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AND INNOVATION FOR SUSTAINABLE ENERGY

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# DELIVERABLE 6.5

## POLICY REPORT 2

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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:

- o **Develop an innovative framework** to evaluate energy initiatives, taking into account existing social practices and cultures that affect energy consumption.

- o **Assess and compare the impact** of European energy consumption reduction initiatives.

- o **Advance the use of Living Lab approaches** for researching and transforming energy cultures.

- o **Produce new research-led insights** into the role of household routines and changes to those routines towards more sustainable energy.

- o **Encourage positive interaction** between actors from society, the policy arena and industry.

- o **Effectively transfer** project outputs towards the implementation of the European Energy Union.
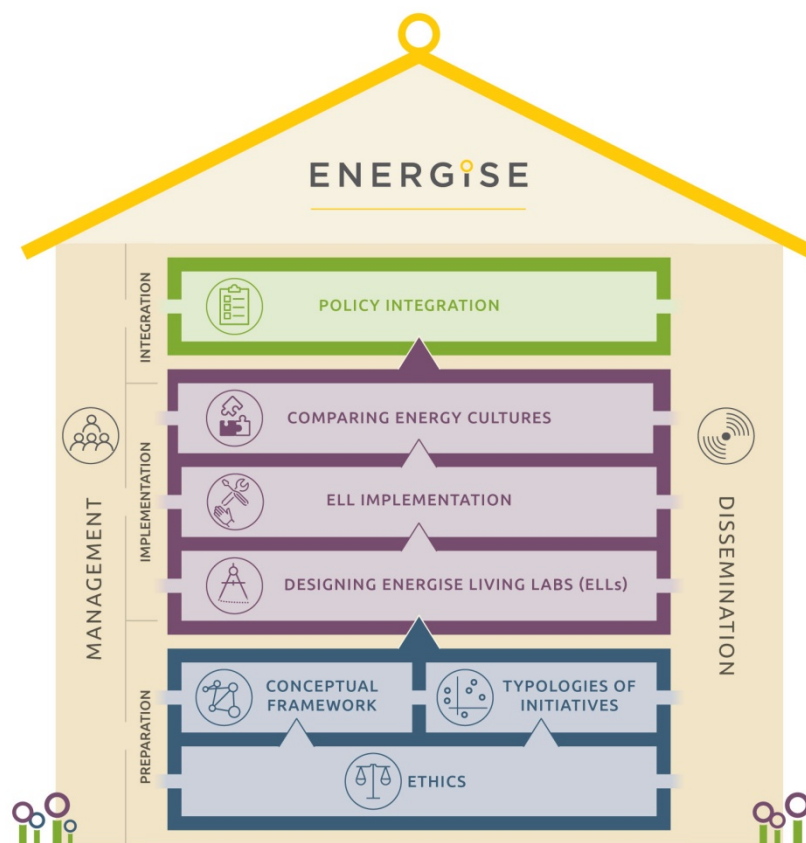
# EXECUTIVE SUMMARY

This document (ENERGISE D6.5) synthesises findings from analysis of sustainable energy consumption initiatives in the EU (WP2), based on the ENERGISE conceptual framework (WP1), and results produced in principal empirical components (WPs 3 and 4). The report reflects on the policy implications of comparative analysis undertaken so far within WP5 to identify linkages between findings across ENERGISE work packages.

The backdrop to this report is the need for reflection on the policy implications of the ENERGISE project in relation to the following: 1) policy-making for sustainable energy consumption; 2) the design; 3) the implementation; 4) the evaluation; and 5) the scaling up or replication of energy living labs that have the potential to contribute to EU energy consumption goals.

The report summarises lessons learned regarding the development and implementation of sustainable energy consumption initiatives in Europe and discusses the policy framings underpinning specific categories of sustainable energy consumption initiatives (WP2). The report discusses the design of energy living labs (WP3), and reflects on the implementation of ENERGISE living labs involving approximately 300 households in eight countries (WP4). The report takes into account early findings from an ongoing analysis of cross-country data on energy use practices and cultures, and the potential implications of this for policy learning (WP5).

The synthesis of WPs 2-5 is enriched by findings from a consultation exercise undertaken with members of the ENERGISE Policy and Decision-making Forum (PDF), in November/December 2018. This aimed to identify the policy implications of the project's activities and findings. In addition, the report draws on insights from an online workshop held (in January 2019) with PDF members and a discussion thereof among consortium members who attended the ENERGISE project meeting held in Budapest, again in January 2019.

The report considers what may be learned from the foregoing discussions in the context of wider debates to be found in the research literature, for example regarding public participation in research and the governance of sustainability. It considers the implications of such debates in suggesting guidelines for the development of EU and national household energy demand reduction policy and initiatives.

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# 1.  INTRODUCTION

This report outlines the policy-relevant findings to date from the ENERGISE project. These include discussion of the policy framings of different types of sustainable energy consumption initiatives, the design and implementation of energy living labs and the analysis of cross-country data on energy use practices and cultures.

The background to the report concerns the need to enhance an understanding of the state of the art of policy-making and other initiatives aimed at promoting sustainable – or, rather, reduced – energy use in household settings. More specifically, there is growing interest in the idea and technique of energy living labs that may facilitate such aims. Hence a core objective of ENERGISE is the design, implementation and comparative analysis of two types of energy living labs run in eight different participating European countries. The European Commission, via its Horizon 2020 programme, is concerned to learn about the social and 'behavioural' factors that might influence the success of such efforts. The ENERGISE work package on policy integration (WP6), for which this report is a deliverable, reflects on what might be learnt from the living labs for policy. It is also concerned with how the terms of the debate regarding sustainable consumption and pertinent national and EU energy policies may need to change.

Some of the key insights here involve the relevance of notions of (good) practice, the limitations of common problem framings employed in energy policies and, fundamentally, the 'imaginaries' typically employed of energy-related social scientific research and its relevance for policy-making on the topic. As the report shows, it is advisable not to take for granted interpretations of 'good practice' employed in relation to energy policy-making and changing behaviour of energy users in their home. To substantiate these points, the report draws on materials produced in WPs 2-5. What follows is also the product of reflection on responses to a survey template completed by the ENERGISE policy and decision-making forum (PDF), a workshop session held subsequently with them and a session held with consortium representatives at a project meeting in Budapest in January 2019. The survey template exercise encouraged PDF members to reflect on the meaning of 'good practice' in relation to energy use practices in the home, and in terms of the design and implementation of policies and of initiatives for reducing household consumption within individual countries and pan-EU. Further, it asked the PDF to reflect on a number of specific matters concerning: the merits of an energy living lab approach to changing practices in order to reduce energy demand; what might be learned from the ENERGISE project to facilitate the implementation of the EU Energy Union; and how insights from ENERGISE can demonstrate and strengthen social science contribution to policy development (findings, method, approach/design of research, dissemination activities/engagement).

