducing energy use are high, initiatives also need to consider how energy-related needs are defined. Questions of why the practice has the level of energy use it has and how this is related to the way it is constituted, how the practice has developed in (personal) history, and how to change the practice form an important first step in co-creating knowledge. We also discuss participants' needs, expectations, inspirations and motivations – making them visible for both researchers and households themselves and also gaining more understanding on what practices are easier and harder to change and why, and what kind of internal dynamics in households are related to performing practices. Interviews are recorded and later, notes are written up. At the end of this visit, interviewers also take photographs or copies of the laundry diaries and read the electricity meter, heat meter and thermometer readings.

The third meeting (point 5) takes place after the interventions (section 4.2.5) and the follow-up interviews for selected households are done three months after the end of the ELLs (section 4.2.6).

4.2.5 TEMPLATE FOR DATA COLLECTION AT THE CLOSE OF THE TESTING PHASE

At the close of the ELL testing phase, data are collected to assess the initial outcomes of the ELL activities. Households are invited to reflect on their experiences in an open-ended

interview (tape recorded and notes written up afterwards). Additionally, quantitative data are collected, including:

- repeating the engagement with energy items (part of the recruitment questionnaire);
- revisiting the social conventions items (part of the recruitment questionnaire); and
- collecting data for the assessment of the acceptability and diffusion potential of the ELL activities, which is justified and elaborated below (see Annex 5 for detailed items).

Acceptability and diffusion potential are relevant to assess since one of the aims of the evaluation is to discover the extent to which the new practices tested in the ELLs have potential to change household practice in the long term and to scale up beyond the circle of ELL participants. Social acceptability refers to acceptance by users, acceptance by other stakeholders and by the general public (Raven et al. 2009; Sauter & Watson 2007; Wüstenhagen et al. 2007). It hence encompasses conventional issues in the acceptance of new systems (Davies 1998), as well as broader issues pertaining to the societal embedding of innovations (Raven et al. 2009) and processes of deepening, broadening and scaling up of sustainability transition experiments (van den Bosch & Rotmans 2008).

Since the ELLs aim, in particular, to challenge social conventions, but operate on a very small scale (e.g. compared to the acclaimed CoolBiz initiative, Shove 2014), social acceptance is also understood here in terms of the opportunity for these new practice variations to be repeatedly performed by several practitioners and hence become stabilized, routinized and scaled up on a wider societal level (cf. Hargreaves et al. 2013). It is also relevant to identify stakeholders (companies, NGOs, local and national governments) who promote and make the new practices available more widely. Moreover, in order for these practices to emerge, the components must be integrated in practice by practitioners (Shove & Pantzar 2005).

Because of this, we propose two levels of assessing acceptance. First, we focus on conventional aspects of innovation adoption and acceptance, such as perceived usefulness, ease of adoption, intention to use, identification and spill-over effects, drawing on Vandenberg et al. (1994), Stewart et al. (2013), Bizler-Harder et al. (2013), Guerreiro et al. (2014) and Toft et al. (2014). These will be assessed using standard questionnaire items (though complemented with open-ended questions) enabling data to be aggregated across all 16 ELLs. Second, acceptance and scalability are also addressed in the follow-up interviews in more open-ended and qualitative terms, focusing, for example, on whether participants have shared their experiences, what opportunities they see for wider dissemination, and what should be changed and who should be involved if we want to disseminate the practices tested in the ELLs more widely (see Annex 6). Since gender equity is one of the social sustainability assessment criteria, we propose adding here some items that explicitly assess how engagement with the ELL measures influenced the amount of housework and the division of labour, as experienced by the households. Moreover, since one of the ideas in the ELLs is to create new practices that are likely to be taken up widely, it is good to assess participants' experiences of whether the new practices create more or less stress in everyday life.

Finally, at this stage, we retrieve information from the electricity and heat meters and thermometers. This can be done in the individual ELLs by reading them during the household visit. In ELL2, we need to ask households to read the meters in the invitation message to the concluding focus group discussion (and telephone follow-up may be needed if households have forgotten to do this).

4.2.6 FOLLOW-UP: RETENTION OF PRACTICES TESTED IN THE ELLs

Follow-up activities take place three months after the end of the active phase of the ELLs. The follow-up survey is sent to all households, and phone interviews are done if necessary to complement the missing data. A sample of households is selected for a more in-depth interviews. In ELL1, the follow-up interviews cover the participants' own estimation on how much they shared their experiences with their communities, whereas in ELL2, special attention is also paid to the diffusion of practices within and outside the community of participating households. This is also an opportunity to monitor potential rebound effects (use of money saved, use of time saved) and spinoff effects (spread of sustainability aspects in other daily practices within and outside households). In addition, stakeholders are interviewed about their views on the potential for replication and scaling up of the ELLs.

A data collection scheme for follow-up activities is provided in Annex 6, with closed-ended questions for households and open-ended interview topics for both households and stakeholders. The follow-up interviews (step 6 in the evaluation scheme) are envisaged to cover themes related to households' experiences and opinions on potential monetary costs of practice change, changes in time use, as well as changes in perceived wellbeing due to participating in ELL. These data also serve as partial inputs for the assessment of rebound and spinoff effects. The interviews with participants will be continued with open-ended questions that aim to address the more complex aspects of acceptability related to opportunities for scaling up the practices emerging from the ELLs, drawing on Shove and Pantzar (2005), van den Bosch and Rotmans (2008) and Raven et al. (2009). These participant interviews will be complemented with similar stakeholder interviews to be conducted with the stakeholders involved in the ELLs as well as members of the ENERGISE Expert Panel.

Another alternative (or complement), perhaps more suitable for addressing spinoff effects and potential for scaling up, is to organise a workshop for stakeholders who participated in the ELL implementation (see also D3.4). Such a workshop would offer the opportunity to use findings from the ELLs for further brainstorming on ideas and concepts for new services and modifications in existing services and infrastructures that would support the scaling up of more sustainable household practices.

