

Intersectional Analysis of Perceptions and Attitudes Towards Energy Technologies

Deliverable D3.3

Niall Dunphy, Alexandra Revez, Christine Gaffney, Breffní Lennon

Cleaner Production Promotion Unit, School of Engineering, University College Cork, Ireland



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About the ENTRUST Project

ENTRUST is mapping Europe's energy system (key actors and their intersections, technologies, markets, policies, innovations) and aims to achieve an in-depth understanding of how human behaviour around energy is shaped by both technological systems and socio-demographic factors (especially gender, age and socio-economic status). New understandings of energy-related practices and an intersectional approach to the socio-demographic factors in energy use will be deployed to enhance stakeholder engagement in Europe's energy transition.

The role of gender will be illuminated by intersectional analyses of energy-related behaviour and attitudes towards energy technologies, which will assess how multiple identities and social positions combine to shape practices. These analyses will be integrated within a transitions management framework, which takes account of the complex meshing of human values and identities with technological systems. The third key paradigm informing the research is the concept of energy citizenship, with a key goal of ENTRUST being to enable individuals to overcome barriers of gender, age and socio-economic status to become active participants in their own energy transitions.

Central to the project will be an in-depth engagement with five very different communities across Europe that will be invited to be co-designers of their own energy transition. The consortium brings a diverse array of expertise to bear in assisting and reflexively monitoring these communities as they work to transform their energy behaviours, generating innovative transition pathways and business models capable of being replicated elsewhere in Europe.

For more information see <http://www.entrust-h2020.eu>

Project Partners:



University College Cork, Ireland

- Cleaner Production Promotion Unit (Coordinator)
- Institute for Social Science in 21st Century



Liverpool John Moores
University, UK



LGI Consulting, France



Integrated Environmental
Solutions Ltd., UK



Redinn srl, Italy



Stam srl, Italy

Coordinator Contact:

Niall Dunphy, Director, Cleaner Production Promotion Unit, University College Cork, Ireland
t: + 353 21 490 2521 | e: n.dunphy@ucc.ie | w: www.ucc.ie/cppu

Executive Summary

This document reports on a study of the perceptions and attitudes towards energy technologies undertaken in six case study communities in France, Ireland, Italy, Spain and the United Kingdom. This exploration is conducted as part of a research project exploring the ‘human factor’ in the energy system, within which a complementary study of energy-related practices is also being prepared. Both of these studies are taking an intersectional approach to the analysis, recognising that people have multiple, interdependent, overlapping axes of social identity – this research is focusing on gender, socio-economic privilege and age.

The purpose of the report is to move away from the dominating paradigm of treating people as uniquely rational decision-makers and introduce the very real social contexts through which they negotiate and understand their role within the energy system; with specific focus on their views on the energy technologies that comprise it. The underlying feelings, assumptions, associations and values held by the people who express them are very real influencing factors on the attitudes and perceptions of people hold.

Subsequently, a report will be produced synthesising these two intersectional analyses along with a range of socio-economic, technical, market and policy analyses from the ENTRUST project. It is intended that this report will be updated over the remaining duration of the project, based on ongoing dialogue with the communities; continued reflexive analysis of the collected data; and insights from complementary outputs (not least those mentioned above) with an updated report envisaged for release in quarter one, 2018.

The report is laid out into sections, with each one addressing a specific aspect of the work involved to produce this deliverable. Section 2 outlines the Methodology for this deliverable, exploring the philosophical and theoretical background to the research. It also details the strategies and design processes that guided the selection of specific research methods and techniques used for data collection and analysis. An important contribution to the methodology has been the consideration of ‘intersectionality’, which has enabled the research to move beyond the “single-axis analysis” taken elsewhere. Section 3 provides an overview of the communities comprising a description of each of the six case study communities involved and an outline of their relevance to the research. Section 4 presents the results and findings of the research, and discusses their meaning in the context of the research aims and objectives. The final section concludes the report with a number of key findings that this research suggests contribute towards determining attitudes to specific energy technologies.

1 Introduction

The work presented in this deliverable provides an analysis of the perceptions and attitudes of people in the case study communities¹ towards energy technology². It is intended that the analysis will take an intersectional approach – in that it will take account of the multiple interdependent and overlapping social positions that people hold (particularly gender, socio-economic privilege and age). Intersectionality³ acknowledges that each person has multiple attributes which intersect within the person, and which intersect with social norms, social institutions, and social structures – and these all impact on a person's life expectations and experiences – both positively and negatively. These life experiences are the very things that impact on how people perceive the world and the attitudes that they hold.

The research involved a mixed-methods approach and comprised both general surveys in the communities, and workshops and in-depth interviews, with both quantitative and qualitative analysis of the results. The aim was to identify not only explicit attitudes, such as various degrees of support or opposition for particular technologies, but also the underlying feelings, assumptions, associations and values which shape them. In so far as possible the results have been correlated with socio-demographic factors, such as gender, socio-economic status and age mentioned above. The report presented here is not intended to be a static 'final' report, rather it will be iteratively improved over the coming months based on (i) continued dialogue with the communities; (ii) continued reflexive analysis of the collected data; and (iii) insights from complementary outputs and in particular from the synthesis process outlined below. Consequently, an update of this report will be forthcoming in quarter one, 2018.

This report is not an isolated piece of work, but rather forms part of a wider work package exploring socio-economic analyses within the case study communities. A second related task is also being carried out exploring peoples' everyday energy-related habits and practices. This complementary task will be reported in Deliverable 3.2 which will be released subsequent to this report. This intersectional analysis of energy practices within the communities recruited informed by a practice approach to the study of energy use in the context of socio-technical systems. The intersectional approach in this task will explore how multiple strands of inequality or privilege interact and mutually reinforce one another to constitute individuals' identities and shape their behaviour, and how particular aspects of identity and behaviour are mobilised by specific settings or institutions.

A synthesis report will subsequently be prepared, incorporating not just the socio-demographic analyses on 'attitudes towards energy technologies' and 'energy-related practices', but also a number of other related socio-economic, technical, market and policy analyses. This will be achieved through the use of thematic synthesis

¹ See Section 3 for an overview of the six case study communities in France, Ireland, Italy, Spain and the UK

² While energy technologies can of course refer to both energy producing technologies and energy using technologies, this report will deal exclusively with those related to energy production, while D3.2 will address energy using technologies in the context of the analysis energy related practices.

³ The concept of intersectionality is explored in greater detail in Section 2

approaches to integrate the findings of work packages including: WP2 ‘Mapping of Energy System’, WP3 ‘Socio-economic Analysis’ and WP4 ‘Policy Analysis’. The resultant synthesis report will feed into subsequent work packages: identifying energy transition pathways; facilitated by recommended policy mixes and co-operation mechanisms; and supported by a specifically designed knowledge platform.

1.1 Background

It is increasingly clear that current energy systems are increasingly unsustainable from a variety of environmental, economic and social perspectives (Grübler, 2012). The challenge of climate change, in particular, has focused attention on energy and it is widely acknowledged that in order to avoid the worst-case climate change scenarios a substantial move away from carbon based fuels is required (Capros *et al.*, 2011). An elemental energy transition⁴ on such a scale will both result in significant societal transformation and so there is therefore a good argument for a rethink on how future energy systems are planned and implemented. The scale of likely societal transformation required for the transition to be successful, will mean that people need to be acknowledged as not just consumers of an energy product but as legitimate stakeholders in the socio-technical energy system. The choice of energy technologies that heretofore has been very much seen as technological question, however in the context of changes that such choice will mean in people’s everyday lives, it can reasonably be argued that envisaged decarbonisation of the energy system is fundamentally not a technical problem, but rather it is as much a sociological puzzle as it is an engineering one.

Achieving the goals of the EU Energy Union will require the social acceptance and acceptability of energy projects required for the transition, such as wind and solar power developments and the enhancement of transmission grids to integrate a greater share of renewable energy. However, many such projects encounter strong public opposition, to an extent that threatens to significantly slow down Europe’s energy transition (Cohen, Reichl, & Schmidthaler, 2014; Enevoldsen & Sovacool, 2016) ‘The current trend, in which nearly every energy technology is disputed and its use or deployment delayed, raises serious problems for investors and puts energy system changes at risk’ (European Commission, 2011). There is therefore a substantial need to understand the perceptions and attitudes of citizens towards the energy system as a whole and its components energy technologies. This report is designed to contribute to this perceived gap in knowledge,

Through six case studies of communities in five different European countries, this research is exploring how various social and economic contexts and in particular different life experiences can influence perceptions of various energy technologies and of the energy system in its entirety. For each case study community, the stakeholders were engaged through a mixed-methods approach comprising both the typical quantitative surveys – which can often provide answers to questions as to what happened, where and when – and qualitative approaches such as interviews and focus groups – which allows one to enquire into how and why something occurs. The material gathered from the interviews form the primary data source informing the overall analysis.

⁴ An energy transition is defined as ‘a shift in the nature or pattern of how energy is utilized within a system’ (Araújo, 2014: 112).

The results of the initial analysis of that data informed the subsequent community engagements, including developing the themes and questions for the focus groups that were also conducted in the six communities.

1.2 Aims and objectives

This report aims to present an intersectional analysis of perceptions and attitudes towards energy technologies, including nuclear power, correlating results with socio-economic factors, focusing particularly on three socio-demographics attributes/identities of gender, socio-economic privilege and age.

1.3 Context of the report

This deliverable was produced as part of work package 3 of the ENTRUST project, specifically Task 3.3 Intersectional analysis of attitudes to energy technologies. WP3 aims to provide a deeper understanding of human behaviour and practices in relation to energy use, and how they are affected by a variety of socio-economic factors, including in particular: gender, socio-economic status and age. The package comprised an initial mapping of socio-economic factors affecting energy practices and detailed analyses of energy-related behaviours, practices, perceptions and attitudes in six case study communities. The research will be informed by an intersectional approach, which is conscious of the mutually constitutive relations that exist among social identities, including gender. The work in this work package (and particularly the collection data, which formed the basis of this report) is very closely linked to and intertwined with the community engagement activities in WP5. Accordingly, two forthcoming deliverables from this WP may be of interest to readers of this report, namely: D5.2 ‘Report on community dialogues’; and D5.1 ‘Expert feedback on community dialogue outcomes’.

1.4 Structure

The report is divided into five sections as outlined below:

- Introduction, which presents an overview of the report, details the background to the work, provide context for the task undertaken, describes the research aims and objectives and presents the structure of the document.
- Methodology, which explore the philosophical and theoretical background to the research, and detail the strategies, plans, and design processes which guided the selection of particular research methods and techniques for data collection and analysis.
- Overview of the communities, which provides a description of each of the six case study communities, and outlines their relevance for the research undertaken.
- Results and Findings, which presents the results and findings of the research and discusses their meaning in the context of the research aims and objectives.
- Conclusions: presents a summation of the results and findings, draw conclusions and points to further work opportunities in this area.

2 Methodology

Crotty (1998, p. 3) defines methodology as “the strategy, plan of action, process of design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes” and contrasts this with methods, which he describes as the means used to gather and analyse data relating to a research question. The aim of a methodology is to, as Moses and Knutsen (2012, p. 5) say to investigate the concepts, theories and basic principles and reasoning underlying research.

2.1 Intersectionality

2.1.1 A research paradigm

Morgan and Smircich (1980, pp. 491–492) posit that research is inherently based upon three assumptions, namely: ontological assumptions, on the nature of reality; epistemological assumptions, on the nature of knowledge; and methodological assumptions, that inform the framing and approach to gaining knowledge on a subject. The set of assumptions adopted by a researcher – whether explicitly or by default – establish a paradigm (Kuhn, 1996, pp. 10–11) or world view (Creswell, 2014, pp. 5–6), under which the research will be conducted. In this research, following (Hancock, 2007, 2013), we have adopted intersectionality as research paradigm, it is a conceptual approach to research that allows an investigation of the simultaneous effects of “categories of difference”, and their intersections, and in so doing overcomes the limitations of other approaches to research. It takes into account the complexity of social locations, as well as the impact of social location on health, well-being, and life chances. In Table 1 below, Hancock (2013) summarises three different forms of approach to researching the organising structures of society such as gender, race, class and other categories of difference, and demonstrate the benefits of an intersectional analysis in comparison to other, more restricted approaches.

Table 1: Three Empirical Approaches to Conceptualising Categories of Difference (Hancock, 2013, p. 268).

	Unitary Approach	Multiple Approach	Intersectional Approach
Number of Relevant Categories/Processes	One	More than one	More than one
Posited Relationship Between Categories/Processes	None	Predetermined and conceptually distinguishable relationships	Relationships are open empirical questions to be determined
Conceptualization of Each Category	Static at individual or institutional level	Static at individual or institutional level	Dynamic interaction between individual and institutional factors
Case Makeup of Category/Class	Uniform	Uniform	Diverse; members often differ in politically significant ways
Approach to Intersectionality	Lip service or dismissal	Intersectionality as testable explanation	Intersectionality as paradigm/ research design

2.1.2 Intersectionality concept

The term ‘intersectionality’ was initially coined by Kimberly Crenshaw (1989) primarily to demonstrate that the categories of race and gender are not “mutually exclusive categories of experience and analysis”. As Patricia Hill Collins puts it: “rather than examining gender, race, class, and nation as distinctive social hierarchies, intersectionality examines how they mutually construct one another” (Collins, 1998). Although the ideas that inform the content and context of intersectionality have been around for well over a century, the term “intersectionality” was specifically coined by Crenshaw in relationship to the exercise of legal rights. This was a significant development in the realm of delivering on “equal” rights for people who suffer from discrimination, because equality legislation is usually defined along single axes – on the basis of sex, or on the basis of race, for example. Crenshaw demonstrated the unfortunate paradox that what is not captured in these single-axis legal understanding of discrimination, is discrimination on the basis of multiple, intersecting axes – with the result that those that may experience multiple, or exacerbated discrimination, for example, as being both female, and black may not have recourse to legal remedy on either axis, as Crenshaw (1989) demonstrated. Treating these “axes of oppression” as singular, as they tend to be in social and legal rights discourses, has had the result of denying access to justice to those who are multiply oppressed, or experience discrimination as a result of being positioned at multiple axes of discrimination. As Crenshaw remarks, the “multidimensionality of Black women’s experience” is distorted by the “single-axis analysis” that is foundational to equality and anti-discrimination policies and legislation (Crenshaw, 1989). Intersectionality captures the ways that multiple identities combine and amplify each other rather than being merely additive.

In short, from the perspective of intersectionality, social positions (that is categories of gender, socio-economic privilege, “race” *etc.*) are multiple, interdependent, and overlapping. Every person has multiple attributes which intersect in the person, and which intersect with social norms, social institutions, and social structures – and these all impact on a person’s life expectations and experiences – both positively and negatively. Intersectionality as a conceptual tool primarily grew out of dissatisfaction with, and an antiracist critique of, what is sometimes termed “white feminism” – that is feminism that was aligned to the interests of white, socioeconomically privileged, heterosexual women and that ignored the issues affecting those at less privileged nodes in Western society. One of the significant benefits of utilising an intersectional approach to research is that it attends to “causal complexity”. Intersectional research captures both the complexity of the individual as well as the complexity of institutional structures that directly impact on the individual and the complex interplay between both. More recently, the use of intersectionality has expanded, and it is now being constructed in a way that is “applicable to any group of people, advantaged as well as disadvantaged” (Yuval-Davis, 2006).

MacKinnon (2013) points out that intersectionality as method “does not simply add variables. It adopts a distinctive stance, emanates from a specific angle of vision, and, most crucially, embodies a particular dynamic approach to the underlying laws of motion of the reality it traces and traps while remaining grounded in the experiences of classes and people within hierarchical relations ... criticising a rigidly top-down social and

political order from the perspective of the bottom up”. Also, expanding on the benefits of intersectionality as methodological tool, Hancock (2007) argues that “intersectionality can also more comprehensively answer questions of distributive justice, power, and government function ... This capability is not limited to the inclusion-oriented content specialization for which intersectional scholarship is well known”.

Intersectionality, draws attention to the fact that identities have multiple aspects – that there is no woman or man who does not also have an ethnic identity, or different levels of socioeconomic privilege, as well as a range of other identity attributes – all of which are highly significant for the individual, and their life experience. These attributes also have an impact on the gender roles that people are expected to enact within societies – different social groups can have varied gender role expectations, for example, even within the same culture. These gender roles differ also where they intersect with age, as well as other sociocultural factors such as socioeconomic privilege, ethnicity, and religion.

Developing an understanding of the role of gender in the energy system is a key objective for this research. A range of strategies have been developed in order to achieve this. In addition to ensuring gender balance within the research team, gender balance has also been a criterion for all community engagements – across the range of activities. The communities are diverse, and the participants from those communities are also from a range of socio-demographic backgrounds, and from the widest age range possible. This approach enables the delivery of the intersectional analysis of gender, and other social positions, that is required to offer insight not only into people’s attitudes towards the energy system, and energy technologies, but also how they live with those technologies within the energy system. Below, we expand on the importance of including gender as a key “variable” for energy research, and through the lens of intersectionality, on the necessity to resist a fictitiously monolithic category “women” or indeed “men” for that matter.