The report is organised as follows. Section 2 considers the work undertaken in WP2 of ENERGISE, which is inspired by Spurling et al's (2013) approach, to identify common problem framings of EU initiatives and how they overplay energy efficiency and individual behaviour change, to the neglect of approaches that value sufficiency and are premised on other theories of change (see Jensen et al, 2017). In section 3, the report considers the

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design of energy living labs that might demonstrate an alternative sufficiency-based approach, informed by the work of our colleagues on WP3, and what might be learned from the implementation of such energy living labs in eight countries and involving approximately 300 households (WP4). The section also concerns what might be learned for policy-making from analysis of living lab data currently being undertaken within WP5. Section 4 aims to synthesise the foregoing discussions of activities conducted across several WPs, to highlight implications for policy of the data presented and the project as a whole. Section 5 represents a conclusion that ties together the various strands of the report.

# 2. LEARNING FROM 'ENERGISE' ABOUT DEVELOPING AND IMPLEMENTING SUSTAINABLE ENERGY CONSUMPTION INITIATIVES IN THE EU

## 2.1 SUSTAINABLE ENERGY CONSUMPTION INITIATIVES: THE DATABASE AND TYPOLOGIES

Employing a problem framing methodology, WP2 conducted a review of 1000+ sustainable energy consumption initiatives (SECIs) in the EU. SECIs are defined in D2.1 as activities that deal with reducing energy related $CO_2$ emissions from households. This can either be in terms of (1) reducing the actual energy consumption, or (2) substituting fossil fuels with renewable energy sources, and include an element of active involvement of households (as consumers, prosumers, innovators, investors, and/or they can be viewed as active participants in various groups relating to sustainable energy consumption). The WP2 review showed that about 75% of the reviewed SECIs framed energy demand reduction as a matter of technological innovation or individual behaviour change (see Table 1).

*Table 1: SECIs categorised according to the Problem Framing Typology*

| Sustainable consumption category | No. initiatives | % of total initiatives |
|---|---|---|
| Change as change in Complex Interactions | 147 | 13.7 |
| Change as changes in Everyday Life Situations | 124 | 11.7 |
| Change as changes in Individual Behaviour | 514 | 48.2 |
| Change as changes in Technologies | 282 | 26.4 |
| *Total SECIs* | *1067* | *100* |

Source: Jensen et al (2017); the open access database of SECIs is available at: http://energise-project.eu/projects

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The problem framing typology of sustainable consumption energy initiatives gives a clear view of how different theories of change are realised in interventions in practice. Table 1 clearly shows the dominance of interventions rooted in a theory of change which emphasises the importance of individual behaviour, which comprise over 48% of the initiatives, and technical solutions, which make up over 26% of the total[1]. In contrast, there is a minor role for policy interventions that address the substructure of individual choices and behaviour. This indicates two areas of neglect: policies which might disrupt and transform isolated practices, and those which might disentangle nests of interacting practices. The clear message of WP2 is that to effectively address the grand challenge of energy, policy-makers need to adopt hitherto marginalised theories of change. They need to design and to implement measures adapted to the task of changing practices which are rooted in mundane, everyday activities, undertaken in particular socio-material and temporal spaces, commingled with and shared though contextually delimited meanings and knowledge. Beyond this, WP2 reminds users of the research of the importance of transcending an over-emphasis on either technical or social dimensions of energy use to embrace a more fully socio-technical and culturally sensitive complex of factors inhering in energy-related social practices, such as heating one's home or doing the laundry.

In addition, WP2 developed a resource consumption typology and found that approximately 10% of the reviewed SECIs understood energy demand reduction as a matter of sufficiency and repairing and sharing, where as 90% of the reviewed SECIs understood it as a matter of efficiency (see Table 2). An over-reliance on energy efficiency may prove counter-productive, as an efficiency-based focus tends to perpetuate meanings and levels of services related to existing (unsustainable) types and patterns of consumption, rather than effectively challenging them (Shove 2017). Interestingly, there is a large overlap between 'efficiency-oriented' SECIs and 'technologically or individual-behaviourally focused' SECIs. It is interesting to set these findings in the context of views which argue for *the reframing of policy interventions away from technological and behaviourally focused interventions, towards more practice and context-oriented initiatives*.

There are several benefits of reframing initiatives. Firstly, orientating initiatives to practice enables attention to everyday patterns of energy use that need to be challenged and changed in order to reduce consumption more effectively. Secondly, context-oriented initiatives can address the local and cultural specificities underlying shared practices of energy use, for example with regard to the use of central heating in homes, the use of tumble dryers and so on. Thirdly, the kinds of reframing advocated here are the key to developing more fundamental thoughtful initiatives capable of addressing complex interactions between energy use domains. These interactions involve configurations of practice inhabiting, for example, keeping warm, personal hygiene and cooking, and combine technological, economic, cultural and symbolic elements. More effective initiatives - oriented to practices and context - may be designed that address what people do everyday that involves energy use, how they do it and what matters to them about it.

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[1] This is in spite of the fact that SECIs that were purely technical in focus (objectives and aims) were not included in the review.

*Table 2: SECIs Categorised according to the Resource Consumption Typology*

| Sustainable consumption category | No. initiatives | % of total initiatives |
|---|---|---|
| Sufficiency | 97 | 9.09 |
| Sufficiency/Efficiency | 35 | 3.28 |
| Efficiency | 961 | 90.06 |
|     Efficiency (reduction and substitution) | 622 | 58.29 |
|     Efficiency (reduction only) | 156 | 14.62 |
|     Efficiency (substitution only) | 183 | 17.15 |
| *Total SECIs* | *1067* | *100* |

Source: Jensen et al (2017); the open access database of SECIs is available here: http://energise-project.eu/projects

## 2.2 DESIGNING AND IMPLEMENTING SUSTAINABLE ENERGY INITIATIVES IN EUROPE

The ENERGISE catalogue of European sustainable energy consumption initiatives (Jensen 2017a) shows that households engage in saving energy in the home or in personal mobility for various reasons. People can engage because of costs and attempts to lead a more decent life, environmental reasons, due to social relations or because of a desire to learn about new solutions and technologies; some might like a change or to simplify their life. It is necessary to be clear about the diverse expectations of different parties in change initiatives. The diversity of households' and others' expectations also gives rise to a need to consider the framings and language the initiators use, since different language can speak to different people in different ways. From a practice perspective, and when ambitions about reducing energy use are high, initiatives also need to consider how energy related needs are defined. A practice perspective offers the opportunity to look beyond existing behaviour and how to perform it more efficiently, to alternative ways to address households' needs and concerns about managing everyday life. For example, a conventional approach might be a behaviour change programme that seeks to change attitudes to consumption and household purchasing choices founded upon these. However, a practice perspective brings into play the material, knowledge, symbolic and everyday routine aspects of (un)sustainable living, for example in relation to the need to keep warm and what that means to users who share practices with others. This deep rooted and collective characteristic of social practices requires a multi-actor, multi-dimensional approach to effect systemic transformation of consumption, rather than more efforts by policy-makers or promoters to change individual consumer attitudes and behaviour.

In order to understand the contextual dynamics of SECIs, WP2 also collected information about broader demographic aspects, energy supply, energy policy, prosumership and

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pertinent actor-configurations in 30 European countries (for D2.5; see Jensen et al, 2018). This aided the analyses of particularly cultural similarities and differences between SECIs, as well as relations between regulatory frameworks, aspects of power and legitimacy and collective conventions related to energy consumption. It also shows tendencies in how energy consumption has been understood and targeted as part of national and local policy initiatives over time.

