

ENERGISE

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

Project acronym: ENERGISE
Title: European Network for Research, Good Practice and Innovation for Sustainable Energy
Grant Agreement number: 727642

DELIVERABLE 3.4

EASY-TO-USE ENERGISE LIVING LAB INTERVENTION AND ENGAGEMENT GUIDEBOOK

Description: This deliverable offers a manual on the formats for engaging households and communities, based on good practices examples identified in WP2, and defines methods, techniques and tools for ENERGISE Living Labs and their timing

Lead parties for deliverable: University of Helsinki

Document type: Demonstrator

Due date of deliverable: 28-2-2018

Actual submission date:

Revision: Version 1

Dissemination level: Confidential, only for members of the consortium (including the Commission Services)

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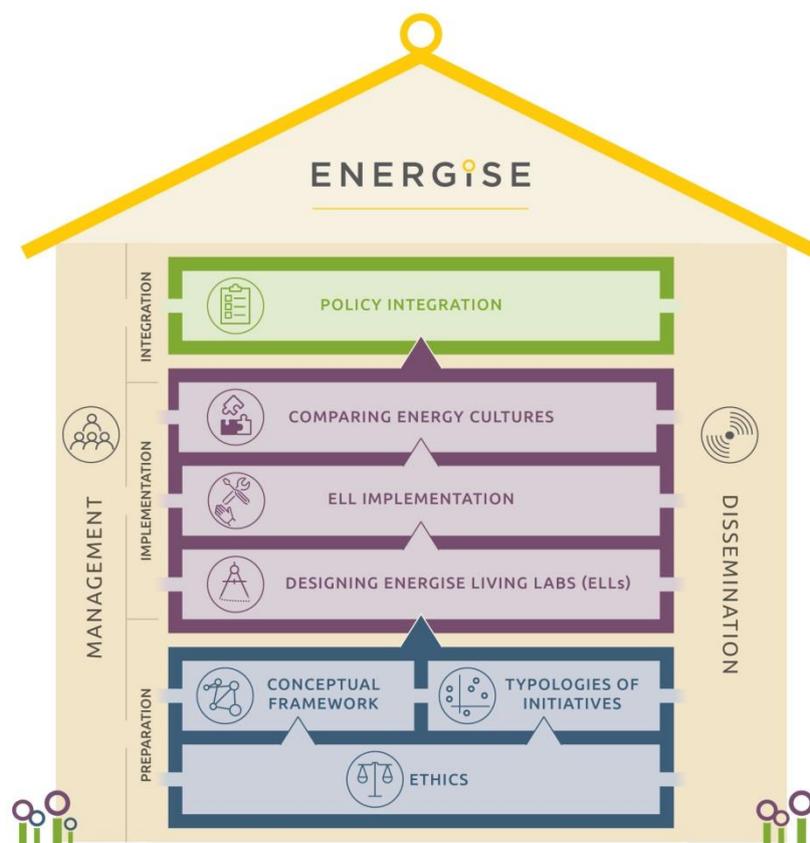
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ENERGISE PROJECT

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

[To be added in the next version.] This deliverable offers a manual on the formats for engaging households and communities, based on good practices examples identified in WP2, and defines methods, techniques and tools for ENERGISE Living Labs and their timing.

1 INTRODUCTION

The ways households are engaged in mundane practices that use energy vary greatly across Europe and within European countries (Laakso & Heiskanen 2017). Similarly, it has been shown that the effectiveness of initiatives to save energy also vary both between and within European countries (see e.g. Abrahamse et al. 2005; Lehner et al. 2016). And while there have been several successful European projects that have rolled out similar interventions in several countries, there is some evidence of variable outcomes depending on geographical, institutional and socio-demographic context (see Laakso & Heiskanen 2017).

ENERGISE Work Package 3 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 ENERGISE Living Labs 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.

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 will translate these findings into designs for innovative, replicable and scalable Living Labs (implemented in WP4). Sustainability Assessment Toolkit (SAT) will provide guidelines for evaluation and assessment of the Living Labs, informing data collection for comparative analyses of energy-related household practices and cultures (in WP5).

The aim of this document (D3.4) is to offer a manual on the formats for engaging households and communities, based on good practices examples identified in WP2, and defines methods, techniques and tools for ENERGISE Living Labs and their timing. This guidebook is written in a step-by-step form and it proceeds from the **preparation** of ENERGISE Living Labs (ELLs) and the identification of sites, participants, stakeholders and resources to the actual **implementation** and monitoring of ELLs and finally to **completion** and **evaluation** of the ELLs. However, it is important to note that many of these steps happen in parallel and are interlinked with and interdependent of each other.

For further guidelines for the implementation, monitoring and evaluation of ELLs, please consult the following deliverables:

- D3.2 ELL Background report
- D3.5 ENERGISE Living Lab evaluation and assessment manual
- D4.1 ENERGISE Living Labs Implementation and Monitoring Plans
- D4.2 ENERGISE Online Monitoring Platform

2 ENERGISE LIVING LABS

Moving beyond mainstream sustainable energy consumption research, ENERGISE explicitly recognises the centrality of wider practice cultures, considering meanings, competences and material conditions as well as the wider societal conditions in which they are embedded (Rau & Grealis 2017). The interest is in prevailing energy cultures – sociocultural factors that shape domestic energy use and create variations in how energy is generated, distributed, viewed, and used both within and between countries (Rau & Grealis 2017). ENERGISE sees a change in these cultures as a key ingredient of successful energy sustainability transitions.

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, backfire and spin-off effects in initiatives, and
- policy options for changing energy use through initiatives to shift unsustainable energy cultures.

In addition, ELLs will incorporate

- 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.

The starting point for the design of ELLs is the ENERGISE conceptual framework (WP1) that approaches energy use as a material expression of people's performance of everyday practices and associated cultural conventions (Rau & Grealis 2017). The ELL design builds on the database and the typologies of sustainable energy consumption initiatives (WP2), as well as on prior research on reasons for variations in several energy-related practices and on the influence of material, institutional, social and organisational aspects of the effectiveness of energy saving interventions (Laakso & Heiskanen 2017). In addition, the design of ELLs will benefit from previous experience on practice-based living labs and other similar initiatives (Laakso et al. 2017). The initial design of ELLs (see Laakso et al. 2017) has been developed in a close collaboration with WP4 that comprises the preparation, roll-out and monitoring of ELLs, and with WP5 leading the cross-national analysis and comparison of ELLs, as well as the consortium partners who will be implementing the ELLs in their countries in 2018.

2.1 BASIC DESIGN OF THE ELLs

The ELLs aim to employ practice-based approaches to reduce energy use in households while paying attention to why energy-intensive practices are performed and how they depend on the context in which they are performed. ELLs therefore recognise the significance of **practice cultures**, or the more or less durable combinations of practices shared and performed by particular units of social organisation (such as households, communities, organisations and nation-states). ELLs focus on how to **change practices and their constituting elements**, while embracing the idea of **sufficiency** – efforts that aim to reduce consumption and related energy use towards environmentally and socially sustainable level (rather than only change it by e.g. replacing one device or appliance with a more energy efficient one, making the present practices more efficient without fundamentally altering them).¹

The aim of ELLs is not to conduct uniform interventions, since previous research has shown that the reactions to, and impacts of, interventions will likely vary across, and even within, households (e.g. Devaney & Davies 2016). Instead, our aim is to fit the change initiatives to the diverse practice cultures and provide tools to change particular practices (Laakso & Heiskanen 2017). ELLs include a deliberative process with various ways to **co-design** the ELLs as well as **co-create** knowledge in the ELLs together with the households, stakeholders and other experts, which are employed throughout the project.

The basic design of ELLs consists of five phases: ELLs start with the (1) definition of the **contextual aspects** underlying practices and the recognition of energy usage as embedded in practice cultures. In (2) the mapping phase, we assess the **baseline of energy use and carbon emissions as well as the practices related to energy use** together with participating households. Considering the households' needs, motivations, concerns and expectations, we also set a **target for practice change**. In (3) the measures phase, the changes (of elements) in particular practices are co-designed on the basis of ideas of **re-crafting practices, substituting practices, and changing how practices interlock** (see Spurling et al. 2013). In (4) the testing phase, the best practices for sustainable energy initiatives identified in WP3 (see Laakso & Heiskanen 2017) are utilised as the **households try to change their daily practices**. The final phase of the ELLs focuses on (5) **evaluation of the outcomes**. Each of these steps are described in more detail in this guidebook.

The ELLs incorporate 320+ households across eight countries in Europe (CH, DE, DK, FI, HU, IE, NL, and UK) - 40 in each country, and 20 in each ELL. In other words, two ELLs are conducted in each of the eight countries. The community elements in ELL2 (promoting community-driven efforts) are added to these basic elements included in ELL1 (targeting individual households). The outline of the design is presented in Figure 1.

¹ There is no single definition around the notion of 'sufficiency', but rather manifold interpretations from various disciplines and approaches, as documented in Spengler 2016. One perspective is to consider a minimum threshold, which everyone should be able to achieve in order to achieve wellbeing, as well as an upper threshold to consumption, above which consumption would impede present and future generations from living a life worth living (e.g. Hirvilammi et al. 2014). A critical point is to consider the scale of action: rather than focus on individual levels of consumption, as captured in e.g. individual carbon footprints, the perspective is societal: individual freedoms are exercised within 'consumption corridors' (Di Giulio & Fuchs 2014), accounting for societal upper and lower limit, or sufficiency.