The concept of intersectionality will be more fully dealt with in later deliverables, particularly: the Intersectional Analysis Energy Related Practices (D3.2) and Synthesis Report on Socio-economic, Technical, Market and Policy Analyses (D3.4).

2.1.3 Feminist Epistemological Standpoint Theory

Sandra Harding’s critical work in the philosophy of science and epistemology are foundational texts for feminist critical analysis in the fields of science and epistemology, and for the development of standpoint theory. (Harding, 1986a, 2004a, 2015). Feminist analyses uncovered the inherent androcentrism across the research milieu that extended beyond the “subject” of research to the research paradigm itself: “Our ability to detect androcentrism in traditional analyses has escalated from finding it in the content of knowledge claims to locating it in the forms and goals of traditional knowledge seeking” (Harding, 1986a). However, in the context of the “western crisis of representation” that emerged from postmodernism and poststructuralism, Harding sees standpoint theory as offering a “third way”. Cautioning against taking a position of “absolute relativism” that can result from an unreflective postmodernist approach to research, she avers the necessity for articulating the social realities that ground our everyday experiences and social practices. That

notwithstanding, she also recognises the necessity for feminist postmodernist suspicion of “the relationship between accepted definitions of ‘reality’ and socially legitimated power” (Harding, 1986a).

However, while feminist critical analyses can reveal the androcentric biases in theoretical discourses, the problem remains of how to theorise without replicating biases, or of replicating inherently fictitiously stable monolithic categories. Instead, the inherent “fuzziness” of categories should be embraced as an analytical tool, particularly given the, relatively, rapid changes underway across societies: “Feminist analytical categories should be unstable – consistent and coherent theories in an unstable and incoherent world are obstacles to both our understanding and our social practice” (Harding, 1986a). Harding makes the acute observation that “the destabilization of thought often has advanced understanding more effectively than restabilisations, and the feminist criticisms of science point to a particularly fruitful arena in which the categories of Western thought need destabilization” (Harding, 1986a).

Emerging out of feminist epistemological theory, standpoint theories have been developed over the course of four decades. Standpoint theory is both an epistemology and a philosophy of science, as well as a research practice (Harding, 2004a, 2009).

Feminist standpoint theory was developed as an alternative to “neopositivist objectivism, on the one hand, and to relativism, on the other”. (Jaggar, 2015) While there are different “origin stories”, feminist standpoint theory is often dated back to sociologist Dorothy Smith’s (1974) germinal article “Women’s Perspective as a Radical Critique of Sociology”. The “explicit formulation” of the theory was first articulated by Nancy Hartsock (Hartsock, 1983) in *Money, Sex, and Power: Toward a Feminist Historical Materialism*, however, the theorist most closely associated with the concept and who has developed the most comprehensive application of the theory is Sandra Harding (1986a, 1986b, 2004b). While standpoint theory is widely used across a range of research disciplines, particularly in the social sciences, as well as a framework for research projects, it is still a controversial theory in many quarters (Harding, 2009). While the use of standpoint theory as a “logic of inquiry”, that is, as “a trans-disciplinary, regulative ideal”, is often unremarked, nonetheless it is utilised in research that is focussed on “race, class, sexuality, and studies in postcolonial research”. (Harding, 2009)

However, it should be understood that standpoint theory “is not an empirical perspective”; it is not a “bundle of beliefs actually held by an individual or group of individuals.” (Jaggar, 2015) And in any case, no viewpoint is “innocent”. While arguing that the “vision is better from below”, Haraway qualifies that, “the standpoints of the subjugated are not ‘innocent’ positions. On the contrary, they are preferred because in principle they are least likely to allow denial of the critical and interpretive core of all knowledge. ... ‘Subjugated’ standpoints are preferred because they seem to promise more adequate, sustained, objective, transforming accounts of the world.” (Haraway, 1988) Feminist standpoint theorists believe that the perceptions of most people in male-dominated societies, including most women, are distorted both by dominant systems of knowledge and by the structure of everyday life” (Jaggar, 2015). “Standpoint theory offers an approach to assessing the epistemic reliability of knowledge claims by taking into account the circumstances in which these claims were produced”

(Jaggar, 2015). It is important to recognise that a “standpoint” is not like a “perspective”: a standpoint “is a theoretical system of beliefs that incorporates some of the views held by members of a particular group but rejects other views ... [the system] presents issues of concern to [the group] in ways that allow their objective interests to be revealed” (Jaggar, 2015). Standpoint theory takes as its premise that membership of subordinated groups can facilitate insight into aspects of social systems that remain obscure to those located in privileged positions of gender, race, and class for example thus producing knowledge that would be otherwise unavailable to those in more hegemonic positions of privilege. However, while standpoint theory recognises that it is “the occupation of marginal social locations that facilitates recognition of certain insights”, it also acknowledges that the “epistemic privilege” of those living at the margins is limited. Their position can provide insight into everyday life “under oppression”, but it is “neither automatic nor all-encompassing” (Jaggar, 2015). Central to both standpoint theory, and intersectionality is the recognition of both the instability of categories, as well as the range of social locations that occur within categories. Both standpoint theorists, and theorists of intersectionality resist conceptualising “woman”, or any other group, as a unified category. Clarifying the remit and range of standpoint theory, Harding emphasises that “standpoint work must always be ‘intersectional’” (Harding, 2009).

2.1.4 Challenging Homo Economicus

In order to appreciate the significance of bringing an intersectional analysis to energy research it is important to recognise the role that *homo economicus* [the rational self-maximiser] and other similarly reductive representations have played not only in energy research, but in research more generally. As feminist (and other critical) researchers, such as Harding above, have demonstrated, the genderless, classless, colourless “human” of theory when interrogated turned out to be male, socioeconomically privileged, and white. The actual human beings who are the focus of research, and who comprise the majority of the cohort of research subjects, across all disciplines, and in health research in particular, have primarily been male. This has had the unfortunate result of skewing research processes, and results, and in effect has led to “bad science” (Rees, 2011). *Homo Economicus* is a recent example of “universal man”. Universal man is the gender neutral, classless, colourless, disembodied, subject of inquiry, who was subsequently revealed through feminist analysis to be, in fact, a white, able-bodied, socially privileged, heterosexual, Western male that he had always been. The dominance of this version of ‘human’ has dominated all the sciences since the Enlightenment – to the detriment of science, society, and knowledge production. “As intersectional work has shown since its inception, social hierarchy creates the experiences that product the categories that intersect. Substantively, white males dominate” (MacKinnon, 2013).

Henrich et al. (2001) demonstrate that not only is *Homo Economicus* an inadequate conceptualisation of “human”, and human behaviour in Western society, it is also untenable as a “working model” of human behaviour in any society. Henrich and his international cohort of fellow researchers carried out cross cultural field work in 15 small scale communities, in twelve countries across three continents. Three experimental games used in economic modelling of human behaviour were conducted in the communities – “ultimatum”,

“public goods”, and “dictator”. The researchers found that not only did the “canonical model” of *homo economicus* fail to hold in any of the societies, it “fails in a wider variety of ways than in previous experiments” (Henrich et al., 2001). The working assumptions of many economists – that human beings are self-interested maximisers – demonstrates a narrow world-view that may well reflect the partiality of their own particular perspective, but it is clearly not a universal trait shared amongst humanity at large. The authors suggest that major revisions to the “rational-actor framework” model are required in order to account for the failures in predicated behaviours, behavioural change, and the connection between economic choices and the “economic and social interactions of everyday life” (Henrich et al., 2001).

2.1.5 The need for an intersectional analysis?

The history of research on the energy system shows that it has been dominated by technocratic and technologically focused approaches to assessing initiatives aimed at reducing energy consumption with an over-concentration on technical remedies to reduce energy consumption (D’Agostino, Jackson, Dramis, & Funiciello, 2001). Conversely, the majority of the limited research that has inquired into the human factor in the energy system is further limited in the range of analyses. Primarily, this research has drawn on reductive models of human behaviour that tend to predominate in economics and related disciplines (Sovacool, 2014) – such as the problematic *Homo Economicus*, described above. In addition, most of the research on the human factor in the energy system has been largely quantitative in nature (*ibid.*). Further to these limitations there has been a significant lack of focus on women in the energy system, and on a gender analysis more generally, with some notable exceptions (Fraune, 2015).

However, the concept of intersectionality has started to make the briefest of appearances in energy research. The call has been made for energy research to bring particular focus to the issue of energy justice, and with that, for the necessity for applying intersectionality as a key element of a conceptual framework for addressing issues of energy justice on a global scale (Sovacool, Burke, Baker, Kotikalapudi, & Wlokas, 2017). While there are clear advantages to using intersectionality, as paradigm, and as conceptual tool, to contribute to producing informed policies and mapping potential pathways for social change at the global level, it also provides clear advantages for research taking place at the micro- and meso- levels.

For ENTRUST, developing our analysis on the human factor in the energy system has its primary focus on the individual, and on communities in order to deliver the bottom-up analysis which is required for understanding that human factor. An intersectional approach to the research process, and analysis is vital for delivering that analysis. Sovacool *et al.* (2017), for example expressly advocate an intersectional approach as one of their ten principles for developing conceptual frameworks for energy justice. Recognising the intersecting multi-layered nature of energy poverty, that includes structural, economic, cultural and political factors, the authors acknowledge that the concept of intersectionality has “rendered itself as a useful theoretical tool for understanding the multiple identities that individuals and communities carry and its consequent implications in the form of disparate resource distribution and social outcomes”.

Intersectionality can be seen to have expanded beyond “inclusion-oriented content specialisation” and offers a new research paradigm, as well as a methodological approach to research more generally (Cho, Crenshaw, & McCall, 2013; Hancock, 2007; MacKinnon, 2013).

2.1.6 Intersectionality and the Research Process

Intersectionality brings a new approach to the way that problems are identified, how they are conceptualised, researched, interpreted, and analysed (Hancock, 2007). Describing intersectionality as “a body of normative theory and empirical research”, Hancock offers an accessible, guide to conducting intersectional research. She outlines the six key assumptions that are foundational to an intersectional analysis of a particular research issue:

- (1) Examining complex social and political problems involves analyses along more than one axis of difference such as gender, race, or class;
- (2) However, while all relevant social categories should be included, no presumption should be made as to the nature of the relationship between any particular category – “the relationship among the categories is an open empirical question” (Hancock, 2007). While, for example, class and gender may be analysed together, it should not be assumed either that they are independent of each other, nor that analysing both will fully capture all aspects of an issue;
- (3) It is understood that categories of difference are not fixed, but rather are “dynamic productions of individual and institutional factors” (Hancock, 2007). The categories of difference are maintained, and challenged in complex interchanges between individuals and society;
- (4) There is significant diversity within each socio-demographic group which has an impact on policy development, its reception, and its impacts;
- (5) Intersectional research integrates multiple levels of analyses of individuals, their interactions within communities as well as with society and social institutions, and in the case of ENTRUST, the energy system;
- (6) Intersectional research requires theoretically informed empirical research that integrates multiple methods applying an intersectional approach across all aspects of the conduct of the research project. (Hancock, 2007)

As further explication of the suitability of utilising intersectionality as a research method, Hancock outlines the “multiple paths” concept (Ragin, 2000) to explore how socio-structural and political institutions impose “solutions” to social issues that are predicated on the experiences of narrow demographic groups. She argues that what is required for the successful outcome to any policy initiative or goal is paying attention to causal complexity, analysing institutional restrictions, and identifying multiple pathways to successful outcomes (Hancock, 2007). As Hancock remarks “intersectionality theory has been incorrectly reduced to identity

politics” (Hancock, 2013). On the contrary, intersectionality avoids the overt relativism that is associated with some schools of “identity politics”, and offers a pragmatic, materially based, theoretical “middle-way” between absolutism and relativism regarding the epistemological and ontological status of categories of identity. Crenshaw writes: “Recognizing that identity politics takes place at the site of where categories intersect thus seems more fruitful than challenging the possibility of talking about categories at all”. (Crenshaw, 1991, p. 377)

Putting intersectionality at the core of the research process has a significant impact on how research is done, and further, for foregrounding what is often invisible in science and technology studies – the lived experience of human beings and their complex interactions with as technologies and technology systems, as well as the with social, economic, and political institutions that impact on and intersect with those interactions. Extending the intersectional analyses beyond the individual “consumer” and their situation, to encompass the institutions they interact with, as well as to those who are leading the technological, economic, and political pathways towards sustainability reveals the complexity of both the overarching “energy system” – inextricably bound up with industrialised society itself, and consequently people’s identities – and can also reveal the relevance of the social positions of all actors – including those with the power to direct change at an institutional level.

It is clear from engagements with the communities that energy poverty is both a reality, and potentially a growing concern across most communities into the future. It is inevitable then that it has emerged as a theme – energy poverty is experienced by people across a wide demographic, and can be an outcome of number of different social circumstances. It is here too that intersectionality can offer a methodology to understand the multiple factors and pathways that are responsible for its incidence in order to avoid the pitfalls of a “one size fits all” approach to prevention strategies and solutions that will have to be incorporated into the transition pathways.

Our analyses and analytical frameworks are grounded in an intersectional ontology and epistemology, and critical theory, and draws from a range of disciplines including human geography, philosophy, and sociology amongst others. If as Wallenborn and Wilhite (2014) observe:

‘The co-evolution of bodies and the material world thus affects the ontology of energy consumption as well as providing an interesting approach to conceptualizing changing consumption practices’

then it is clear that the particularity of those bodies – their gender, ethnicity, socio-economic privilege, age, bodily ability, sexuality, *etc.* is implicated in their relationship with energy and the wider energy system. An analysis that does not attempt to capture some of that complex particularity cannot hope to offer a rich analysis of the ‘human factor’ in the energy system.

2.2 Methods

Sunikka-Blank & Galvin (2016) observes that analysis of qualitative data can provide information on how and why something is happening, while quantitative data could indicate where and how much of it is happening. In keeping with the aims and objectives of this report, the research involved a combination of methods, involving the collection of both qualitative data (through face-to-face interview and focus groups) and quantitative data (through survey). This so-called mixed methods approach is suited for research aimed at understanding the perceptions and attitudes towards energy technologies and what lies behind these perceptions and attitudes.

2.2.1 Interviews

Some forty-four in-depth, semi-structured interviews were conducted face-to-face with members of each of the six case study communities. As a qualitative method, interviews are widely considered to help researchers ‘reach the parts which other methods cannot reach [and] probe an interviewee’s thoughts, values, prejudices, perceptions, views, feelings and perspectives’ (Wellington & Szczerbinski, 2007, p. 81). A key feature of the semi-structured interview is its combination of structure and flexibility, especially in terms of exploring the themes with which we wished to engage (Legard, Keegan, & Ward, 2003). The interviews we conducted involved using pre-formed, concise, easily understood, open-ended questions that the respondents’ relationship with the energy system and with energy itself (a copy of the interview schedule is included as Appendix 3). In keeping with the practice for semi-structured interviews, participants were given the freedom to develop and add to the answers as they wished. Personal anecdotes and opinions of their own in response to the questions were welcomed. The interviewers also had the freedom to ask supplementary questions or follow up on particular lines of enquiry that emerged from the discussion when they thought it was appropriate. At the same time, every effort was made on the part of the interviewer to avoid steering the interviewees, or show personal preferences during the questioning. All interviews were recorded, and notes taken where appropriate – a key consideration was to make sure such activities did not interfere with the natural flow of the conversation or the interviewees’ train of thought. Audio recording was considered to be sufficient, given the potential for video recordings to detract from the process and because they were not necessary for capturing the information needed. The audio recorder was positioned discreetly between interviewer and interviewee, and at the beginning of each interview the interviewer was required to ask the interviewee’s permission to record the interview. Written consent was requested from the interviewee for the research team to record the interviews and for the findings to be used at a later date. The resultant transcripts were analysed as described in Section 2.2.3 below.

2.2.2 Focus Groups

Parallel to the conduct of the interviews, 13 focus groups were run involving 84 participants (with at least two focus groups in each of the six case study communities). Morgan (1988, p. 10) describes focus groups as “basically group interviews, although not in the sense of an alternation between the researcher’s questions and the research participants’ responses. Instead, the reliance is on interaction within the group”. Gill *et al.* (2008)

agrees, noting that a focus group is more than just collecting data from multiple participants at once – rather it is a facilitated group discussion. Focus groups are group discussions on a predetermined topic for research purposes; the discussions are observed, guided, facilitated by a researcher and the discussions are typically recorded and transcribed. The group interaction is a key feature of focus groups, Kitzinger (1994) argues that it is this group dynamic that distinguishes between focus groups and other group discussions, while Morgan (1988, p. 12) observes that focus group *“produce data and insights that would be less accessible without the interaction found in a group”*. Gill *et al.* (2008) recommends that the optimum size for a focus group is between six and eight participants, noting that if groups are too small discussion is limited and if they are too large, they are hard to manage and it may be difficult for participants to contribute to the discussion. Kitzinger (1995, p. 299) contends that the *“method is particularly useful for exploring people's knowledge and experiences and can be used to examine not only what people think but how they think and why they might think that way”*. It is this exploration of a person's beliefs that the method so appropriate for this study. Wilkinson (2016) notes that data collected from focus groups are typically analysed using conventional qualitative data analysis techniques such as those used for interview transcripts. She comments that *“focus groups are distinctive, then, primarily for the method of data collection (i.e., informal group discussion), rather than for the method of data analysis”* (Wilkinson, 2016, p. 84). The focus groups were held in easily accessible locations local to the communities themselves. The duration of the discussion varied between 90 and 120 minutes, they were led by a member of the research team who took on the role of a moderator and facilitated the discussions. The discussions were recorded, transcribed and analysed as described below. A copy of the focus group plan is included as Appendix 4.