The briefs provide contextual overviews of particular socio-material aspects at play in each country that may influence energy consumption levels, as well as insights into national (and in some cases regional) energy policies, including how energy consumption is understood and targeted. The SECIs that are analysed in detail in National Briefs provide good practice examples, which highlight understanding energy consumption as an outcome of everyday life dynamics and complex interactions between multiple actors, institutions and infrastructural aspects.

For more detail about National Briefs see: http://www.energise-project.eu/node/1238

To inform ongoing work on WP6 and final outcomes of the ENERGISE project (i.e. recommendations for policy and practice), it is important to reflect on the types of SECIs, their design, implementation and contextual factors in the eight ELL countries. Some common issues arising from the analysis of SECIs by country include the need for evaluation of initiatives and the need for more assessment of whether 'smart' solutions – or in general new technical solutions – deliver the promised environmental benefits. There are considerations to be made regarding policy frameworks. For example, although SECIs usually reflect national policies or are enacted within a national policy framework, they may also address issues currently beyond policy agenda or even challenge prevailing policies. Further, there may be a lack of support from the central governments, or it may be that such support is limited in scope, or that more tailored support is needed. It may be noted that many SECIs are locally embedded and are often supported by local governments and locally specific measures. The policy context is changing such that, in general, older and newer SECIs often have different foci. It should be recognised that SECIs may have been developed within different policy contexts and that lessons learned from our analysis might not be similarly applicable across initiatives.

The overview of SECIs and the contextual dynamics of their design and implementation analysed in National Briefs provides an idea about similarities (i.e. in energy consumption patterns for space heating) but also differences between European countries (e.g. large variations across Europe in relation to final energy consumption for households, shares of fuel in final residential energy consumption and residential final energy consumption by type of end-use). Further analysis focused on material, discursive and social dynamics of selected SECIs. Here, Jensen (2017) examined 81 diverse case studies that could inspire the design of best practice cross-cultural interventions, as well as initiatives that involve a strong                                              practice-based                                              element.

## 2.3 LESSONS LEARNED: TYPES OF INTERVENTIONS FOR CHANGING ENERGY PRACTICES

The ENERGISE project suggests that the effectiveness of particular designs and interventions is strongly dependent on local configurations of practices and practice architectures (Kemmis et al, 2014). WP3 (D3.1) elaborated further the idea about context-dependency of interventions and a large role played by material, institutional and social aspects/conditions of energy use, which influence whether and how people 'act' on proposed interventions (Laakso and Heiskanen, 2017). It is suggested that an understanding of context-dependence offers a realistic view of the potential, but also the limitations, of various types of interventions.

Analysis of SECIs aimed to provide an inspiration for subsequent work packages of ENERGISE. One of the aims of WP3 was to identify which kinds of interventions in energy using household practices might work in *several European countries* and sub-national contexts, given the differences in practices and cultures between and within countries. The Good Practice report (D3.1) uncovered different ways in which European initiatives can work to change ingrained practices. The report identified the categories of initiatives that might work in changing household energy use across Europe: challenges, competitions, games; pioneer practices; needs-based tailored support; learning by doing; and peer-to-peer learning. Reading across WP2 and WP3, ENERGISE sees great potential in approaches that promote collaboration and engagement among participants and between organisers and participants. However, the effectiveness of each sustainable energy consumption initiative depends on tailoring the particular measures used to the requirements of the context, though some types of interventions are more cumbersome to tailor to their context than others.

*Challenges, competitions and game* approaches are ways with which to challenge existing practices by creating a temporary space for experimentation as well as by framing change in terms of fun, entertainment and rewards. The practices that change are not always specified (targets are usually set in terms of energy saving, although there are some exceptions), nor are they usually analysed (so there is less feedback to organisers).

*Pioneering practices* is another approach that aims to challenge existing practices by engaging households in fixed-term experimentation with new practices (e.g. new ways of showering and new understandings of cleanliness). The experimentation provides households with experiences that support the adoption of new practices, while offering user feedback on opportunities and problems encountered in adopting new practices.

*Needs-based tailored support* is an approach that aims to fit and adapt new energy saving actions into existing practices, with a concern for the particular needs, opportunities and obstacles specific to the group of participants. Such projects aim to introduce new competencies and meanings, while offering expert, technical and financial support.

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*Learning by doing* is an approach to engaging households that starts with material engagement with devices or DIY projects or experimenting with new ways of performing daily practices. These usually have a practical function and create new competences but usually also aim to empower participants toward energy citizenship.

*Peer-to-peer learning* is an approach to engaging households that builds on existing social relations to reshape understandings of normality. Examples are eco-homes open doors days, which have been organised in several European countries.

WP3 also considered that there are types of initiatives that be might necessary but difficult to implement well. These include initiatives that are incompatible with existing infrastructure or institutions, such as those requiring home improvements, which those in rental accommodation may not be able to undertake if tenants are not allowed to make repairs. They also include initiatives that may be disproportionate to the (perceived) scale of the problem, e.g. competitions that focus solely on energy saving (and carry the risk of some people "going overboard" on achieving short-term goals to the detriment of wider, longer-term aims). Looking at things differently, one might also mention initiatives that lack clear focus; they can create a 'buzz' but without effectively contributing to concrete achievements, as some 'pledge' campaigns have done.

Some recommendations for policy makers on how to best engage households in changing their energy practices are summarised in a European Policy Brief (Laakso et al, 2019)[2]. It is suggested that for the reduction of household energy use the co-creation of initiatives in a multi-actor process is beneficial as it integrates a variety of perspectives. Understanding the context dependence of the outcomes is important for transferability of sustainable energy initiatives. The scalability of initiatives requires stakeholders' understanding of the contextual conditions of initiatives, i.e. understanding of what would work where, how and why. It is also critical to understand the potential diversity of participants and the social context, material conditions and time limitations of the interventions.

## 2.4 POLICY FRAMINGS FOR SUSTAINABLE ENERGY INITIATIVES

The ENERGISE project consortium is clear that energy policy-making is not only about state-mandated regulations and what government or civil servants do. Rather, effectively addressing challenges like reducing consumption in domains such as household heating, requires a more inclusive approach to energy and climate change governance and research policy. A fundamental insight for policy-makers concerns the benefits of taking a practice-theoretical approach to understanding and reducing energy demand. It suggests that researchers and policy-makers may benefit from exploring and working with how particular institutionalised configurations of social practices hold particular energy consumption patterns in place. Fundamentally, this requires the application of a different theory of change from those that have typified energy demand reduction policy in Europe to date.

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[2] See the link to the brief at: https://zenodo.org/record/2449617#.XHJsnOj7Q2x

The typologies speak to issues of framing, which in policy terms might be characterised in relation to competing imaginaries. These 'socio-technical imaginaries' are indicative of different visions of how the world is or should be and how such futures may be accomplished. In connection with matters of energy and sustainable consumption, the various imaginaries are manifest in the foci of policy, the role of research in informing policy and the contributions of civil society and other actors to the policy process. The imaginaries are variously enacted in the national energy policy trends examined in relation to 30 European countries, presented in Jensen et al (2018).