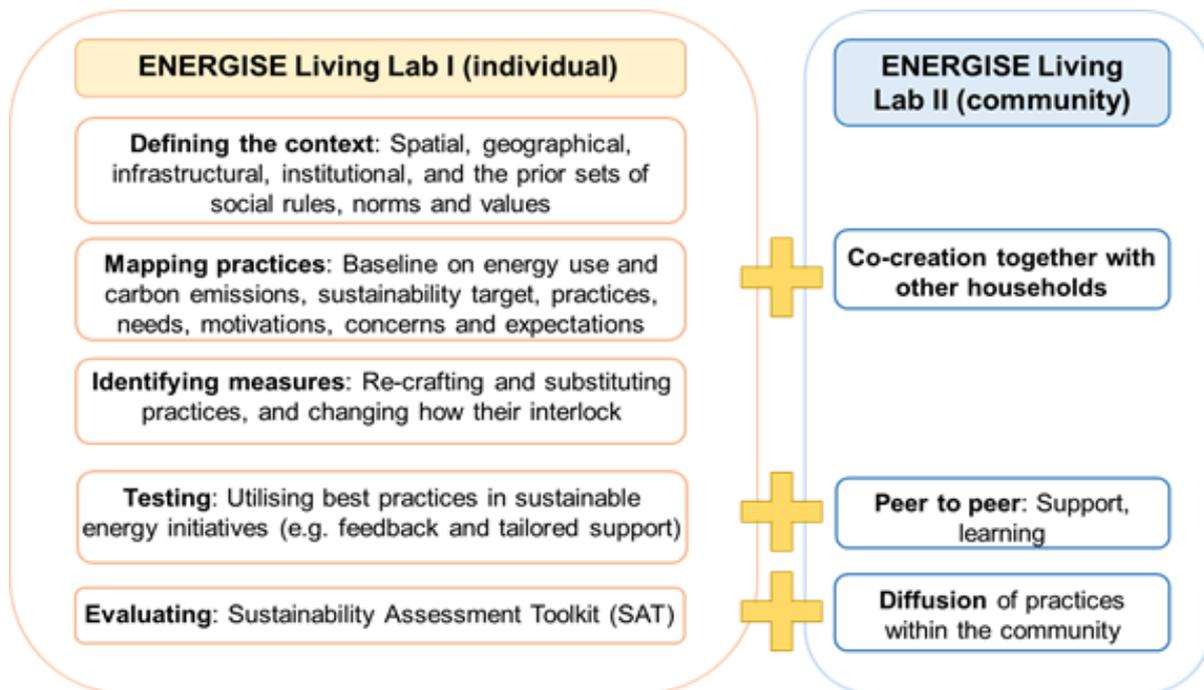


Figure 1. Basic design of two ENERGISe Living Labs.

Each ELL focuses on **two consumption domains** that are chosen from space heating, hot water use (especially showering), daily mobility (especially car driving), cooking and laundering (Figure 2). These domains have been selected on the basis of their share in total energy use of European households, as well as of these practices directly relating to household energy use and being likely to include practices and practice configurations that are more or less open for change. All 16 ELLs across the eight countries focus on one common domain. They also work with another domain, which is the same across both the ELL1 and ELL2 in each country, but can vary between countries. The selection of domains to be included in ELLs in each country is done on the basis of contextual aspects, relevance in terms of energy use in the particular context, and requirements set by the need for comparability of ELLs across Europe. The domains to be included in the ELLs are selected by the consortium partners, through deliberation with the local implementation partners to ensure the relevance in terms of local aspects. When selecting the domains, attention should also be paid on the need to have at least three ELLs across Europe engaged in the same domain, to secure the comparability.

Each of the abovementioned domains includes many practices - hot water use, for instance, consists of practices of showering, bathing, washing dishes and so forth. For the feasibility of the ELLs, the actual **practices to be tested within each domain are limited to two** (e.g. practices of showering and washing dishes in the domain of hot water use, and practices of commuting and grocery shopping in daily mobility). These practices are discussed individually with the participating households, or (in the case of ELL2) within the community, and the ways to change these practices to a more sustainable direction are co-created with the participants. This co-creation can also involve local stakeholders.

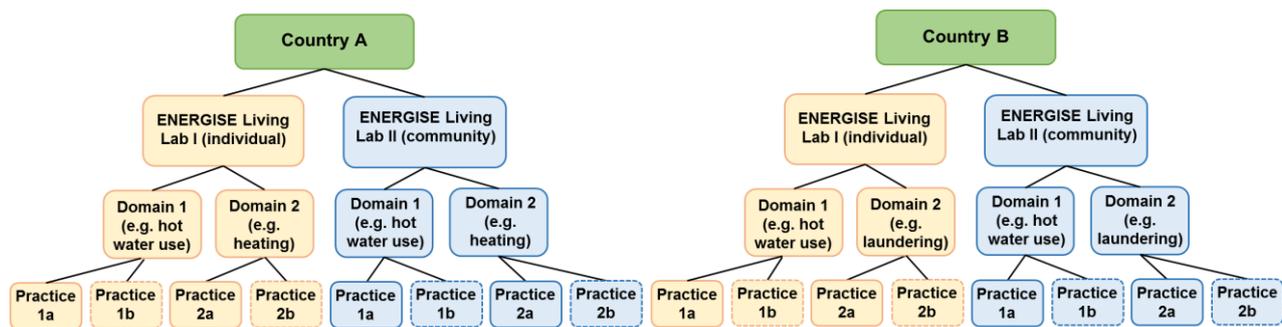


Figure 2. The structure of ELLs in each eight country.

The ways to change these practices to achieve the set sustainability targets are also co-created with households. The change mechanisms follow the frames of Spurling et al. (2013). Recrafting practices refers to changing the elements of which a practice is formed, to make the practice more sustainable (e.g. making commuting more sustainable by shifting the time of departure outside rush hours, and learning more fuel-efficient driving). Substituting practices means replacing the whole practice with another one (e.g. shifting from driving to cycling). Changing how practices interlock refers to combining work trips, shopping trips and other needs for driving in a new way, or replacing driving with teleworking and home-delivery of goods. Examples of the ways to recraft or substitute practices or change their interconnections are provided in Table 4 (p. #).

In the testing phase, these potential ways to change practices are **tested by households in real life**. The cross-culturally successful engagement and support tools identified previously in WP3 (Laakso & Heiskanen 2017) are employed at this phase. Households are provided with tailored support, to respond their needs and to help them to embed the new or changed practices in their daily life. Households are also provided material devices and applications to support learning by doing, and challenges and rewards can be used to frame the change in terms of fun. In ELL2, peer-to-peer support and community engagement help to challenge the prevailing norms and perceptions on how to perform practices properly.

The ELLs are thoroughly **monitored** from the start. The Sustainability Assessment Toolkit (SAT, see D3.5) provides detailed information on ELL output, outcome and impact indicators and measures, as well as detailed quantitative and qualitative methods for **evaluating** (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 social acceptability of the two types of ELLs and their individual elements.

2.2 TIMING OF THE ELLs

The first three phases of ELLs (defining the context, mapping practices and identifying measures) happen before the “active” phase of testing that lasts altogether eight weeks. These phases can happen over a longer period, recognising that they might be laborious for both participating households as well as the researchers responsible for implementation.

After these “preparatory” phases, each set of one or two practices is tested within a period of eight weeks, and the testing happens in parallel to allow a maximum time for experimenting with new or altered practices (Figure 3). Testing in the other domain can also start a couple of days after the first one, to allow some time for the households to adjust in the testing. The testing phase starts with a kick-off meeting. In the halfway point of the testing phase, the researchers discuss with the households on the progress of the testing and some further support or other engagement tools may be provided if needed. If the households face some difficulties, these and the reasons behind the obstacles are discussed and some alternative practice configurations may be tested. Testing phase ends with a final meeting followed by evaluation and follow-up activities. Community elements are added in ELL2 throughout the process.

As the participants attempt to integrate the new practice into their routines to see if and how they take hold or to reveal new issues, it is important to track this progress by monitoring activities throughout the ELL, to observe the interconnections and potential rebound or other effects due to the changes (see also Scott et al. 2012). After the “active” phase of testing, it is time to evaluate the output, outcome and impact of ELLs. In addition, to capture the long-lasting effects of the short-term intervention, a follow-up interview will be organised with each household, approximately four months after the end of the testing phase.

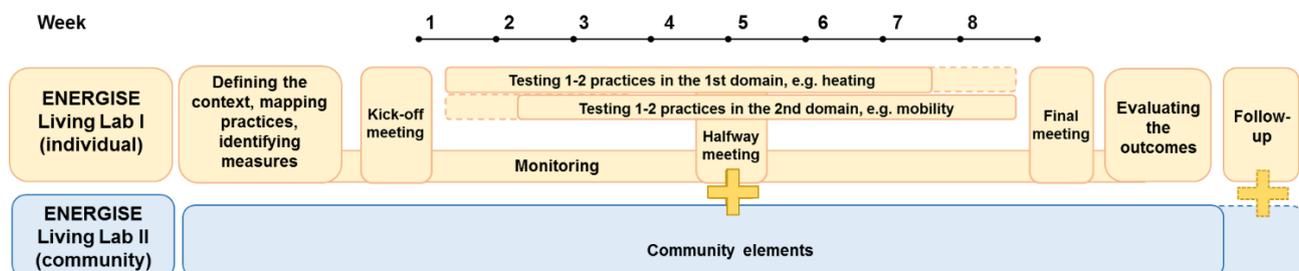


Figure 3. Initial timeline of the ELLs.

In the following chapters, the whole ELL process is divided in smaller steps to help the detailed planning and preparation, engagement of households and stakeholders, concrete implementation as well as the evaluation. Each step also defines the methods, techniques and tools for ELLs and their timing.

2.3 ELL DESIGN STEERING IMPLEMENTATION AND MONITORING

The ELL design introduced above provides a basic structure and a “backbone” for implementing and monitoring ELLs. In order to be able to make comparative research on ELLs within and across countries, it is important that each ELL follows certain requirements:

1. Each country has at least 20 households in ELL1 and at least 20 households in ELL2
2. ELL1 and ELL2 are to be kept separate and cannot be mixed at any stage of the project
3. ELL2 has additional community elements that separate ELL1 and ELL2
4. Households experiment with practices within two predefined consumption domains in each ELL
5. Both ELLs in each country engage in the same two consumption domains
6. Each ELL needs to follow the steps in the ELL Guidebook
7. In each ELL, the monitoring and evaluation needs to follow SAT
8. Each partner has to document their actions during the ELLs as instructed in WP4
9. Each ELL participant will be interviewed four months after the active phase of ELLs

Besides these requirements, ENERGISE partners can conduct additional data collection or continue research after the follow-up activities. These requirements thus set a baseline for the research in order for the ELLs to be as similar, feasible and comparable as possible.