2.2.3 Analysis of transcripts

Both the interview and the focus group transcripts were coded using template analysis, which as King (2004, p. 256) explains comprises not one but rather a group of techniques for organising and analysing data. This involved creating a list of codes – the ‘template’ – representing themes found in the text. Some codes were defined *a priori*, but were subsequently refined and developed in the course of coding the interview transcripts - *i.e.*, assigning codes to segments of text. As the coding process advanced, relationships between the codes became apparent, the template was thus structured in a hierarchical manner denoting such relationships. Qualitative data analysis software (specifically NVivo) was used in this analysis process. Such software does not automate the analysis but does facilitates coding, organising, linking and cross-referencing of material. The analysis of the transcripts was aided by handwritten notes taken during, and immediately after the interview in order to record non-verbal communication, *e.g.*, inflection, body language, facial expressions and gestures, and by records of verbal cue. Such non-verbal cues can often change the meaning of what has been said. Such cues will help to identify where the respondents are engaging in sarcasm, exaggeration, or deception; they will distinguish between where the speaker takes pride in what is being said or is somewhat embarrassed; moments of confusion may be identified perhaps informing how the response should be considered; unwillingness to speak on certain topics may become apparent, *etc.* Such information will not be

readily identifiable from a written transcript alone. Particular care needs to be taken when dealing with translations of transcripts – meanings may be altered or even information lost through poor translation, where nuances are not detected or idioms misunderstood, for this reason it is important that native speakers be used as far as possible in interviewing, transcribing (translating where required) and the data analysis. Within this type of qualitative study, subjects of interest are explored, themes emerge from the data and this in turn facilitates more informative explorations of the subjects. Through an iterative process findings are developed from the data based from the emergent themes (Holliday, 2002, pp. 1–7).

2.2.4 Surveys

The report further draws on a total of 209 surveys across the six communities – a copy of the survey on attitudes to energy technologies questions can be seen as Appendix 3. Groves *et al.* (2009, p. 2) describe a survey as “*a systematic method for gathering information from (a sample) of entities for the purpose of constructing quantitative descriptors of the attributes of the larger population of which the entities as members*”. While the term ‘qualitative survey’ is often used to indicate information through a series of open-ended questions (Jansen, 2010), the term ‘survey’ used without any qualifier inherently indicates a quantitative data collection method, which is focus on counting and measuring. The collected descriptors, which are quantitative summaries of observations are called statistics – these may be presented in a range of manners (*e.g.*, number of people that eat meat, average income of a group, unemployment rate) (Groves *et al.*, 2009). The basic tool of the survey is a questionnaire, which is set of written questions with a choice of answers, devised for the purpose of collecting statistical information. The purpose of a questionnaire is to administer a standardised survey across all subjects – as this is a quantitative data collection method, asking the questions in the same way to different respondents is a key characteristic. Questionnaires can be administered in a number of ways – for example they may self-administered through postal or online survey, or they may be administrated by a researcher either face-to-face or over a telephone call⁵. The surveys carried out in this study were in-person face-to-face surveys, these have the advantage of a greatly increased response rate, while admittedly being substantially more expensive to conduct. The data collected in the surveys were analysed and the resultant statistics were used to supplement and complement the qualitative data arising from the interviews and focus groups

⁵ While some would argue that in the case of a survey administered face-to-face (or even through a telephone call), an interview schedule is the more appropriate term for the set of questions, this is an argument on terminology rather than methods and so not particularly relevant to the discussion here.

3 Overview of the communities

To explore the socio-technical issues involved in the sustainable energy transition, six varied communities in five different European countries are being engaged: an Irish rural community; a cohort of university students; residents of an eco-neighbourhood in a large French city; a diverse urban community in a large Spanish city; and a disadvantaged urban fringe neighbourhood in the UK. These communities provide a diverse range of socio-demographic characteristics, life experiences, and socio-political contexts. As such, they provide opportunity to gain considerable insight into the different obstacles faced by communities to the transition to a more sustainable energy system. A more detailed account of the selection and recruitment process for each community will be produced in the forthcoming *D5.1 Report on Community Dialogues*. A breakdown of the communities is presented below.

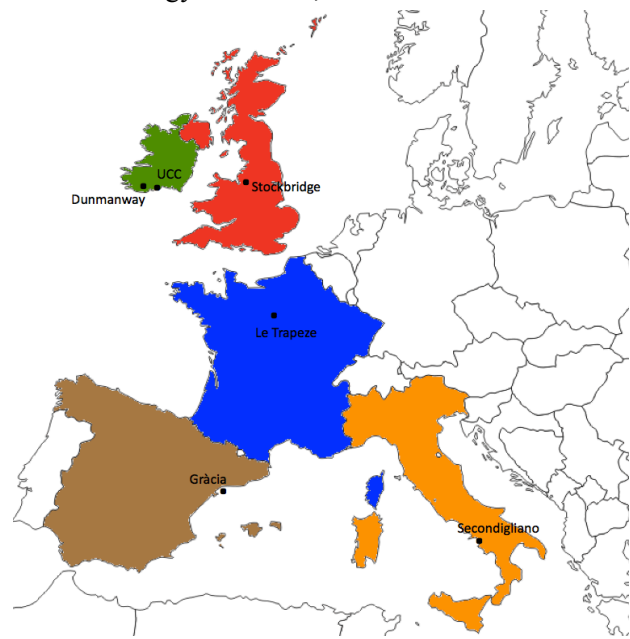


Figure 1: Map indicating location of communities

Table 2: Breakdown of the six research communities, along with their defining characteristics

Research Community	Type	Defining characteristic
Le Trapèze (France)	An eco-neighbourhood	New development intended to adhere to latest sustainable urban principles. Strong financial resilience, weak social resilience.
Dunmanway (Ireland)	A rural town	Historic market town with rural hinterland. Changing land-use and employment patterns. Medium-to-strong financial and social resilience.
Stockbridge (United Kingdom)	Urban fringe	New Town development, with sudden significant inward migration. Issues: high unemployment, anti-social behaviour, crime, limited social cohesion, isolation. Weak financial and social resilience.
University College Cork (Ireland)	Students embarking on life stage transition	Socially diverse community undergoing major life transition. Medium-to-strong financial and social resilience.
Secondigliano (Italy)	Urban fringe	New Town development, with sudden significant inward migration. Issues: high unemployment, anti-social behaviour, crime. Weak financial and medium social resilience.
Gràcia (Spain)	Diverse urban neighbourhood	An historic, cohesive and socio-economically diverse urban community. Medium-to-strong financial and social resilience.

3.1 Gràcia, Spain

The district of Gràcia, in the City of Barcelona, is one of the city's historical quarters. Its status as an independent town was maintained up until the 19th Century when in 1897 it was incorporated into the municipal government of Barcelona. The original dirt road from Barcelona to the town has since been replaced by the broad, tree-lined boulevard Passeig de Gràcia, at the heart of one of the city's most important commercial and retail areas (Associació del Passeig de Gràcia de Barcelona, n.d.). Comprising the neighbourhoods of Vila de Gràcia, Vallcarca i els Penitents, El Coll, La Salut and Camp d'en Grassot i Gràcia Nova, people there still hold a strong sense of local identity with the area. The neighbourhoods of Vila de Gràcia and Camp d'en Grassot i Gràcia Nova constitute the historical core of the district. Civic engagement in local projects – both cultural and political initiatives – is in keeping with the rest of the city and is characteristically high.



Figure 2: Gràcia: Location within Barcelona (Map Data © 2017 Google)

Gràcia has a rich demographic profile with both well-established social groups mixing with newer more ethnically diverse and bohemian residents, mainly composed of artists and young people of different cultural backgrounds. The population of Gràcia has increased substantially over the last 20+ years, with significant numbers of residents coming from other countries – most

notably from Africa, Eastern Europe and Latin America (Medina, Provansal, & Montero, 2010). This trend is largely felt across the city. In the past, the neighbourhood has acted as a focal point for a number of underground social movements in the city and more recently the anti-austerity movement, Los Indignados, received strong support here (eldiario.es, 2011).

The neighbourhood is well serviced and benefits from a good public transport system including rail, with the Gràcia railway station located under Plaça de Gal·la Placidia, and the Fontana and Lesseps metro stops (L3 line) located under Carrer Gran de Gràcia and Plaça de Lesseps respectively (L3 line). The neighbourhood is also served by lines L6 and L7 of the Barcelona Metro and lines S1, S2, S5 and S55 of the Metro del Vallès commuter rail system. Tourist bus routes, such as those used by Barcelona Bus Turístic, also service the area with the Gràcia bus stop located on its Blue Route, just after the Sagrada Família bus stop. La Sagrada Família Basilica by Antonio Gaudí is one of the most popular tourist attractions in the world and is the city's number one attraction.

Local squares, or *plaças*, and other planned open spaces form a significant part of the landscape of the area, and play a key role in encouraging the lively social dynamic that the neighbourhood is known for. Gràcia is also relatively low-rise especially when compared to the grandiose elegance of the neighbouring Eixample district and the narrow streets that lead into its many *plaças* help to give the area its distinctive feel. The main square is the Plaça del Sol, but all the many squares in Gràcia serve a similar purpose; from a day-to-day meeting point for local children and older people, to the hosting of concerts and festivals, or acting as focal points for local protests. Many *plaças* have small playgrounds for young children to play in, with seating nearby and are family-friendly by design.



Figure 3: Gràcia: An example of one many *plaças*, near Biblioteca Juame Fuster

Described in tourist literature as a neighbourhood with a small-town feel (Barcelona Bus Turistic, 2017), with its numerous narrow streets and small squares, the district also has many city parks within its boundaries including the famous Antoni Gaudí-designed Park Güell (La Salut neighbourhood) situated on Carmel Hill in the foothills of the Collserola mountain range that rings the north-eastern part of the city. Other famous landmarks include the clock tower in Plaça de la Vila, the modernist Casa Fuster and Gaudí's Casa Vicens.

A notable neighbourhood festival that takes place annually, from 15th to 21st August, is La Festa Major de Gràcia. It is the largest and most popular of its kind in the city, with over five hundred thousand visitors from outside the area joining local people in the festivities. Activities include Catalan traditions like the *colles castelleres*, who are groups of performers who build mobile human towers up to seven or eight storeys high that move from one *plaça* to another. Other traditions include the *correfoc*, or 'firerun', which involves groups of 'devils', or *colles de diables*, dancing to the beating of drums while spraying sparks from fireworks strapped to forked sticks. The drummers of the Correfoc have their own parade called the *Tabalada Infernal*. In addition to the parades and street performances, local residents compete to be awarded the best decorated street and balcony, and of the 500+ activities hosted throughout the festival over three hundred are children and family-oriented events.

A recent development has been the ongoing consultation between the municipal government and local people to create so-called 'superblocks' in Gràcia with a view to pedestrianising many of the streets in the neighbourhood and reducing vehicular traffic more generally (Bausells, 2016). The projected subsequent drop in air pollution is seen as a positive development, but there is concern as to how these superblocks will be

implemented, with residents in one neighbourhood where it is being trialled complaining that life in the city has become more difficult since they were introduced (Garfield, 2017).

By promoting the potential for creating healthier public spaces for the community and prioritising pedestrians and cyclists the municipal government council is hoped to encourage local people in the design stages that took place in 2016. El Poblenou, in the Sant Martí district, is the first of at least six superblocks to be installed across Barcelona by 2018.

Relevance to the project

Gràcia is a close-knit community which displays a rich variety of socio-demographic backgrounds. For example, recent census figures show that the local indigenous population has aged significantly, which we calculated would most likely manifest itself in terms of specific needs and attitudes towards existing energy systems. Likewise, the growth and changes in the population stemming from inward migration were considered to be potentially significant in terms different social and cultural approaches to energy. Additionally, the district also has a rich variety of local based businesses such as restaurants, cafés and shops, presenting a strong opportunity for examining the views held by small and medium sized enterprises (SME) owners regarding energy systems.

3.2 Dunmanway, Ireland

Dunmanway is a busy inland market town located in the centre of West Cork, 38 miles northwest of Cork city, and acts as a commercial and cultural focal point for its largely rural hinterland. The main road through the town is the R586, which is designated a secondary route in Ireland's road network classification system. Sited between the Sally and Brewery rivers, two tributaries of the River Bandon, it was founded in the 17th century as an English colony and acted as a resting point for troops travelling between the garrison towns of Bandon and Bantry. Its establishment as the primary market town for the area was led by Sir Richard Cox, Lord Chancellor of Ireland 1703–1707, with trading in flax for the linen industry being a significant commercial activity. The town's two original triangular squares still survive.

The catchment area for this community engagement comprises the town of Dunmanway (population 2407), along with its environs amounting to an additional 22 electoral divisions, and a total population of 13,470. The remainder of the area is largely rural and in some cases quite remote. According to the 2011

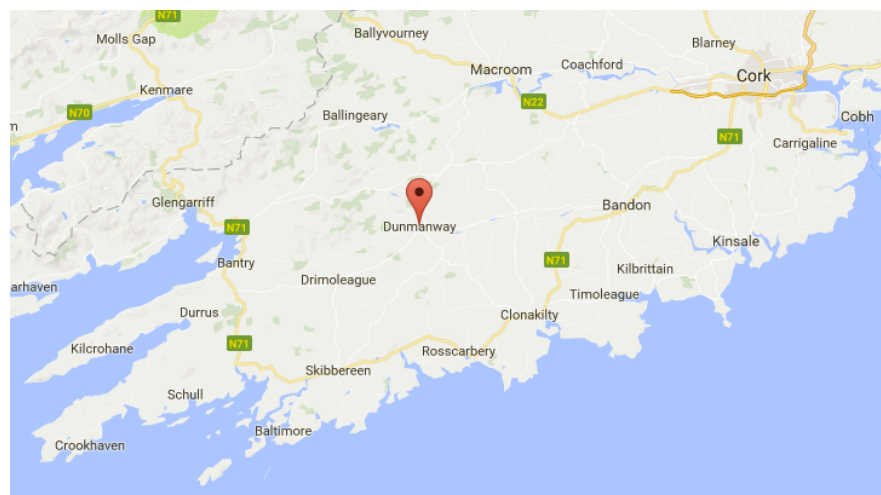


Figure 4: Dunmanway: Position relative to Cork City (Map Data © 2017 Google)

National Census the demographic profile of the area shows a larger than national average population of older people in the area with 36.2% falling into the category 65 plus. 19.6% of adults have primary education only, which is marginally above the national average. Third-level education figures in this catchment area at 19.2% and is significantly below the national average. In terms of social class, the Dunmanway catchment area has a 29.6% share of professional classes – slightly below the national average – and a 17.5% share of unskilled classes which is identical to the national average. In the Dunmanway catchment area unemployment rates are in keeping with the national averages. Another notable statistic is the high level of house ownership in the Dunmanway catchment area at 78.3%, while local authority rented housing accounts for 5.9%.

The issues facing Dunmanway are those that can be identified in rural communities across Europe. These include depopulation resulting in an aging resident population, changing land use patterns, shrinking local employment opportunities, along with the homogenising influence of multinational retail and the inability of local business to compete. In addition, the continuing decline in state investment in rural areas has further



Figure 5: Dunmanway: Public information sign

diminished public services more generally and resulted in outdated infrastructure that was better suited to earlier historic economic models that are no longer extant. This is especially true in relation to incoherent strategies for rolling out rural broadband and the absence of a viable public transport network in many areas. A recent 2015 Teagasc⁶ report indicates that only 37% of Irish farms are considered to be economically viable⁷, with family farm incomes adequately meeting family labour costs, with the Mideast and Southeast regions having to the greatest concentration of viable

farms in the country. The border and western regions continue to have the lowest viability rates. The same report also indicated only 29% of farms in the state were considered sustainable, where the farm is not economically viable, but farmer and/or spouse had an off-farm job to supplement incomes. Most worryingly, 34% of farms were considered economically vulnerable where the farm is not viable and neither farmer nor spouse have an off-farm job. The highest proportions from this cohort are concentrated in border and western regions (Hennessy & Moran, 2015). This vulnerability has contributed to numerous rural issues outlined earlier, with electoral districts in Dunmanway bucking increasing population trends at both the county and national level. One Dunmanway Rural District, Milane, recorded as much as a 20.1% population decrease in the 2016 National Census.

⁶ Teagasc is an Irish state body that provides research, advisory and training services to the agriculture and food industry, and to rural communities.

Agriculture is a key sector in Ireland and is a significant contributor to the country's economy. It is also both a significant consumer of energy and a producer of CO₂ and other greenhouse gases, which are linked to human-induced climate change. As landowners, farmers contribute significantly to issues concerning the production, siting, transportation and consumption of energy. Situated in a predominantly rural area (albeit with some one-off industrial units), Dunmanway offers an ideal location to engage with the farming community, as well as the rural community more generally, and explore their role in relation to the energy system.