4.2.7 REFLECTION AMONG ENERGISE CONSORTIUM PARTNERS

Reflection among the ENERGISE consortium is important for both formative (i.e., ongoing) and summative (concluding) evaluation. In the case of the ELLs, ongoing reflection among the consortium is particularly important, since the aim is to roll-out the ELLs similarly across countries. Nonetheless, the design and implementation needs to be sensitive to unexpected issues emerging in the ELLs. Because of this, regular discussions are needed.[12] Collective reflection by ENERGISE consortium partners is also recommended on whether, in which respects, how and why the ELLs were successful at different sites and in different countries. This serves as important input to an overall evaluation, as well as for further research ensuing from such evaluation.[13]

[12] These are envisaged as part of WP4 Task 4.3, Roll-out and monitoring of ENERGISE Living Labs.
[13] Such reflection is envisaged as part of WP4 Task 4.4, Harvesting data and experiences.

4.3 COMBINING SUSTAINABILITY ASSESSMENT DATA TO INFORM EVALUATION AND FURTHER RESEARCH IN ENERGISE

In the previous sections, the different types of evaluation data have been presented largely in the order in which they are collected. In the following, they are linked to the outcome indicators (section 4.3.1). Moreover, envisaged ways of using the data are presented (section 4.3.2). Finally, section 4.3.3 presents a suggested structure and division of labour for producing reports from the evaluation data.

4.3.1 COMBINING DATA FROM EVALUATION STEPS AND ITEMS TO ADDRESS OUTCOME INDICATORS

From the perspective of evaluation, Table 3 shows how data from the various steps and items are combined to assess ELL performance on the output indicators:

- Outcomes in terms of total energy use are evaluated in terms of how much energy the ELL has saved relative to total direct household energy use.
- Rebound and spinoff effects are addressed in several ways. Potential direct rebounds are assessed using the help of the screening tool (Annex 1), and issues raised are monitored by keeping track of the weekly laundry diary surveys, as well as qualitative interviews at stage T3 (3 months after the end of the active ELL phase). Financial and time-use rebounds are addressed on the basis of households' views on how they have used any money or time saved. Evaluation of spill-over effects draws on changes in households' engagement with energy, explicit questions concerning potential spill-over effects to practices in other consumption domains and forms of sustainable consumption (closing ELL interview, T2) and qualitative data on practice change (gathered T2 and T3). Spinoff effects such as new innovations engendered are addressed via interviews and workshops with stakeholders actively involved in the ELL implementation. Rebound, backfire and spinoff effects are also addressed when analysing the qualitative data collected during interviews and group discussions.
- As concerns indicators of social, economic and environmental sustainability, the influence of the ELLs on gender equity in housework can be assessed with data accumulated from the diaries (Annex 4), complemented with data from the self-assessment questionnaire (Annex 5, items GE 1-4) and qualitative data on practice change and involvement of household members collected in follow-up interviews (Annex 6).
- The influence on the ELLs on willingness to challenge conventions is assessed on the basis of changes in participants' willingness to challenge social conventions (Annex 5, items SC 1-15).
- The influence on the financial stability of the households can be calculated on the basis of changes in direct energy use and costs (Annex 3).
- A procedure for calculating outcomes in terms of CO_2 emissions from direct energy use is exemplified in Annex 3. Basically, we draw on calculations of energy saved by type of energy source/fuel (kWh, m^3) and CO_2 emission coefficients per country for each energy source, obtained from National Inventory Submissions to the United Nations Framework Convention on Climate Change.[14] We recognise that the changes

[14] unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php

in household practices do not influence the CO_2 emission coefficients, since they do not change the energy sources. However, this calculation allows us to assess the overall influence of changes in energy using practices on the households' overall carbon footprint, and also to consider the order of magnitude of potential implications of any spill-over and spinoff effects.

- We evaluate acceptability (and scalability) through the qualitative interviews as part of the household visits at the launch of the ELL interventions. Closed- and open-ended acceptability items at the close of the active phase (Annex 5) ask questions pertaining to changes made in each consumption domain. Moreover, we can add questions pertaining to particular measures and tools used once these have been definitively selected. Acceptability and potential for scaling up is also assessed using data from open-ended interviews with ELL households and stakeholders in the follow-up questionnaire (Annex 6).
- With socio-demographic data from Annex 2 and data on total energy and energy savings from Annex 3, we can analyse whether there are differences among different kinds of households in responses to the ELLs. For example, we can examine whether single-person households respond more strongly to the ELLs than families with children, or vice versa. Given the small number of households per country, this is best assessed across the entire cross-country sample (N=320).

In order to facilitate the use of the collected evaluation data, the Online Monitoring Platform can be programmed (if this is not too costly) to create predefined sets of graphic output or menus for selecting data output variables. This can speed up the process of producing country-level evaluation reports, which are also likely to be of interest to local stakeholders.

Some of the data collected for the evaluation can also be used for research purposes in other work packages or for scholarly publications within ENERGISE. To serve this purpose, all of the data will be collected and stored in the Online Monitoring Platform or on EMDESK in an appropriate and readable format (xlm, xls, csv) and a data characterization map will be provided.

Table 3. Combining data to assess ELL performance on outcome indicators.