3 ELLs STEP BY STEP

In the following, the basic structure of the ELLs introduced above will be disassembled onto a smaller steps from the **preparation** of ELLs and the identification of sites, participants, stakeholders and resources to the actual **implementation** and monitoring of ELLs and finally to **completion** and **evaluation** of the ELLs.

PREPARATION OF ELLs (STEPS 1-7)

The first steps of ENERGISE Living Labs focus on specification of the objectives and goals of ELLs, as well as of the consumption domains most relevant in the particular context in terms of energy use and openness for change. On the basis of these steps, the target groups and sites are defined in more detail, as well as engagement and motivation methods. The steps also include definition of the needed resources and support.

STEP 1: SPECIFICATION OF THE OBJECTIVES OF THE ELL

ENERGISE adopts the living lab methodology in order to test novel ways to perform everyday practices together with the households in their real-life surroundings (see Laakso et al. 2017). The main aim of ELLs is to promote sustainable energy use while acknowledging the context-dependence of the change initiatives. The function of objectives is to express the expected results and to provide guidelines for determining if the achievement of these goals has been satisfactory. Objectives should be clear and estimable (in quantitative or qualitative terms).

General objectives (i.e., long-term outcomes) and goals of ELLs are to (1) permanently change energy-intensive practices in participating households and support the diffusion of sustainable practices within the communities and (2) provide policy suggestions to allow wider use of practice-based change initiatives and living labs.

Intermediate objectives (i.e., short-term outcomes) of ELLs are to (1) reduce direct energy use in households in two of the five consumption domains (space heating, water heating, daily mobility, cooking and laundering) and (2) provide context dependent and independent tools for local stakeholders and other actors to help reducing energy use locally also in other households.

Specific objectives (precise, immediate outcomes) of ELLs are to (1) successfully employ practice-based approaches to reduce direct energy use in 40 households in each country and (2) understand how energy-intensive practices in households depend on the context in which they are performed.

Questions to guide the planning:

- What is our overall target in the ELLs?
- What are our targets in the long-term, short-term and immediately?
- What are the indicators for reaching our specific target?
- What are our objectives in terms of learning, research, engagement with the participants and stakeholders, energy use and sustainability?
- What are the energy consumption domains that we wish to study?
- What are the implications of these objectives and indicators with the monitoring and evaluation of the ELLs?

***Example:** Based on my knowledge of the context and discussions with possible implementation partners, I have chosen reduction of hot water use while showering as my overall target. My ELL objective is under the domain of hot water use but there may be connections to other energy use domains such as heating (such as getting warm in a cold day) and leisure activities (such as exercise). The other domain I'm focusing on is daily mobility, as these two domains (mobility and hot water use) are also connected to each other and hence they form a nice "package" to study. I'm confident that these domains are relevant to the households I would like to work with, both significant in terms of energy consumption, feasible in this context and in the allotted time, and relevant to the research project in terms of contributing new knowledge and insights.*

I wish to challenge the underlying social norms and cultural conventions, help the participants gain new knowledge and skills, and reduce the time spent in showers, the amount of water used and the temperature of the hot water (i.e., the meanings, competences and materials of the practice).

My research target is to find out whether the participants could in fact reduce the hot water use, whether it was difficult to them and why, whether the practice was easy to spread within and/or outside the household, how did it influence the feelings of comfort and cleanliness, are there other objectives of showering than getting clean, and how such secondary needs

could be fulfilled in a more energy efficient way.

My target with engagement of the participants is to motivate them to participate and to commit themselves to the experiment during its whole duration. I wish to extract information on the practice and offer the households support on how to change the practice. With stakeholders, I wish to increase their understanding on the benefits of engagement with the households and to get support for the ELL especially in terms of my specific targets.

STEP 2: FORMING THE LOCAL IMPLEMENTATION TEAM

[This step on the local implementation teams will be updated on the basis of D4.1, ENERGISE Living Labs Implementation and Monitoring Plans.]

The implementation team is each partner's window into the site, as well as into a community and into households. Implementation teams can include people from, for example, an association or organisation that already has established relations of trust in the potential sites and has expertise and interest in the selected energy consumption domains. Ideally, local implementation teams also have experience in participatory activities, such as organising workshops and other activities in the community. Also the local ENERGISE partners are a part of the implementation team.

Local implementation teams are formed by ENERGISE partners in good time before the actual implementation of the ELLs, in early 2018. Local implementation teams actively participate in all the following steps of ELLs, so it is also important for them to be on the same page as the ENERGISE consortium members in terms of the desired approach and outcomes of the project. Thus a phase of co-creation and deliberation with the implementation teams is also necessary, in order to "bring them behind the scenes".

STEP 3: FINDING THE SITE FOR THE ELLs

To understand the configuration of practices, we need to understand contextual aspects. These can include issues such as differences in cooling or heating systems (or needs for these systems, or opportunity to pay for these systems), in the provision of public transportation services, in the ways in which housing associations are organised and in the presence of local (or national) energy policies. In short, they encompass formal and informal institutions, rules, values and norms, and other elements that outline the local practice cultures of energy use.

One of the preparatory steps in the ELLs is thus a fine-grained analysis of the context in which they are run (i.e., material, social and institutional dimensions of practices) on the relevant level (national, sub-national, local).² When looking for the sites for the ELLs, attention needs to be paid on the ways the particular sites support or prevent the change in

² 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.

practices in the selected domains (i.e., e.g. if the aim is to make daily mobility more sustainable, what kind of alternatives for private driving exist).

Questions to guide the planning:

- What are the suitable contexts for my ELL1 and ELL2 and where to find them? Could the site be the same for both ELLs?
- Can I realise the targets I defined in step 1 at these sites? Do they have the necessary infrastructure?
- Are the sites easily reachable for me as a researcher and for the participating stakeholders?
- Do the sites secure a variety of participants in terms of households' size, location (rural/urban), income and gender across ELLs? Do the sites include the hard-to-reach groups?
- What kind of communities of place can be found at the sites and are they suitable for the ELL2?
- Can I ensure that I can run a separate ELL1 and ELL2 without them becoming mixed with each other over the duration of the ELLs?
- Do these sites offer the predefined material requirements (e.g. devices, technologies, infrastructures, services) or can I easily bring them to the sites?
- Do the sites propose some special requirements to the selection of my local implementation teams and stakeholders?
- Do the sites pose some specific requirements to the support that I would need in these contexts?
- Is there some context specific issues I should add in the interview and survey templates and how could this affect the data collection process?
- Do I and my team have enough expertise on the methods used for data collection, or do we need some training? Should we do e.g. some test interviews?

Example: *My target is to reduce energy use related to the hot water use in the participating households. This does not pose any specific requirements for the site, but the households need to have a bathroom and a shower. The context specific issues might be related to water scarcity or the energy/ water costs due to which the households might be keen to reduce their water use, or to the availability of public baths and saunas and how common it is to use them. For example, in Finland, in rural areas the households may need to pay for water according to their use, whereas in urban areas the water use is included in rents. However, unlike in e.g. mobility, there are not many requirements for infrastructure or materials. I can thus rather freely select the site, and I select a neighbourhood in more rural area as well as a large apartment building, to be able to compare practices between these two sites.*

My other target is to reduce the energy use in personal, daily mobility by reducing private car use. As I wish the participants have a number of alternatives to select from, the site needs to have infrastructure and services for cycling, using public transport, and car sharing. By using these selection criteria for the site, I can ensure that the changes in mobility practices are realisable.

STEP 4: THE DEFINITION OF THE TARGET GROUPS OF THE ELLs

As described in the previous chapters, the ELLs are focused on practices and changes in practices to reduce household energy use. Also the starting point of ELLs are the energy-relevant practices, and participating individuals are seen mainly as carriers of these practices (see e.g. Shove et al. 2012) instead of setting specific target groups and then identifying the practices they are engaged in. The first selection criteria of households is thus that the **households need to be engaged in practices** under focus (i.e., space heating, hot water use (especially showering), daily mobility (especially car driving), cooking and/or laundering).

The nature of the ELLs means that they are not designed to be representative in a statistically significant sense. Rather, the aim is to illustrate the variety of practice cultures by engaging households that represent a combination of different types of households across Europe. Due to the need for comparability and potential for upscaling of ELLs as well as the aim of the project to engage a socio-demographically balanced group of households in each country, there is also a set of other selection criteria such as **size, location (rural/urban), income and gender**. Thus, although each ELL does not have to include a socio-demographically balanced group of 20 households, it should be ensured that different types of households are represented across ELLs.

The third criterion is the **inclusion of hard-to-reach groups** (i.e. households who are lacking the means, tools and/or reasons to save energy and who have not been actively involved in participatory processes such as living labs). These households may include energy-poor households; people living their “busy years” and thus in need for solutions making everyday life easier; people living in apartment buildings such as tenants, who have no interest in saving energy because they either have little insight into how much energy they use or how to influence it; people not interested or involved in energy reduction or energy efficiency campaigns or other initiatives; and rural households who might struggle with the relative decreasing of value of their homes and thus limit both the asset increase value and profitability of investment in e.g. renewable energy. To the contrary, only including households with existing, strong motivations to reduce their carbon emissions for environmental reasons might not best serve the theoretical objectives of the project.

The ELL design also poses some **(material) requirements** for the participating households. In order to monitor heating practices, some kind of access to metering data is necessary. There might be some difficulties in targeting apartment buildings in some countries due to lack of individual energy metering and billing. To change practices of car driving, a household needs to have a car, and changing laundering practices presupposes access to a washing machine. The participating households thus need to be engaged in particular energy-intensive practices in heating, hot water use, mobility, cooking and/or laundering.

Implementation of the ELL2 promoting community-driven efforts requires some kind of existing **community of place**. Restricting the selection of community to communities of place is due to the need to bring participating households together for co-creation activities and joint discussions, as well as the aim to focus on the social norms and cultural conventions underlying mundane practices - in the case of communities of place, the infrastructural elements are often shared, which helps to detect these non-material elements of practices.