Relevance to the project

Dunmanway is a relatively small community, located approximately one hour from Cork City by car. It is a broadly representative example of Irish rural communities across the country. Pressures from outward migration, changing work patterns, suburban sprawl, and the subsequent dormitory town style settlement patterns associated with these, all have an impact on how people live here. It offers an interesting contrast to the more urbanised European communities of practice involved in the project; in addition, the socio-cultural and spatial contexts seen in Dunmanway are mirrored elsewhere in Europe.

3.3 Secondigliano, Italy

Situated in the Bay of Naples, and in sight of the iconic volcano Mount Vesuvius, Naples is the third most populous city in Italy after Milan and Rome, and is the most densely populated city in the state (Piccolo & Leone, 2008). The metropolitan area of the City of Naples is home to over 4 million people and remains vulnerable to volcanic and seismic activity from both Vesuvius to the east, and Campi Flegrei to the west of the city. The Post-war period has seen much expansion and reconstruction activity due to the heavy fighting that took place there during the Second World War, with the port of Naples considered one of Europe's busiest and most economically important. It has the fourth largest economy in Italy after Milan, Rome and Turin. The historic city is a UNESCO World Heritage Site, covering some 1,700 hectares in total, and has long been considered an important cultural centre. Its culinary contributions include the now ubiquitous pizza, which while historically a staple for the city's poorer residents it is now considered one of the mainstays of Italian cuisine. Naples also has a rich and long running architectural heritage, with numerous palaces, churches and piazzas found throughout the city. The historic quarter is also home to numerous museums, parks and gardens.



Figure 6: Naples: One of the many book stands in the historic city centre

The demographic profile of the city is younger than the national average and it is home to a sizeable student population. The University of Naples Federico II, considered one of the oldest universities in the world (Timeshighereducation.com, 2017), alone has nearly eighty thousand students enrolled across its 13 faculties.

The rapid expansion of the city during the Post-war years saw what were once rural communities, like that in Secondigliano, merged into the wider metropolitan area of Naples. Secondigliano was still a largely rural town up until the 1960s. The 1970s saw the start of significant construction work taking place, with extensive social housing developments there and in the adjacent neighbourhood of Scampia. A devastating earthquake in 1980 resulted in an additional 35,000 families from the historic city requiring new housing and these families (some with significant social problems) were moved from the historic and central parts of Naples and into areas like Secondigliano.

These new developments consisted mainly of large tower blocks of flats, which housed the significant numbers of people being moved from Naples. Consistent poor planning from the beginning, along with ill thought out strategies for providing additional supporting facilities to these housing units, such as an integrated transport network linking back to the city, poor recreational amenities to facilitate families and young people, and minimal commercial investment in the area has seen massive social problems develop. According to the 2001 National Census, both Scampia and Secondigliano have higher percentages of young people than elsewhere in Naples. The percentages of older people, 65+ years of age, is also lower than the national average (Istituto Nazionale di Statistica Italia, 2017).



Figure 7: Secondigliano: Fresh food shopping

The rapid industrial decline seen elsewhere has had a particularly devastating effect in Naples generally. The once thriving industrial-based economy, which supported the large working-class population here has shrunk considerably. Consequently, unemployment, poverty, drug addiction and crime have risen sharply. These trends have been worsened by the loss of social networks and community supports people once had in their old neighbourhoods. Also, the continuing presence of organised crime syndicates, referred to collectively as the Camorra, contribute to the persistent high rates of

unemployment, especially youth unemployment, the significant truancy and drop-out rates from school, and the easy access to drugs. Access to tertiary education remains elusive for many young people (Mazzeo, 2009). In Secondigliano, these social problems are more acutely felt due to its peripheral location in relation to the rest of the city, a situation that has been ruthlessly manipulated by the many organised crime factions there.

Housing in the city is almost entirely comprised of permanent buildings, including in the most deprived neighbourhoods. A notable exception is Campo Autorizzato, a Roma encampment in Secondigliano, located beside the Carcere Di Secondigliano maximum security prison (McDougall, 2008; Scaramella, 2003). Recent research examining how Italian authorities continue to ambiguously frame the concept of *nomadism* – whether for Roma or for more recent migrants from Africa and the Middle East – within public policy and bureaucratic

practices suggest deliberate efforts on the part of authorities to legitimise segregation policies for certain minorities living in the area. These have been tied up with government efforts to house all of Naples inhabitants in permanent building structures, and has helped to manipulate Roma – and by extension, migrant – identities in contrast to the ethnic Italian majority (Sigona, 2005). Despite its economic significance to Italy, Naples continues to be one of the least ethnically diverse cities in the country, at least according to official statistics. However, given the nature of work available to new migrants – primarily in agriculture – and the desire by some to remain screened from official scrutiny, even when it comes to accessing state supports, the real figure is bound to be much higher (Piccolo & Leone, 2008).

Access to structured employment pathways are low amongst women in Secondigliano, who often have to rely on informal working arrangements, working for example as domestic cleaners or similar types of casual labour often resulting in precarious employment conditions and low job security. With employment opportunities for men also being precarious, many families rely on these types of casual labour for survival.

The issue of waste disposal and recycling has long been an issue in Naples. Referred to as the ‘Waste Crisis’ the criminal influence on the waste services in Naples has resulted in over 20 years of dysfunctional waste management (Kaye, 2010). At a national level, Italy has made strides in improved waste recycling rates, however, Naples still must export significant percentages of its own waste (much of which could be recycled) to incinerators in Germany and the Netherlands. It is also dealing with the legacy of decades of illegal dumping of toxic and domestic waste in and around the city. The so-called ‘Triangle of Death’, situated north of the city has, some suggest irreversibly, damaged the human health, food security and environment of the affected populations there (Marfe & Di Stefano, 2016). On a more positive note, some small progress has been made towards improving the waste situation in the area with recent pilot projects in select Naples neighbourhood encouraging separate waste collection practices amongst the population there. This still does not resolve the problem of recycling or responsibly disposing of the waste once it has been collected however.



Figure 8: Naples: Example of graffiti.
Translation: ‘the hate, I do not repent’

Relevance to the project

Secondigliano is a peripheral urban neighbourhood that expanded substantially and rapidly through the development of low-cost, subsidised housing. The area has a poor reputation due to a high incidence of organised crime and a large concentration of working poor and disadvantaged families. The area, therefore, offers an opportunity to explore energy attitudes and behaviour within a community marked by deprivation. As a neighbourhood with substantial social housing infrastructure it also provides a chance to learn and reflect on the particular challenges and opportunities promoting sustainable energy transitions present.

3.4 Le Trapèze, France

Le Trapèze is situated in District 3 of Boulogne-Billancourt, and is essentially a suburb of Paris and is part of what is considered a strategic centre of economic activity southwest of the capital. It is one of the wealthier districts in France with the average annual income of residents there nearly twice the national average (SalaireMoyen.com, n.d.). This area is home to a number of so-called eco-neighbourhoods known collectively as Ile Seguin-Rives de Seine. Le Trapèze comprises 37.5 hectares in total and is located in what is widely considered to be one of the wealthier suburbs of Paris. The neighbourhoods in and around Le Trapèze have been built on the site of an old Renault automotive plant and are divided into 15 neighbourhoods, comprising of 5 to 6 buildings in each. The communities here use a combination of energy sources, beyond the nearly ubiquitous presence of nuclear power found elsewhere in France. This area has also been designated an eco-neighbourhood because of the utilisation of district heating for residents, the higher standards of insulation in the buildings compared to elsewhere, and an emphasis on pedestrian walkways and green spaces in the public spaces provided.



Figure 9: Le Trapèze: New housing developments under construction on a former Renault automobile factory

The project has been designed to optimise its ecological and environmental ambitions through architectural design, balancing function and form in terms not only of its environmental impact, but also along economic and social terms too. The neighbourhood is designed to achieve a balance between private and public spaces; with private and social housing, offices, retail outlets and shops, as well as social amenities all being carefully planned out. The types of social amenities that facilitate neighbourhood living include nurseries, a school group and a multi-media library. These are complimented by one of the main attractions of Le Trapèze, its seven-hectare public park that runs parallel to the Seine. The park has two large planted areas and is criss-crossed by a network of landscaped walkways.

The neighbourhood is organised into ‘macro-lots’ (around ten in all) with ownership comprising a combination of private and collective ownership models (Ville de Boulogne-Billancourt, 2011). Communal garden areas and parking facilities are shared between several buildings. The management of these buildings and the communal areas is organised through a series of associations coordinated by the management company AFUL. One significant limitation to the development that has been identified is the absence of a community centre such as a ‘town hall’ where residents can meet. Instead cross-community communication between residents is only possible through an online forum. This is problematic for a number of reasons and while initially there was a significant take-up for this means of communication on the part of the residents, with nearly 900

members there are only between 50 and 100 members currently active. Effective communication across the community is therefore somewhat limited.

At present, there are between 10,000 and 15,000 inhabitants living in the now completed Trapèze West development and the soon to be completed Trapèze East development. By 2018, it is estimated that this district will be home to up to 18,000 people. Also, 65% of the energy supplied to this neighbourhood comes from renewable sources at present, mainly geothermal energy, with plans underway to expand the role of solar energy here. Along with roof-top water recovery systems for cooling and heating, the goal is to have 100% of its domestic energy needs coming from renewable sources. Homes here and the transport system are less energy intensive than elsewhere in Paris. Le Trapèze is serviced by the Metro and by an innovative public bicycles scheme. It was the first area outside central Paris to have Vélib' stations (public bikes), which launched in 2009. There is also an urban community subsidy scheme to encourage residents to purchase electric bikes, in an effort to reduce congestion and pollution levels from privately owned cars.



Figure 10: Le Trapèze: Landscaped public green space between housing developments

Le Trapèze has set up a number of ambitious targets and commitmentss towards realising a more sustainable future. These include: a strong emphasis on promoting and developing cleaner energy infrastructure and attitudes to energy consumption, using renewable energy sources where possible; the implementation of an innovative system of water management; and promoting of green public spaces, healthy lifestyle aspirations and soft measures to improve travel systems in the district. The area has been widely recognised for its commitment to sustainable development and it was awarded the term of EcoQuartier in 2013. This use of EcoQuartier has not been without controversy in France, with some considering this type of development making similar mistakes to the New Town planners of the 1960s (Chastenet *et al.*, 2016).

Relevance to the project

Le Trapèze is relevant to the ENTRUST project due to its characteristics as a relatively recent community which has been developed with core sustainable development goals as a driving factor in its development. The focus on soft measures to tackle both energy behaviour and cleaner travel systems is of significant interest to the core aims of the research project and Le Trapèze has been identifies as having significant potential to offer unique insights into the promotion of these sustainability principles in other neighbourhoods. With this in mind we hoped to explore both the barriers and drivers to a sustainable energy transition as encountered in this neighbourhood.

3.5 Stockbridge, United Kingdom

Located 6 miles east of Liverpool, in the Metropolitan Borough of Knowsley, Stockbridge Village is considered one of United Kingdom's most socio-economically deprived communities. Similar to what occurred in Secondigliano, it was built in response to Liverpool's inner-city housing crisis of the 1950s and 1960s which saw some 200,000 people move to new residential areas outside the city's boundaries.



Figure 11: Stockbridge: Aerial view of Cantril Farm housing estate during construction, early 1960s (V. Gill, n.d.)

Approximately 15,000 people moved to Stockbridge as part of this initiative. Originally known as the Cantril Farm estate, named after the farmland that existed there prior to the development, a mixture of nine tower blocks in addition to a number of two-storey homes was built. However, poor planning decisions, official neglect and the sporadic rolling out of the prerequisite public transport, health care, and shopping facilities needed to support the new community, resulted in a steady decline from an

initial hopeful promise for residents living there (Dobson, 2011; Williams, 1986). Because of an administrative oversight – although the land was purchased by Liverpool City Council, due to its location the county of Lancashire was responsible for services such as education – there was repeated neglect from both authorities, with the result that Catholic church-run schools provide the only option for residents (Dobson, 2013). Over the succeeding years up to the 1980s Cantril Farm's reputation gained considerable notoriety with soaring unemployment rates (over 45%), violent crime, and drug abuse grabbing headlines in local and national media outlets. The housing estate was based on the Radburn principle for planned housing estates, which was an American interpretation of designs stemming from the English garden city movement of the 1920s. This principle advocated separating pedestrians and car traffic, both on the grounds of safety and improved energy consumption practices on the part of residents, who are encouraged to use the designated footpaths available to them rather than taking their car for short journeys (Lansing, Marans, & Zehner, 1970). However, this design, coupled with years of government neglect and minimal community engagement, helped foster numerous spaces that were ideal for unobserved criminal activity to take place, increasing a spiral of greater insularity and fear for residents living there.

The situation had become so bad by the 1980s that a new landlord, the Stockbridge Village Trust (now Villages Housing), took over responsibility for the area (Sim, 1984) and renamed Cantril Farm to Stockbridge Village, marking the beginning of significant refurbishment efforts that have taken decades to complete (Dobson, 2013). Four of the original nine tower blocks that were built in the late 1960s (along with hundreds of maisonettes and low-rise apartment block) were demolished during the 1990s with the five remaining towers seeing significant refurbishment in a multimillion pound regeneration project that covered the whole estate.

The facilities originally promised to residents back in the 1960s were finally realised in 2012 with the opening of a new primary school and the Stockbridge Village Neighbourhood Centre, equipped with a sports hall, café, swimming pool, meeting spaces for residents and a youth club (Knowsley Council, 2012). Other regeneration schemes included the establishment of community woodland in the Littlewood area funded under the Single Regeneration Budget (SRB) which ran from the mid-1990s to 2001 (Nolan & Vaughan, 2001). More recently, a key strategic objective of the Knowsley Local Plan Core Strategy is to turn Stockbridge Village into a ‘thriving district centre’ with the bulk of its ‘in-centre development’ activities being focused there (Knowsley Council, 2016).



Figure 12: Stockbridge Village Neighbourhood Centre

Despite this progress, the residents of Stockbridge Village continue to face significant social issues that have only been further exacerbated by government cutbacks to community funding projects under the rubric of austerity. These include intergenerational patterns of poor health, high unemployment, deprivation, and high instances of fuel poverty. With its history of poor planning and neglect from local authorities, as well as of crime, drugs, and underemployment, with up to 42% of working-age adults receiving state benefits (The Economist, 2013), there is limited local community resilience to meet the challenges brought on by Austerity. Effectively an underclass ghetto, it is one of the least ethnically-diverse communities in the United Kingdom, 96% of the population classified as ‘white British’:

In short, Stockbridge Village is isolated. Its isolation is partly geographical—it is two miles from the nearest railway station, and three out of every five households have no car—but mostly cultural. Its residents are trapped in a cycle of low achievement and low earnings.

(The Economist, 2013)

Relevance to the project

Stockbridge Village provides us with another representative example of the many urban fringe communities located across the European Union. Residents in these communities often experience multiple intersecting systems of social inequality (Walby, 2007) and have historically used energy in ways that differ from other citizens in the state. For example, car ownership is lower than the national average and community members in these types of areas have a more limited range of choices when it comes to the energy sources they may wish to use in their home. They have also received highly-centralised cycles of government attention at mixed levels of intensity throughout course of their community’s existence, which can have significant negative impacts on their levels of resilience towards meeting the challenges the energy transition presents.

3.6 University Students, Ireland

University College Cork – National University of Ireland, Cork (UCC), in Irish: Coláiste na hOllscoile Corcaigh, is one of the four constituent universities of the National University of Ireland (NUI), and is situated in Cork, the second largest city in the Republic of Ireland. Located in the south of the country it was founded in 1845 as one of three newly established Queen’s Colleges – the other two located in Belfast and Galway. It became University College Cork, under the Irish Universities Act of 1908. UCC has approximately 20,000 full-time students and nearly 3,000 staff members. It is ranked in the top 1.1% of universities globally in the QS World University Rankings and is Ireland’s leading research university. UCC plays an important social and economic role to the city of Cork. In the 2009 census, the population of Cork was approximately 120,000, which indicates that students in UCC account for 15% of the total population of the city. While it is clear that some of these students live at home with their parents, those students living in off-campus in private accommodation still account for a significant percentage of the people residing in Cork.

The city of Cork is the main commercial and financial centre in the south of Ireland, with a busy seaport and numerous pharmaceutical and technology industries. Major multinational companies including Apple, Pfizer and EMC have set up their European headquarters there. Awarded European Capital of Culture in 2005 and listed in the Lonely Planet Guide in its top ten cities to visit in 2010, the centre of Cork city is within walking distance of UCC’s main campus. It is also serviced by numerous city bus routes and, more recently, the city council has set up designated bicycle lanes to facilitate travel to and from the city centre to the university. Students have a number of choices of accommodation available to them. For those who grew up in the city, many continue to choose to live in the family home. Others choose private rented accommodation around the campus or in the city centre itself. There is also the possibility of using university accommodation, though this option is, in the main, taken up by First Year undergraduates, and international students.