The work carried out for WP2 demonstrates that the prevailing imaginary and the mainstay of energy demand reduction initiatives in European countries is predicated upon policy-making which emphasises individual behaviour, focusing on the correction of 'poor consumer choices', or sidesteps choice through the adoption and diffusion of energy efficient technologies (e.g. in 'smart' buildings and cities and consumer products). In addition, the role of research tends to be to inform knowledge of factors affecting individual behaviours and how these might be 'nudged' in the 'right' directions.

Much less prevalent are imaginaries in which the policy focus is on either discrete or interlocking social practices. Also underplayed is an imaginary (Genus et al, 2018) in which the contribution of civil society is envisaged as part of a collectively arrived at policy agenda and options. This can emerge from possibly very different political and epistemic cultures than currently typify European countries, in which the dominant imaginary is characterised by attempts to get consumers to make the 'right' purchasing choices or to undergo energy-related behaviour change (see: Shove, 2010, in relation to the case of UK climate change policy).

Imaginaries informed by problem framings drawn on a practice perspective would lead to different understanding of policy intervention sites for sustainable energy initiatives. The focus would shift from technical innovation, consumer choice and encouraging individual's sustainable behaviour to social practices around energy (re-crafting practices, substituting practices, and changing how practices interlock). According to Spurling et al (2013), using a practice perspective and choosing different targets for intervention would encourage new imaginaries of what is 'normal' in everyday sustainability, and as a result would allow social change to happen i.e. new practices becoming normal.

# 3. ENERGY LIVING LABS AS EXPERIMENTAL SPACES

## 3.1 DESIGNING ENERGISE LIVING LABS

ENERGISE WP3 adopts a living lab methodology in order to test novel ways to perform everyday practices together with households in real-life surroundings. ENERGISE Living Labs (ELLs) are targeted initiatives to transform energy use in households and communities. The main aim of ELLs is to develop a better understanding of how to reduce energy use in households, while acknowledging the context-dependence of the change

initiatives. ELLs are sites that enable experimentation with practices by energy users and the collection of data across cultural contexts.

The starting point for the design of ELLs is the understanding of energy use as the performance of everyday practices and associated cultural conventions. The ENERGISE Living Labs are small-scale interventions that aim to engage households in co-creating and experimenting with new energy-related practices in order to transform energy use in households and communities. The two domains in focus in ENERGISE are: space heating, in which attention is placed on reducing the amount of direct energy used for space heating; and laundering in homes. Space heating has the biggest share of overall energy use in households across Europe. There is thus a pressing need to reduce the amount of energy used for heating homes. Laundering in the home features relatively less than other domains in energy studies, despite being socially and culturally embedded in patterns of daily life and other practices such as use of water and heating water and personal hygiene.

Two types of ENERGISE Living Labs were designed that work across diverse contexts and domains of energy use and engage various households and communities. The deliverable D3.4 developed a manual on the formats for engaging households and communities, based on good practices examples identified in WP2, and defined methods, techniques and tools for ENERGISE Living Labs and their timing. (Subsequent deliverables – D7.12 and D7.13 – will summarise and collate this work and will be available to the public at a later date). The ELLs can be described as 'learning by doing' and 'pioneering practices' initiatives. The ELL designs employ deliberation with the participants as well as challenges and needs-based, tailored support (in both ELL1 and ELL2) and collective, peer-to-peer learning (in ELL2), complemented by "packages" of tips, devices and other materials to support experimenting and innovating in practice.

16 ELLS, engaging approximately 300 households, have now been implemented in eight European countries (CH, DE, DK, FI, HU, IE, NL, and UK). The aim was to employ practice-based approaches to reduce energy use in households while co-creating knowledge on why energy-intensive practices are performed and how they depend on the context in which they are performed.

Importantly, ENERGISE aims to create an approach to changing energy-related practices that is to some extent transferable from the project to other projects or initiatives in a range of contexts. This requires evaluative criteria that are understandable and acceptable to policy-making users of the research, as well as being warranted by the project aims. Bearing this in mind, ENERGISE adopted a mixed methods approach that combined a wealth of qualitative data with a set of quantitative indicators, measured before and after the ELLs, in order to provide evidence of the merits of the ELL approach. The project developed a Sustainability Assessment Toolkit (SAT) for the evaluation and assessment of ELLs (D3.5). The SAT includes output, outcome and impact indicators and measures, as well as detailed methods for baseline definition, identification of rebound effects and identification of spin-off effects. As a toolkit for evaluation and assessment, the SAT consists largely of quantitative and standardised measures to be applied before and after

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the ELLs. Based on the SAT, an Online Monitoring Platform was developed for data collection (in WP4).

The ELLs aim to design and test promising solutions for developing common, or at least harmonised measures for improving the implementation of sustainable energy policies across Europe through potential policy impacts and impacts on the public debate. The translation of results into recommendations for future EU energy policy and research (in WP6) will provide decision makers with insights and high-quality data required to advance the Energy Union.

*Figure 1. Basic design of two ELLs. The collective elements in ELL2 (promoting community-driven efforts) are added to basic elements of the intervention included in ELL1 (targeting individual households).*
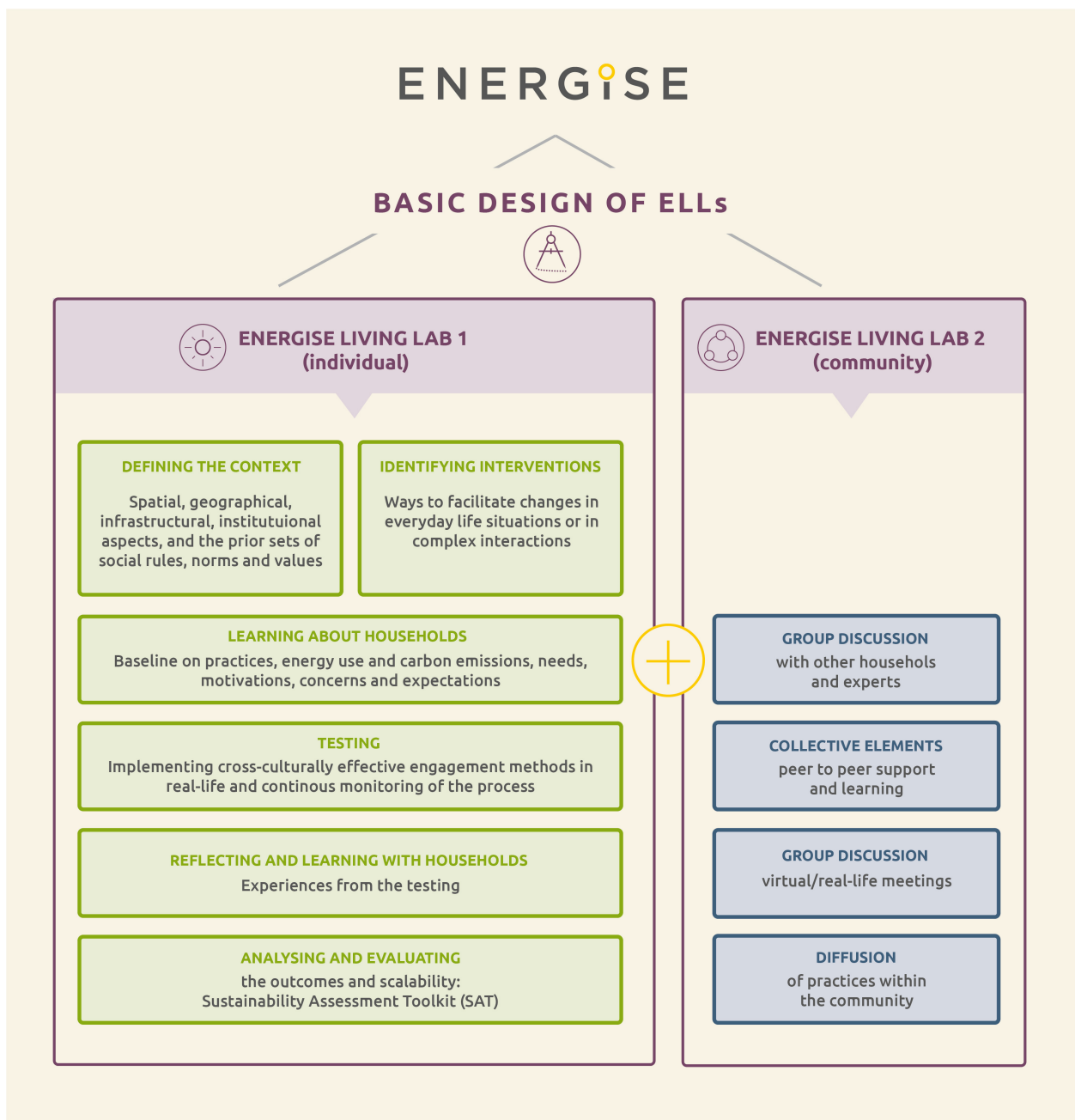