ELL indi-cators	Specific measures	Before (T1)	After (T2)	Long-term (T3)	Expected results
Total energy use	Energy bills (annual/ monthly)				How much has the ELL reduced total energy use?
	Heat demand	meter readings[15]	meter readings	meter readings	How much has the ELL reduced heat demand?
	Electricity demand for laundry	electricity demand for control period	electricity demand for ELL period	long-term electricity demand (3 months)	How much has the ELL reduced electricity demand for laundry?
Rebound and spinoff effects	Direct rebound	screening tool, potential rebounds	laundry diary, interviews on what people did differently	interviews on what people did differently	Did ELL participants use some resources more when trying to avoid using others?
	Financial rebound			estimated financial savings, stated use of money saved	What is money saved used for? (more/ less energy-intensive than energy?)
	Time-use rebound			estimated time savings, stated use of time saved	What is time saved used for? (more/ less energy-intensive a than energy?)
	Spillover effects	engagement with energy	engagement with energy, stated spillover effects	interviews: qualitative data on practice change	Does the ELL have positive (or negative) spillover effects
	Spinoff effects			interviews/workshop with stakeholders	Does the ELL give rise to innovations among service providers?
Social economic & environmental sustainability	amount of housework and gender equity	laundry diary	laundry diary, housework & stress questions	follow-up interview (questions about household members and housework)	Has the ELL added/decreased housework for women?
	willingness to challenge conventions	stated willingness to challenge	stated willingness to challenge	follow-up interview, open questions	Has the ELL created willingness to challenge conventions?
	sharing of new practices with others		acceptability and scaling questions: identification	closed & open-ended questions about sharing	Has the ELL resulted in sharing of new practices?
	engagement with energy	engagement with energy questions	engagement with energy questions	open-ended questions, anything concerning energy empowerment?	Has the ELL empowered participants to engage with energy more actively, and if so, in what ways?
	household finances	money spent on energy/year	money saved through ELL		What has been financial impact of the ELL?
	CO_2 emissions	from energy data	from energy data		CO_2 emission savings & share of total CO_2 from consumption per country
Acceptability and scalability		Interviews: qualitative data on households' responses	acceptability questions, interviews: qualitative data on households' responses	interviews: qualitative data on households' and stakeholders' responses	Does the ELL have potential to be accepted (a) by participating households (b) by other households (c) by stakeholders
Differences btwn socio-emographic groups		Energy use, willingness to challenge norms, engagement with energy	Energy use, CO_2 and financial impact, willingness to challenge norms, engagement with energy		Variance analysis entire sample (N=320): are there any differences by household type, income and educational level?

[15] From heat meters. When no metering is available, calculated for 4-week control period compared with ELL active phase on the basis of avoided consumption.

4.3.2 USE OF DATA FOR EVALUATION

Several different types of data are collected for the evaluation. In the following, some examples are presented on how we envisage the use of collected raw data for evaluation.

Changes in energy use: Several confounding factors are likely to influence changes in energy use on a household level. In order to obtain statistically significant results concerning changes[16], it is recommended to aggregate data on a national level for the 20 individual ELLs (ELL1) and the 20 community ELLs (ELL2). As an example, changes in the household energy use for laundry can be investigated by

(a) comparing initial metered electricity use/week for laundry over the pre-ELL baseline period (T1) to electricity use/week during the ELL testing phase (T2) and electricity use/week over the follow-up period (T3);
(b) we can also produce quantitative reports of practice changes (e.g. total number of washes) at the different points (T1, T2 and T3); and
(c) moreover, metered electricity use can be compared to the laundry diaries for a sample of households (congruence between metered electricity use vs. calculated electricity use).

Similarly, changes in metered (and temperature correct) heat demand and/or indoor temperatures would be evaluated by comparing average heat demand/temperatures from the eight-week baseline period (T1) to average heat demand/temperatures from the four-week testing phase (T2) as well as to average heat demand/temperatures during the three-month follow-up period (T3). The temperature corrected heat metering data are likely to render more reliable results, which can be compared to results obtained by calculating nominal energy savings on the basis of indoor temperatures for a sample of cases where both sets of data are available. Long-term changes (T3-T1) can be used to investigate the persistence of changes and to estimate annual energy savings and ensuing CO_2 savings. These, in turn, can be compared to average household carbon footprints (in countries where available) to estimate the overall reductions obtained via the ELL interventions.

Other quantitative indicators can be treated in the same way, to calculate changes resulting from the ELL interventions. We can examine whether people are more willing to challenge social norms or engage with energy at the end of the ELL active phase than before it. We can also produce quantitative data on the share of households that evaluate the acceptability and scalability of the ELL positively or otherwise.

The data can be compared, depending on the most interesting points for evaluation, available sample sizes and types of variables

- on a national level, to compare individual ELLs with community ELLs;
- to compare outcomes across countries;
- to compare individual and community ELLs across the entire sample of 320 households; and
- to make the necessary comparisons between socioeconomic groups (on a very aggregate level, e.g. high vs. low income and single, two person and larger households), using the entire sample of 320 households.

Our hypotheses are that the community ELLs would render greater positive outcomes than the individual ELLs (i.e., greater reduction in energy demand, propensity to challenge

[16] NB: Independent and dependent variables also need to considered carefully.

social norms and engagement with energy), however, perhaps differently in different countries. On the other variables, our hypothesis is that the ELLs would work similarly across households and across countries. As to the potential negative outcomes, such as rebound effects or extra housework for women/households, our hypothesis is that the ELLs produce few such outcomes and few differences across countries or socioeconomic groups.

From an evaluation perspective, the **qualitative data** can be used to verify and understand the quantitative outcomes. If we find differences or unexpected outcomes, we can investigate potential reasons for these. The qualitative data can also be used to understand complex issues (like time-use rebound) as well as participants' judgements concerning the scalability of the ELLs.

4.3.3 REPORTING ON EVALUATION DATA

A suggestion for how to report on the evaluation data is presented in Table 4.[17]

Table 4. Suggestion for reporting on different outputs from the evaluation.