**Figure 13: UCC: Students on the main campus,
near the university library**

Psychological studies have shown that habitual behaviour can be deeply ingrained and act as a barrier to sustainable energy-related behaviour, such as travel (Graham-Rowe, Skippon, Gardner, & Abraham, 2011; Möser & Bamberg, 2008). However, research has also shown that changes in life circumstances, such as a new job, or a new home, can influence people to engage in more deliberative cognitive processes. Very often, it is the reaction to such sharp discontinuities [or in some way altered continuities] from previous life events (Brammer, 1992) – in this case moving from secondary schooling to third level education and adulthood, or



Figure 14: UCC: researchers engaging with students

indeed a return to education as a mature student – that are considered to be either liberating or potentially threatening to a student. How a person reacts to such a liminal experience depends on the pre-existing coping skills the individual has already built up, along with their perceived sense of control over the transition process itself (O’Shea, 2014). It is this negotiation of what (Palmer, O’Kane, & Owens, 2009) describe as ‘betwixt spaces’ where students develop new and meaningful connections with university life. It can be argued that the transitioning experience students undergo may, for some, mirror the wider societal need to shift to low carbon energy configurations. As such, these times of change represent a window of opportunity for people to

establish new habits or understandings of the world around them (Verplanken, Walker, Davis, & Jurasek, 2008; Walker, Thomas, & Verplanken, 2015). Given that many of the students in UCC are currently transitioning to more independent living, and as a consequence should also be developing a better understanding of the energy system and the role they play within in it, they are potentially more likely to be open to engaging in these deliberative cognitive processes, making them ideal participants for ENTRUST.

Relevance to the project

The students attending University College Cork that we have engaged with have been primarily undergraduates who normally reside in Ireland. This mixed-gender, mixed-age group provides an interesting, broadly representative sample of the types of student living in Cork city. Third level students undergo a significant life stage transition. During this transition period, new experiences and newly-learnt knowledges tend to either challenge or reinforce long-held assumptions and beliefs that an individual may have. Consequentially, this can be a formative time as far as attitudes to energy are concerned and attitudes may not be as entrenched as those found within the general population. Research in this, somewhat transient, community provides an interesting comparative context to the other communities within the project.

3.7 Community engagement

A full report on the engagements with the communities will be report in Deliverable 5.1 ‘Report on Community Dialogues’ which will be available in late 2017. A summary of the engagements is presented below to contextualise the information in this report. These interactions have been designed so as to involve local community stakeholders and residents in a collaborative process – to lead towards a positive co-production of knowledge on the experiences of people in the energy systems that are present in each community. The methods for our research engagements in the six communities comprised: semi-structured interviews, focus

groups and surveys as discussed above – these are the information collection methods which contributed to this report. In addition, there were other types of engagements which will contribute to other objective of the project e.g., citizen juries (a deliberative democracy fora) are being used for example to explore possible futures of the energy system; outreach events are used to engage with local communities to inform them of the project and to increase awareness of energy system and our place in it. Once appropriate case study communities were identified for the research project, a systematic approach was taken to the project's interaction with the communities, and engagement was rolled out in a number of distinct phases:

- *Engaging with community gatekeepers:* Having identified the community itself, the first stage of our community engagement process was to identify key actors, who could provide access to members of each local community. Local partners in each of the countries where the communities were situated took the lead in these initial efforts to identify and contact actors who could in some way act as 'gatekeepers' into those communities (Crowhurst & Kennedy-Macfoy, 2013; Reeves, 2010). Understanding and negotiating the differences between access and cooperation were a foremost consideration for when engaging with these initial gatekeepers (Wanat, 2008). By describing the project and explaining its goals – in particular the focus on a community-based, 'bottom-up approach' to the energy transition – we sought to encourage the gatekeeper to participate. This proved more successful in some communities and less so in others. Where a gatekeeper proved either unwilling or unable to help develop further relationships with members of their community we identified a new gatekeeper and started the process again. We were also mindful that communities may have had negative experiences of previous research projects. Consequently, we were quite reflexive in our approach, acknowledging our role as researchers and making every effort to build strong relationships and trust with the gatekeepers
- *Snowballing:* Once a relationship of trust was established with the gatekeepers we engaged in 'snowballing' methods to identify, and then recruit, other members of the community – often those who engaged in the gatekeeper's social network. While this chain-referral sampling method is often used when researching hidden, or hard to reach, populations – notably with those involved in criminality or stigmatising activities (Heckathorn, 1997; Petersen & Valdez, 2005) it also proved useful for the research team given the language barriers and any cultural differences that arose as a result. We were also continually mindful of our commitment to intersectionality and socio-demographic representativeness. Therefore, we made every effort to ensure that cross-section of participants in each community was gender-balanced and displayed a range of socio-economic, geographic, and energy use profiles.
- *Semi-structured interviews:* After establishing good relationships with community members, a series of semi-structured interview carried out in each area. The advantage of this method is its flexibility, and its capacity to capture a 'thick' description of a given topic and they can provide rich data for a

more comprehensive analysis than some more quantitative approaches, notably ‘closed’ questionnaires for instance. Using semi-structured interviews, the aim was to capture the key issues and concerns that are important to people living in the six communities in relation to energy; as well as gaining insight into their everyday understanding of the energy technologies that comprise the energy system.

- *Focus groups:* Building on the findings from the semi-structured interviews, a series of focus groups were conducted – two in each community, except Dunmanway where three were conducted – to further explore the key energy-related concerns that affect them and their community. The participants, in the main, were not those who participated in the semi-structured interviews. Coupled with the semi-structured interviews, the focus groups helped to develop a more comprehensive understanding of energy practices in each community. The focus groups, in addition to the semi-structure interviews, have been recorded and transcribed.
- *Survey:* In addition to the qualitative research, a questionnaire that explored attitudes to energy technologies was also implemented across the six communities with in excess of two hundred responses.

Some of the findings from this engagement to date will be discussed in the next section.

4 Findings

4.1 Introduction

The findings provide an overall assessment of the perceptions of, and attitudes towards, the energy system more broadly, particularly people’s feelings of disempowerment with regard to decision-making about energy – its production, its location, and the limit on choice regarding sources of energy, and the production of electricity in particular. As may be expected, given the wide demographic range of communities and research participants, there are a diverse range of views on all aspects of the energy system, and in particular on each of the major energy technologies currently available. The findings of this deliverable will feed into future deliverables, most notably the **D3.4 Synthesis report on socio-demographic, technical, market and policy analyses**, which will deliver a comprehensive intersectional analysis that reflects this diversity, integrating all strands of the research involving the community engagements. That analysis will be positioned within the policy and technology landscape incorporating the overall findings from the community engagements, and the explorations of the technical and political aspects of the energy system.

A series of emerging themes have been developed from the data produced from our community engagements and those findings that are the most pertinent for this deliverable are presented below. In keeping with the objectives of this task, **T3.3**, this discussion gives particular emphasis to the attitudes and perceptions expressed by participants from the different communities regarding the range of large-scale energy

technologies currently available in the energy system, that are expressed by participants from the different communities.

4.2 The (in)visibility of energy

The complexity of the human factor in the energy system reflects the wider complexity of the energy system itself, yet the seamless existence of energy – electricity in particular – in the lives of people renders it not just invisible, but almost imperceptible. In fact, energy infrastructure is often only made “present” in people’s lives by its absence – during an electricity blackout, or the aftermath of a particularly destructive storm for example. As a participant in one interview put it:

the younger generation...they know nothing of blackouts...they wouldn't be used to it, like. When you grew up in the city, you should go back 20 years ago now, every Christmas you would have a blackout. They [the electricity workers] used to go on strike every year, you know...But it's different nowadays, and I keep on going back to the weather, because it is a major factor in all of this.

Emma⁷, Dunmanway

However, this present ubiquity is stronger in some national electricity grids than it is in others. A participant from one of the focus groups addressed this assumption of an innate and continuous electricity supply by demonstrating that this is not replicated in other parts of the world:

I know in (country of origin) we have nuclear energy and I know that we have a terrible energy ... I don't know, you might be, not be aware of it, but there we have blackouts and they are like planned and you get a ... you know, you get information ... I was there on a recent holiday after not having been there for four years and we went to a shopping centre and it was dark, it [the shopping centre] didn't have lights and they had to actually look at things with a torch because inside the shop it was dark if you don't have the lights on. In the middle of the day!

Caitlin, Dunmanway

This invisibility and the ubiquitous nature of current fossil-fuel based energy infrastructures have deep-rooted consequences for our collective efforts to change to renewable energy sources. Renewable sources of energy production are more visible over greater swathes of landscape, in a way that the older fossil-fuel and nuclear power stations are not. The installation of new grid connections linking the renewable sources to national

⁷ In reporting the data produced from our engagements with participants from the communities, we are using names for the participants, rather than participant-identifiers. This is a deliberate decision reflecting the primarily qualitative nature of the research, and emphasises the centrality of people and their opinions and attitudes to the project – respecting their subjectivity as persons, rather than as mere sources of data. All persons quoted are anonymised using names randomly chosen from the top 100 most popular names for each country.

transmission points are also visible intrusions on the landscape, but the social costs are largely borne by those who do not necessarily benefit from the installation of this infrastructure, mainly in rural communities. In the interviews and focus groups there was a noticeable engagement with the topic of wind energy, and wind turbines amongst participants in the Irish rural community – where wind energy can be a contentious issue with regard to planning. It should be noted that there was support in this community for wind energy, as such, but what was clearly expressed by participants was a desire for more meaningful community consultation and the need for community empowerment with regards to the planning and placement of these installations. However, this community was not alone in expressing deep dissatisfaction with their disenfranchisement from decision-making around the energy system. One participant quite succinctly demonstrated this conflicted attitude towards wind turbines, moving from a position of initial acceptance to one that is more hostile in tone.

I didn't mind the turbines in the beginning, but there is a huge amount of them around here and they are hideous. You know. They're not clean. You know. They're not the golden goose of energy consumption or production.

James, Dunmanway

While wind energy was a focus of interest in the Irish rural community, solar energy was, not unexpectedly, a focus of interest in both Spain and Italy. The participants in Gràcia discussed in some detail the topic of solar power, and the impact the troubled history of developing a solar energy industry in Spain had had there. Across the communities, many expressed concerns too about the sources of energy, evidencing a positive attitude towards renewable energy, and frustration that they could not choose the source for their own electricity supply.

One subject – energy pricing – held particular resonance for participants. During the course of our community engagements it became clear that across all of the communities that concern for the price of energy, and for the price of electricity in particular, was a constant factor. As with an electricity blackout, the arrival of utility bills effectively makes energy more “present” in people’s lives. The cost of energy is of such importance to some individuals that they purport to have made life-changing decisions because of it.

One of the reasons we left [the city] was because bills were just going up and up and up. To the extent that the council bill was going up, the utility bills were going up, everything was going up and our salaries were staying the same or dropping in the recession and we just thought this is ridiculous, we can't continue.

Lucy, Dunmanway

4.3 Power and the control of the energy system

The issue of power (political as opposed to energy-related) and the control of the energy system emerged as a significant issue across every community. Concerns about the control of the system can, broadly speaking, be described as coalescing on two levels, that is, concerns have been raised about the system on the macro structural

and political level; as well as on the community and individual level – these can be loosely categorised as those with “power”, and those without.

People have confidence in energy technologies, and they are, for the most part, comfortable with technology and the conveniences that technology brings. However, they mistrust the corporate energy system with its powerful energy actors and the political system that between them hold the levers of power associated with the energy system. On the political front, control of energy can become a literal “power play” between central and regional governments; and pricing structures and supports for the energy industry, including renewables, are also significant issues.

Problems arise when technologies are seen as being imposed without adequate consultation with the people affected. These problems are strongly linked to the issue of power and control, and with the perception, if not the recognition, that the control of the energy system rests in the hands of the powerful few – policy makers, largescale energy industry operators, financiers *etc.* – while communities and individual consumers have little to none of either.

Well the wind farms were very careless really in their community consultation. They had a meeting ... Now I live in the area, I saw the planning permission going up, I was alert, aware, looking, and didn't know that there was a meeting, a consultation meeting in Dunmanway. So, next thing of course is an opposition group. Surprise, surprise, you know. And then the really shocking thing is the community group will have to pay for their legal opposition.

Muriel, Dunmanway

Across all of the communities we have engaged with there is deep unhappiness with the undemocratic nature of how decision-making is conducted, especially in terms of energy production, particularly when communities feel the system is stacked against them, actively disempowering them. This feeling is particularly strong in those communities that were in some way first empowered or encouraged to invest in a specific energy source, only to later become disenfranchised or penalised by a subsequent change in policy, as is the case in Gràcia.

In Gràcia there was disquiet that the national government in Madrid would not allow regional innovation to take place. This compounded the animosity felt by some in Catalonia towards the central government in Spain. One of the discussions that came from the Gràcia focus groups centred on central government's efforts to standardise solar energy production, giving prosumers six months to legalise their installations or face monetary penalties, or worse. A number of participants suggested that individual prosumers were targeted and jailed because of this change of policy. Whether the respective harshness of the penalties incurred is true or not, it had a chilling effect on people's attitudes towards investing in solar energy.

Apart from what we believe, the news coming out is that the government of Spain has made people lose a lot of money invested in solar energy. They deceived them and wrote

this new law that says you are committing a crime for installing a solar panel on the roof of your house. Of course, then you really get discouraged from following this path.

Arnav, Gràcia

The feeling of disenfranchisement from decision-making extended across all of the communities. The national policies around renewable energy, and in particular policies concerning planning for renewable energy farms were contentious. Participants in the rural Irish community, while supportive of wind energy in the community, were direct and forthright in their criticism of the lack of consultation with regard to the installation of wind turbines, as mentioned above. There is the perception that planning rules favour the energy companies, and this was exacerbated by, as they saw it, the less than inclusive, and far from transparent “engagement” with the communities who would be living with the installation.

It's very undemocratic anyway. Everybody in the catchment area of this turbine proposal, whether it be the wiring or the things themselves, are against it, apart from the two or three people, and [the wind farm developer], who are involved in actually making money out of it. Everyone else is against it, and yet they can just push ahead with it. It's not what I call democracy.

Ciaran, Dunmanway

4.3.1 The power to implement change

Across all of the communities, there was a desire expressed to move to a sustainable energy system. While it is not clear that people recognise the scale of what is involved in moving to a sustainable energy system, particularly in achieving the longer-term targets agreed in the Paris Climate Accord (2017), nonetheless there was both a desire for a sustainable system, as well as an optimistic outlook on its probability – albeit not spread evenly across all communities. However, this enthusiasm was tempered by the impression that the power to bring about a sustainable energy system lay with the powerful few, such as energy lobbies and policy makers, and not with the powerless many who comprise the majority of energy consumers.

For example, in the technologies survey, explored in more detail below, overall people indicated that they were very optimistic about the capacity of renewable technologies to produce a sustainable energy system; however, when interviewed, people described the limitations they felt on their capacity to effect change at present, and expressed their feelings of having little control over how the energy system would change going into the future.

You have a small control of what you are really using ... the control that you have over your use of energy, at least in my case, it is mainly over using public transport instead of... either walking or private transport. It is more composed of small gestures, such as switching off the lights, the use of water and so on. But the feeling is that where energy comes from, it is not under our control, where energy comes from.

Giulia, Gràcia

However, as indicated, people feel detached from the decision-making process, and they feel that they have very little control over the pathway forward. A contributing factor of concern for some in the communities is the fear of corruption, and its impact on the development of renewables, and in the case of Italy, nuclear energy. Participants there expressed fear about the possibility of substandard materials being used in building the energy production facilities; although this particular aspect was not expressed as a concern across the other communities. In Secondigliano, one participant mentioned the level of perceived involvement of organised crime syndicates in what they termed as “the green economy” – most notably with regards to wind farm developments in the region, given the favourable EU supports wind developers can get for them. There was genuine concern that if this wasn’t tackled it would undermine any progress made in rolling out renewable energy technologies in the area.

In Gràcia, the perceived ‘energy oligopoly’ came in for a considerable degree of criticism and frustration for participants.

I think it’s very interesting because it’s a way to start to try to break up the monopolies, right, that there are in the electricity business, and that are related to this idea of revolving doors, right? Because, ultimately, energy is a pretty important control system... and it’s good that this issue is brought up, but I am not sure about what kind of energy system they will put in place.

Albert, Gràcia

There was a general understanding from most of the participants we engaged with that there needed to be change in how the energy system is structured, with most accepting the need to switch towards renewable energy sources. What was less clear to some was how this transition is to be manifested. Contrary to the messages coming from policy makers in some member states that encourage individual changes in behaviour and practices under a narrative of consumer choice, many recognised that those with the real power are not doing enough to shift towards the energy technologies that will realise the energy transition. Many participants were cynical about the supposed power they are purported to have as consumers who by their purchasing power alone can drive the fundamental economic restructuring that is needed for the energy transition. When asked their opinion on who should drive the energy transition, participant responses invariably focused on policy makers and the large-scale energy companies. Susette, in Le Trapèze put it like this:

What we are saying is that change comes from people, petitions, etc. But, in my opinion, the question should be “from whom should the change come?” It is those who control energy, companies that manage energy in collaboration with the government. In any case, people will follow, whether they agree or disagree.