Source: adapted from Laakso et al (2017): Figure 5

For more information on designing Living Labs see WP3 deliverables here: http://energise-project.eu/deliverables or Heiskanen et al (2018).

## 3.2 IMPLEMENTATION OF ENERGISE LIVING LABS

The whole ELL process was divided into smaller steps to help the detailed planning and preparation, engagement of households and stakeholders, concrete implementation as well as the evaluation of ELLs. Each step also defined the methods, techniques and tools for ELLs and their timing. In the figure below the guidebook steps in the ELL implementation phase are presented together with the data collection points in the SAT. It also describes what kind of interaction with the households was proposed for each step.

WP4 centres on the international roll-out of two types of ENERGISE living lab that target individual homes and communities respectively. Based on the review of good practice examples in WP2, ENERGISE project partners (re-)connected with key actors such as companies, agencies, municipalities or communities who have been or are involved in innovative, insightful and effective energy initiatives that are directly relevant to ENERGISE.

*Figure 3. Key connections between implementation steps in D3.4 and steps for monitoring and evaluation D3.5 (adapted from D3.4)*
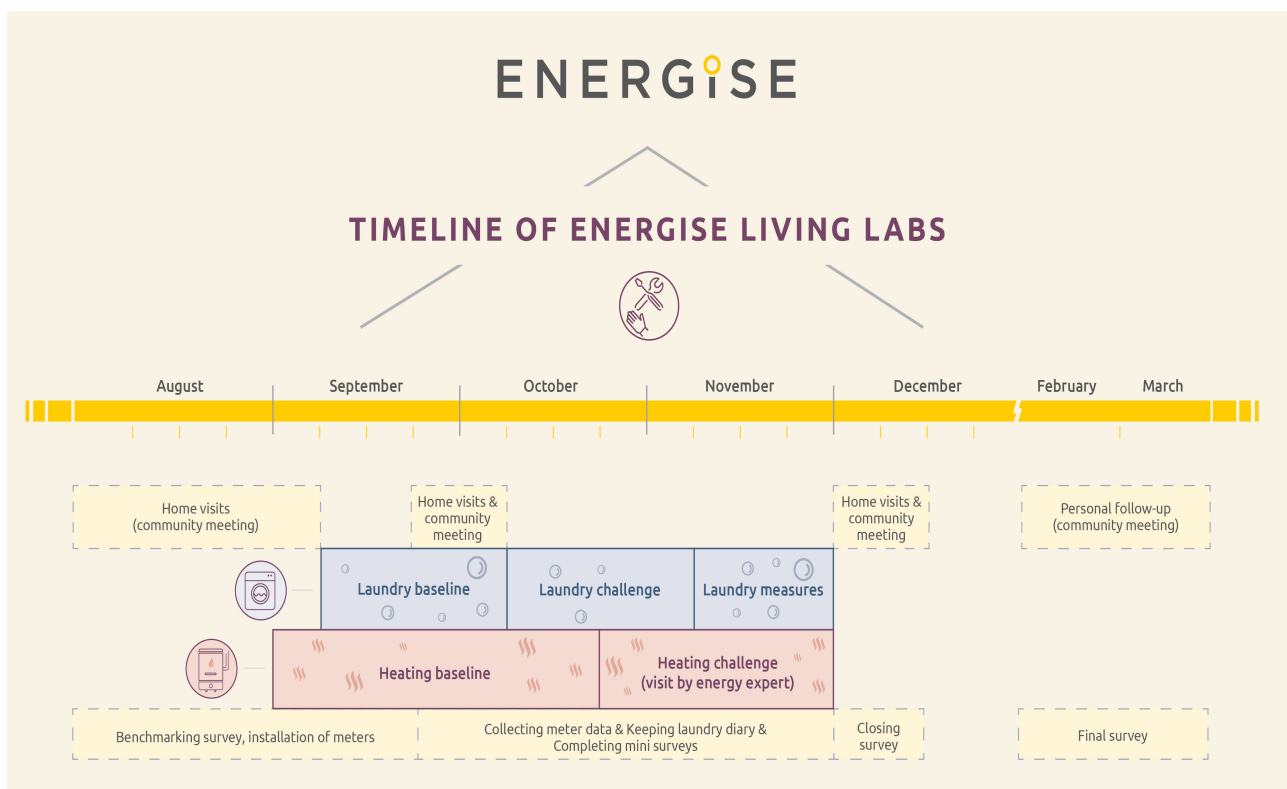


Source: ENERGISE project website: http://energise-project.eu/node/1239

Participant recruitment involved 20 households for the individual-level ELL and 20 households from a defined community (of place) for the collective-level ELL, amounting to a maximum of 40 households per country and approximately 300 households across the

eight participating countries. To ensure comparability and to arrive at meaningful insights into practice cultures and associated energy use, the aim of the ENERGISE consortium is to implement ELL initiatives that are as similar as possible in terms of timing and approach but taking into account local needs and contextual conditions. The WP4 monitoring plan that forms the basis of D4.1 was designed for the purpose of documenting ELL implementation in order to trace similarities and differences. Local ELL implementation plans elaborated on the composition of local implementation teams, including agreed roles and responsibilities, and plans in terms of timing and approach. The following tables provide an overview of the implementation plans with respect to sites, household characteristics and ELL initiatives.

