Towards a practice-theoretical classification of sustainable energy consumption initiatives: Insights from social scientific energy research in 30 European countries

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Abstract

Reducing residential energy use and related CO_2 emissions across society requires approaches that understand energy demand as dependent on the performance of a range of interconnected social practices, which includes aspects of timing, location and material contexts. However, current energy policy and change initiatives often rely on a somewhat narrow combination of rational consumer choice models, efficiency measures and information-based behavioral change theory, thus falling short on anticipated reductions (EEA, 2013). Insights from the ENERGISE project highlight the merits of a practice-theoretical approach to social scientific energy research that explicitly recognizes complex interactions in the social organization of everyday life. The paper demonstrates how such an approach provides knowledge on variations in energy use across households, social groups and societies and how these are (not) acknowledged in the problem framings of dominant energy policies and change initiatives. Reflecting on experiences made during a large-scale comparative analysis of sustainable energy consumption change initiatives in 30 European countries, this paper presents a new and innovative methodology for investigating the dynamics of change initiatives that target energy use within households and communities. It concludes with some critical reflections on the methodology presented.

Keywords: energy consumption, problem framings, change initiatives, energy policy, social practices

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1. Introduction

It is widely accepted that the well-being of human and other species now and in future generations is vulnerable to the effects of anthropogenic climate change and that urgent adaptation and mitigation measures are required (IPCC, 2014). This mandates for a fundamental change in existing systems of production and consumption and energy use as recognized by, for example, the UN Framework Convention on Climate Change conferences and agreements (e.g. COP 21, Paris Agreement). Despite a rapidly growing body of innovative social scientific energy research (e.g. Fox *et al.*, 2017; Heiskanen and Matschoss, 2016), its methods and concepts remain underutilized in conventional energy research (Sovacool, 2014; Sovacool *et al.*, 2015). Similarly, efforts to develop and implement change initiatives have often neglected important social-scientific insights in favor of 'hard' climate science (Castree, 2016). Responding to recent calls for a broadening of horizons concerning the role of social science in understanding and potentially changing human aspects of climate change (e.g. Castree *et al.,* 2014; Castree, 2016; Geels *et al.,* 2016; see also editorial to this special issue), this paper responds to three specific points from the debate.

First, there is a plurality to social scientific theories and concepts that is often overlooked, which limits the potential contribution that these could make to climate change research and policy. Indeed, as Castree (2016, p731) asserts, 'claiming to "accurately" understand human thought and action "in context" only works if one ignores the many theoretical, methodological, analytical and normative approaches available to comprehend society'. This calls for frameworks that draw on various, convergent ideas about the embeddedness of human thought and action. Second, in methodological terms, an appreciation of the plurality of social science approaches to investigating 'social aspects' of climate change also means to recognize the broad range of assumptions undertaken, and positions adopted, regarding the design and execution of research. Recent contributions to the debate recognize that this plurality may embrace normative as well as epistemological and ontological consideration (Castree, 2016; Fox *et al.*, 2017). In addition, they may concern assumptions about inter-, multi- or cross-disciplinarity, researching or engaging with non-specialist researchers, or the impact or policy integration of social science findings (Rau *et al.*, 2018). Third, this has implications for the type of analytical inquiry that researchers engage in. To take one particular topic of inquiry, numerous small-scale studies have shown that reducing residential energy use and related CO_2 emissions across society requires approaches that understand energy demand as dependent on multiple aspects such as timing, location, context, materiality and performance of a range of interconnected social practices (e.g. Shove and Walker, 2014; Heiskanen *et al.*, 2018). A growing body of literature, which calls for change initiatives to be carefully designed to the context, or situation, which they seek to influence (Castree, 2016), complements this. Thus, there appears to be an urgent need for methodologies that explore and 'unpack' notions of contexts across initiatives (Heiskanen *et al.*, 2018).

There is an emergence of research projects and networks that explore the options of drawing on a range of social scientific understandings of energy efficiency and energy consumption, such as SHAPE ENERGY[1] and EUFORIE[2], as well as global networks such as the Future Earth Systems of Sustainable Consumption and Production Knowledge Action Network[3]. Building on similar discussions, this paper contributes to the development of methodologies for energy research that clearly demonstrates: (i) the value of social scientific inquiry into the content and scope of existing sustainable energy consumption initiatives; (ii) an explicit discussion of the assumptions that underpin existing inquiries into 'social aspects' of energy consumption; and (iii) a particular focus on exploring and unfolding the role of problem framings and related 'contexts' in which these sustainable energy consumption initiatives unfold. The methodology and discussion presented is established by drawing on research undertaken by the authors (and others) in the framework of the ENERGISE project[i].

This paper presents a new and innovative methodology for reviewing and classifying a large set of existing sustainable energy consumption initiatives (SECIs)[4] in Europe. Specifically, it discusses how a social scientific approach has been developed to highlight and unpack a range of aspects connected to energy consumption, including cultural, social, discursive and material aspects of SECIs. In doing so, we particularly focus on unpacking implicit (and multiple) *problem framings* at play in SECIs, and how these are reproduced in objectives, methods, types, strategies for intervention and (expected) outcomes.

Problem framings are closely linked to how energy consumption is understood, and how sustainable energy consumption initiatives are designed and expected to unfold. Exploring these problem framings thus allows us to understand what exactly these initiatives are expected to change, and how. This essentially lends a hand to exploring in which way human action is understood and accounted for in change, and what role human action is assigned (or not) in change processes. As the discussion unfolds, we also reflect on the methodological assumptions and approaches that have guided our research, the challenges posed in relation to our understanding(s) of the topic or problem at hand, our views of knowledge-production, research design, and the ways in which we work across disciplines and engage with non-specialists and users of the research.

[1] https://shapeenergy.eu/
[2] http://www.utu.fi/en/units/euforie/Documents/EUFORIE-leaflet-2017.pdf
[3] http://futureearth.org/future-earth-sscp
[4] SECIs in the ENERGISE project are defined as activities that deal with reducing energy-related CO_2 emissions from households either in terms of reducing the actual energy consumption, or substituting fossil fuels with renewable energy sources; and, in both cases, with the active involvement of households. This definition is elaborated further in Section 3.

The paper proceeds as follows. Section 2 presents the conceptual framework for the methodological development. Subsequently, the practical aspects of developing the methodology are discussed in Section 3. Section 4 highlights a number of opportunities for empirical inquiry made possible through the methodology. Section 5 discusses the problems of method in more detail, followed by a set of conclusions in Section 6.