	Per country (each partner, T4.4 and T5.3)	**In total (T5.4)**	**Comparison between socio-demographic groups (T5.4)**
Energy use, CO_2 and financial impact	Influence on heating energy use, laundry energy use & total Comparison/combination of data from meters & nominal savings calculations Calculation of financial and CO_2 savings (directly from database) Comparison ELL1 vs. ELL2	Influence on heating energy use, laundry energy use and total • Across countries • Any relevant differences between countries Comparison ELL1 vs. ELL2 across countries	Variance analysis across countries (household size, income levels) (N=320)
Social norms (& willingness to challenge) + engagement with energy	Descriptive stats Change between T1 and T2 Comparison between ELL1 and ELL2	Descriptive stats Change between T1 and T2 • Across countries • Any relevant differences between countries Comparison ELL1 vs. ELL2 across countries	Variance analysis across countries (single HHs vs. families, income levels) (N=320)
Housework & stress Social acceptability	Descriptive statistics	Descriptive statistics • Across countries • Any relevant differences between countries	Variance analysis across countries (single HHs vs. families, income levels) (N=320)
Rebound, backfire and spinoff effects	Descriptive stats from follow-up questionnaire + selected questions from engagement with energy and social acceptability	Interpretive analysis • Across countries • Any relevant differences between countries	
Qualitative data (open-ended questions, notes from meetings)	Each partner writes up, or provides responses to questions provided by UNIGE (see T5.3)	UNIGE processes, perhaps combining with some of the other data	

[17] The details of this will be specified in WP4 and WP5.

4.4 ENSURING APPROPRIATE DATA MANAGEMENT PRACTICES

Part of the data will be collected on the Online Monitoring Platform, which will adhere to the data management practices outlined in Goggins and Fahy (2017). In particular:

- ENERGISE researchers will collect primary data only in WP4. Raw data, including interview recordings or analogue weekly diaries, will be stored securely (e.g. in a locked cabinet) on the premises of the partner responsible for the ENERGISE Living Labs these data are based on, or on a secure server linked to the Online Monitoring Platform. In a next step, analogue data will be digitalised, e.g. by processing raw data into (translated) interview transcripts or (translated) diary excerpts. These will be shared among all partners for evaluation and analysis in WP5.
    - Digital data will be collected to a secure server, by reading devices visually or by physically downloading the logger data from devices to the OMT via ENERGISE partners' (secured) computers. We will primarily use digital tools that do not directly interact with household wlans, and hence should not present a data security risk.
- Researchers will be strongly advised to encrypt all sensitive data using public key encryption software, in particular Pretty Good Privacy (PGP), the publicly available public key encryption application. The private key will be provided by the researcher to the project manager only. Additionally, all data files, especially records connecting ELL participants' identities to the data they provided, will be password protected where possible and saved to an external drive that will remain the property of the project management. Personal details and consent forms will be retained for three years following the study.

Data management practices will be communicated to the participating households and other stakeholders and appropriate consent forms will developed.

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ANNEX 1. EX-ANTE EVALUATION OF MEASURES

Sustainability assessment screening tool, with example for laundry challenge.

	Potential effects: laundry challenge (part of laundry intervention)		**Comments**	**Recommen-dation: monitor/ improve/ redesign**	**Refe-rences**
	scale: large, medium, small	**likelihood, large, medium, small**			
Total direct energy use reduction	small	large	According to different sources, laundry makes up about 2-14% of total energy use in the home (not known in all cases whether this includes drying). Laundering less is very likely to reduce this energy demand.	monitor	1,2,3
direct rebound effects: immediate use of the same or another resource	small	small	The laundry challenge might lead to increased use of other resources. For example, clothes might be (completely or partially) rinsed by hand. Use of dry cleaning agents might add to chemical load, though this is unlikely to be greater than the avoided amount of laundry detergent.	monitor	?
indirect rebound via financial savings and use of money saved	small	small	Total laundry costs amount to about 25-110€/year. Likelihood depends on whether money is spent on items that are more or less energy intensive than electricity, water and detergent. All other sectors are less energy intensive than electricity, and most are less energy intensive than water and chemicals.	monitor	4, 5
indirect rebound via time savings and use of time saved	small	medium	Households with children use about 30 minutes/day for laundry. Households without children are likely to use less. Laundering less is likely to save part of this time.	monitor	6
spillover effects, i.e., potential for changes in other consumption domains and energy-related competences	medium	medium	Reducing the amount of laundry reduces the use of water and detergent, as well as the amount of electricity or heat for drying and ironing. Laundry is a visible and understandable item of household energy consumption. It also connects to conventions of cleanliness, and there is potential for positive spillover in other areas of personal cleanliness.	monitor	?
Potential for spinoffs or innovations (e.g. companies, public authorities)	large	medium	There is potential for spinoffs or innovations in laundry care products and equipment, clothing design, and home design (e.g. space for slightly used clothing).	monitor	7
Changes in calculated CO2 emissions from direct energy use	small	large	These are directly related to energy savings.	monitor	
Changes in households' willingness to challenge established conventions	medium	medium	Laundry visibly connects to conventions of cleanliness, and there is potential for positive spillover in other areas of personal cleanliness.	monitor	?
Changes in households' total time and gender division of labour for household work	medium	medium	Less laundering should reduce housework for women. Women do laundry-related housework on average 3-4 times more frequently than men.	monitor	8,9
Financial stability: changes in money saved/spent	small	medium	Total laundry costs amount to about 25-110€/year.	monitor	4, 5
Empowerment of consumers to engage with energy	medium	medium	Attempting to refrain from doing the laundry for a fixed time period is likely to raise interest in more sustainable ways of laundering?	monitor	10
Social acceptability for the households involved	?	?	This is a genuinely open question that needs to be researched carefully. Workshop findings positive.	monitor	11
Social acceptability for other households	?	?	This is a genuinely open question that needs to be researched carefully.	monitor	11
Social acceptability stakeholders engaging in energy-related interventions	medium	medium	The idea was raised at the ENERGISE expert panel workshop with experienced practitioners, and did not raise objections.	monitor	11

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ANNEX 2. CONTEXT AND RECRUITMENT DATA COLLECTION TEMPLATE

Background information, with an introduction along the lines of "this information is important for us to select a diverse group of people for our project and to make sure what equipment participants have". NB: response options are to include "don't know" option.