In short, the following criteria need to be addressed when selecting the participating households:

1. The predefined material requirements (e.g. devices, technologies, infrastructures, services, such as car ownership, access to energy use data)
2. Securing a balanced variety in terms of households size, location (rural/urban), income and gender across the ELLs
3. Including hard-to-reach households, i.e. households who are lacking the means, tools and/or reasons to save energy and who have not been actively involved in participatory processes such as living labs.
4. Not focusing on households with strong environmental motivations and vast experience in energy initiatives
5. Focusing on communities of place

Questions to guide the planning:

- What are my selection of criteria for the participants considering on the one hand my target and on the other the requirements for the comparability of the participants across the ELL countries?
- Does my selection criteria and the final selection enable the reaching of my ELLs target?
- Does my choice of participants secure a balanced variety in terms of households' size, location (rural/urban), income and gender across the ELLs?
- Who are the hard-to-reach groups in my country? Which of them to select as participants in order to secure reaching of my ELL targets? How can I reach these groups?
- Is there a difference in the target group for my ELL1 and ELL2? If there is, does it contribute positively to the reaching of my objectives of the ELLs?
- Do I, in fact, need different types of participants for the ELL1 and ELL2 in order to reach my target?
- Can I ensure that I can run a separate ELL1 and ELL2 without them becoming mixed with each other over the duration of the ELLs?
- Are my selected groups of participants already very involved with energy efficiency? That is, is there anything left to do in their household practices?
- Do the participants of my ELL2 form a place-based community (enabling e.g. car or washing machine sharing)?

Example: *My target group for the ELL1 is formed by inhabitants of one residential area in a smaller town. The inhabitants are a very mixed group of people including unemployed and seniors, couples without children and families with children, most of them living in detached houses (fulfilling the criterion 2). I also need to consider a balanced gender selection in the ELL. The income level ranges from low to middle income and there are also unemployed persons among the participants representing a group of hard-to-reach people in my country (fulfilling the criteria 3). All the houses have showers, saunas and water meters (fulfilling criteria 1). On the basis of the local stakeholders, these households have not participated in previous initiatives targeted specifically at their energy use (fulfilling criterion 4).*

My target group for the ELL2 is formed by inhabitants of one large apartment building (thus fulfilling the criterion 5 on community of place). The inhabitants are a very mixed group of

people including single households of students, unemployed and seniors, couples without children and families with children (fulfilling the criteria 2 and 3). I also need to consider a balanced gender selection in the ELL. All the apartments have showers and there is a shared sauna and laundry room in the building (fulfilling criterion 1). On the basis of the local stakeholders, there have not been previous energy initiatives in the building (fulfilling criterion 4).

STEP 5: THE DEFINITION AND RECRUITMENT OF THE OTHER RELEVANT STAKEHOLDERS

As you can see from the previous steps, implementation of ELLs is all but a simple task. There is a need to understand and know the local, contextual influences on daily practices, to be able to reach the potential participant households (also those that are hard-to-reach), and to actively communicate with the participants (as well as monitor the ELLs, but we'll get back to that later). The local implementation teams provide their knowledge and local contacts in the project, but it is also useful to think about the other relevant stakeholders that could provide their expertise in the project, disseminate the results and support the upscaling of the outcomes.

This step includes identifying the relevant local stakeholders and their role in practices related to energy use, as well as other actors who are likely to benefit from and use the information and lessons provided by ELLs. In this step, also the potential role of each stakeholder in the implementation of ELLs is estimated.

Questions to guide the planning:

- Who are the external stakeholders who are critical for the realization of my ELLs and what is the role of each in the ELL?
- Who can support my ELLs in the chosen context/site (such as offering venues for kick-off or group discussions, providing materials and information, etc.)?
- Who would benefit from the collaboration?
- Who would bring some valuable input that benefits the participants?
- Who would bring me some additional benefits as an organizer of the ELLs?
- Who is critical for the dissemination of the novel practices and further development of the ELL approach?
- Who should be the members of my local implementation teams?

Example: *Based on my previous experience and contacts in the field I have listed the stakeholders who can benefit from the ELLs and who can support me in my ELLs. They include environmental and energy NGOs, the local energy company, the local public transport operator and a cyclists' organisation. I also contact the environmental authority of the city in which I am organising the ELL. Due to their previous project, they have direct contacts to housing associations, and through them we can find suitable households. The authority benefits from ELLs because we can offer them expertise and evidence on the activities for energy use reductions with the households which they can use in the future.*

STEP 6: SELECTION OF THE INTERACTION TYPES

Based on previous work in WP3 on cross-culturally good engagement tools in sustainable energy consumption initiatives, the following five interaction categories were developed (see Laakso & Heiskanen 2017):

Needs-based, tailored support aims to change practices while simultaneously making everyday life easier for the participating households. When changing practices, special attention is paid to how the changed practice, or a set of practices, fits into existing practices (i.e. to how practices interlock). The development of new competences and meanings are supported, while offering technical support and advice. This may also include support from relevant (local) stakeholders, such as municipal actors, businesses and organisations. Stakeholders could also support the ELLs with necessary materials required for execution if such opportunities should emerge in the co-creation process (such as the provision of meters and/or other equipment to follow energy consumption or even clothing such as cardigans).

Learning by doing starts with material engagement with devices or DIY projects, with the aim being to create new competences and thus to empower participants. By familiarising themselves with (e.g.) materials to improve insulation of the apartment and gaining competencies in using them, the participants can also attach new meanings related to sustainable energy use and energy efficiency (i.e. practices are re-crafted with new elements). This approach is suitable for people interested in technologies and material components and capable of making DIY projects at home. Additionally, stakeholders could support households by providing the necessary materials and information on how to use them.

Challenges frame the change in terms of fun, entertainment and rewards. Here, the focus is not as much on easiness as on setting and committing to targets and goals to be achieved during the testing phase. Participating households are provided with immediate feedback and game elements in challenging themselves, and encouraged to make quick and ambitious, although temporary, changes in their everyday life. After the challenge, households are supported in maintaining at least some of the trialled change, with the idea that even if the remaining changes are not as ambitious, they still are better than the practices at the starting point. This approach is suitable for people looking for variation in daily life, and possibly for students or other groups who are not yet able to make even small energy renovations at home.

Community learning and engagement (in ELL2) refer to an approach for engaging households that builds on existing social relations to reshape understandings of normality. This community element builds on peer-to-peer support (and even pressure), in which participating households learn from each other and are able to discuss and compare their experiences. Participants can also learn from each other from the beginning: some participants might already be doing something more sustainably than others, and these kinds of benchmarks can be useful in visioning about practice change.

After recruiting the local implementation teams and other relevant stakeholders and identifying the ELL sites and potential target groups, it is time to agree on the selection of engagement tools that are provided to households during the ELLs. When selecting the

engagement and support tools, it is also important to discuss about the **monitoring** during the testing phase.

Questions to guide the planning:

- Have I consulted the instructions in D3.5 and plans outlined in D4.1? How does this step support the evaluation of ELLs? How will I ensure the comparability of the ELLs at this step?
- Does the context-tools combination support the achievement of the desired goals?
- How can I ensure that the tools selected really support the change in the households and realizable utilisation of the tools?
- How do I involve the stakeholders in the ELLs at this step?

Example: *I know that many of my implementation partners have previous experience in working with households. Together with them, we discuss about the potential interaction and engagement methods on the basis of their experiences and know-how as well as of the examples from ENERGISE Sustainable Energy Consumption Initiatives. This way we can find the best ways to support and learn from the households while paying attention to the contextual and cultural aspects of energy use. After deliberation with the implementation partners, I discuss with other ENERGISE partners to make sure that the approaches planned are in line with those selected in other countries.*

STEP 7: DETERMINATION OF THE NECESSARY RESOURCES

As living labs and practice-based studies in general, ELLs require intensive working and collaboration with the participating households and other stakeholders, as well as communication with other consortium partners conducting ELLs in their countries. An important step in the preparation of ELLs is thus a detailed determination of the necessary resources.

The ELLs are conducted in 2018. The preparation starts already in spring with steps 1-5, followed by recruitment of the participating households, contacting the relevant stakeholders and collecting background information from the participants in the first face-to-face meeting. The active phase of ELLs lasts for eight weeks in autumn 2018. During this testing phase, households are met face-to-face in kick-off and final meetings. Although in ELL2 some of the individual meetings can be replaced with joint meetings with all 20 households, there might still be need to interview each household separately. At the midpoint of the testing phase, all households are contacted to ask about the progress thus far, provide further support, and react to the concerns raised by the participants. This might also require face-to-face interaction. The final meeting also consists of interviews, and after that the households are contacted once more in the follow-up phase.

In other words, each household may be met (or contacted e.g. by phone) altogether five times (once before, three times during, and once after the active ELL phase) and each contact takes time, acknowledging the in-depth nature of the qualitative data collection. In addition, households need to be instructed with surveys, questionnaires, diaries and other

methods of data collection.³ Finally, time needs to be allocated for the concluding phase so that households are provided with the needed resources to continue on a new path after the ending of the ELLs, as well as for the follow-up activities.

In addition to contacts with the households, time needs to be allocated to interviewing stakeholders, internal communication with the ELL teams, and so on. Also the analysis of all the data collected requires a lot of resources.

Table 1 provides a very simplified illustration of the time required in ELLs from the recruitment to follow-up. In addition, time is needed for the preparatory steps as well as the analysis of data that are not included in this table. This exemplary table illustrates how the active time with households and other participants may require 400 hours of work for two ELLs, corresponding to ten 40-hour weeks. It is also important to note that many actions, such as the communication with households at the middle point of testing phase, should take place within a week with all participants, to allow all the households to proceed with testing more or less simultaneously. Implementation thus requires personnel to conduct the interviews and communicate with the participants.

Table 1. Time required with the participants in ELLs.