2. Theoretical and conceptual framing for making enquiries about energy consumption

Despite significant efforts by the EU, as well as national and municipal governments, to reduce domestic energy use over the last twenty years, the prevalence of traditional problem framings, that have typically relied on a combination of rational consumer choice models, efficiency measures and information-based behavioral change theory, has undermined the delivery of anticipated reductions (EEA, 2013). The variety of ways in which households, researchers, organizations and civil society approach the challenge of reducing domestic energy use needs to be explicitly recognised in order for critical thinking to take place about the different ways in which SECIs can be developed and implemented. In this regard, a large body of literature has highlighted the underutilization of various social science methods, concepts and topics when faced with contemporary questions related to energy consumption (see Sovacool, 2014 for a recent systematic analysis of social-scientific energy research).

Theories and problem framings produce particular forms of knowledge about the spaces in which change can or will come about. It is often argued that a 'sound evidence base' is central to the formulation of successful sustainable consumption policy (Scholl *et al.*, 2010, p46). However, the dominant focus on technical data in much energy research produces particular forms of 'evidence-base', often contextualized by a narrow palette of social science knowledge (e.g. behavioral economics) (Lavelle and Fahy, 2016; Foulds *et al.*, 2017). Observations from the ENERGISE project highlight that a broader social-scientific approach that recognizes the complex interactions and cultural conventions of everyday life, can produce relevant knowledge on variations in energy use across households, social groups and societies, as well as their links with energy governance and policy (Rau and Grealis, 2017). The following sections will elaborate on this issue.

2.1. Energy consumption as a consequence of social and material organizations

In contrast to individualistic rational choice models, the view of energy and resource use as a result of ingrained and normalized everyday practices and routines, performed by people in particular socio-cultural contexts, is gaining greater prominence in academic discourse (e.g. Heiskanen *et al.*, 2010; Røpke, 2009; Fox *et al.*, 2017). A number of studies has considered the social, cultural and organizational aspects of

people's (social) engagement in more or less energy-intensive activities (e.g. Gram-Hanssen, 2011; Lavelle *et al.*, 2015; Jensen, 2016). Additionally, detailed socio-material studies about how domestic energy demand changes with the introduction of new technologies, energy sources, or appliances have also been undertaken (Bartusch *et al.*, 2012; Moran *et al.*, 2016). Recent calls for a greater attention to practice-theoretically inspired research stem from its ability to provide valuable insights into the timing, location, cultural context, materiality and performance of a range of interconnected practices related to (energy) consumption.

At the same time, challenges presented by a practice-theoretical approach have been acknowledged, including the difficulties of observing embedded motivations behind the performance of practices. Spurling *et al.* (2013) use an iceberg analogy to describe how the reasons behind the performance of practices typically consist of both tangible aspects that lend themselves to immediate observation (see Watson, 2012; Dijk and Parkhurst, 2014), and deeper, and for the most part unobservable aspects. Taken-for-granted norms and conventions, political and economic conditions and institutions, the availability, presence and prevalence of particular technologies and infrastructures, as well as inherited practices and traditions often remain hidden, when attention is paid only to observable patterns of behavior (Shove, 2010; Rau and Grealis, 2017). To explore and incorporate into analysis these hidden aspects of practices, innovative and integrated forms of social inquiry are required (Spurling *et al.,* 2013; Fahy and Rau, 2013; Davies *et al.,* 2017).

Several dimensions need to be taken into consideration when seeking to address 'hidden', albeit formative, aspects of energy consumption, all of which correspond to the idea that energy use is to be understood as an outcome of particular practice configurations (Shove *et al.*, 2012). Such dimensions could be material configurations and processes of legitimization of particular energy intensive ways of life (Genus and Jensen, 2017), configurations of discursive practices, or cultural ideas of what constitutes 'the good life' (O'Neill *et al.*, 2018). Here, the issue of spatial scale lends an important delimitation to such inquiries, as insights into existing practice configurations that the SECI seeks to correspond to or intervene in are tied to particular cultural and possibly geographical 'contexts' in which they are uncovered (Hui and Walker, 2017).

Ultimately, what is needed is a new conceptual and methodological appreciation of the socio-cultural aspects of collective energy demand and variations in how energy is generated, distributed and used both within and between particular sites (Hui and Walker, 2017; Shove *et al.*, 2012). This has implications for the ways in which 'contexts' of energy consumption are understood and conceptualized, including dominant problem framings related to how, when and where change initiatives are expected to come about. It also highlights the need for methodologies that facilitate inquiries into problem framings in both completed and

ongoing sustainable energy consumption initiatives. Their deployment in empirical studies will not only allow for a classification of such change initiatives but enable explicit inquiries about what can be viewed as 'contexts' for particular SECIs and their scope, aims, methods and outcomes. Thus, a further elaboration of how problem framings can be unpacked and explored is required.

2.2. Problem framings related to energy consumption and resulting sustainable energy consumption initiatives

The way that energy consumption is understood to be a challenge in particular research-designs or action initiatives is tied to what can be termed as problem framings (Spurling *et al.,* 2013) or theories of change (Heiskanen *et al.*, 2018). Problem framings or theories of change reflect the underlying ideas about how change can come about, as well as what kind of change may come about. For example, popular problem framings in current EU energy policy often prioritize a reduction in the resource intensity of existing patterns of consumption through technical innovation and optimization. This assumes that solutions can be 'surgically removed and replaced by other solutions, seamlessly entering the social tissue where they are installed, without causing any change but reduction in energy inputs' (Labanca and Bertoldi, 2018, p496). However, conceptual frameworks challenging sustainability problem framings that focus exclusively on technological fixes and traditional theories of individualistic behavioral change are emerging. For example, Spurling *et al.* (2013) provide an instructive theoretical framework for analyzing sustainability challenges from a practice perspective. Introducing six distinct categories, these authors distinguish between more common policy interventions based on technological innovation, shifting consumer choices and behavioral change, to those that involve a re-crafting, substitution, or change in the interlocking of existing practices.