Background information	Name	
	Contact information	address, phone number, e-mail
	Age and gender of each household member	separate options for each household member up to 10 members
	Highest education	choose from: Basic education, Secondary level, Secondary vocational education and training, Higher (third level)
	Employment status	choose from: Full-time employment, part-time employment, unemployed, student, retired, other
Housing	Home ownership status	choose from: tenant, owner, rent-free tenant, communal property, mix
	Building type	choose from: detached, semi-detached, attached, apartment building, student housing, senior housing
	Decade of construction	options -1920 up until 2010-
	Decade of last major renovation	options -1920 up until 2010-
	Apartment type	choose from: dormitory, studio, 2-bedroom, 3-bedroom, 4+-bedroom
	Total floor area	open text, square meters
	Has your household moved to your current residence during the past year	yes/no
	Does your household plan to move to another residence during the coming 6 months	yes/no
Heating	Home heating system	choose from: individual per dwelling, collective (shared by several dwellings)
	Type of energy used for primary heating system	choose from: gas, oil, electricity, biomass, district heating, other
	Type of energy used for secondary heating system	choose from: gas, oil, electricity, biomass, district heating, other
	Additional energy sources used	choose from: heat pump, solar/PV panel, solar heaters, other
	Can you regulate the room temperature?	yes/somewhat/no
	Does your household have access to energy bills or meter data for electricity and all heating sources the past year?	yes/no
	Are you willing to agree to the use of your energy data (anonymously) in our study?	yes/no
Laundering		
	Does the household have a washing machine?	yes/no
	Does your household regularly use a shared washing machine (e.g. laundry room) or a laundry service	yes/no
Internet and smart phones	Internet access at home	yes/no
	Smart phone ownership	number of household members, 0-10
	Use of Facebook	yes/no
	Use of WhatsApp	yes/no
	Other social media platform	free text
Communities and group memberships	Are any members of your household active in the following types of associations?	(choose from housing or neighbourhood associations, parent's association, local environmental NGO, local social NGO, sports club, community garden, other)
Engagement with energy, EE1[18]	Prior participation in some organized energy saving initiative	yes/no + please specify
EE2	Prior participation in some organized environmental initiative	yes/no + plase specify

[18] Adapted partly from Energy Neighbourhoods audit: ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/presentation_of_en2_en.pdf

EE3	Membership in energy related/environmental organizations	yes/no + plase specify
EE4	Follow energy and climate issues in the media (TV, newspapers)	Select from (a) regularly (b) occasionally (c) hardly ever
EE5	Engage with energy and climate outside the home	Select all relevant ones (1) consider energy & climate when voting (2) raise energy & climate issues at work (3) raise energy & climate issues in associations where I am a member (4) other
EE6	Actively search for information on energy saving	Select all relevant ones from (1) read brochures/newsletter when delivered home (2) actively search for information online or at the library etc. (3) ask friends for advice (4) ask experts for advice (5) other
EE7	Own efforts in heating (investments)	Select all relevant ones from (1) energy efficient heating system (2) insulation, draught-proofing (3) energy renovations (4) investments in renewable heating (5) investments in energy monitoring/control (e.g. thermostats, timers) (6) other
EE8	Own efforts in heating (active management)	Select all relevant ones from (1) monitor heat consumption (2) keep temperature at below 20°C, (3) turn down the heat when airing (4) insulate heating pipes (5) clean radiators, convectors, vents, chimneys etc. (6) regular maintenance of heating system (settings, venting, cleaning etc.) (7) other
EE9	Own efforts in heating (adaptive management)	Select all relevant ones from (1) turn down heating for the night (2) turn down heating when not at home? (4) avoid heating unused rooms (3) heat less and use clothing to keep warm (4) use curtains/blinds (5) other
EE10	Own efforts laundry (investments)	Select all relevant ones from (1) purchase energy efficient (A+++) appliances (2) other
EE11	Own efforts laundry (active management)	Select all relevant ones from (1) wash cold/30°C (2) wash full loads (3) use air drying (4) remove stains before washing (5) sort laundry (white/coloured, dirty/clean) (6) other
EE12	Own efforts laundry (adaptive management)	Select all relevant ones (1) remove stains without washing entire piece (2) replace washing by airing clothes (3) replace washing by brushing clothes (4) invent new storing practices to avoid mixing used and unused clothes (5) other
EE13	Own efforts other consumption domains (investments)	Select all relevant ones (1) energy efficient home appliances (2) energy efficient electronics (TV, computer), (3) energy efficient light bulbs (LED) (4) investments in renewable energy (at home or outside it e.g. energy co-operative) (5) other
EE14	Own efforts other consumption domains (active management)	Select all relevant ones (1) know how much energy my household consumes per year (2) know temperature setting of fridge (3) use power cord with to turn off appliances on standby (4) regularly defrost fridge/freezer (5) regularly clean coils at the back of fridge/freezer (6) other
EE15	Own efforts other consumption domains (adaptive management)	Select all relevant ones (1) regularly turn off TV etc. when not in use (2) regularly turn off computer/printer etc. when not in use (3) avoid purchasing additional appliances (4) other

The following questions could be introduced along the lines of “in order to plan and assess our activities, it is important for us to know how people in your community feel about thermal comfort and cleanliness. Please let us know how you feel about the following statements”.