Action	Time per participant (hours)	Number of participants	Total time (hours)
Recruitment of households	1	40	40
Instructing households on the project, process, and collection of data	1.5	40	60
Start & baseline interviews (ELL1)	3	20	60
Start & baseline interviews (ELL2)	2	20	40
Start group discussions (ELL2)	2	1	2
Kick-off meetings	1	40	40
Midpoint communication (ELL1)	1	20	20
Midpoint joint discussion (ELL2)	2	1	2
End & feedback interviews (ELL1)	2	20	40
End & feedback interviews (ELL2)	2	20	40
Follow-up interviews (ELL1)	1.5	20	30
Follow-up joint discussion (ELL2)	2	1	2
Key stakeholder interviews	1.5	15	22.5
Total			398.5

In addition to time required, there is a need for local support at the ELL sites: places to organise group discussions, as well as knowledge on local context, services and infrastructure. Necessary equipment may include meters to monitor energy use, applications

³ A more specific description of these materials and methods is provided in D3.5, ENERGISE Living Lab evaluation and assessment manual.

for participants to report their mobility and/or time use, DIY materials for insulating homes and so on, depending on the domains and practices selected and the monitoring tools agreed with the partners.

Questions to guide the planning:

- Do I have the necessary resources for the planning, implementation, monitoring and analysis of the ELLs in terms of time, personnel, space, knowledge, rewards, finances, equipment, and information material?
- Are there some additional resource needs related to either of the ELL designs?
- How can I secure the necessary resources for the successful and timely implementation of the process of ELL1 and ELL2 from planning and implementation to monitoring and analysis?

Example: *I have reviewed my targets in the long-, short- and intermediate term and noticed that I need to interview 20 households at least five times during the ELLs (of which three takes place within approximately 8 weeks) and to organise at least two joint meetings for the community activity. I have also reviewed the timeline and notice that the activities take place within 8 weeks.*

Interviewing 20 households three times means that I will have to conduct 60 individual interviews during 8 weeks, 20 before that and 20 for the follow-up some 6 months after the activity. I read the instructions and notice that the first interview takes approximately 3 hours and the later interviews 1-2 hours. Therefore I need to have almost 300 working hours of resources just for the household interviews. I, however, remember that need to interview also the stakeholders and organise the events with the ELL2.

I therefore notice that I need approximately 400 hours of work to implement my ELLs and after that some additional time to report my findings to the use of other WPs. I notice that per week this means 50 hours of work for the 8 weeks of ELLs, not including the time to travel to individual households for the interviews or the time for getting to know my material and household beforehand.

I am so glad that I have a team of colleagues to share the work with me!

IMPLEMENTATION AND MONITORING OF ELLs (STEPS 8-15)

After careful preparations, it is time to recruit the most important members of ELLs – the households. The following steps also include the active phase of the ELLs from defining the baseline together with the households to actual testing phase.

STEP 8: RECRUITMENT OF HOUSEHOLDS

After defining the consumption domains under focus, as well as potential sites, stakeholders and households, it's time to start recruiting the people. Local implementation teams and

other stakeholders are valuable in identifying the local people and communities filling the selection criteria. Ways to recruit the households include:

- Announcements in the local media and social media
- Finding the potential households through contacts of the local implementation team, stakeholders and associations, who know the sites and communities
- Contacting interest organisations, such as organisations of unemployed or pensioners, ethnic organisations, sport clubs or other free-time organisations
- Announcements at municipal organisations, such as maternity clinics, day care centres, schools and service centres
- For recruiting households within a community of place, announcements at neighbourhood organisations, housing associations and other local groups
- Finding households with snowball method with the help of the local stakeholders and other contacts: one household provides the names of other potentially interested households (however, note the limitations of this method in ELL1)
- Setting a stand at a community event or other event in which local households participate

When recruiting households, the selection criteria need to be kept in mind: after the households have indicated their interest, the first contact should be motivating and encouraging, including the basic information of the ENERGISE project, the aims of ELLs and what is expected of the households – and what they get in return. At the recruitment stage, households are provided with an information package including basic information about the ENERGISE project, about the ELLs, about the role of each actor in the project, about the ethics (anonymity, right to end their participation whenever they want, about the ways the data is used etc.) and about the benefits of participation for the households, sites and communities.

Households need to provide relevant background data, to make sure that the final group of participants in all ELL countries fulfils the criteria. The number of households at the recruitment stage should exceed 40 – some of the participants may still withdraw from project before the start of ELLs, after hearing more about the project, or due to some other reasons (house removal or other changes) – to end with a socio-demographically balanced group of households in each country.

Some of the participants may withdraw also during the ELLs. To avoid this, it is important to be open about the amount of work the project requires from participants, but nevertheless be prepared for some dropouts. At the recruitment stage, it should thus be thought whether the number of households at the beginning of the project should be higher than 40, e.g. 45, to allow some flexibility if someone decides to give up the project before the end of ELLs.

Questions to guide the implementation:

- Have I consulted the instructions in D4.1? How will I ensure the comparability of the ELLs at this step?
- How do I recruit the households? How should I approach them? Who should I contact?
- Is there some support I would need to be available for the recruitment of participants for the ELLs?

- Do I need to contact additional households in case of drop-outs? How many?
- While recruiting, have I explained the complete ELL implementation process to the recruited households in terms of time, activities, contact, feed-back, possible corrective measures and finalisation phase of the ELLs?
- How can I make sure that I will not need to use more resources at this stage than initially planned?

Example: *I do not have any direct contact to possible households that I could engage in the ELLs. Therefore, I consult my list of stakeholders that are in a key position to offer support in the recruitment, and they provide me a list of names of the local people to contact. In the list, they have included an enthusiastic individual who is known to be very active in the apartment building he is living. I contact him in order to find out, whether the place where he lives could be the site for the ELL, and whether he could help in contacting the residents. With his help, I contact the potential ELL participants.*

I may also have contacts with local implementation partners and organisations, who have existing relations of trust in a specific neighbourhood that might be suitable for my ELL. I contact them and they'll help me in finding the households.

STEP 9: THE MOTIVATION AND EMPOWERMENT OF PARTICIPANTS

The ELL households are going to be engaged in a laborious, time-consuming and intensive project of more than eight weeks. It is thus important to consider the ways to motivate the participants and encourage them to stay in the project until end and to maintain and share the new practices and lessons learned during the ELL. How to **reward** households from their efforts and communicate about the benefits the households gain from their participation? Here, it is important to remember that households may engage because of costs and attempts to lead a more decent life, environmental reasons, due to social influence or pressure, or because of a desire to learn about new solutions and technologies. Some people might simply like a change or to simplify their life. Understanding these motivations and linking the ELLs to the ways for households to achieve their personal goals helps households to engage in the project. Financial reward might compensate for the time the participants are using for the ELLs and also make sure that some hard-to-reach groups participate in the project.

The households should not be “left alone” after the end of ELLs: what kind of materials, tools, instructions and/or networks to provide households to support the **maintenance** of the new practices and even **empowering** the participants to act as change agents in their communities on a longer term?

Questions to guide the planning:

- What can be reached realistically in changing my target practices according to previous research?
- What benefits can I offer for the households for participating in the ELLs?

- How can I reward the participants at the end of the ELL? How might this reward affect their participation in ELLs and how to ensure that they are not participating only because of the reward?

Example: *I have gained initial agreement to participate by 20 households. When visiting them, I explain in more detail what ENERGISE is about. My first goal is to establish relations of trust with my household members, while also bringing them “behind the scenes” to uncover our unique approach to understanding energy practice cultures. I would not use this conceptual language, but rather bring people towards a common understanding that begins in our first exchange and continues through all of our subsequent interactions. It’s an iterative process. I also tell the participants of the reward that they will receive after the ELL.*

STEP 10: COMMUNICATION WITH THE PARTICIPANTS AND OTHER STAKEHOLDERS

It is also important to think about the **ethical issues** of the ELLs: within small municipalities, neighbourhoods or communities, how to maintain the anonymity of the participants or are they supposed to openly share their experiences throughout the project? How to manage the data in a way that ensures that the participants remain anonymous even after the end of the project? This is also related to the dissemination both to the general public and to the academic audience. Especially in smaller municipalities and communities, local media can be highly interested in the project.

In addition, there is a need to think about the ways to **communicate** with the households - how to balance between providing the households enough attention and support, with still enabling them to maintain their privacy and avoiding intrusiveness? What kind of **forums** to use for communication: is there a closed Facebook group in ELL2 for the participants to communicate, and how to ensure low-threshold communication with participants in ELL1?

One important issue to think about is the language that is used with the households. When working with households, it is unnecessary to give lectures about the structure of and theoretical framework behind the ELLs with domains, practices, elements and so forth. The discussions would rather be about what people do, how and why, as well as about the ways practices are interconnected by discussing e.g. about the social norms related to particular practices, and how these norms guide also other practices. This discussions then adhere to the project’s internal language.

In order to keep the local stakeholders on board, it is also important to think about the ways to communicate with them throughout the project – should they be also included in the forums used for communicating with the households? It is also important to note that some of the stakeholders might be keener on participating in the ELLs, whereas others might only want to hear about the outcomes of the project and the ways to utilise these outcomes locally.

Questions to guide the planning:

- Are there some ethical considerations related to the ELLs (e.g. publicity)? How do I deal with these problems?
- How do I communicate with the households in an understandable and engaging way?
- How do I involve the stakeholders in the ELLs at this step?
- How do I work with media?
- What would be a well-functioning and easy way to communicate with the participating households?

STEP 11: GAINING A BASELINE: DELIBERATIONS WITH HOUSEHOLDS

After the recruitment process begins the mapping phase of ELLs. This phase includes deliberating about practices together with the households, assessing the baseline of energy use and carbon emissions and the practices related to energy use, as well as collaboratively setting a target for practice change. This is also the first time to meet the households face to face.