Table 1: Six ways in which the sustainability challenge is framed (adapted from Spurling *et al.* (2013))

Problem Framing	Target of Intervention
Common framings in current policy interventions	
1. Innovating technology	Reduce the resource intensity of existing patterns of consumption through technical innovation and optimization
2. Shifting Consumer Choices	Encourage consumers to choose more sustainable or energy efficient products
3. Changing Behavior	More broadly, encourage individuals to adopt more sustainable behaviors and discourage them from less sustainable behaviors

Framings drawing on a practice perspective	
4. Re-crafting Practices	Reduce the resource intensity of existing practices through changing the components which make up those practices (meanings, skills and materials)
5. Substituting Practices	Replace less sustainable practices with more sustainable alternatives, with an eye to how alternative practices can fulfill similar purposes
6. Changing how Practices Interlock	Social practices interlock with each other – for example, mobility, shopping and eating. Changing the way they interlock means exploring and harnessing the complex interactions between practices, so that change ripples through interconnected practices.

Practice-theoretical problem framings such as these clearly promote a new understanding of the dynamics of consumption, highlighting different opportunities for change and implying an in-depth understanding of multiple aspects that affect the stability, and sustainability, of practices over time (McMeekin and Southerton, 2012; Jensen, 2017; Greene and Rau, 2018). In addition, they introduce novel questions about what to include in sustainable consumption policies and change initiatives. For example, long-standing institutions or well-established cultural conventions that operate at various spatial scales may stabilize particular sets of practices (Genus and Jensen, 2017). In understanding how sets of practices are configured in particular spaces or places, inspiration may be drawn from a framework for understanding the local configuration of practices developed by Kemmis *et al.* (2014) who consider the local (site-based) configuration of practices and how this configuration is enacted, with practices understood as interrelated and held together in so-called ecologies of practices.

The following section details the practical steps taken by the ENERGISE research team when developing a corresponding methodological framework for investigating 1,000 SECIs across 30 European countries. This section also includes a more detailed account of how ENERGISE defines SECIs, as well as the phases through which data has been collected on SECIs.

3. Practical steps taken in developing a methodological approach for assessing SECIs

3.1. Defining SECIs

In ENERGISE, SECIs are defined as activities that aim to lower energy-related CO_2 emissions from households by either reducing actual energy use, or substituting fossil fuels with renewable energy sources. To capture initiatives that would go beyond purely technology- or supply-oriented measures and to inspire the development of a Living Lab methodology later on in the ENERGISE project (Heiskanen *et al.*, 2018),

active involvement of households was set as a requirement for the inclusion of SECIs in our analysis. Initiatives led by companies or energy suppliers that actively targeted and mobilized households could also be included.

To facilitate empirical enquiry across a large variety of initiatives seeking to achieve the same goals of reducing energy consumption or carbon emissions, we deliberately applied a rather broad definition of a SECI. In particular, the differences between individual and collective aspects of initiatives were seen as important from a social practices perspective. To ensure consistency in data collection, guidelines were developed to identify relevant SECIs. A number of different householder roles were considered relevant for ENERGISE (e.g. consumers, 'prosumers', co-producers, innovators, investors), depending on the practices these householders engage in.

3.2. Phases of data collection

In order to identify and assess SECIs and details about their scope, aims, methods and outputs, two primary phases of data collection were designed and undertaken over the course of six months. The first phase of data collection involved developing a database of over 1,000 SECIs across 30 European countries, which together comprise a multifaceted overview of the vast variety in scopes, scales and objectives, types and methods of interventions and outputs of SECIs across Europe. In order to undertake an overall identification and assessment of the SECIs, a database template was developed through which specific aspects of each SECI could be explored and described (see Table 2). The categories included in the database template were inspired by conceptual frameworks and analytical interests as described in Section 2, with specific attention to establishing a framework that would enable empirical inquiry related to how and to what extent particular 'contexts' of energy consumption were considered in the SECIs. Categories were also defined to explore the SECIs in terms of whether, and if so, how, they take social practices as targets for intervention for sustainability, rather than individual behavior, 'choice', or technical innovation alone (Shove, 2010; Spurling *et al.*, 2013; Shove and Walker, 2014). Thus, the database enables an exploration of the 'problem framings' within which actors (including initiators, partners, funders, etc.) in the SECIs might operate. Throughout the development process, the database template went through extensive feedback cycles among all ENERGISE partners, ensuring that the diverse experience and expertise of the ENERGISE consortium would be utilized. In total, 30 categories were defined and included in the finalized database template for data collection. These categories, and the knowledge they help produce, are presented in Section 4. For practical reasons, and to ensure consistency, all categories were described in a short and instructive way, to make sure that the aim and intention of the category was as explicit as possible for the purpose of data collection. Where appropriate, categories were coded with a list of multiple-choice

answers, which the researcher could pick from. Examples of these categories are 'scale', 'type of funding', and 'target area'. However, it was always possible for the researcher to add another answer if needed. Other categories enabled free-text answers, where the researcher would have to write a short answer. Examples of such categories are 'objectives', 'methods of intervention' and 'outputs'. This structured provided consistency in data collection, whilst still allowing for surprising/unexpected findings.

The second phase of data collection involved more in-depth qualitative analysis of 80 cases selected from the larger database. These cases were chosen based on two primary criteria. First, towards achieving the objectives of the ENERGISE project in terms of providing a catalogue of diverse examples of SECIs that include best practice examples of focusing on individual or collective aspects of energy consumption. Second, their compatibility with the conceptual framework, inspired by Spurling *et al.*'s (2013) problem framings that draw on a practice-perspective (see Table 1). An example of an initiative selected on this basis might be one where energy consumption is understood as a consequence of everyday practices such as making dinner or travelling to work, as opposed to addressing energy consumption as an issue in and of itself without addressing any explicit 'contexts'. Additionally, SECIs included in phase two were subject to nominations, discussions and feedback sessions among all ENERGISE partners. As with the database, a template was agreed for in-depth reporting on these cases. The sections included in this second template were explicitly focused on elaborating the semantic, material and social spaces within which the SECI operated, and, in turn, established (intentionally or not), for the intended goal of the initiative (Kemmis *et al.*, 2014). Therefore, the framework explored material, discursive and social aspects of each SECI, as well as additional information of methods and type of intervention and the role of householders.

The categories developed for the assessment of existing European SECIs are presented in Section 4. For illustrative purposes, Sections 4.1 and 4.2 describe a selection of these categories in more detail, focusing on elaborating what they make possible to investigate, and why that is important according to the points of debate presented in the introduction of this paper. This includes an elaboration of the inter-relations between the categories in the database (for the first phase of the data collection), but also how the categories for in-depth descriptions (the second phase of data collection) were developed based on initial assessments of the database.