Thermal comfort, SC1	What indoor temperatures do you believe to be recommended in your country?[1]	temp degrees
SC2	What indoor temperatures do you consider to be normal for your (type of) building?	temp degrees
	Among my acquaintances it is normal to	
SC3	- Check and adjust thermostat settings	Likert scale agree-disagree
SC4	- Turn down the heating when airing the room	Likert scale agree-disagree
SC5	- Turn down the heating when leaving the room	Likert scale agree-disagree
SC6	- Turn down the heating when leaving for the day	Likert scale agree-disagree
SC7	- Turn down the heating when leaving for a week or more	Likert scale agree-disagree
SC8	- Be concerned about energy use for heating	Likert scale agree-disagree
Cleanliness, SC9	Clothes should always smell as if newly washed[2]	Likert scale agree-disagree
SC10	It is embarrassing to wear clothes with a body odour	Likert scale agree-disagree
SC11	If children are not clean, it is a sign of neglect	Likert scale agree-disagree
	Among my acquaintances it is normal to[4]	Likert scale agree-disagree
SC12	- wear the same top or shirt two days in a row?	Likert scale agree-disagree
SC13	- wear the same skirt or pants two days in a row?	Likert scale agree-disagree
SC14	- wear the same underclothes two days in a row?	Likert scale agree-disagree
Challenging social norms, SC15	On a scale of 1-10, how concerned would you be about deviating from social norms in (a) keeping your home warm 1 and (b) keeping clothes and other items clean	Scale of 1-10
Space for 2-3 open-ended questions at this stage		

1. Adapted from Vavra et al. 2016; Urban & Ščasný, 2012.
2. From Arild et al. 2004.
3. From Freeburg and Workman 2010.
4. From Stevenson et al. 2009.

ANNEX 3. ENERGY CONSUMPTION TOOL

Data to be collected when visiting the households for the first time (T1)

Energy	Energy bills for all fuel sources (from background questionnaire) (alternatively permission to access data from energy provider)	Note billing period, total kWh/m3/etc., total cost, cost/kWh/m3/etc., name of energy provider, type of electricity (standard/green)
	If firewood, estimate of annual firewood consumption	Note consumption volume, m3
	If other	Note consumption volume and cost
	Heat meter reading	Note heat meter reading, kWh
	If heat meter is shared by space heating and domestic hot water, data needed for disaggregation (insulation level, water use)	To be specified
	Type of energy used for electricity	Choose from: renewable, non-renewable
	All laundry appliances	Make, model and age of appliances + energy rating
Meters	Install meters and make sure they are functioning properly and that households know how to read them	
Laundry diary	Hand out and explain laundry diary	
Weekly surveys	Demonstrate weekly survey on mobile or laptop	

Process of energy saving calculation (data to be fed by partners is highlighted)

energy use by source from energy bills			
	kWh	period	cost €/kWh
district heat	3000	1.1.-1.9.201	0,06
electricity	500	1.1.-1.9.201	0,14

heat meter reading		
date	kWh	kWh/day
1.9.2018	3000	12,4
1.10.2018	3500	16,7
30.11.2018	3900	13,3
1.3.2018	5200	14,4

→ fed into temp correction, sheet A

changes in indoor temperature

	temperature	
date	indoor ° C	outdoor ° C
1.9.2018	22	14
1.10.2018	22	6
30.11.2018	18	0
1.3.2018	20	0
mean long-term reduction	**2**	

electricity meter reading (laundy)		
date	kWh	kWh/day
1.9.2018	0	
1.10.2018	6	0,20
30.11.2018	7,2	0,04
1.3.2018	15,2	0,09

→ if unavailable, feed long-term temp reduction into sheet B: calculates share of heating/total energy (average) and average savings from each degree reduced

savings in electricity and temperature-corrected heat are fed into CO2 calculator

	/5 months (active ELL+follow-up)
Heating energy saved, kWh	175
Electricty saved, kWh	17
HH fuel mix	
Energy savings in ELL households	HH1
Heating energy saved, kWh	175
Electricty from laundry equipme	17,1
HH fuel mix (from energy bills data)	
Appliances, electricty source	
Electricity, national average	4805,1
Heating	
District heat, Helsinki	43750
Total CO2 emission reductions,	48,6
Compared to HH average CO2-e	3667
percentage of emissions	1,3 %

CO2 coefficients for energy sources	
	g CO2/kWh
District heat, Helsinki	250
Electricity, ntl average	281
Electricity, "green"	0
Biomass	14
Fuel oil	266,04
Natural gas	198,72

Sheet A. Calculator for temperature-adjusted heating energy demand

Calculator for heating degree day-adjusted heating energy demand

Instructions

1. Find data on the heating energy consumption for the months shown in the table, during the heating period in 2016-2017 and 2017-2018.
2. If heating and domestic hot water share the same meter, you can estimate the share of heating using the procedure on sheet B
3. Insert the monthly heating energy use into the green cells (column B).
4. Insert the monthly heating degree days into the correspon 2016-2017 data available: http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do
5. If possible, insert the monthly heating degree days of the test reference year (column D)
6. The program calculates what the the heating demand would have been in 2016-2017 heating seasons climate or in TRY climate.
   This is calculated from the relations between the heating degree days.

	Heating energy demand	Heating degree days	Heating degree days in	Calculated consumption
2016-2017	kWh	in 2016-2017	test reference year (TRY)	using TRY HDDs, kWh
September	454	168	161	435
October	1117	421	331	878
November	1756	577	495	1506
December	1830	600	595	1815
January	2101	665	650	2054
February	1770	616	602	1730
March	1389	541	607	1558
Sum	10417	3588	3441	9976

	Heating energy demand	Heating degree days	Calculated consumption	Calculated consumption	Difference 2017-2018 / 2016-2017
2017-2018	kWh	in 2017-2018	using HDDs from 2016-2017, kWh	using TRY HDDs, kWh	%
September	551	201	461	441	1
October	1008	403	1053	828	-6
November	1337	474	1628	1396	-7
December	1512	551	1646	1633	-10
January	1618	597	1802	1762	-14
February	1789	703	1568	1532	-11
March	1303	525	1343	1507	-3
Sum	9118	3454	9500	9098	**-9**

Sheet B. Demo of calculation tool for reduction in heat demand in cases where separate metering for space heating is unavailable

Example where space heating and domestic hot water use the same energy source (but not appliances)

Changes in indoor temperature (from data input by partners)

	indoor ° C	local outdoor ° C (control)
8-week baseline average	22	14*
ELL challenge phase, average	18	6
remaining ELL period + 3 months follow-up	20	0
average long-term reduction	**2**	

* if indoor and outdoor are close to each other, consider need for additional corrections

Calculating total reduction of households' energy demand for space heating based on national average of energy demand reduction per degree indoor temperature reduction.