Susette, Le Trapèze

Despite this perceived lack of personal power or control over the energy system many people remain optimistic about their and their own community's potential to make positive changes and to move towards a sustainable energy system.

4.4 Views on energy technologies

The purpose of this task T3.3 is to undertake an intersectional analysis of perceptions and attitudes towards energy technologies, including nuclear power. In this section, we focus on four large-scale technologies – fossil fuels, nuclear energy, wind energy, and solar power. Combined results from both the survey, as well as the findings that emerged from the intersectional analysis of the qualitative data, with regard to preferences and attitudes towards large-scale technologies, are presented below.

As discussed previously, the qualitative elements of the research were designed to allow perceptions and attitudes towards technologies to “emerge” naturally during the qualitative engagements in order to better assess these in a more meaningful way. Additionally, in order to provide a “snap shot” of opinion on specific energy technologies, a general survey was conducted in the communities of practice (see Appendix 5 for the survey questions). Amongst other questions, respondents were asked to rank power generation technologies in order of preference. Nine large-scale methods of power production were listed, including both “traditional” power generation using fossil fuels, as well as forms of renewable production, in order to gather an overview of attitudes towards forms of power generation in general.

The results from the survey show a strong preference for renewable energy, while the older technologies of coal-fired and oil-fired power generation are the least favourite technologies, with nuclear power only marginally more preferable to respondents.

Table 3: Ranking of preferred large-scale electricity generation source across all communities

	1	2	3	4	5	6	7	8	9	Total	Score
Solar power	62% 121	18% 35	6% 12	5% 10	4% 8	2% 4	1% 1	1% 2	2% 3	196	8.06
Wind power	15% 29	40% 76	18% 34	14% 27	5% 10	4% 8	2% 3	2% 3	1% 1	191	7.16
Hydro-electrical	9% 18	13% 25	28% 55	21% 41	16% 30	7% 14	3% 6	2% 3	1% 1	193	6.34
Geothermal	2% 3	13% 24	19% 35	27% 51	18% 33	11% 21	4% 8	5% 9	1% 2	186	5.72
Biomass	5% 9	8% 15	11% 21	15% 28	28% 53	11% 20	9% 17	6% 11	8% 15	189	5.02
Gas-fired	1% 2	3% 5	4% 8	7% 14	10% 19	30% 56	30% 57	10% 19	5% 9	189	3.89

	1	2	3	4	5	6	7	8	9	Total	Score
Nuclear	6% 11	3% 5	5% 10	4% 7	6% 11	11% 21	11% 20	7% 13	47% 86	184	3.05
Oil-fired	1% 2	3% 5	5% 10	2% 3	8% 14	9% 17	19% 35	40% 75	13% 24	186	3.04
Coal-fired	1% 1	3% 5	5% 9	4% 8	4% 8	12% 23	21% 39	27% 50	24% 45	188	2.95

It is clear from the results shown in the table above, that solar power is the most popular renewable technology with 62% of all first preferences. The preference for solar held in all communities, for both women and men, for all ages, and across the different levels of socioeconomic privilege. Wind power emerged as the second preferred technology, by a clear margin. Wind found particular favour in the two Irish communities, where wind power closely vied with solar for the position of most preferred, in ranking terms – despite conflicts over the location of wind turbines in the Dunmanway area specifically, and in the Cork region more generally, as discussed below. Wind also scored relatively highly in Stockbridge. Although there are some differences between communities, there is a very strongly expressed preference for renewable sources of energy production across all communities, with fossil fuel sources, and nuclear, being the least preferred technologies. Even in the French community, Le Trapèze, nuclear was less favoured than renewables, and was ranked lower than Solar, Wind, Hydro, Geothermal, and Biomass.

On the issue of state financial support for large-scale power production, as shown in Figure 15, when asked to indicate which technologies governments should be “heavily” investing in, solar power is the most popular technology amongst respondents across the communities overall; additionally, this preference holds for government supports for solar “micro” domestic energy production also. Again, overall, wind is the clear second favourite energy technology. However, on a community by community breakdown, there is some variation, as shown in Figure 16.

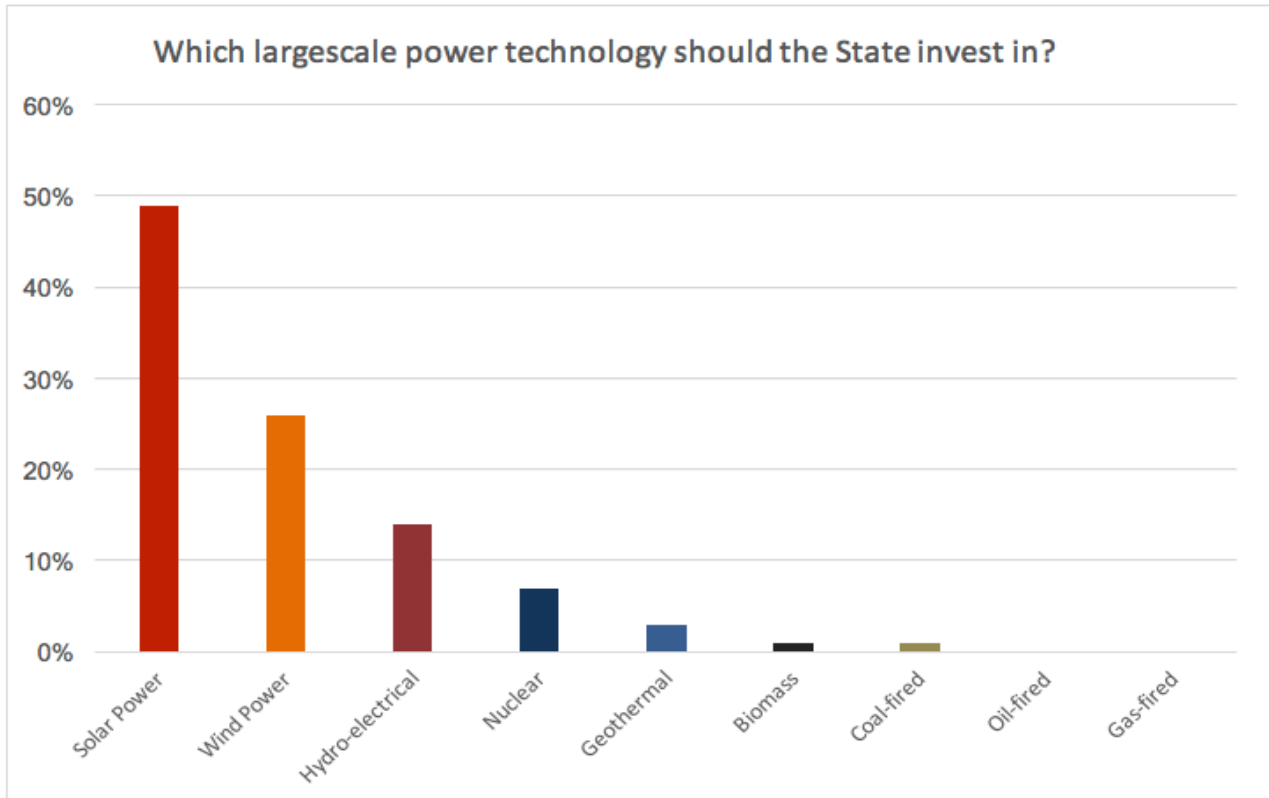


Figure 15: Preferred large-scale electricity generation investments

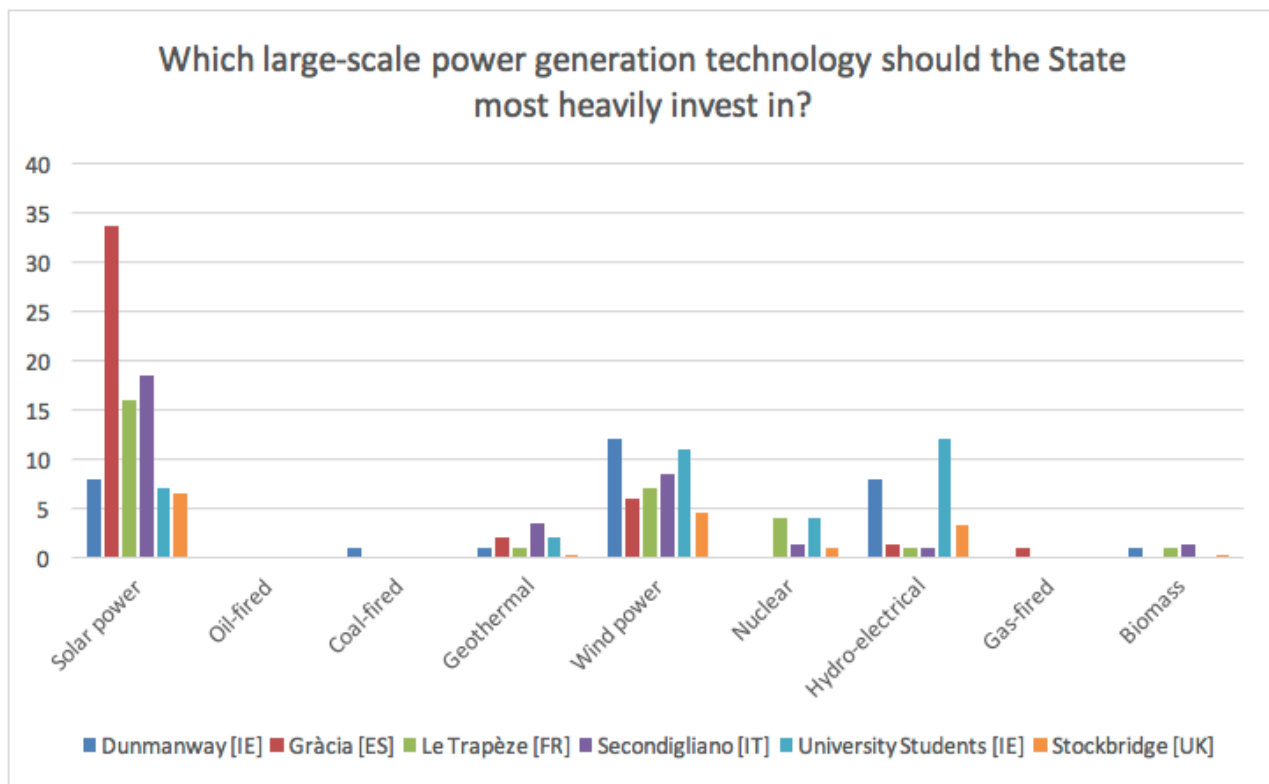


Figure 16: Preferred large-scale electricity generation investments, by communities

On the question of State investment, as might be expected solar power found great support in those countries with the greatest amount of solar irradiance, Spain, Italy, and France. Despite some disquiet with the

development of the micro-generation of solar power in Spain, it was the most popular technology for government support there. Wind power was preferred to solar for State investment in both Irish communities – Dunmanway and the university students. In contrast to the other communities, there was also strong support for government investment in hydro-electrical power in both of these communities as well. Additionally, participants from these two communities also commented in the survey that the State should invest in tidal and wave energy too, reflecting the fact that Ireland is an island nation, with great potential for producing energy from the surrounding ocean and seas. These survey results, and the findings that emerged from the in-depth intersectional analysis of the qualitative elements of the research demonstrate that support for renewable energies overall is very strong, with support for solar power being particularly robust.

4.5 Fossil fuel energy

The findings and results derived from the technologies survey as well as from the qualitative engagements indicate that attitudes towards fossil fuel energy are largely negative in comparison to attitudes towards other energy sources. As shown in the figures below, the participants were asked to rank nine different types of large-scale electric power generation technologies in order of preference; three fossil-fuel technologies were included in these – oil, coal, and gas.

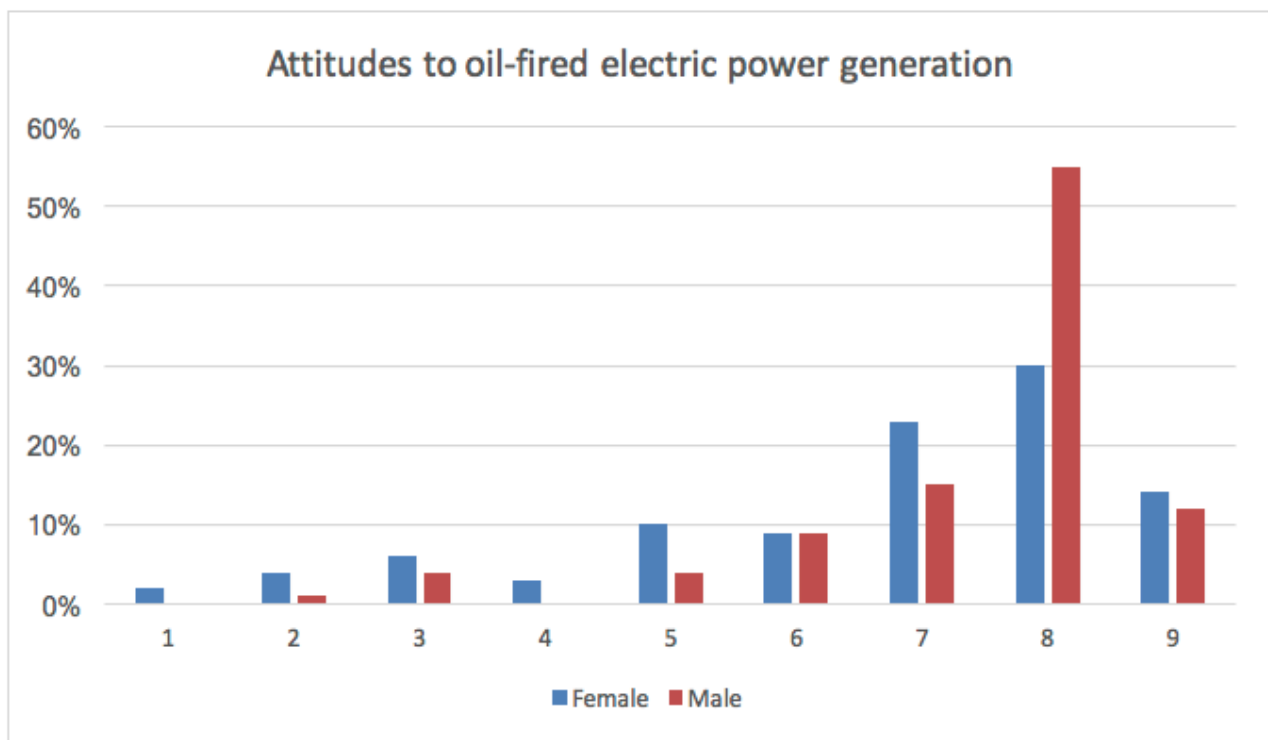


Figure 17: Attitudes to oil-fired electricity generation (1 highest preference, 9 lowest preference)

Overall, the attitudes towards these technologies was overwhelmingly negative, and they were ranked at the lowest end of the scale in comparison with other technologies. Overall, fossil fuels were ranked lower than the other technologies, with the exception of nuclear power. Nuclear was rated slightly lower than gas, but was preferred to oil and coal. Interestingly there is also a small difference in the ranking between female and male

participants: male participants show a more consistent aversion to fossil fuels, whereas there is a more dispersed ranking of fossil fuel among female participants.