*Table 1 Overview of ENERGISE Living Lab (ELL) sites*

| Country | Denmark | Finland | Germany | Hungary | Ireland | Netherlands | Switzerland | United Kingdom |
|---|---|---|---|---|---|---|---|---|
| **Individual ELL** | Municipality of Roskilde | City of Porvoo | Municipality of Weilheim-Schongau | Municipality of Gödöllő | County Tipperary | City of Maastricht | City of Meyrin (eco-neighbour-hood) | Hastings/St Leonards on Sea |
| **Community ELL** | Municipality of Roskilde | District of Marihaka (Helsinki) | Municipality of Weilheim-Schongau | Municipality of Gödöllő | County Tipperary | City of Roermond | City of Meyrin (eco-neighbour-hood) | Hastings/St Leonards on Sea |

Source: Revised from Backhaus et al (2018)

*Table 2 Variation in socio-economic characteristics of participating households*

| Country | Denmark | Finland | Germany | Hungary | Ireland | Netherlands | Switzerland | United Kingdom |
|---|---|---|---|---|---|---|---|---|
| **Individual ELL** | diverse | some variation | diverse (comparatively well-off) | diverse | diverse | diverse | some variation | some variation (comparatively less well-off) |
| **Community ELL** | diverse | some variation | diverse (comparatively well-off) | diverse | diverse | some variation | some variation | some variation (comparatively less well-off) |

Source: Revised from Backhaus et al (2018)

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*Table 3 Overview of measures planned in relation to 'launder less' and 'heat less' challenges*

| Country | Denmark | Finland | Germany | Hungary | Ireland | Netherlands | Switzerland | United Kingdom |
|---|---|---|---|---|---|---|---|---|
| Laundry | pre-defined challenge; provide useful items and ideas | pre-defined challenge but open to HHs suggestions; provide useful items and ideas | HHs choose challenge based on suggestions; or pre-defined challenge; possibly provide useful items | HHs choose challenge; or: predefined challenge; provide useful items and ideas | pre-defined challenge but open to HHs suggestions; possibly provide items | HHs choose challenge based on suggestions; provide useful items and ideas | pre-defined challenge; suggest ideas to meet challenge | HHs choose challenge based on suggestions; discuss ways to meet challenge; provide useful ideas and items |
| Heating | pre-defined challenge; provide useful items and ideas | pre-defined challenge but open to HHs suggestions; provide useful items and ideas; optional expert visit | HHs choose challenge based on suggestions; or: pre-defined challenge | HHs choose challenge; or: predefined challenge; provide useful items and ideas; optional expert visit | pre-defined challenge but open to HHs suggestions; optional expert visit | HHs choose challenge based on suggestions; provide useful items and ideas | pre-defined challenge; suggest ideas to meet challenge; optional expert visit | participants define challenge; discuss ways to meet challenge; optional expert visit |

Source: Backhaus et al (2018)

The application of the sustainability assessment toolkit ensured effective monitoring of ELL impacts and generated data for cross-national comparison. The ENERGISE Online Monitoring Platform was specifically developed to monitor the experiences and energy use of the ENERGISE Living Lab participants who took part in the 16 ELLs across eight countries (D4.2). An overview of all data was produced and made available for comparative analysis (D4.3). It provided: a list of surveys completed, and by how many respondents, in each country and in total across the 16 ELLs; an overview of the number of interview/focus group summary forms per country and in total; and an overview of the number of interview transcripts per country and in total.

For more information on implementing ENERGISE living labs see WP4 deliverables here: http://energise-project.eu/deliverables

## 3.3 COMPARING ENERGY PRACTICES

WP5 (Deliverable 5.1) provides an overview of the collective conventions, governing frameworks and material systems of the eight countries involved in ELL implementation (Sahakian and Naef, 2019). The WP5 team analysed national reports and also drew on an extensive literature review relating to heating and laundry practices in Europe. The D5.1 report emphasises the role of collective conventions or social norms in holding together everyday practices. Further, it highlights the energy-related policies, material systems and arrangements, and socio-demographic characteristics that shape the context in which changes in energy usage in the home take place and need to be understood. It is

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assumed that no single element, acting alone, can shape practices, but rather that several overlapping elements, placed in relation to practice configurations, give a shaping effect.

In relation to governing frameworks, WP5 identifies policies related to energy usage in the eight ELL countries. It considers decarbonisation and nuclear phase-out activities, as well as trends towards 'prosumers' or consumers who become producers of primary energy, and finally the policy landscape in relation to household energy usage and ranging from efficiency measures to sufficiency. WP5 also notes the very different systems of energy distribution and heating systems in each ELL country, but a relative homogeneity when it comes to laundry practices as tied up with the use of washing machines.

One initial finding was that, while comparable data is available on policies, technical configurations, climatic conditions and socio-demographic variables in relation to the eight countries under study, there was a lack of comparable empirical data on the collective conventions around heating and laundry in and across European countries. Therefore, it was decided that WP5 needed to consider social norms around heating, including what we call the standards and scripts around comfort in the home; the institutional guidelines around indoor thermal comfort; and the different ways of adapting, and adapting to, comfort. In relation to laundry, WP5 studied: standards and scripts; different ways of deciding what is 'unclean'; and the normalisation of washing machine use over time. It also uncovered social norms in relation to representations of environmental change, and what approaches have been used to challenge norms and contest collective conventions.

WP5 thus validates the focus on tackling social norms and practices, as was done in the deliberation phase of ELL implementation, and recognising the diverse contexts in which energy usage takes place. While there are differences within and across countries, there are also quite a few similarities, such as similar trends towards increased indoor temperatures and increased washing machine usage. Despite attention paid to energy transitions in recent years, it is suggested that processes by which practices become normalised need to be taken seriously - to avoid the continued spread of unsustainable user practices and thus increased energy usage in the home.

# 4. BEYOND TECHNIQUE: BUILDING THE CONTRIBUTION OF SOCIAL SCIENCES TO SUSTAINABLE ENERGY INITIATIVES AND POLICY

This section discusses several important issues connected with what may be learned from the ENERGISE project about designing and implementing sustainable energy consumption initiatives in general and energy living labs in particular. Fundamentally, it highlights the implications of the project for related policy-making and more broadly addresses the potential contribution of social scientific energy research therein. A core

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issue concerns the participation and engagement of citizens in consumption initiatives such as ENERGISE. This could be framed in terms of, for example, the role of challenges, in the design of initiatives and how they might elicit and keep energy living lab participants engaged. At the same time, this could embrace the part to be played in inducing changes in consumption practices by feedback on energy use gained in the process of monitoring the practices of participants (and in the 'Hawthorne effect' of their being monitored).