	%	
Finland, average reduction per 1 degree	5 %	
Reduction in space heating demand from average long-term reduction (table above)	10 %	

Calculating reduction in total energy demand by relating to national/local average share of space heating/type of dwelling

	space heating, %	domestic hot water, %
Average share of space heating, Helsinki apartment building[19]	70 %	30
Total energy use per dwelling, kWh/a	6000	
Total space heating per dwelling, kWh/a	4200	
Savings achieved through ELL kWh/a	420	
Share of total energy demand	**7 %**	
Share of total heating demand	**10%**	

** in the case of electric heating, also electricity use for appliances needs to considered

[19] National averages available http://www.entranze.enerdata.eu/#/share-of-space-heating-in-total-residential-consumption.html, more detailed data available in some cases e.g. from the EnergyNeighbourhoods project. Any additional information needed for this can be collected in conjunction with the energy bill and meter installation.

ANNEX 4. WEEKLY QUICK SURVEY

Example of a quick survey to be sent to households each week during the ELL (online/mobile)[20]

Please check your laundry diary. How many washes did your household do this week?
at 30 °C: full load ☐ half load ☐ less than half load ☐ eco-mode ☐
at 40 °C: full load ☐ half load ☐ less than half load ☐ eco-mode ☐
at 60 °C: full load ☐ half load ☐ less than half load ☐ eco-mode ☐
at 90 °C: full load ☐ half load ☐ less than half load ☐ eco-mode ☐

Did your household use any drying appliances? If so, for how long
tumble dryer, minutes ☐
drying cabinet, minutes ☐

Did your household do any ironing? If so, for how long
ironing, minutes ☐

Have members of your household invented new ways to keep clean during the week?
☐ used apron to keep clothes clean
☐ removed stains to avoid cleaning entire piece of clothing
☐ aired clothes to make them fresher
☐ other ____

Please check the reading on the power meter attached to your laundry machine and enter here the meter reading: ☐

How are you feeling about the laundry challenge?
☐ excited
☐ relaxed for not having to do so much laundry
☐ OK
☐ worried

Add here tip of the week!

Please check the reading on your thermometers enter here the temperatures:
☐ living room
☐ kitchen
☐ bedroom 1
☐ bedroom 2
☐ any other room

Have you engaged in any new ways of keeping warm during the past week?
☐ drawn curtains/blinds to keep out draughts
☐ rearranged furniture to keep out of draughts
☐ worn warmer clothing/slippers/used blankets
☐ adjusted thermostat settings
☐ other _____

How are you feeling about the heating challenge
☐ excited
☐ ☐ OK
☐ worried

Add here tip of the week!

[20] Might add here something about gender, need to test how much time/effort this takes.

ANNEX 5. ACCEPTABILITY QUESTIONNAIRE ITEMS AND INTERVIEW QUESTIONS

Interview questions	
1. How do you now feel about participating in this project?	
2. To what extent have different household members participated in the project?	
3. How have different household members felt about participating in the project?	
4. Have there been some particularly fun things about the project?	
5. Have there been some particularly worrying things about the project?	
6. Have you gained any new insights concerning your everyday life during the project?	
7. Have you invented any new ways of doing things during the project?	
8. Have you made any changes to your dwelling, heating system or laundry appliances during the project?	
Questionnaire items (HH can fill in on interviewer's laptop)	**Choose from**
GE 1. In terms of overall amount of housework, do you feel participating in the project has resulted in more or less housework?	much more, somewhat more, no impact, somewhat less, much less
GE2. In terms of relations between members of your household, do you feel participating in the project has made relations in your household	much better, somewhat better, no impact, somewhat worse, much worse
GE3. In terms of overall stress in your life, do you feel participating in the project has resulted in more or less stress	much more, somewhat more, no impact, somewhat less, much less
GE4. As concerns the division of labour in your household, do you feel the project has created more or less work for	
the female adult in your family (if any)	much more, somewhat more, no impact, somewhat less, much less
the male adult in your family (if any)	much more, somewhat more, no impact, somewhat less, much less
one or more children above aged 15 or more (if any)	much more, somewhat more, no impact, somewhat less, much less
one or more children aged below 15 (if any)	much more, somewhat more, no impact, somewhat less, much less
Perceived usefulness	Likert scale: agree-disagree
The new practices of (a) cleanliness or (b) [insert domain] that I tested in the ELL	to be repeated for both domains
· make my everyday life easier	
· make my everyday life more enjoyable	
· help me to have a more satisfying family life	
· help me to be healthier	
· help me to save time	
· help me to save energy	
· help me to save money	
· help me to reduce my carbon footprint	
· contribute to making the world a better place	
Open comments: _____	
Compared to other ways of saving energy and reducing CO2 emissions (such as using the car less or eating less meat), the practices tested in the ELL were	Likert scale: much easier-more difficult
Compared to other ways of making my everyday life easier, the practices tested in the ELL were	Likert scale: much easier-more difficult
Ease of use	Likert scale: agree-disagree
It was easy for me to experiment with the new practices tested in the ELL	
It was difficult to learn to do things in new ways in the ELL	

It was difficult to the change my way of doing things at home at first but it got easier	
It was easy to experiment with new ways of doing things but difficult to continue doing so for several weeks	
I expect that continuing to do things at home in the new ways we tested will not require a lot of effort from me	
Why was it easy or difficult to experiment with the new practices, open question___: _____	
Intention to use	Likert scale: agree-disagree
I think my household will go on with trying to apply the new practices until the end of the year	
This was an interesting experiment but I don't think my household members and I will continue doing the new practises	
My household and I plan to continue applying some of the new practices in the future	
I don't think my household and I will do any of the new practices after the project ended	
Identification	Likert scale: agree-disagree
I have told my friends about this project as a positive experience	
I am proud to tell others that I am a part of this project	
I am not willing to make an effort to help spread the results of this project	
I feel this project does not contribute to values that are important to me	
I would like to help my friends adopt the new practices tested in the ELLs	
I don't feel these new practices would be helpful anyone I know	
Spillover effects	5-point scale: have already done- might do-not sure-not likely-no
How likely do you consider yourself in the future to	
engage with energy and climate concerns in my home	
join an organization working with energy/climate issues	
take climate and energy into account when voting	
pay more attention to the climate impacts of the food you eat	
given advice to others about energy, climate and lifestyle issues	

Repeat here engagement with energy questions from pre-ELL survey!