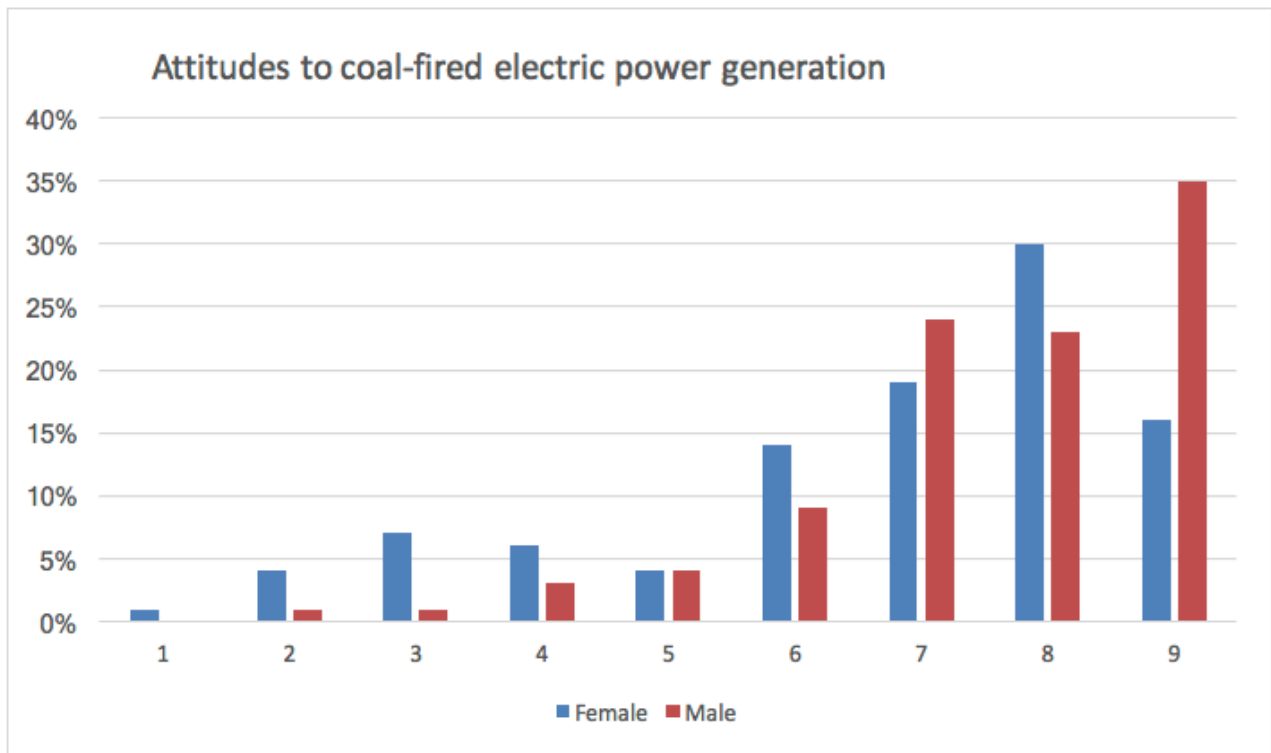


Figure 18: Attitudes to coal-fired electricity generation (1 highest preference, 9 lowest preference)

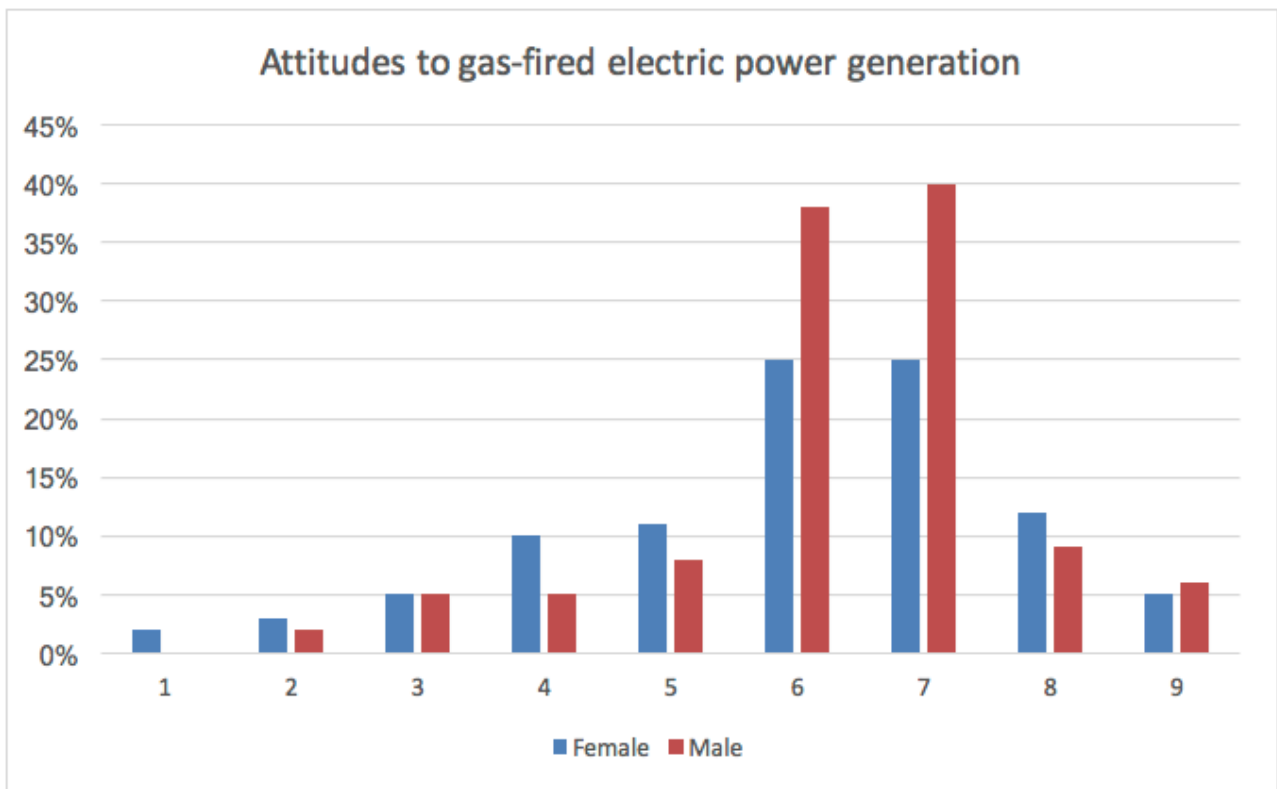


Figure 19: Attitudes to gas-fired electricity generation (1 highest preference, 9 lowest preference)

With regard to support for state investment in large-scale power generation, it is clear that fossil fuel technologies received the lowest amount of support from survey participants for State investment – by a considerable margin, see also Figure 18 and Figure 19 above. Oil was the most unpopular, no person (from any community) thought it should receive State support, with coal and gas almost as unpopular an option as oil, with just one person supporting each option. Interestingly, nuclear power was more popular than any of the three fossil fuels mentioned by more than a factor of 10.

4.5.1 Fossil Fuels: Key results and findings

Turning to the qualitative engagements with community participants, fossil fuel energy received comparatively less attention from our respondents in comparison to other sources such as solar, wind, or nuclear. Respondents spoke often in general terms about existing energy systems but usually did not explicitly identify these as derived from fossil fuel sources.

The subject of fossil fuels was raised more often in the interviews and focus groups by women, rather than by men, with twice the number of women making reference to fossil fuels as men – although, as noted, it was not widely discussed, with only approximately one third of the female interview participants and one sixth of male participants referencing fossil fuels explicitly. Among the six communities, fossil fuel was mentioned most in Dunmanway, Stockbridge, and Gràcia.

Three key themes permeated most of the debate concerning fossil fuels. These were largely negative in tone and focused on oil dependency issues, future energy security, and the impact of fluctuating oil prices on everyday lives.

The issue of society's dependence on fossil fuels emerged in most of our communities in several ways. These ranged from concerns about the lack of choice of alternative power sources, the growing pervasiveness of technologies and patterns of travelling and living linked to fossil fuels, and the promotion of a consumer society that is largely reliant on fossil fuel sources. The following extract taken from a focus group with our community in Dunmanway illustrates this point:

A lot of modern houses are very well insulated, so they probably need less energy, but they have boilers that are only linked to oil, which I think is terrible

Doreen, Dunmanway

Energy security and peak oil were also highlighted and some participants stressed that either nuclear energy or renewables need to be considered to lead society away from dwindling fossil fuel sources. In this context making changes now rather than later is seen as the only means to ensure social stability and address society vulnerability to fluctuating oil prices. The next quote comes from a focus group interaction with the UCC student cohort, where Ailis articulates both a concern for oil depletion, the lack of public awareness concerning energy supply, and the need for renewable alternatives:

We're talking about oil and gas for everything we're using. It's like people don't realise it's running out . . . so I would like to do it now before we have no choice

Ailis, UCC

Fluctuations in the price of oil were discussed in different ways by participants in all communities and in general the price of energy is something that respondents described as impacting their everyday lives and lifestyles. In the engagements with the Dunmanway community, the price of oil, and its related fuel products, emerged from the discussions as being particularly relevant for the Dunmanway community, where the dependency on oil for home heating systems, as fuel for transportation, and fuel for farming practices was viewed as making rural communities particularly vulnerable to fluctuations in oil prices. Urban areas in contrast were seen to have more choices of transport, and energy sources, which some participants argued makes urban dwellers less dependent on oil.

Additionally, the political impetus behind the significant reduction in oil prices was mentioned by a number of respondents. This development seems to drive concerns over a lack of political commitment to develop cleaner and more sustainable energy systems. The following quote taken from Jaspar during a focus group interaction in Le Trapèze exemplifies this wider perception:

it's a shame but the level of governmental policy, the price of oil is very low right now . . . abnormally low. And so, we enjoy it, consumers over indulge, governments are happy because it increases purchasing power, it lowers costs for companies, so it is the alignment of the stars for our President – good for him. But in fact, it would have been necessary to take advantage of it. It is not very popular, but to transform some of this decrease in the form of an additional tax, so as, for example, to make a great program for energy saving, to subsidize energy savings in housing and others. But hey, it's politics, it's demagogy.

Jaspar, Le Trapèze

Table 4 below, presents the influencing factors that were identified in the communities as informing attitudes to fossil fuel energy sources across the six communities.

Table 4: Attitudes to fossil fuel energy: influencing factors

Variable	Linked variables	Key findings	Key communities
Personal and interpersonal Factors	<i>Knowledge, direct experience, values, age, gender, class, income</i>	<ul style="list-style-type: none"> • Strong perception of increased oil dependency • Concern of energy use associated with use of dirty and polluting energy sources • Views of Fossil Fuel as polluting and wasteful 	Le Trapèze, Secondigliano, Stockbridge
Structural Factors	<i>Technology type, environmental factors, institutional structure and spatial scale</i>	<ul style="list-style-type: none"> • Structural factors further enhancing oil dependency from technology to social practices • Energy security and peak oil and large concern for many respondents 	
Political Factors	<i>Perceptions of decision-making, support for policies, orientations, interest groups, institutions.</i>	<ul style="list-style-type: none"> • Perceptions of oil prices and dependencies linked to national and geopolitical agendas 	
Market Factors	<i>Market penetration, consumer experiences, familiarity with goods and services, relative price</i>	<ul style="list-style-type: none"> • Fluctuation of oil price and local impacts • Awareness of fossil fuels implicated in consumer society growth 	
Community Factors	<i>Networks, social integration, local identity, collective ownership and empowerment</i>	<ul style="list-style-type: none"> • Perceived rural and urban differences in energy use practices and choice of energy sources 	

4.6 Nuclear energy

The findings and results from both the technologies survey as well as from the qualitative engagements show that attitudes towards nuclear energy are mixed. In the survey, participants were asked to rank nine different types of large-scale electric power generation technologies in order of preference (see Table X, above). Nuclear power was ranked seventh of the nine technologies. Overall, participants rated nuclear energy as considerably less preferred than renewables, but rated it as preferable to both coal-fired and oil-fired methods of power production, and only slightly less favoured than gas-fired. However, nuclear was consistently the least favoured placing, with 47% of all participants rating it in last place as the least favourite option. This compares with coal-fired power, at 24%, and oil-fired at 13% of respondents. Attitudes towards nuclear power may be mixed, but it is clear that there is a strongly negative attitude towards the technology.

Table 5: Ranking of community preferences towards nuclear energy

	1	2	3	4	5	6	7	8	9	Total	Score
Le Trapèze (France)	11% 3	7% 2	7% 2	4% 1	7% 2	32% 9	7% 2	0% 0	25% 7	14% 28	4.36
UCC (Ireland)	16% 5	3% 1	10% 3	10% 3	0% 0	19% 6	3% 1	3% 1	35% 11	16% 31	4.26
Stockbridge (UK)	0% 0	5% 1	15% 3	0% 0	20% 4	0% 0	20% 4	5% 1	35% 7	10% 20	3.50
Secondigliano (Italy)	6% 2	0% 0	3% 1	6% 2	6% 2	6% 2	8% 3	3% 1	64% 23	18% 36	2.47
Dunmanway (Ireland)	3% 1	0% 0	3% 1	3% 1	7% 2	7% 2	10% 3	7% 2	60% 18	15% 30	2.37
Gràcia (Spain)	0% 0	3% 1	0% 0	0% 0	3% 1	5% 2	18% 7	21% 8	51% 20	20% 39	2.00

Given the prominence of nuclear energy in France, it may perhaps be expected that amongst the communities, nuclear power would find the highest level of popularity with Le Trapèze, where it received a share of first preferences of 11%. To give that figure context, it should be pointed out that nuclear as a preferred energy source came in far behind solar, at 54%, and wind, at 24%, in the Le Trapèze community. Perhaps surprisingly, given there are no nuclear power stations in Ireland and a strong public sentiment against nuclear power, that a significant percentage of university students appeared to indicate quite a positive attitude towards nuclear energy. 16% of the university students consulted gave it a first preference. However, it should also be noted that more than twice that number of university students put it as the least preferred option, giving it their least preferred option. While no participant from either Stockbridge, nor Gràcia gave nuclear power their primary preference, two people in Naples did, and one person in Dunmanway did too. Again, nuclear was the least favoured technology for power generation in both of these communities.

When asked which large-scale electric power generation technologies their governments should be investing in, nuclear power, while coming in far behind solar, wind, and hydro-electrical, had a similar level of support as geothermal, again boosted by the Irish university student cohort. It should be noted that this, perhaps unexpected, support for nuclear power from the students may relate to supporting the funding of research into nuclear fusion, as opposed to nuclear fission. In contrast to this support for nuclear in the technologies survey, it is interesting to note that the students did not mention nuclear power at all either during the interviews, nor during the focus groups.

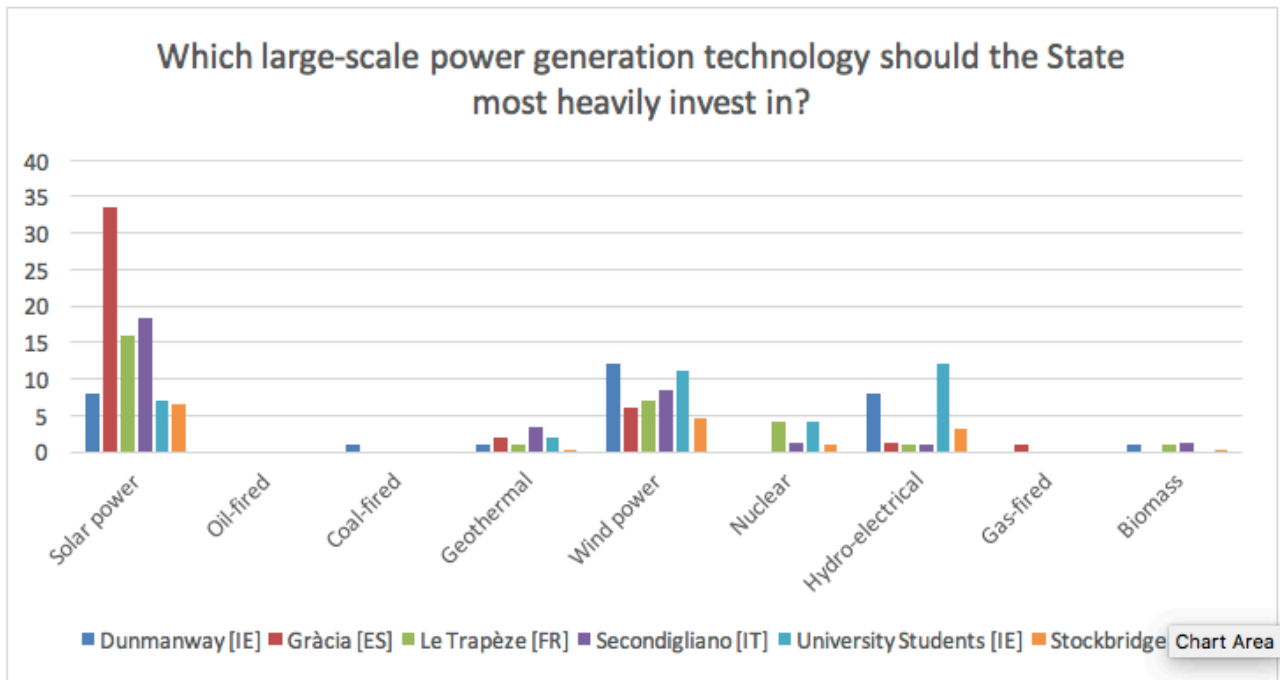


Figure 20 Ranking of preferences for large-scale power generation investment

What is clear from the survey is that there is a significant gender divide on the issue of nuclear power. Of the 6% of respondents who thought that the state should prioritise investing in nuclear energy, just one percent were women, the other five percent were men.

The qualitative data concerning nuclear energy is uneven among our six different communities, as is the profile of the participants that raised and debated both the merits and the drawbacks of nuclear energies. In keeping with the data from the technologies survey, there is a strong gender discrepancy between male and female participants regarding the discussion of nuclear energy. Over half of the men who participated in the interviews and focus groups mentioned nuclear energy, whereas only five percent of our total female cohort offered any comment on nuclear energy at all. There was also a significant difference in level of discussion with regard to the various age cohorts. While the youngest group, those aged 18 to 24, did not discuss nuclear energy at all, there was a rising level of interest as the participants got older, with the oldest groups giving nuclear power the most attention. Unsurprisingly, the community who most discussed the issue of nuclear power was Le Trapèze in France, followed by Stockbridge in the UK – this is perhaps not unexpected as these two communities are located in countries with a significant nuclear industry.

4.6.1 Nuclear Energy: results and findings

Findings derived from qualitative materials captured in the form of semi-structured interviews and focus groups strongly emphasise the divided range of opinions and stances regarding the development and employment of nuclear energy. Positive attitudes towards nuclear energy options were framed in terms of ensuring future energy needs are met, devising a feasible energy system based on a mix of energy sources and

improving existing practices and technologies. The idea that ‘nuclear is needed’ and that it is an ‘alternative’ to ‘harmful’ fossil fuel sources permeates most of the favourable attitudes to nuclear technology.