The initial selection of consumption domains under study in each ELL has been done already during the first steps of preparation. The selection is based on both energy intensities of the domains as well as the contextual aspects – i.e., the opportunities to monitor heating practices in homes in urban areas or the availability of alternative means of mobility in rural areas. However, also the participating households have some opportunity to reflect on the consumption domains and practices within the domains. Together with households, we **discuss, expose and learn about the practices** that lead to energy use, and map the most energy intensive practices as well as underlying social norms and conventions, required skills and material components, and rules and regulations, with a special focus on the two domains but also acknowledging the other energy-relevant domains. Our aim is to recognise the social embeddedness of many of our practices, which include everyday routines and habits that are hard to change, and to discuss explicitly the limits of addressing change solely through individual actions and more efficient technologies, without taking into account the social norms, conventions and standards that hold our practices together. 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 elements to make the practice more energy-efficient form an important first step in **co-creating knowledge** and identifying opportunities for change (see examples of relevant elements in each practice domain in Table 2 and in Laakso & Heiskanen 2017). The overview of relations between energy use indicators and the constitution of the practice (including inertia of the existing practice and potential tensions in performing the alternative practices) forms the basis for the identification of the target for practice change (Kuijter 2014).

Table 2. Examples of the relevant elements in each practice domain.

Practice domain	Relevant elements		
	Material	Meaning	Competence
Practices related to home heating	Type and size of dwelling, windows, doors, shades, radiators and other heating systems, clothes, energy costs	Norms around feelings of indoor comfort, collective heating conventions, rules and knowledge (deriving from different sources and occasions)	Regulating room temperatures, turning heaters on/off, avoiding heat leakages, making renovations
Practices related to hot water use, especially showering	Availability of hot water (central heating, boilers), bathrooms, showers, bath tubs, taps, shampoos, energy costs	Norms and notions around cleanliness, hygiene, comfort, leisure, convenience, health, privacy and psychological wellbeing	Taking a “wake-up” shower, preparing for the day ahead, showering after sports
Practices related to laundering	Washing machine, dryer, clothes, laundry rooms	Norms and standards around cleanliness, health and hygiene	Using the right temperatures, defining the need to laundry
Practices related to cooking	Kitchens, appliances, ingredients, recipes	Understandings of a proper meal, a number of hot meals a day	Knowing how to do the grocery shopping and to cook, serve and store food
Practices related to personal daily mobility, especially car driving	Cars, bicycles, parking lots, infrastructure and city planning, public transport	Norms around feelings of comfort, convenience, independence, temporal flexibility, normality of car ownership and use, traffic education	Connecting different daily practices, social participation, driving to supermarket to “stock up”

The mapping also includes participants’ **needs, expectations, inspirations and motivations** – discussing them and making them visible for both researchers and households themselves and also gaining more understanding on what practices are easier and harder to change (i.e., “stickiness” of practices) and why and what kind of internal dynamics in households are related to performing practices. From a practice perspective, and when ambitions about reducing energy use are high, initiatives also need to consider how energy related needs are defined.

Finally, the energy use as well as related carbon emissions are estimated.⁴

The community element to be added in this phase is a co-creation session in which the participating households gather together to discuss the social norms, rules and other elements steering the practices related to energy use, and how to collectively address and challenge these elements to change practices. This kind of peer support is important in disrupting and challenging the prevailing assumptions on what is normal or acceptable, and opens up the dynamics of practice and opportunities and/or obstacles related to their change, outside the individual household (cf. Devaney & Davies 2016).

⁴ The interview templates as well as instructions for assessing the household energy use are provided in D3.5.

Questions to guide the implementation:

- Have I consulted the instructions in D3.5 and plans outlined in D4.1? How will I ensure the comparability of the ELLs at this step? How does this step support the monitoring and evaluation of the ELLs?
- How do I gather information on the baseline, i.e., map the practices, assess the energy use, and discuss the possibilities and limitations, acknowledging the contextual aspects in energy use?
- How can I make sure that I have adequately mapped the practices, determined the energy use, and discussed the possibilities and limitations?
- How can I ensure that the co-creation plays a significant part at this step and how do I give the households enough space for co-creation? What is my own role as a researcher in this step?
- How do I involve the stakeholders in the ELLs at this step?
- How can I make sure that I will not need to use more resources at this stage than initially planned?

Example: *At the first meeting with ELL1 households, I have three main aims: first, I want households to reflect on the social embeddedness of everyday life. I explain that one of our focus areas is hot water use. I raise the topic at hand (cleanliness, for example), and ask people to share their habits and routines around this topic. In my individual household discussions, I would invite my participants to reflect on how much of our everyday practices are tied up with habits and routines, involving things, time, skills, etc. I guide the discussion towards what I understand to be the different elements of a practice, without naming them as such. In my collective discussions with several households, through our discussions the participants would become aware of the similarities and differences between individual practices.*

Following this reflective phase, my second aim is to gain interest in the topic in relation to energy usage: Why is cleanliness important? For this, I have a series of observations that I share, based on existing research. For example, “we have more clothes and wash more today than our grandparents did”, or “it’s not socially acceptable to wear the same clothes every day”. I might bring visual elements with me, to serve as a form of photo-elicitation around these points.

The third and last phase would be to discuss the implications of this topic and the domains from an energy-usage perspective. I end with this conversation around energy usage and intensity, emphasizing that the goal is not to change people or replace technologies, but rather work with people to understand how addressing the topic of cleanliness can relate to different energy-intensive aspects of everyday life, such as showering. There is previous information from my country, that water is used from less than 100 to more than 300 litres per person daily, and that a good target would be 100 litres. However, previous practice-based studies show a potential for hot water savings of up to 90% (Kuijjer & De Jong 2011). I show examples on how to reach such a reduction and together we discuss about what it would mean in the context of their home and the practices related to hot water use. We jointly list the benefits that the piloting and the reduction of the energy use would bring to the household. This is where language on energy sufficiency might be shared, both by the research team but also by the households themselves. This rich discussion is part of the ethnographic material I will then transcribe, but also leads to a baseline of data collection

that involves information such as current wash cycles and temperatures, goals for the project, etc.

My role is to steer the conversation, help the households think about the alternative ways to fulfil the needs related to hot water use, and provide information on energy use of different alternatives, while paying attention that I'm not leading the conversation. This way, we end up with the baseline and a target for practice change.

In my ELL2, my team also organises an event at the local city centre for a co-creation workshop for the participants. We organise a joint discussion calling for the ideas of the participants, and how they could reduce, or already have reduced their hot water use during showering and how they have embedded these new ways in their everyday lives. We collect the ideas at a whiteboard and jointly envision new creative ways to support these practices for the reduction of warm water use.

STEP 12: SELECTION OF THE WAYS TO CHANGE PRACTICES

ELLs create a temporary time and space where established routines are disrupted to facilitate learning about new practices. Households are supported to challenge the underlying assumptions on how to properly perform practices, and think about the ways to change elements of practices or the whole practice and the ways they are connected (see examples of potential changes in practice elements in Table 3). Mapping what practice-configurations are being performed in relation to each energy-relevant domain, as well as what are the households' expectations and needs, allows for adopting **suitable measures for each household and site**.

The actual selection of the ways to change practices is **co-designed** with the households on the basis of a **menu of measures** (Table 4), based on three frames of Spurling et al. (2013): re-crafting practices, substituting practices and changing how practices interlock. The menu is supposed to act as an inspiration for co-design with the households, not as fixed selection of available options. To help discussions with the households, the menu of measures is translated into measure cards that illustrate what could re-crafting and substituting practices or changing the ways they interlock mean, and what benefits could this bring for the household (see Appendix 1 for some examples). As energy is central to the ELLs, general estimations on the effect of each measure on energy use are also provided. In this way households also gain more skills in assessing the scale of their actions in energy use and emissions. Simplified energy/carbon reviews may be used to support these aims.

Table 3. Examples of the potential changes in elements in each practice domain.

Practice domain	Relevant elements		
	Material	Meaning	Competence
Practices related to home heating	timers for thermostats, programmable thermostats, DIY insulation, blinds, shades, curtains, carpets, fans, home automation, apps	overheating as unhealthy, waste of money or environmental risk, importance of fresh air, active heat management as increased control of the house	better understanding of how heat management works and of options, skills of using and maintaining heating systems, ability to adapt practices to peak power periods
Practices related to hot water use, especially showering	low-flow taps, timers, meters, more efficient boilers, pipe and boiler insulation, temperature control	excess showering as unhealthy, bad for skin and for environment, saving time in the mornings	skills of quick showering, learning about alternatives
Practices related to laundering	spot cleaning, brushing & airing clothes, drying, low-flow taps, meters, more efficient appliances, detergents	lowering standards of cleaning to avoid allergies, increasing the durability of clothes, preserving environment, saving water and time	unlearning cleanliness, planning and washing full loads, air drying, airing clothes, washing at lower temperatures
Practices related to cooking	apps for collective meals, more efficient/smart appliances, buying perfect amounts in a cooking box	eating together, saving energy when cooking, not having to cook every day (easiness, saving time)	energy efficient cooking (e.g. baking lots at once, exploiting afterheat), cooking with microwave, preserving and storing food
Practices related to personal daily mobility, especially car driving	low-carbon vehicles (electric, biogas), new schemes for multimodal transport (mobility as a service), (electric) bicycles, devices for monitoring fuel use and offering tips on fuel efficient driving, online platforms for car-sharing and -pooling, safe cycling lanes, possibility to combine cycling with other modes of transport	environmental awareness, safety and health issues, less time for other practices (exercise, reading, etc)	new skills of cycling (and cycle maintenance), using public transport, sharing or pooling cars, fuel-efficient driving and car maintenance

Utilising the idea of co-design, we support and encourage households to **co-construct ways for shifting the particular practices** onto more sustainable pathways. The close collaboration and co-creation with households also helps the households to take ownership of the changes, thus making the participation and the measures more meaningful for all members of the households, and potentially overcoming the challenges related to involving all household members identified by e.g. Devaney and Davies (2016). Relevant stakeholders may be included in this phase, to provide local expertise and support.

Ideally, measures should target several aspects of and differences in household energy use arising from diverse practice cultures, thus also allowing better understanding of the

interconnections between practices. A close focus on the interconnections between practices also helps to address the potential rebound, backfire and spin-off effects, i.e. the situations in which a change in one practice reflects on changes in other practices, either increasing or decreasing the total energy use. It is thus important to highlight the ways the potential changes reflect to surrounding practices and what implications this has for the total energy use.