4. Assessing SECIs: categories for empirical enquiries

The template used in the first phase of data collection (Table 2) incorporates a multiplicity in scope, aim and range of analytical categories, which were developed as a result of various social scientific understandings of energy consumption (related to geographical, cultural and social practice theoretical underpinnings, see Section 2). Section 4.1 provides examples of what type of knowledge these categories

might produce, and why that knowledge is pertinent for the further work of categorizing SECIs in terms of their problem framing, as well as how they consider contexts in which they unfold. Section 4.2 presents in more detail how particular SECIs, reviewed and documented through the first phase of data collection, have been elaborated in the second phase of data collection in relation to the semantic, material and social spaces within which they operate.

Table 2: Overview of the 30 categories developed as well as the empirical enquiry they enable (knowledge production).

Category	Knowledge Production
1. Scale of the Initiative	Inquires about whether a SECI is locally situated, regional, national or cross-national. Provides context for the SECIs' objectives, methods of intervention as well as (elements of) the outputs.
2. Brief description	Inquires about scope and aim of the SECI, based on the way initiators and other actors are presenting the initiative. Provides insights into what the SECI aims to achieve, as well as why and how this will occur.
3. Objectives	Inquires about objectives of the SECI, which are (often) linked to the description (category 2) of the SECI. Explicitly observing and stating the objectives of the SECI, as presented by key actors involved in the SECI, provides further information about the aim and intention of the SECI.
4. Target group(s)	Inquires about the target group of the SECI. This provides an understanding of the people with whom the SECI envisages to work. Exploring this factor helps to develop an understanding of the means through which the SECI-initiator believes sustainable energy consumption will come about.
5. Target building type	Inquires about the type of residential building that is targeted, which also helps explore some of the (implicit) assumptions behind a SECI. For example, targeting single-family houses (semi-detached or detached) and households versus targeting people in apartment buildings may imply different assumptions about different aspects of agency.
6. Target ownership status	Inquires about targeted ownership status, which is closely connected to categories 4 and 5. Whether a SECI targets tenants or homeowners may reflect specific ownership patterns in the specific country, but it may also reflect different assumptions of the

	types of change that can come about depending on ownership status.
7. Target area	Inquires about whether a SECI is targeting and/or implemented within a rural or an urban context (or both), as the material, social and discursive conditions for the SECI may vary.
8. Target number of households	The number of households targeted can reveal distinctions about the aims and scope of the SECI, including whether tapping into aspects of social organization is an explicit part of the initiative. This data can inform our understanding of the problem framings employed by the actors involved.
9. Actual number of households	Inquires about how many households have actually been involved in a SECI, compared to the targeted number of households (category 8). For instance, potential problems regarding recruitment and how they have been overcome are particularly interesting to explore.
10. Funding allocated	Inquires about amount and type of funding. This is relevant in terms of assessing the (local) conditions for the SECI; whether it is general or relatively unique (is the funding unique/rare), who the partner(s) is/are.
11. Primary funding Source	Inquires about the primary funding source, which is directly related to category 10. It is interesting to know what the primary funding source is and whether it is the only funding source, which may contribute to an understanding of the motivations behind the SECI.
12. Other Funding Sources	Inquires about other funding sources, which is directly related to categories 10 and 11, and informs considerations relating to partnership and governance.
13. Outputs	Inquires about outputs of the SECI and the way that the actors involved describe these. Exploring what kinds of outputs that are promoted and reported on, and how they are verified, may provide insights into problem framings.
14. If outputs are measured	Inquires about whether and how the outputs are measured. This relates to category 13.
15. Indication of type of outputs	Inquires about type of (measured) output. For example, if the outputs are measured in monetary values it may suggest that people are defined as rational decision makers driven by monetary incentives. Directly related to categories 13 and 14.
16. Timeline	Inquires about timeline for the SECI. This provides insights into the duration of the SECI,

	but also the extent and orientation of the SECI. Timelines may be defined by different actors (e.g. funder, initiator) and may give rise to limitations.
17. Duration and type of household involvement	Inquires about the duration, type and extent of the involvement of households, which provides insights into dynamics that might lead to changes in consumption patterns.
18. Resources committed by households	Inquires about whether households are committing to make available certain resources such as money, time and effort. This may have an impact on the quantity and quality of participation.
19. Type of Initiator	Inquires about type of initiator. This is an important part of assessing the broader motivation and objectives of the SECI, governance issues, and potentially the outputs. It is interesting to assess what the initiator brings to the SECI in terms of power, legitimization, material and social conditions for change.
20. Type of consumption targeted	Inquires about the type of consumption targeted (e.g. heating, lighting). This provides insights into what the various actors, including the supporting funder, understand what energy is for. Such enquiries help to explore the involved actors' theories of change. Closely related to categories 3, 13, 14 and 15.
21. Consumption change	Inquires about the type of change various actors, including the funder, are promoting (e.g. more efficient products), and what the initiator takes to be the target of intervention. This is closely tied to category 20 and is interesting in relation to category 22 (how change is understood also depends on how it is measured and vice versa).
22. Evaluation methods	Inquires about how the intervention is designed and evaluated. Can help develop an understanding of the theories of change at play in the SECI. This is related to categories 13, 14, 15 and 20. It is interesting to assess what is set up as requirements for a 'successful' SECI by the SECI initiator(s) and other actors involved.
23. Indication of whether initiator found SECI successful	Inquires about whether the SECI is regarded as successful by the initiator; this relates to categories 3, 13, 14, 15, 20, 21 and 22. Assessing whether the initiator considers the SECI to be successful or not, and comparing that to the objectives, outputs and changes in consumption gives an indication of the problem framings within which the initiator (and related actors) might be operating.
24. Method of interventions	Inquires about goals and objectives of the SECI. This is interesting on a practical as well as on an analytical level. This relates to categories 3, 13, 15, 20 and 21.

25. Type of change	Inquires about whether a SECI assumes social practices as targets of intervention, or whether SECIs consider attitudes, consumer choices or technological innovation as the target of intervention.
26. Community aspects	Inquires about whether a SECI assumes certain aspects of community. This is important in terms of assessing any potential, explicit considerations about the sociology of consumption.
27. Information or Interaction based	Inquires about whether methods of intervention are information- or interaction-based. This provides an understanding of whether any social aspects of change are considered and explicitly addressed in the SECI. This relates to category 26.
28. Incentives	Inquires about whether any kinds of incentives were included in the SECI, and if so, which type (e.g. financial reward, gifts). This relates to categories 13 and 21.
29. Rebound effects	Inquires about whether rebound-effects appear to occur. This is important as it helps to explore the nature, extent and potential reason for rebound effects. Related to categories 13, 21 and 24.
30. Spin offs	Inquires about whether and how the outputs of a SECI are dynamically embedded in wider systems of practices. Inquiries are made as to whether any explicit and potentially unintended changes (positive or negative) have happened as a result of the SECI. Can be compared with data from categories 21, 24 and 29.