A more debatable matter concerns the argument that there is an over-emphasis on techniques for engaging citizens in projects such as ENERGISE, to the marginalisation of deeper questions connected with the role and influence of participants on the purpose, questions and methods of initiatives. Moreover, such concerns bring into focus the relation between the 'microcosm' (e.g. of energy living labs) and wider developments in policy-making, (bottom-up) public engagement and co-inquiry - or co-produced – energy research. In articulating our arguments here, the section relates the discussion to that of previous sections on problem framing frameworks and imaginaries. It calls for reflection on possible limitations on realising alternative energy practices and culture change imaginaries rooted in the 'lived' world of our 'invited' living labs (c.f. Krzywoszynska et al., 2018 on participation labs and the argument that futures are not as open as might be supposed and that such initiatives may actually constrain creativity). At root, there is a need to recognise that participatory interventions such as ENERGISE living labs do not exist outside of wider social and political processes (Southerton and Welch, 2018). At the same time, while engaging in such reflection, it should be borne in mind that such initiatives help to counter a deep-lying and unfortunate preoccupation with narrowly conceived 'solutions' reliant on energy efficient technologies.

Participation exercises are typically limited and only partially representative, something that calls for sensitivity towards the ecology of different types, processes and effects of participatory exercises (Chilvers and Kearnes, 2016). Chilvers and Kearnes (2016) argue that to 'remake' participation requires reflexivity across diverse actors concerning how participatory collectives close down spaces for influence and inclusion of certain participants. The co-construction of more effective and democratic participatory processes, they say, is implicated with the relations and reflexive capacities of the full range of societal actors. It does not reside with the instrumental expertise of engagement practitioners or researchers, nor with the special insights of lay participants invited to take part in participatory exercises or experiments.

How do the design and implementation of the ELLs connect to debates about 'upstream' public engagement and co-inquiry (Genus, 2014)? What is the 'real' purpose of the engagement and are professionals, funders and users of ENERGISE 'deceiving' themselves about the engagement of citizens (Wynne, 2005)? How do such matters bear on issues of responsibility and accountability (Genus and Stirling, 2018), given the commitment of Horizon 2020 to principles of responsible innovation, which emphasise inclusive deliberation and reflexivity (Owen et al, 2013)? Answers to these questions are bound up with the imaginaries enacted by diverse stakeholders in projects such as ENERGISE. The following sub-section (4.1) reflects on these issues in relation to

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suggested guidelines for designing and implementing sustainable energy initiatives and policies in the EU.

## 4.1 POLICY IMPLICATIONS: SOME REFLECTIONS

A central aspect of WP6 is to gather reflections and suggestions from members of the project's Policy and Decision-making Forum and the ENERGISE consortium as a whole. This is with regard to the potential and relevance of Living Labs and other sustainable energy consumption initiatives for policies for energy demand reduction and, more particularly, for implementation of the EU Energy Union Action Plan. These insights may be refined later by analysis of data from surveys, interviews and workshop interactions with living lab participants, which is not available at the time of writing. What is available is data from PDF members who completed a question template in November-December 2018 and attended an online workshop in January 2019. In addition, a session with consortium members at an ENERGISE project programme meeting held in Budapest, in January 2019, discussed the findings and insights from the foregoing. The following reflections are drawn from these multiple data gathering and discursive processes.

The generally shared view is that initiatives such as the ELLs are potentially transformative and of practical benefit to policy and lay actors, whilst facilitative of co-produced, interdisciplinary and action-oriented social scientific energy research. The ENERGISE living labs have the potential to produce policy-relevant findings and support evidence-based decision-making especially locally. However, more support would be needed for local policy makers and other actors to utilise these findings and knowledge and more effort would be needed to enhance decision-making processes that transcend existing boundaries between actors.

Energy living labs such as our ELLs can be considered as a kind of governance innovation *per se* and thus afford the opportunity to learn about new forms of (energy system) governance. Living labs can be employed as a means by which to conduct small-scale testing of a particular research result, methodology, approach and/or product, the outcomes of which can then inform subsequent attempts at scaling up, replication or transfer. They can facilitate multi-stakeholder and/or cross-disciplinary cooperation and discussion, while providing a safe and empowering environment for household participants to provide valuable feedback on certain approaches, methods, products, etc. The employment of a co-creation approach, such as in the ENERGISE living labs, allows integration of social scientific research and innovation processes and practices occurring in real life communities and settings. It points the way to a more open, collaborative approach to research and innovation, involving professional researchers and a range of other partner actors.

Living labs can provide insights and understanding about practice-oriented (i.e. as distinct from 'behaviour') change and can develop action plans on lifestyle changes that can be readily implemented by stakeholders and partners. They can test proposed measures, which is helpful for policy makers, who prefer solutions over problems. Moreover, they are

performative and visible, which also supports policy interest and adoption, and they provide policy makers with encouragement that issues can be solved.

Living labs may be used in different stages of the policy development process: identification of problems; preparation of the policy and testing various approaches and/or acceptance; consultation; and finally implementation and communication. They can provide a good way of testing and getting feedback on policies still in their developmental phase; they may be used to test and compare different approaches and methods for policies. Finally, they may also be used to get initial support from (for example) early-adopters for policies, the results of which can then be widely communicated, and the participants can in a way become "social marketers" of the policy. If policy-makers were involved more (actively) in the development of the energy living labs, they could have a bigger stake in learning about, reflecting on and using the outcomes.

The ENERGISE Living Lab findings inform policy-makers about the relative effectiveness of collective vs. individual approaches in targeting energy efficiency issues in households. They also provide information about the responsiveness of different demographic groups and households with different heating systems (e.g. gas or electric in the UK) to proposed intervention measures. Further, they provide insights into the effectiveness of incentives or measures on people's motivation to reduce in-home energy use (i.e. measures such as information provided to increase awareness about environmental issues, financial rewards, or thank you gifts such as veg boxes or aprons). Overall, the findings enrich policy understanding of incentives and initiatives that work better and how to target different groups and types of households recognising the differences in their responses. The living labs reveal issues with domestic energy regulations and other policies applied to domestic buildings and households (e.g. building regulations, energy performance certification, or national roll-out of smart meters). Cross-country comparisons will be useful for understanding what kinds of national initiatives might be more or less effective, which cultures are more susceptible to types of initiatives used, and how much room is there for improving energy consumption practices. Cross-country comparisons also inform implementation of the Energy Union by showing potential differences between EU countries that need to be acknowledged and addressed when developing EU-wide energy policies.

As well as acknowledging the possible beneficial impacts of initiatives like the ENERGISE living labs, our Policy and Decision-making Forum recognise a number of limitations or challenges that need to be addressed if their promise is to be fulfilled. Fundamentally, living lab initiatives such as employed on ENERGISE necessarily are small in scale and/or highly localised. Only limited sets of qualitative and quantitative data are obtained from or generated with a limited number of people from the target group, and because of this, the outcomes may be considered unreliable for policy-makers. Further, it would likely be very costly and human resource intensive to conduct comparative or larger scale studies with greater sample sizes or longitudinality, or broader scope (i.e. to include more aspects of household energy consumption than the domains of heating and laundry examined in the ENERGISE living labs).