Table 4. Menu of suggested measures to change daily practices in ELLs.

	(1) Recrafting practices	(2) Substituting practices	(3) Changing how practices interlock
Practices related to home heating	Adaptive heating practices: turning off heat in unused spaces (with/without the help of devices), creating hot spots, turning off/down heating at peak power periods	Heating people not rooms (pullovers & slippers, electric blankets, portable heating devices, reordering furniture), substituting passive time at home (e.g. TV time) with outdoor exercise	Retiming cooking practices to benefit from or avoid heat from cooking, teleworking from a hub instead of home (to avoid the need to heat for one person only), integrating heating/ventilation/ cooling practices in morning/evening routines
Practices related to hot water use, esp. showering	Shorter/colder showers	Splash washing, sponge baths, dry cleaning	More efficiently combining practices of exercising and showering, using public baths (also as means for relaxation)
Practices related to laundering	Washing full loads, appropriate temperature settings, environment-friendly detergent, new storing practices to avoid mixing dirty, used and unused clothes	Replacing washing laundry at home by using shared laundry rooms in the building, replacing washing by airing clothes, spot cleaning,	More efficiently combining practices of exercising (or other practices causing dirty clothes) and laundering, combining laundry practices with other cleaning practices e.g. once a week (cleaning days), sharing of washing machine with neighbours
Practices related to cooking	Using leftover food apps for meal ideas, cook for several days at once (and store meals), learning about quick-to-cook, energy-efficient meals	Replace hot dishes with salads	Connect meals to other activities (child care, school, work, hobbies), eat together with family, friends or neighbours
Practices related to daily mobility, esp. car driving	Fuel efficient driving	Replacing car driving (even if only parts of the way) with cycling, public transport, car-sharing, carpooling	Teleworking to avoid driving, organising travel needs (e.g. shopping, leisure activities) to minimise driving, prefer local services

Questions to guide the implementation:

- Have I consulted the instructions in D3.5 and plans outlined in D4.1? How does this step support the evaluation of the ELLs? How will I ensure the comparability of the ELLs at this step?
- How do we select the practices to be changed together with the households (in ELL1) and in the community (in ELL2)?
- How do I ensure the comparability of the ELLs at this step?
- How can I assess the willingness of participants to engage in the changes? Do the target practices fulfil the needs of the household, as well as the need for reducing energy use, and how can I identify the potential rebound and spin-off effects?
- How do I involve the stakeholders in the ELLs at this step?
- What is my own role as a researcher in this step?
- How can I make sure that I will not need to use more resources at this stage than initially planned?

Example: *In ELL1, after identifying the target for practice change, it is time to discuss the ways in which this target is achieved. I briefly describe what the re-crafting and substituting practices mean, as well as how to change the interlinkages between practices. After that, we talk about the ways these could be employed in the everyday life of the participant and what would each change mean in terms of energy use. We also discuss about the potential rebound and spin-off effects.*

My team has also organised a kick-off meeting for the ELL2 participants. We commonly share ideas, how we can target some of these practices and how we could change them. We discuss what part of the practice especially leads to high energy use and jointly co-create how that practice could be realised differently and what would that take. We consider re-crafting or substituting the practice based on the views from the participants of this special context. We also discuss how this practice might depend on another practice and are there some ways to change how the two practice interlock.

STEP 13: THE KICK-OFF

After the first face-to-face meeting with the households, in which we have collaboratively decided on the practices to be re-crafted or substituted, as well as discussed the ways practices could be more energy-efficiently interlinked, and on the potential ways to implement these changes by e.g. utilising the examples in Table 4, it is time to stop for a while and revise the plans for the testing phase on the basis of the deliberation with the households. Together with the local implementation teams and other relevant stakeholders, we have discussed and narrowed down the engagement tools to support and encourage the households in the testing phase, and now it is time to check that these tools really seem suitable for the households.

After these pre-testing phases, each set of one or two practices is tested within a period of eight weeks (see timeline in Figure 3). This active phase of the ELLs starts with a **kick-off meeting**. There may be already some weeks since the last contact with the households, when the practices, targets for practice change, and ways to achieve these targets. It is thus necessary to contact the households once more before the start of the actual testing.

Households are given explanations on the provided support and engagement tools, and they may receive the meters and other necessary equipment (or if these are installed previously, this is the time to check that they are properly installed and working), guidebooks and applications, and the specific time frame is discussed as well as the ways and timing of communication with the project team. Households are also reminded of the self-monitoring they will be doing during the testing phase. After this kick-off, the households are ready to start!

Questions to guide the implementation:

- How do I support and encourage the households in changing the practice? How do I discuss the objective and time frame for each activity utilising the chosen tool?
- What is my own role as a researcher in this step?
- How do I select a suitable interaction method (e.g. Facebook group) for community activity to support the community element?
- What is the frequency of contact that I wish to maintain and my resources make possible? What is the media of contact?
- How do I involve the stakeholders in the ELLs at this step?
- How can I make sure that I will not need to use more resources at this stage than initially planned?

Example: *At this kick-off meeting, I go through the testing phase with the households and figure out how I could best support them in their practice change initiatives. This builds on our common analysis of how and why changes in practices are difficult to make and maintain.*

In my individual ELLs, the households are focusing on making changes in their use of hot water. They are not used to thinking about their hot water use as they do not own water meters and the water use is included in rent. Materials that can help them are water meters (to see how much water they use and what is the water temperature), timers that help them to understand how much time they use in the shower, and dry-cleaning products that can help them to reduce showering. They also reorganise some of their daily practices, such as exercising, to avoid excess showering.

Since adopting these new practices may prove to be effortful, and some household members may be resistant, we also discuss about the possible reasons behind the resistance and about how to support all household members during the ELLs. We also agree on how I am communicating with the households during the testing and highlight that they can contact the team whenever they feel like it.

STEP 14: ACTIVITIES IN THE ACTIVE PHASE

The households are testing new or changed practices for eight weeks. The testing in the other domain can start a couple of days after the testing in the first one, to allow some time for households to get used to the testing.

During the testing phase, households do self-monitoring by filling in the practice diaries.

In the **halfway point** of the testing phase, the researchers discuss with the households and some further support may be provided if needed. If the households face some difficulties, these and the reasons behind the obstacles are discussed and some alternative practice configurations may be tested. This halfway point also serves as a point for introducing the community elements in ELL2.

At the end of the testing phase, households also report on their energy use and other and fill in other questionnaires they did also before the start of the testing.

Questions to guide the implementation:

- Have I consulted the instructions in D3.5 and D4.1? How does this step support the monitoring and evaluation of the ELLs? How will I ensure the comparability of the ELLs at this step?
- How do I time my contacts with the participants? What did I agree on the timing with them at the first contact?
- How do I involve the stakeholders in the ELLs at this step?
- How do I organise the work in the local implementation teams?
- How will I conduct the mid-term evaluation? Do I need to engage in corrective actions? How do I proceed with those? Have I agreed on this with the participants?
- How do I monitor the households' activities and collect feedback? How do I balance between giving enough space for the households while ensuring the sufficient monitoring and support? What is my own role as a researcher in this step?
- How can I support the households in case that the participants lose their interest or become exhausted during the testing?
- How can I make sure that I will not need to use more resources at this stage than initially planned?

Example: To monitor the testing phase, I have divided the monitoring activities for each testing weeks, for both ELLs and for both domains.

WEEK	HOT USE	WATER	MOBILITY	COMMUNITY ELEMENTS	OTHER
1	Reducing time spent in showers		Replacing car use by bus in commuting and shopping		
2				Car pooling	A text message to each household to remind that they can call me whenever they want
3					
4	Reducing weekly showers from 6 to 3-4 (every other day)		Bicycling to work a couple of times a week		At the end of week 4, I call to each household and ask how the testing has been going. I also agree on the time of the final meeting.
5				Discussions in the Facebook group	
6					A text message to each household to remind about the collection of data
7					Households fill in the questionnaires etc. on weeks 7 and 8
8					At the end of week 8, I remind households about the questionnaires

STEP 15: ENDING THE TESTING PHASE WITH THE FINAL MEETING

Testing phase ends with a **final meeting** followed by evaluation and follow-up activities. In the final meeting, the households' first thoughts about the testing phase are discussed. Households have filled in the questionnaires and self-monitoring documents (such as practice diaries), and these are discussed in the meeting and any gaps are filled in. Households in ELL2 are brought together for a joint discussion to enable households to share the experiences, discuss about the potential for new practices to diffuse within and outside the community, and to envisage further actions.

In the final meeting, households also receive the reward from their contribution in the project, they are provided with support to continue performing the new practices and to share their experiences, and further actions are agreed: when the researchers are planning to do the follow-up interview, how are the results of the project shared with the participants, and whether participants should expect contact from local media.

Questions to guide the implementation:

- Have I consulted the instructions in D3.5 and D4.1? How does this step support the monitoring and evaluation of the ELLs? How will I ensure the comparability of the ELLs at this step?
- Looking forward: do I offer my support if someone wants to continue or try the same somewhere else? How can I support such activities?
- How will I follow-up the ELLs? Do I agree on an individual follow up at the beginning of the ELLs with the participants or do I agree with each household on an individual plan that goes beyond the project's plan to follow-up?
- How can I make sure that I will not need to use more resources at this stage than initially planned?
- With whom should I agree on the dissemination of the results, and how this related to the ethical issues discussed with the participants in step #?

Example: *I have contacted each household at the middle of the eight-week testing phase and agreed that I'd visit them about a week after the end of the testing phase. The participants have sent me their responses to the questionnaires and I have already looked at them before the meeting, so I have some understanding on what was the testing like from the participants' point of view.*

This final meeting follows the structure of the first meeting we had. I again invite the participants to reflect on how much of our everyday practices are tied up with habits and routines, involving things, time, skills, etc. We also get back to the expectations of the participants towards this project and how the ELLs answered to them. We discuss about the practices experimented from an energy-usage perspective and what would it take to reduce energy use in households on the basis of the participants' experiences.