4.1 Types of knowledge produced by categories – key examples from the database

The categories briefly described in Table 2 allow for particular types of empirical inquiry and so produce knowledge about particular aspects of SECIs and their dynamics. Exploring how a SECI is described to different audiences is required to get a sense of the scope and aim of the SECI. The descriptions provided in the database are based on the way that initiators or other actors are presenting the SECI (mostly through archival material), thus providing some insights into what the initiative aimed to intervene in, as well as why and how particular changes might come about. Descriptions from the database show that SECIs carried out on a local scale are often quite specific in what they aim to change. Larger SECIs (national or cross-national) often describe their aim as developing models for the sharing of learning, or for up-scaling initiatives previously carried out at a more local level. The particular ideas about what is being intervened in and why (i.e. problem framings) are not necessarily explicit from descriptions alone, but can often be traced in presented objectives. For instance, there is a qualitative difference between seeking to encourage

'*collective learning, social connections, economic and social assistance in terms of sustainable urban neighborhoods and improving quality of life*' compared to '*financing home improvements related to insulation and ventilation and efficient heating*' (examples from ENERGISE database).

As described in Section 2, the spatial dimension of scale in which analysis is performed lends an important delimitation to exploring existing practice configurations that the SECI seeks to correspond to or intervene in, as these are tied to particular cultural and possibly geographical 'contexts' in which they are uncovered (Hui and Walker, 2017). Therefore, inquiring as to the size and general location of a SECI is interesting as it may help to understand the SECIs objectives, methods of intervention as well as (elements of) the outputs, and allow for comparison between other SECIs with similar or different scales of intervention. For instance, there may be a qualitative and quantitative difference between a SECI that has developed locally and a SECI that is targeted and implemented on a larger scale nationally or cross-nationally. Equally, it is interesting to explore potential differences between outputs of cross-national SECIs across different countries or cultures. In addition, exploring whether a SECI is implemented in a rural or an urban context (or both) is important, as the material, social and discursive conditions for the SECI can be expected to be somewhat different depending on whether a rural or an urban backdrop is present. The number of households targeted can provide further details about the aims and scope of the SECI and can inform our understanding of the problem framings employed by various actors. There may also be requirements from funding partners, revealing certain, potentially conflicting, assumptions. In order to explore to what extent social organization is explicitly part of the SECI, the targeted number of households can be compared to the scale and the objectives of the SECI. As an example, a Danish project, initiated by an energy provider, seeks to reach many households, but plays on the social aspects of sharing information, experiences and perhaps social pressures, via social methods. Another SECI seeks to target a broad range of households by targeting several communities (such as housing associations). In contrast, other SECIs target many households by promoting energy-related renovations, but do not necessarily tap into aspects of social organization or matters of locality.

Exploring the types of building (as well as ownership status) may equally reveal particular aspects of embedded problem framings. For example, from the ENERGISE database, there appears to be a tendency to set goals such as 'self-sufficiency', 'energy efficient buildings' and 'sustainable citizenship' for SECIs targeting (semi-) detached houses, whereas there is a greater tendency to set goals such as 'changes in behaviors', 'promotion of co-ownership', 'reducing costs' and 'empowerment' across SECIs that target apartments and apartment blocks. In addition, knowledge about the amount and type of funding is relevant in terms of further assessing the (local) conditions for the SECI. Potentially this insight can support

an understanding of what the aim and objectives are. For example, if the SECI is funded by a municipality or a local organization, it suggests that the SECI is relatively locally oriented and may seek contextually appropriate solutions to local issues. In contrast, if the SECI is funded by an energy supplier or national government, the SECI may target a regional or national context, but may also have more narrow sets of objectives related directly to energy use. For example, the Energy Team Heerlen initiative funded by the Dutch municipality Heerlen involved twenty volunteer energy coaches on unemployment benefits and aimed at reducing household energy use as well as re-integration into the labor market. In comparison, The Dutch Perspective (Perspektief) Project, funded by the national ministry, very specifically addressed household energy use (in and of itself) as a target of intervention.

The reported outputs of the SECI also provide crucial insights to what the initiator, as well as the funder, takes to be a relevant target of intervention. There can be a variety of outputs including more energy efficient buildings; an increase in energy efficient appliances; more energy-efficient use of appliances; changes in consumption patterns, etc. Therefore, exploring what kinds of outputs that are promoted and reported on may provide insights into the problem framings of the SECI. Where outputs are measured, it is interesting to explore how they were measured, verified and reported. For example, if the outputs are measured in monetary values it may suggest that people are defined as rational decision makers driven by monetary incentives. If the outputs are measured in changes in use, it may suggest that the initiator values changes in routines and habits as crucial for sustainable transition.

Exploring the duration, type and extent of the active involvement of the households provides insights into dynamics that might lead to changes in consumption patterns, but it also lends inspiration to the design of future SECIs. Exploring to what extent the households are committing to making available certain resources is interesting and relevant for the development of other SECIs but also for assessing the 'accessibility' and aim of the SECI. For example, if households commit to spending money in a SECI, it is relevant to know the mechanism through which this happens, such as a joint purchasing scheme as a result of a new, dynamic relationship between actors in several sectors (e.g. banks, energy providers and municipal representatives, as in many Energy Services Company (ESCO)-based SECIs), or whether it is based on a more traditional approach where SECIs assist households with reimbursements of potential costs associated with home energy improvements. Each approach reveals something about the scale of changes encouraged, whether it is understood to be a matter of individual households and their economy, or whether a SECI seeks to change dynamics between practices across sectors.

Assessing the type of initiator is an important part of assessing the broader motivation and objectives of the SECI. It is interesting to assess what the initiator brings to the SECI in terms of governance and material

and social conditions for change. Further, considering the primary initiator in relation to other categories about types of funding may reveal how successful an initiator and other involved actors have been in securing (long-term) support from other actors. Additionally, explicitly exploring whether the initiator is a research institute, university, municipality, energy provider, etc., may provide meaningful insights into what academic, practical and policy-related problem framings are being reproduced in the SECI.