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Arguably, ENERGISE living labs open up a space in which households can (with support from other partners or peers) experiment with changing everyday consumption practices, which they can continue in the 'after life' of the ENERGISE living labs. Of course, some modesty is required. Some households will not fully engage with an initiative that they may not see as theirs. Others – those who are pioneers or 'early adopters' - may feel that the project is not ambitious or challenging enough for them. (On the other hand, participants in a number of countries seemed happy to have been enrolled in 'pre-defined' challenges that took them more out of their 'comfort zone' than would have been the case had they defined the challenges themselves). Nevertheless, those participants who take ownership of the living labs post-project can spread ideas and practices to others. It should be noted that challenging practices could backfire and reinforce prevailing (unsustainable) ones. However, the creation of space for households to deviate from existing practices carries with it the potential for 'contamination' – diffusion of the subversion of ingrained practices. This idea of contamination conjures up notions of virus (as in something going 'viral' online). This may not be synonymous with concepts of 'scale' that are so often invoked in energy policy discourse but confers the idea of amplification of living labs on social media. In any case, the ENERGISE consortium notes that there are several different 'scales' of implementation or diffusion of new practices – peer, household, building, municipality, region, and national levels.

Whilst much attention is paid to the design and implementation of national- or EU-scale measures, it may be that actions at other scales offer more flexibility for locally adapted and effective options, more suggestive of eco-systems or networks of energy demand reduction measures and collaborating actors than universal roll-out of centralised state policy. Having said this, in relation to the conventional use of the term 'scale' and the technical design of initiatives, it is apparent that the scalability aspect of energy living labs needed to be addressed more explicitly from the outset of their design. This could be achieved perhaps by better engaging stakeholders beyond the local sites of the living labs. For the collective energy living labs, it seems sensible to invoke "community of place" as a recruitment strategy, although on reflection an active "community of interest" might have provided more shared ground for the participants. Such a stratagem may be beneficial to living lab group solidarity and cohesiveness as well as contributing a sense of ownership in connection with the project/living lab. In an existing, active community, living lab challenges may become the subject of real "community effort". Engaging less active communities or households from 'hard-to-reach' groups requires different approaches (e.g. through NGOs who work with those groups).

Whether initiatives engage already active communities of place, interest (or indeed 'practice'), less active communities or marginalised groups, they need to be mindful that they do not close down the very spaces for citizen creativity and action that they may be trying to open up. Moreover, those sponsoring or executing such initiatives need to be wary of reproducing or exacerbating existing unequal social relations. On ENERGISE, some evidence of this is apparent in interviews with household participants, one of whom referred to not wanting to 'mess up your [i.e. the researchers'] project', thus framing their own involvement more as passive subjects than active energy citizens. Further, the remit, duration and conditions of project funding and the complexity of the project complicated

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attempts to engage with participants in a more open and collaborative manner than is typically the case. Thus the co-inquiry approach set out in the original ENERGISE proposal submitted for funding became in the execution of the fieldwork a more limited form of 'co-creation', restricted to selected elements of living lab challenges. Potential remedies for this lie in the definition of clear evaluative criteria both for projects and initiatives, which may be applied ex ante and ex post and allowing for greater in-project flexibility, with regard to timelines, design and implementation, focal domains and challenges.

A role for qualitative and mixed methods energy social scientists - and energy social science more generally is to mobilise insights from projects like ENERGISE, to transform the discourses of energy consumption policy and energy research funding. This could move in the direction of an imaginary emphasising 'softer', more fulsomely engaging research. Such work might be conducted in partnership with civil society, and involve 'real world' experimentation with and changing everyday energy practices and cultures. In this way, researchers should be as concerned with maximising their contribution to policy debates and futures as they are with generating data and recommendations for policy, based on problems and agendas 'given' by funders and policy-making agencies.

# 5. CONCLUSION

The ENERGISE project comprises a number of work packages, the findings of which highlight important issues that need to be addressed in order to design and implement effective sustainable energy consumption initiatives, such as energy living labs. This policy paper has drawn out salient points regarding not only matters of good design and implementation but also in relation to deeper matters concerning the governance of energy consumption and research.

The project contributes new knowledge regarding the types of initiatives that carried out across Europe, highlighting the tendency for policies and interventions that focus on changing individual behaviour, improving energy efficiency and the adoption of new technologies. It is clear that in Europe there is far greater concern with energy efficiency than with realising sufficiency of consumption. Critically, initiatives with a focus on single or interlocking energy user practices are far less prevalent. Our pan-European analysis of sustainable consumption energy initiatives also shows the need for learning across initiatives and between peers. Such learning is something that the design of initiatives needs to cater for more explicitly and effectively in the future.

Thinking instrumentally about what may be learned from the ENERGISE Living Labs, the design and implementation of the ELLs testify to the need for early and clear planning of initiatives. The conduct of the ELLs suggests that a limited number of domains (but more than one) should be included in initiatives, bearing in mind the operational difficulties of addressing a wide range of areas of domestic energy use in a time-limited project and the aim to gain access to inter-locking practices. The number, identity and scope of domains in initiatives may be the product of co-creation with household participants.

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The ELLs show the importance of selecting sites with which implementation teams have some familiarity and of engaging local implementation partners with knowledge of – and in – the local context(s). These local partners can be very helpful in advising on potential sites for energy living labs and assist with recruitment of and engagement with individual and collective household participants. The local partners may also help to ensure the post-project durability of any benefits derived during the 'active' phase of a project, contributing to the embedding and diffusion of positive outcomes. The ELLs point to the benefit of working with households (individual and/or collectively), rather than merely individuals as consumers, in terms of gaining to access to everyday practices and operationalising challenges to practices and analysing the factors which enable or inhibit changes in energy practices and cultures. However, timing is not something about which unequivocal guidance can be given: seasonal coincidence has the advantage of, for example, being able to gather practice data and operate challenges at the most relevant time, say in winter in relation to heating practices. However, there appears to be a benefit in a phased approach. So, to take the example of the heating domain, first one introduces participants to the project and agrees with them the extent of the challenge to reduce or switch off the thermostat at a time when outside temperatures are still relatively warm. This allows participants to instigate a change in practice, which may then be carried over into the period when cold weather eventually arrives and the domestic heating is turned on or used for longer periods each day. The relatively short time periods of active ELL phases (less than three months) and SECIs in general suggest that more attention needs to be given to post-project legacy and durability, or that funding should be available to conduct longer practice-focused initiatives.

As stated previously, the paper is concerned that researchers and others should not get bogged down in instrumental questions pertaining to how to design living labs. Certainly, there is a need to stand back and reflect on the purpose and wider impact of projects such as ENERGISE. Here, it is argued that appealing to an alternative imaginary, informed by problem framings drawing on a practice perspective, leads to a new understanding of potential policy options and sustainable energy consumption initiatives. The new focus would shift from a preoccupation with technical innovation, consumer choice and encouraging individual sustainable behaviour. Instead, the fundamental concern should be with diagnosing social practices around energy (re-crafting practices, substituting practices, and changing how practices interlock) and then challenging those. The alternative imaginary emphasises changing energy practice cultures and participatory governance, based on a civic epistemology valuing experimentation and the co-creation of knowledge with active participants, who are no longer merely passive research subjects. The question remains as to how to fully realise this imaginary, given prevailing patterns and processes of research funding and policy and assumptions about (social) science and what it entails, which actors reproduce even as (some) try to transform them.

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