After this, the interviewer takes out the households' response to the social conventions items from the recruitment survey. This is how you responded before the start of this project. Do you still agree? Interviewer makes notes if respondent wants to change.

On a scale of 1-10, how concerned would you be about deviating from social norms in (a) keeping your home warm 1 and (b) keeping clothes and other items clean	Scale of 1-10

Before closing the interview, please remember to collect:

Heat meter reading	_ kWh
Temperature readings	log from meter
Electricity meter readings	log from meter

ANNEX 6. FOLLOW-UP QUESTIONNAIRE/INTERVIEW TEMPLATE

To be conducted 3 months after the end of the ELL active phase. This template includes an interview/survey template for households. The interview questions at the end are also for use when interviewing stakeholders involved in implementing the ELLs.

Introduction: It has now been three months since the end of our ENERGISE Living Lab last autumn. We are now getting back to you to ask about your views on the long-term impact of project on your everyday life.

Have your continued doing some of the things you experimented with in the ELL laundry challenge?	chose from: running fewer laundry cycles, using alternative ways of cleaning clothes (e.g. airing, stain removal), other: please specify
Have your continued doing some of the things you experimented with in the ELL heating challenge?	choose from: having lower indoor temperatures, avoiding drafts by using curtains/blinds or keeping furniture rearranged, other: please specify
Do you think you would have started any of these things if you had not been involved in the project?	choose from: all, some, none
Have you adopted any other new practices in your household?	yes/no, which ones (open-ended question)
If these any other way in which you have changed your practices as a result of participating in the project?	yes/no, please specify: (open-ended question)
Have you monitored your energy consumption more frequently since the project?	yes/no, please specify: (open-ended question)
Are there other things in your everyday life that you do differently as a result of participating in the project?	yes/no, please specify: (open-ended question)
Which members of your household have been active in adopting the new practices?	open-ended question
Have there been any changes in who does housework as a result of participating in the project	open-ended question
Have you spoken about the project with other members of your household during the past 3 months?	yes/no, please specify: (open-ended question)
Have you spoken about the project with friends, neighbours or colleagues during the past 3 months?	yes/no, please specify: (open-ended question)
Have you taken any new initiatives related to energy or the environment outside your home?	yes/no, please specify: (open-ended question)
For ELL2 participants: Have you kept in touch with other participants in the ELLs during the past 3 months	yes/no, please specify: (open-ended question)
Have there been any major changes in your life circumstances since the end of the project	yes/no, please specify: (open-ended question)
How many laundry cycles do you currently run per week	number /cold, 30°C, 40°C,, 60°C,, 90°C,
Please enter your indoor temperature from the thermometer	room 1, 2, 3, etc.
Please enter the reading from your heat meter	___kWh
Please enter the electricity meter reading from your laundry machine	___kWh
Please enter the date of these meter readings	DD/MM
Do you think your household has saved any money as a result of participating in the project	no, yes (choose from 5-20€, 20-50€, 50-100€, more than 100€)
If you have saved money, what have you used it for or what will you use it for?	choose from: everyday running costs, savings, eating out, purchase of new equipment (please specify), entertainment (please specify), travel (please specify), other (please specify)
Do you think your household has saved any time as a result of participating in the project	no, yes (choose from less than 1 hour a week, 1-2 hours a week, 3-4 hours a week, more than 4 hours a week
If you have saved time, what have you used it for?	choose from: sleeping, reading, TV/ computer, housework, home maintenance, sports or outdoors, cultural activities, travel, other (please specify)

Questions for participants AND stakeholders:	
Have you shared your experiences in the ELLs with anyone	scale: never – once or twice – now and again – regularly/not applicable
Spoken to	
friends	
relatives	
neighbors	
co-workers	
my children's school	
groups/associations in which I participate	
other	
Shared on	
Facebook	
Twitter	
Blog post	
Newspaper article	
other	
Would you consider sharing your experiences in the ELL in the future	scale: never – once or twice – now and again – regularly/not applicable
Speak to	
friends	
relatives	
neighbors	
co-workers	
my children's school	
groups/associations in which I participate	
other	
Share on	
Facebook	
Twitter	
Blog post	
Newspaper article	
other	
Open-ended questions	
Open comments on sharing experiences:_____	
If the opportunity were to arise, would you participate again?	
Would you recommend participating in this kind of project to your friends, neighbours, co-workers?	
What did you see as the main benefits/weaknesses of the project?	
Have you gained any new insights on energy-related household practices while participating in this project? Which ones?	
Could this project be repeated in another community? Where? Why?	
Should the (a) local government (b) national government and (c) EU support some of the practices tested in this ELL? Which ones? Why? How?	
What opportunities do you see for wider dissemination of the practices developed in the project within your (a) community and (b) country?	
What barriers do you see for wider dissemination of the practices developed in the project within your (a) community and (b) country?	
What positive/negative impacts might wider dissemination of the practices developed in the project have within (a) your community and (b) your country?	
What should be changed and who should be involved if we want to disseminate these practices more widely within (a) your community and (b) your country?	