Focusing on the type of consumption targeted provides insights into how various actors understand energy use. Consumption change can be characterized in several ways such as 'using greener products' (a greening of existing consumption patterns) or as 'sharing products', 'repairing products' or 'using less products' (a change in the configuration of the consumption pattern: see Rau *et al.*, 2018). In assessing types of change, the database is designed to identify whether SECIs seem to assume social practices as targets of intervention, or whether SECIs considers attitudes, consumer choices, or technological innovation as the target of intervention (Shove, 2010; Spurling *et al.*, 2013). The difference between these two ways of understanding and targeting energy consumption is significant – targeting social practices means employing an understanding of energy consumption as dependent on understanding the timing, location, context, materiality and performance of a range of interconnected social practices, such as the practices that people perform in their homes and as part of their everyday lives, including heating, cleaning, cooking and driving. Assuming technological innovation or consumer choices to be the target for intervention often presumes behaviors to be an outcome of (individuals') attitudes and values, and thus that changes related to energy consumption are primarily a matter of (individuals') attitude and choice (Spurling *et al.*, 2013). In the ENERGISE database, SECIs that understand energy consumption challenges mainly to be a matter of efficiency often report on (actualized) objectives to convince or nudge people to buy more efficient products, whereas SECIs that understand energy consumption challenges mainly to be a matter of unsustainable ways of life, such as resource intensive transportation habits, report on (actualized) objectives of changing social and infrastructural aspects of mobility patterns.

The ways through which the goals and objectives of the SECI are pursued is interesting on a practical as well as on an analytical level. Methods of intervention include campaigns, peer-to-peer learning, community engagement, training, experimentation, monetary incentives, and/or (governmental) legislation. Insights into the various methods of intervention may equally provide insights into the problem framings at play, by understanding what the intervention is targeting, and through what means and purposes. For example, SECIs that focus on social aspects of consumption might have different objectives and outputs than SECIs that primarily draw on legislation, or define motivations for change purely as a matter of monetary incentives. It is equally relevant to assess how the intervention is evaluated, as this can help to develop an

understanding of the problem framings at play in the SECI. Here, it is interesting to assess what is set up as requirements for a 'successful' SECI by the SECI initiator(s), and other involved actors. There may be qualitative and quantitative differences in outcomes related to measuring and evaluating outputs in terms of KWh's saved compared to measuring changes in habits and routines, as well as reporting on discursive, social and/or material changes. Interestingly, as found in an example from Denmark, families involved in the SECI, who mainly participated to save money, left the initiative when the set goal (in terms of savings in KWh) was met, whereas families, who were more actively engaged in broader changes in lifestyles, stayed with the initiative for a longer period and also took part in co-developing the initiative's scope and aim further. Other examples can be found in a Hungarian SECI (Energy-Neighbourhoods) where some families stayed engaged in the project long after having met the set target in reductions of KWhs in order to share their experience with others and help them to save too. Some families found inspiration in the actualisation of particular savings in such a way that they wanted to see if they could save even more. Different households, in different kinds of contexts, experience different possibilities for engaging in energy savings, and the range of these might be important to explore in detail.

4.2. Examples of additional sets of categories for follow-up analyses of semantic, material and social spaces

Following the recording of over 1,000 SECIs in phase one of data collection, 80 SECIs were selected for further exploration. In the selection, a balance was ensured between SECIs that varied in terms of scale, target group, target area and type of initiator. SECIs appearing to employ a type of intervention that represents what Spurling *et al.* (2013) have characterized as re-crafting practices, substituting practices and changing how practices interlock (see Table 1), were considered for further investigation. For example, if a SECI's description and objectives presented an understanding of energy consumption as result of the organization of everyday life, the SECI was preliminarily selected for further assessment. It should be noted that the SECI and its initiator may not themselves have framed methods, types and targets of intervention in a way that corresponds to the problem framings as described by Spurling and colleagues (2013). Nevertheless, it is interesting to learn from SECIs that appear to have employed a nuanced understanding of the social, material, infrastructural and cultural aspects of energy consumption.

The 80 SECIs that were selected for further investigation were elaborated in relation to a set of specific questions that allowed for further interrogation on a number of relevant aspects. For example, in relation to implementation, the following additional questions were asked: How did the SECI start? How were householders enrolled? What process was followed? What kinds of events, if any, were organized in relation to the initiative? When did changes in energy consumption start happening (if they did)? What appeared to have led to these changes? What was the intervention and implementation cost?

Outcomes were also further explored, and several additional questions were asked relating to type and extent of the outcomes, such as whether any measured reductions in energy consumption or emission reductions have come about, and what has been done to obtain these reductions. Additionally, 'norms of reporting' are further explored as well as whether any examples of changes in representations of everyday life can be identified, e.g. whether householders are doing things differently. For example, do they cook differently? If so, what things have changed in the householders' everyday lives that have led to lower energy consumption? These aspects were particularly explored in order to get a more detailed account of any potential changes in practices as a result of the SECI. Additionally, the role of households was explored in greater detail, particularly in terms of the role (individual) household members are 'given' (or perceived to have) by the SECI. Also investigated was how the households have been enrolled in the SECI, and to what extent they have been involved; for example, if they have taken part in designing the SECI, and whether and how they have been engaged in one or more activities.

In all, a more detailed exploration of the selected SECIs in phase two allowed a particular practice-theoretically guided understanding of what may be at play in processes of change toward more sustainable energy consumption. These investigations explore discursive, socio-political and material arrangements that transcend and (re)order the practices that are being (intentionally or unintentionally) intervened in. More details of the specific data collection method, its usefulness, and its application in phase two, are provided below.

The textual and communicative aspects of the SECI

In exploring the cultural-discursive arrangements, or the 'semantic space' of SECIs, a set of distinctive questions was instructive: What seems to be the general framing of the initiative?; How is energy consumption framed as a problem? What do initiators say or write about the problems they aim to solve with the initiative? Does it correspond to the way that householders talk about the problem? Is there any indication that the initiative differs from the norm, and treats energy consumption as a result of social organization rather than as a result of individual actions? With what words are the outcomes/results (if any) described? In what way is the role of the household framed and communicated (e.g. as people living everyday lives, or as rational consumers who like to save money, placing responsibility on either individuals, groups, or society)?