In my ELL2, there is a group discussion in addition to individual interviews, to that the 20 households have a chance to collectively reflect on the testing and the potential for these kinds of practices to diffuse within the community.

CLOSING UP OF THE ELLs (STEPS 16-18)**STEP 16: CLOSING UP WITH OTHER IMPLEMENTATION PARTNERS**

This step is in part parallel with the previous one, but covers also the closing up with stakeholders and the implementation teams. You can also collect written feedback from all the people engaged in the ELLs. The discussions with local stakeholders consider the upscaling potential of both new practices requiring less energy, as well as of new co-creation and engagement arenas such as ELLs and methods used in the ELLs. The stakeholders or other actors may also want to disseminate the outcomes of the ELLs in local media, and this is the point to agree on dissemination.

Questions to guide the closing up:

- How do I intend to end the activity? How can I ensure that everyone ends up being happy and satisfied with the project?
- Do I want to organise a feedback seminar? Do I request systematic feedback from implementation partners and other stakeholders?
- How do I involve the stakeholders that have supported the ELLs?
- Do I also want to reward stakeholders and local implementation teams?
- What is my own role as a researcher in this step?
- How does this step support the evaluation of the ELLs?
- (If I wish to:) How much resources do I still have to go beyond to what has been planned in the project?

Example: *I am also interested in hearing how my local implementation team as well as other stakeholders who have been engaged in the ELLs feel about the project. I organise a dinner to thank them all for their participation and during the dinner, I also collect some feedback and discuss about the potential to employ the ideas on more sustainable showering and mobility practices on a larger scale, or to use the ELL approach to further test and learn about new practices. I carefully collect all the feedback and send it later to everyone, to ask if they want to add something. I also promise to send a summary of our findings to everyone who's interested.*

STEP 17: FOLLOW-UP

Follow-up takes place approximately four months after the end of the testing phase in ELLs.

Questions to guide the follow-up:

- How do I intend to implement the follow-up phase of the ELLs?
- Is there something interesting that I have found in the materials but have not managed to ask from the participants sooner, and how do I bring these issues up to get more information?
- What is the information that I am interested in related to the follow-up phase of the ELLs? What are the informational needs of the other WP's of the project (see also D4.2)? How do I collect information at the follow-up (see also D3.5)
- How much resources should I leave for the follow-up of the ELLs?

Example: *For almost four months I have been analysing all the rich data collected during the ELLs. I have noticed that there still remains some interesting questions unanswered. I am also interested to hear how the participants have continued their everyday lives – have the new practices remained, or have the households got back to their old habits and why. I contact the households and agree on a short interview to ask these questions. For ELL2, I organise a meeting for all households, but only eight of them has time to join. I interview the rest of them by phone.*

STEP 18: REFLECTION ON THE ELL PROCESS

At this step, it is time to get back to step 1 and find out if the objectives set for the ELLs have been satisfactorily achieved. At this step it is also time to reflect on your own actions as a researcher, your impact on the ELLs and the context in which ELLs have been implemented, as well as the ways to remove yourself from the picture and let the participants to continue their (new) daily practices without active engagement with the researchers.

The outcomes of ELLs are **evaluated** on the basis of Sustainability Assessment Toolkit (SAT) that serves as a material for an online monitoring tool that will be developed for data collection (in WP4). In addition, WP5 leads the comparative research done within and across the ELL countries. Information of the materials and methods used for evaluation is provided in D3.5 ('**ENERGISE Living Lab evaluation and assessment manual**', which is a more detailed description of the output, outcome and impact indicators and measures, as well as detailed methods for baseline definition and identification of rebound and spin-off effects).

Questions to guide the reflection:

- How do I determine the success of my ELLs (See D3.2, D3.5 and D4.2 for the needed information)?
- Do I need some information for the determination whether the initial targets and goals for the ELLs have been realised? How do I collect the information?
- How and when do I communicate internally with other ELL teams?
- How do I respond to the feedback I receive?
- How should I plan my use of resources so that there still are resources left for final evaluation?

4 SUMMARY

ENERGISE Living Labs aim to employ practice-based approaches to reduce energy use in households while paying attention to why energy-intensive practices are performed and how they depend on the context in which they are performed.

Conducting a participatory research together with 20 households and a number of local implementation partners who all engage in the ELLs for various reasons, and multiplying this by two in each country and by eight countries, while ensuring the comparability of ELLs across countries as well as the feasibility within the available time and other resources, is all but a simple task. By providing a step-by-step guidelines on how to proceed from refining the ELL design, involving the relevant actors and recruiting households, to identifying practices and the ways they are interlinked, their underlying meanings, competences and material conditions as well as the wider societal conditions in which they are embedded, to finding ways to steer these mundane practices onto a more sustainable paths and testing these alternative practice configurations in real life, to successfully closing up the living labs, this guidebook aims to make this task more realizable.

This guidebook focuses on engagement methods and the ways to implement the ELLs at different stages. Further guidelines on implementation and monitoring is provided in D4.1 and on evaluation and assessment in D3.5 (ENERGISE Living Lab evaluation and assessment manual).

REFERENCES

- Devaney, L. & Davies, A.R. 2016. Disrupting household food consumption through experimental HomeLabs: Outcomes, connections, contexts. *Journal of Consumer Culture*.
- Di Giulio, A. & Fuchs D. 2014. Sustainable Consumption Corridors: Concept, Objections, and Responses. *GAIA* 23(S1), 184-192.
- Kuijjer, L. 2014. Implications of Social Practice Theory for Sustainable Design. Doctoral Dissertation, Technical University of Delft.
- Kuijjer, L. & de Jong, A., 2011. Practice theory and human-centred design: A sustainable bathing example. Paper presented at the Nordic Design Research Conference 2011, Helsinki.
- Laakso, S. & Heiskanen, E. 2017. Good practice report: capturing cross-cultural interventions. ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Deliverable 3.1.
- Laakso, S., Heiskanen, E. & Matschoss, K. 2017. ENERGISE Living Labs background report. ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Deliverable 3.2
- Pawson, R., & Tilley, N. 1997. *Realistic Evaluation*. Sage.
- Rau, H. & Grealis, E. 2017. Framework document for ENERGISE team: Everyday practices, cultural conventions and energy use: researching new opportunities for reducing domestic energy use in Europe. ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Deliverable 1.2.
- Scott, K., Bakker, C. & Quist, J. 2012. Designing change by living change. *Design Studies*, 33(3), 279–297.
- Shove, E. 2014. Putting practice into policy: reconfiguring questions of consumption and climate change. *Contemporary Social Science*, 9(4), 415-429.
- Shove, E., Pantzar, M. & Watson, M. 2012. *The Dynamics of Social Practice: Everyday Life and how it Changes*, London: Sage Publications.
- Spengler, L. 2016. Two types of ‘enough’: sufficiency as minimum and maximum. *Environmental Politics*, 25(5), 921-940.
- Spurling, N., McMeekin, A., Shove, E. et al. 2013. Interventions in practice: re-framing policy approaches to consumer behaviour. Sustainable Practices Research Group Report. Available at: www.sprg.ac.uk/uploads/sprg-report-sept-2013.pdf
- Vedung, E. 1998. *Public policy and program evaluation*. Transaction Publishers.

APPENDIX 1

Examples of the measure cards which support the discussions of practice changes with the households.

<p style="text-align: center;">manage heating actively</p>  <p style="text-align: right; border: 1px solid black; border-radius: 10px; padding: 2px;">Recrafting practices</p>	<p style="text-align: center;">adaptive heating practices</p>  <p style="text-align: right; border: 1px solid black; border-radius: 10px; padding: 2px;">Substituting practices</p>
<p>How and why?</p> <p>You get a tailored analysis of heat losses and your heating system</p> <p>We explore low- and no-cost solutions: timers for thermostats and airing, DIY insulation, blinds, shades, curtains, carpets, fans, arrangement of furniture so that radiators are not blocked, home automation apps...</p> <p>Benefits</p> <ul style="list-style-type: none"> • Gain new skills and better control of the house • Healthier home • Save on heating/cooling costs • Reduce your carbon footprint • On average, small low-cost measures can reduce your energy use by 10-30 % 	<p>How and why?</p> <p>Heat people, not space</p> <ul style="list-style-type: none"> • Turn off heat in unused rooms, manually or automatically • Avoid power peaks by turning heating off/down • Create centers of warmth with comforters, portable devices, reordering furniture • Keep warm and cosy using woolly knits and slippers <p>Benefits</p> <ul style="list-style-type: none"> • Try out a romantic old-style lifestyle • Save on heating/cooling costs: they account for 2/3 of household energy costs • Reduce your carbon footprint: reducing indoor temperature by 1°C reduces energy demand by 5 %
<p style="text-align: center;">try quick showers</p>  <p style="text-align: right; border: 1px solid black; border-radius: 10px; padding: 2px;">Recrafting practices</p>	<p style="text-align: center;">reorganize laundering</p>  <p style="text-align: right; border: 1px solid black; border-radius: 10px; padding: 2px;">Changing how practice interlock</p>
<p>How and why?</p> <p>Develop a new habit of quick showering</p> <ul style="list-style-type: none"> • Use timers and meters to find out how much time, water and energy you use, and to remind you when you have showered enough • Reduce water use with low-flow taps <p>Benefits</p> <ul style="list-style-type: none"> • Save time in the mornings • Keep skin healthier • Save on energy and water • Reduce your carbon footprint: domestic hot water uses 10-25 % of household energy 	<p>How and why?</p> <p>Combine laundering with other activities</p> <ul style="list-style-type: none"> • Combine cleaning and washing day • Wash during the night to allow air drying during the day • Combine sports/exercise and laundering • use laundry room/laundrette/laundry service in connection with socialising • Share laundering/washing machine with neighbour <p>Benefits</p> <ul style="list-style-type: none"> • Save on energy and water • Reduce chemicals from detergents • Save time • Reduce your carbon footprint: laundry consumers about 4 % of domestic power use