The discursive aspects of the SECI are important to assess in order to understand the underpinnings of what is being said and written, which may provide insights into problem framings at play. As an example, paying close attention to how aims and goals have been textually communicated in the SECI Model SøPassagen, provides interesting insights to what kind of (academically underpinned) discourses the SECI appeared to

rely on. Collective and social aspects of change were emphasized, and words and phrases such as 'motivation', 'ownership' and 'sense of belonging' are used as of importance to achieving the goals of the initiatives. Expressions such as 'community based social marketing' and 'visible participation' reveal aspects of the theoretical or conceptual underpinning of the SECI. Additionally, the initiative is framed through particular terms such as 'engaged and attentive communication', 'collective norms and identity', and 'making a difference'. These terms imply that the SECI understands the challenge of changing energy consumption as something 'collective' that is broader than the individual's own sense of purpose. However, this seems to be based on a problem framing that to some extent ties an understanding of energy consumption and change to be a matter of social psychology and competition. Interestingly, the SECI appears to be reflexive in its evaluation as the partners decided that 'visible participation' as a competitive element makes participants lose interest in the initiative. Therefore, the competitive element was removed.

The physical/technological aspects of the SECI

Making enquiries about the material and technological aspects of SECIs assists in the understanding of parts of the infrastructural underpinning (or condition) of the SECI. Pertinent questions include: Are the material and infrastructural aspects being challenged by the SECI?; Does the SECI seek to make changes independent of the material and technological setting related to the site of the SECI? Will changes happen to the material and technological arrangements in any case? These aspects can be explored through a further set of distinctive questions: What kinds of activities are/are not made possible in the physical conditions of the initiative? Are technologies introduced to households, which enable different ways of using energy or carrying out practices? Are householders asked to stop/start using certain technologies or products? Is the volume of products that householders use targeted?

As an example, a Hungarian SECI introduced new technologies to particular kinds of households that enabled new ways for the households to be connected to cleaner and safer energy supply. The SECI took place in a very poor community where most of the residents live in fuel poverty and are forced to burn illegally harvested wood and/or household waste to heat their homes. In this community, people had no access to the gas mains or any local district heating system, but used their own stoves. Thus, the project was not able to focus on energy reduction through system maintenance or upgrade, but focused on the fuel used. Together with local stakeholders, the SECI organizers discovered that agricultural waste could be used as an alternative, and environmentally-friendly fuel source. In addition, given the high level of unemployment in the community, collecting agricultural waste and turning it into biomass briquettes, using

simple, mostly hand-powered machinery, provided at least temporary employment to members of the community.

Shared understandings related to the SECI

Investigating aspects of solidarity, socially shared understandings and power is important in order to assess particular aspects of the configuration of SECIs. It is interesting to know if the initiator and the householders involved in the SECI share an understanding of what needs to be changed, or whether it the case that they do not agree on this. In this respect, it is relevant to explore potential connections between outcomes of the SECI and aspects of shared understandings (or lack thereof) as well as aspects of power and legitimacy. The socio-political arrangements, or social spaces, through which solidarity and power can be explored, are investigated by considering a set of distinctive questions: Are there shared understandings of what energy is used for between initiators/the SECI and householders? Is there a shared understanding of the role of consumption between actors involved in initiative? What is perceived to be the 'normal' or 'appropriate' way to save energy? How are shared understandings reached and agreed upon?

Exploring notions of shared understandings (or the lack thereof) enabled some interesting findings on contrasting intentions in the Danish SECI Klimafamilier. Many of the resourceful families involved in the SECI were accustomed to a different way of approaching a project, primarily from their own work-cultures, which in this case contrasted the municipality's focus on 'softer' facilitation. The contrasting ways of viewing the intention with the project almost ended the engagement of the participating families, demonstrating that initiatives have to take point of departure in where participants 'are' and what they want to do, from the outset.

In summary, the headings presented and explained above have made it possible to draw on several social scientific understandings of energy consumption and sustainable energy consumption initiatives (as elaborated on in Section 2). The variety and scope of the elements addressed clearly highlights the multiplicity in aim and approach of social scientific enquiries, and in systematically going through what each factor implies regarding assumptions and problem framing positions. Although heavily building on practice-theoretical understandings of energy use, the development of the phase two template has intentionally been closely related to the unpacking of our own theoretical and normative considerations tied to a variety of ontologies at play in our own research team. The elements were developed to guide empirical investigation of a large set of European SECIs and their 'contexts', but they have equally been developed to guide and unpack our own theoretical and analytical 'baggage' and assumptions. This has not been without problems, and Section 5 will go into detail about some of the issues that have arisen.

5. Problems of method? Discussion of possibilities and limitations

While numerous local energy projects examining the topic of consumption have emerged across Europe, including many case studies involving household, community and organizational initiatives, there has been little or no emphasis on linking them to identify similarities and differences and their impact on actual outcomes. As McKinnon *et al.* (2015) rightly argue, '[t]oo many studies go unread. Collate them to enable synthesis and guide decision-making in sustainability' (p185). ENERGISE recognized and responded to this need for extensive synthesis work by developing a methodology that would allow for reviewing and cataloguing a large set of data on European SECIs (phase one of data collection), and that would facilitate detailed empirical exploration of SECIs that seemingly respond to particular types of problem framings (second phase of data collection). However, this process has not been without complications, and the team of researchers faced a number of practical as well as conceptual challenges.

5.1. Dealing with Practical challenges

Some of the *practical problems* encountered include difficulties when (i) capturing cross-European data from multiple sources authored in several languages; (ii) producing a live collaborative dataset that will be useful for other audiences. In order to overcome some of these challenges, several steps were taken:

(a) Approximately 30 researchers from around Europe were involved in gathering data on these SECIs, primarily through desk based online searches, over a six-month period. Prior to the commencement of the online searches, it was ensured that researchers working on reviewing particular countries had the required skills to review national languages, or had specific contacts from the respective country that they could liaise with. For instance, none of the researchers spoke Swedish, but the researcher assessing Swedish SECIs liaised with a local contact. Regular meetings and discussions were held within the research team to ensure that members of the team had a shared understanding of the data categories, and to deliberate about issues of eligibility for inclusion in the database after having piloted the templates, and to improve consistency throughout the data collection process given the different (social) scientific backgrounds within the team.

(b) The dataset is not exhaustive in terms of European sustainable energy consumption initiatives, but it comprises a multifaceted overview of the vast variety in scope, scales, objectives, types and methods of intervention, and outputs of SECIs across Europe. The SECIs were organized according to national origin (or national relation for the cross-national SECIs) and were identified by name, scale, descriptions and objectives. The resultant innovative and comprehensive open access database, while one of the outputs from the ENERGISE project, is

not an end in itself. Rather it provides a searchable public database[5], which relevant scientific and non-scientific stakeholders and audiences can utilize as a resource for research and information on energy initiatives across Europe, as well as continue to contribute their experiences and knowledge, collaborate with others, or collectively challenge a range of practices that require high levels of energy consumption.

5.2. Conceptual challenges

Some of the conceptual problems encountered included difficulties when (i) researching and classifying the quantity of SECIs without risking decontextualizing the SECIs from their specific embedding; (ii) assessing the SECIs problem framings in spite of limited access to (local) initiators and actors involved in the SECIs; and (iii) evaluating what the data and the assessment can and cannot do. To overcome these challenges, several steps were taken, some of which have already been touched upon in Sections 2, 3 and 4. In taking these steps, certain reflections emerged that deserve attention:

(a) In researching and classifying over 1,000 SECIs without risking decontextualization from their specific embedding, the vast number of categories developed to investigate each SECI was deliberately designed to reflect social, material, discursive, organizational and scalar aspects of each SECI. The categories were based on a conceptual framework that was developed as a result of a collaborative process between several researchers. Breaking down the SECIs in different components through 30 categories allows for cross analyses between a range of aspects, but it also allows for complex and nuanced depictions of each SECI on its own. In addition, the data collected through these categories inspires several analyses and recommendations. Allowing for the classification of SECIs to take center stage in some outlets, and the detailed accounts of a selection of SECIs in other outlets, allows for several enquires to be undertaken. The typological assessment of problem framings can be found in Jensen *et al.* (forthcoming). Additionally, a typological assessment of different understandings of resource consumption can be found in Fahy *et al.* (forthcoming). Finally, a resulting review of efforts to reduce domestic energy use across urban areas in Europe can be found in Goggins *et al.* (forthcoming).

(b) The research team experienced challenges in terms of capturing the problem framing of the SECIs for several reasons. First of all, they are often not explicitly recorded and have to be deducted from available documents. Then, as there are a variety of actors and stakeholders involved in most SECIs, it is challenging to decide whose problem framing the SECI design and

[5] http://energise-project.eu/projects

communication includes, for example, the implementer, funder, participants, and, in many cases, a mix of actors. In trying to overcome these challenges, the 'main' problem framing, as it is interpreted to be from the material available on the SECIs, is reported on. The resultant open access database remains open to changes, inviting actors from the reported SECIs to respond and react to our interpretations, and thereby allowing for an iterative and co-creative process.

(c) Although the research team had regular meetings to discuss the conceptual underpinnings of the established categories, as well as the practical challenges of using them for empirical inquiry (delimitation, potential ambiguousness, etc.), it was a challenge that the team, as a collection of social science researchers, draw on slightly different ontological understandings of the dynamics of energy consumption. Even if the team may share the same overall understanding of energy consumption as a result of socially shared phenomena, and, therefore, as a whole may distinguish itself from other social scientific understandings of energy consumption that takes energy consumption to be a matter of individual behavior or psychology, the details in the differences of perspectives had to be negotiated quite substantially before and during data-collection. Even though several social scientific concepts may help people to understand energy consumption as a result of socially shared activities and practices, ontological underpinnings of analytical interests embedded in these concepts have to be convergent.

(d) In any communication about the data collected about the SECIs, it is important to stress that we are classifying the SECIs in accordance with particular social scientific interests. As a consequence, we are able to highlight and bring forward aspects about particular social, material, discursive, organizational and scalar aspects of the SECIs. These aspects challenge existing research fields (e.g. mainstream economics and behavioral psychology) that broadly dominate understanding of human dimensions in leading scientific journals, policy debates, media reporting and public discussions of sustainable patterns of production and consumption. It is not the intention to evaluate the SECIs, but rather to demonstrate certain tendencies in existing SECIs, both in order to bring attention to (hidden) assumptions embedded in SECIs as well as to highlight and learn from the many complex and nuanced attempts made towards sustainable energy consumption that have yet to be systematically assessed and catalogued.

6. Conclusion

This paper responds to several calls made in relation to the importance of broadening horizons concerning the role of social sciences in the contribution to knowledge about human and social dimensions of climate change and related challenges of energy use, which can inform energy and climate policy interventions. In

developing a methodology for exploring large-scale data on sustainable energy consumption initiatives (SECIs), this paper establishes an important contribution to these calls.

First, the methodology reported on makes it possible to explore a large number of SECIs without decontextualizing them from their specific embedding, for example, by emphasizing the importance of social and material aspects of problem framings, methods, types and mediums of interventions, targeted areas of consumption, and types of outputs. Second, the format and process of developing the methodology has invited a collaborative and co-creative approach to both establishing categories of empirical inquiry and to facilitate a convergent and mutual understanding of human dimensions of energy consumption across a variety of social science researchers, by explicitly clarifying and negotiating assumptions made about human action within each category. Third, the methodology reported on makes possible an attempt to systematically analyze and report on SECIs representing a variety of methods, types and mediums of intervention present in current SECIs. This analysis facilitates classification of predominant problem framings in current SECIs that may or may not be problematic with respect to the growing concerns that traditional problem framings (that focus on rational consumer choice models and efficiency measures) are failing to deliver anticipated reductions in levels of energy consumption. It should be noted, however, that assessing what seems to be the primary problem framing of the sustainability challenge in each SECI is not without its problems, as theoretical and ontological understandings of change processes are rarely explicitly reported on in the material available for SECIs and may not be readily present in the daily activities of the SECI and amongst the actors involved. Therefore, we call for more explicit efforts to create opportunities for discussing, sharing, exploring and potentially challenging embedded understandings of change processes amongst all actors involved in SECIs, be they academics, NGOs, policy makers or businesses.

The paper also utilizes the opportunity to present in detail the categories established for the typological assessment of sustainable energy initiatives, and elaborates on the type of knowledge produced by each category as well as across categories. By combining knowledge produced from each category, problem framings can be interrogated from many angles and with particular aspects in focus. Amongst these are the way that energy consumption is understood as a challenge; the role of the funder in defining the dominant problem framing reproduced in the SECI; variations between anticipated objectives and results; and social, material and discursive underpinnings of the SECI. The paper provides examples of insights obtained through the categories, and establishes how the methodology can enable a comprehensive and detailed picture of the social and material organization of change initiatives. In setting up a detailed account of the scope and specific purpose of each category, including a number of questions that help moving

understandings of energy consumption away from technological fixes and individualistic behavioral change, and towards acknowledging a broad range of social and material aspects of energy consumption, this paper works as a practical guide for social scientific inquiry of energy consumption, which can be used by a range of potential SECI initiators, funders, academics, practitioners and policy makers.

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