On the other hand, negative attitudes to nuclear technology reflect a big concern with regard to the impact of nuclear energy production on the environment and human health, the threat of natural disasters and terrorism, the hidden costs of nuclear energy associated with the disposal of nuclear waste and the continuing financing of expensive nuclear energy research and infrastructure. There was a strong sense of fear for those that were opposed to nuclear technology, with it being described as an ‘aggressive source of energy’, causing ‘brutal pollution’. A comment from one resident of Le Trapèze captures both the perception of the necessity for nuclear power, as well as the fear of its potential for harm.

I'm afraid of nuclear power, but I think France needs energy. However, I think there are too many power stations. I lived sandwiched between 3 power stations in the Loiret. There were 3 power stations nearby and it made me feel scared. In case of an accident one day...

Raquelle, Le Trapèze

There is an interesting scalar component in reference to nuclear energy. Locally, some respondents expressed concern over the potential impact of nuclear energy production and waste. However, it was also recognized in communities that currently don’t have nuclear energy, namely our Italian and Irish communities, that national boundaries provide little safeguard in terms of nuclear energy impacts. In this instance, references were made in Ireland concerning contamination coming from the Irish sea due to the Sellafield Nuclear plant located in the UK, and in Italy concerning vulnerability in the Alps area due to nuclear power stations in the south of France.

Lack of information was mentioned by both proponents and opponents of nuclear energy. Most people stated they had limited knowledge concerning nuclear energy. It was also noted that there is a great level of uncertainty and knowledge dissimulation which prevents people from understanding the real impact and cost of nuclear energy production. Negative and more neutral attitudes to nuclear power are framed by perceptions of nuclear energy as harmful and clouded in misinformation, which is coupled with contrasting perceptions of alternative renewable sources as more ‘clean’ and ‘natural’. The following quote taken from a focus group interaction with Elizabeth, a home maker in the Stockbridge community, illustrates this point:

I don't know enough about nuclear energy and I don't know enough about fracking, and I think that renewables just seem safer. I think that's for me, [because] I don't know enough about it, [it's] more natural

Elizabeth, Stockbridge

Narratives linked to nuclear energy whether they were positive or more neutral in stance emphasised the fact that the energy system needs to be made of a mix of technologies, and that this is the only means for obtaining energy security in the future. It is notable that these narratives already highlighted above were mainly derived from respondents from our communities in Le Trapèze and Stockbridge. The following quote taken from an interview with Louis in the Le Trapèze community illustrates this point:

I'm not sure that nuclear is perfect and I'm not pro for only one energy. I am very French in that area. I love complexity because I think there are specific uses for different 'niches', and that there is no one solution that meets all the needs, and which is perfect.

Louis, Le Trapèze

Table 6 below provides a detailed summary of all the key findings identified pertaining to respondent's attitudes to nuclear technology. These ideas will be further addressed in the discussion section of this section.

Table 6: Attitudes to Nuclear Energy: influencing factors

Variable	Linked variables	Key findings	Key communities
Personal and interpersonal Factors	<i>Knowledge, direct experience, values, age, gender, class, income</i>	<ul style="list-style-type: none"> • Male dominated theme • Divided opinions with significant numbers of those in favour and against • Lack of information a big concern for many respondents • Debate largely framed by concerns over securing energy sources for future needs 	Le Trapèze, Secondigliano, Stockbridge
Structural Factors	<i>Technology type, environmental factors, institutional structure and spatial scale</i>	<ul style="list-style-type: none"> • High level of concern over pollution, nuclear waste and side-effects of nuclear energy production • Nuclear energy debates largely confined to areas with existing nuclear energy industries • Improving existing technologies to move from nuclear fission to nuclear fusion • Less visible form of energy 	
Political Factors	<i>Perceptions of decision-making, support for policies, orientations, interest groups, institutions.</i>	<ul style="list-style-type: none"> • Proponents largely favouring an energy mix policy • Opponents stating that a partial policy focus on 	

Variable	Linked variables	Key findings	Key communities
		nuclear leads to the detriment of development of cleaner alternatives	
Market Factors	<i>Market penetration, consumer experiences, familiarity with goods and services, relative price</i>	<ul style="list-style-type: none"> • Questions over economic viability due to high costs of technology and waste disposal • Weak producer-consumer relationship • End-user price of nuclear energy seen as affordable. 	
Community Factors	<i>Networks, social integration, local identity, collective ownership and empowerment</i>	<ul style="list-style-type: none"> • Fear of local environmental impacts • Some references to collective action in terms of anti-nuclear mobilization debates 	

4.7 Wind energy

The results of the technologies survey showed that producing electricity from wind energy came a strong second in terms of popularity with participants, while not as strong as solar, it scored highly amongst all communities, both genders, and across all age cohorts and socioeconomic groups. In terms of discussion, the analyses of the data produced from the qualitative engagements in the communities, wind power emerged as the most talked about form of energy production. Both women and men raised the topic of wind energy, and it was raised by all age cohorts, and in all communities. However, reflecting its status as a very “live” issue in Ireland, it was raised most by the participants from Dunmanway and UCC, with a strong showing from the participants in Stockbridge, UK also.

5.7.1 Wind Energy: results and findings

Wind energy production and consumption was widely discussed by our interview and focus group participants. In particular, there was a significant number of debates emerging from our rural community in Dunmanway. This community with strong agrarian traditions has relatively recently seen the introduction of wind farms in the area, and like other places in Ireland, and indeed Europe, this has proved to be a controversial issue in some quarters.

Wind energy is notably more intrusive on the landscape compared with other forms of energy production. Debates concerning the merits of promoting renewable sources of energy were more diverse and divisive among the respondents. In some instances, these diverse positions were seen to spark a greater debate among the community about the future of the energy system. The following interview extract with Sophie one our respondents from the student cohort in UCC demonstrates the evolving debate ensued from controversy around the implementation of wind energy infrastructure in rural areas.

It got a few people kinda of talking about – “well hold on, if that windmill doesn't go here, does it go somewhere else?” Or – “Do we not get the extra power, or what?” and for a short while it did kinda start a bit of a discussion about – “Oh hold on, so what would that have given us, or does it go somewhere else?” “Is it located somewhere else now”, um ... A bit of conversation started about how their energy is provided.

Emma, UCC

Concerns over the social and environmental impacts of large scale wind farm developments highlighted issues such as noise pollution, the negative impact on the landscape, the impact on birds, as well as less tangible effects on human health. Smaller scale wind turbines were more acceptable than large scale structures. Negative views of wind farms were also expressed in terms of dispossessing rural people of their resources by harvesting local assets, with no concrete benefit to the local area and communities. There was a strong awareness of the controversial aspect of promoting wind energy at local level and some respondents were supportive of community anti-wind energy groups.

With regard to wind farms, the lack of local consultation was particularly galling to participants. Sarah explains the modus operandi of the wind energy company, as it was perceived in the local community.

So, they were very sneaky in some ways, when they set up a public meeting ... They had a few posters up and they had a couple of people from [the wind energy company]. I just thought, that was, it was like a kind of a cover up. It was like [they]’re seen to be holding a public discussion, but there’s actually no great discussion going on. And there were a few people who asked pertinent questions, and “oh, we’ll get back to you”, “oh we’ll send you on those maps”. Yeah, and they heard nothing back. So, it was just a bit of a fob off, and a, just a show to be seen, ’cause they probably have some kind of obligation to hold a public discussion.

Caoimhe, Dunmanway

This is not to say that there was outright opposition to wind energy in Dunmanway, far from it. The attitude towards wind energy among respondents from Dunmanway who participated in the technologies survey was very positive. As with the other communities, they too rated wind power in second place, after solar, although it was more preferred than in other communities – in fact, strongly vying with solar for most preferred technology. Overall, the community had a positive attitude towards wind energy, it was the means of introducing it into the area that was problematic – particularly the fact that the community consultation was perceived as tokenistic. The size and scale of the developments were also criticised, as well as the fact that communities were seen to not directly benefit from the installations – with the exception of the land owners who stood to profit from the turbines.

It is Coillte [State owned] the forestry people who have sold the land to the wind turbine people, and I think it's a bad place. It's too close to housing, they're too tall. It seems to me like a totally missed opportunity, going the private enterprise route, rather than the community. I think there would be no objection if they were smaller, and there was some guarantee that the local community benefitted from them.

Muriel, Dunmanway

Many of the respondents that supported wider wind energy development often linked this to either potentially free or considerably cheaper energy for the consumer. As indicated, some respondents also wanted to see greater benefits for the local communities where these wind developments are/will be located. In terms of visual impact, proponents of wind energy with experience of living beside these structures reported that they had no negative impact, while some people described them as pleasant.

Those who were interested in wind energy, as well as other renewables in general, but who had no strong feeling either way on the issue, expressed the need for more information on renewable energy. It was felt that in order to gain the appropriate level of understanding of the potential merits, as well as potential drawbacks and negative impacts of wind energy, that there was a strong need for accurate information to guide people. The following quote taken from a focus group interaction with Matilde from the Le Trapèze community highlights this point:

I don't know. If we talk about wind energy, it's good. But then I read stuff and I say to myself, "finally it's not that good" ... I have a question. How do we know the information we read [is accurate]?

Nadya, Le Trapèze

National discrepancies between the take up of these technologies were discussed by participants, and political and institutional differences amid different countries were highlighted as affecting perceptions of how wind energy development is accepted in those countries. For example, in our Secondigliano community, issues of trust were highlighted as a deterrent in terms of allowing stakeholders, perceived to be corrupt, to take the lead in developing these infrastructures. There was a strong feeling that criminal interests "has put its hands on everything...even...on green economy" including "beautiful wind turbines." Similarly, in the Gràcia community there is lack of trust in energy supply companies to deliver a fair deal for communities.

Table 7: Attitudes to Wind Energy: influencing factors

Variable	Linked variables	Key findings	Key communities
Personal and interpersonal Factors	<i>Knowledge, direct experience, values, age, gender, class, income</i>	<ul style="list-style-type: none"> • Largely divided stance on value of wind energy • More evenly spread intersectional response rate 	Dunmanway, Stockbridge, UCC

		<ul style="list-style-type: none"> • Lack of information over merits and disadvantages of wind energy 	
Structural Factors	<i>Technology type, environmental factors, institutional structure and spatial scale</i>	<ul style="list-style-type: none"> • Noise highlighted as an issue • High energy visibility: links to both negative and positive impacts to landscape • Concerns over large scale infrastructure 	
Political Factors	<i>Perceptions of decision-making, support for policies, orientations, interest groups, institutions.</i>	<ul style="list-style-type: none"> • Views of other European nations such as Germany and Holland as policy models for promotion of renewables and wind energy • Calls for better structures of governance to tackle corruption and ensure a fair energy system is developed 	
Market Factors	<i>Market penetration, consumer experiences, familiarity with goods and services, relative price</i>	<ul style="list-style-type: none"> • Support for wind energy framed in terms of it being either a free or cheap source of energy • Lower acceptance of large scale wind farms 	
Community Factors	<i>Networks, social integration, local identity, collective ownership and empowerment</i>	<ul style="list-style-type: none"> • Introduction of wind turbines tipping point to increase community energy debates • Relatively strong awareness of anti-wind farm associations and debates • Energy justice debates linked to extraction of local resources and benefits to communities 	

Table 7 above provides a detailed summary of the key findings pertaining to respondent's attitudes to wind energy. These findings will be integrated with the intersectional analysis of energy practices in **D3.2** and incorporated into **D3.4 Synthesis report on socio-economic, technical, market and policy analyses**.

4.8 Solar energy

There was a high level of interest in solar power technologies expressed by participants across all six communities. While more men than women made references to solar energy, it was raised across all communities, including the Irish and UK communities – despite the fact that Ireland and the UK are not renowned for sunny weather. Solar energy is popular across all age cohorts, and all sociodemographic groups.

Of all the communities, the participants from Gràcia engaged with the topic of solar energy the most. However, while there was a high level of support for solar energy, there was considerable unhappiness and disquiet expressed with regard to the development of solar power in Spain, and specific solar policies which participants perceived to be divisive.

4.8.1 Solar Energy: results and findings

Attitudes toward solar power were broadly positive with regard to the potential that this form of energy has for the future of the energy system. In general participants expressed strong aspirations in all communities to secure a clean and stable form of energy supply linked to renewable energy. In these accounts, solar energy was often singled out as a key source. Concerns over climate change, pollution and energy security frame much of the conversations about the need to promote the production of cleaner forms of energy. Narratives portraying solar energy as being more ‘natural’ were frequent, and across our six communities this source of energy production was perceived to be the least invasive and harmful.

However, some respondents expressed concerns in relation to solar energy. In the rural community in Dunmanway, for example, participants expressed concerns regarding the takeover of rural land from other traditional uses such as agriculture and tourism. Other respondents also voiced a dislike for the visual impact of large scale solar energy production. Aside from the more immediate land use and visual landscape concerns, there were also some other issues highlighted with regard to optimal models of governance pertaining to energy production and consumption in the future. The following quote from José drawn from a focus group interaction with the community of Gràcia illustrates this point:

There are some laws that protect some [energy] lobbies. There is no possibility to abandon that cycle because you become illegal. The alternative is to participate in a cooperative. This is a logical and coherent way to look for an alternative to the model, but the truth is that the public is not yet aware of the possibility to change the model, or that you could produce your own energy, or that they do not have to pay a tax for using the energy of the sun/wind for something that is free and renewable, you could manage it by yourself. It is a contradiction but it is a kind of democracy in which we are engaged that will not change until society, a neighbourhood, a social group become more aware and decides to claim a model change.

Arnau, Gràcia

While these concerns do not represent the majority of views on the topic they do appear linked to participants which have considered in more detail the overall significance of developing solar energy. These narratives were prevalent in the community of Gràcia where solar energy policy has been more controversial and marked by policy shifts which started by promoting private installation of solar panels at household level in the form of grants, but subsequently moved to tax the use of solar energy by households – the ‘sun tax’. Appeals for new models of governing energy have largely emerged from these experiences which feed into calls for

community mobilization groups and ideas about cooperative style energy system infrastructure. While the idea of independent energy ownership was, by and large, supported by many of the respondents, it was also highlighted by two participants that in terms of national energy security this model can be problematic. Apart from these policy issues, participants also highlighted concerns over the practical maintenance of solar panels, their vulnerability to burglars and vandalism.

Finally, a significant finding in terms of divisions along lines of socioeconomic privilege suggests that solar energy is largely perceived by most people to be a source of energy primarily enjoyed by the more privileged households, and that the high expense of the technology makes it largely inaccessible for middle to low income families. The next quote taken from a focus group interaction with Marie a young student from our UCC cohort is an example of this:

I think like solar power and solar panels are grouped into the same thing as underfloor heating and stuff like that. It seems fancy and inaccessible and people think it is more for rich people

Iseult, UCC

Table 8 below provides a detailed summary of the key findings pertaining to respondent's attitudes to solar technology. These findings will be integrated with the intersectional analysis of energy practices in **D3.2** and incorporated into the Synthesis report **D3.4**.

Table 8: Attitudes to Solar Energy: influencing factors

Variable	Linked variables	Key findings	Key communities
Personal and interpersonal Factors	<i>Knowledge, direct experience, values, age, gender, class, income</i>	<ul style="list-style-type: none"> • Respondents often associate household solar energy with more privileged homes • Perception of solar energy as the most natural source of energy 	Gràcia Dunmanway Le Trapèze
Structural Factors	<i>Technology type, environmental factors, institutional structure and spatial scale</i>	<ul style="list-style-type: none"> • Concerns over security, maintenance and longevity of solar technology at household level • Seen as a more visible energy source and linked to concerns over aesthetics and use of space for developing these technologies 	
Political Factors	<i>Perceptions of decision-making, support for policies, orientations, interest groups, institutions.</i>	<ul style="list-style-type: none"> • High expectation of greater tax incentives • Some grant schemes seen as overly complex and onerous for less well-educated groups 	

Variable	Linked variables	Key findings	Key communities
		<ul style="list-style-type: none"> • Volatility of policies in this sector, in some of the communities, discouraging household investment and interest in these technologies 	
Market Factors	<i>Market penetration, consumer experiences, familiarity with goods and services, relative price</i>	<ul style="list-style-type: none"> • Strong emphasis on the need to develop new models of energy production and consumption based on mixed energy sources and co-ownership • Some concern expressed over feasibility and security of independent (i.e. household owned) energy systems • Concerns over affordability of solar technology • Concern over hidden costs of installing new technologies in the form of new billing systems or new taxes 	
Community Factors	<i>Networks, social integration, local identity, collective ownership and empowerment</i>	<ul style="list-style-type: none"> • Cooperatives and community projects highlighted multiple times • Solar energy seen as a potential resource for community led initiatives 	

4.9 Views on the capacity of renewable technologies for change

There is a significant level of confidence that renewable technologies have the capacity to produce a sustainable energy system that also helps to tackle the worst effects of human-induced climate change. Results from the online survey indicate that across the communities 69% of women and 71% of men (weighed average) had confidence in renewable technologies.

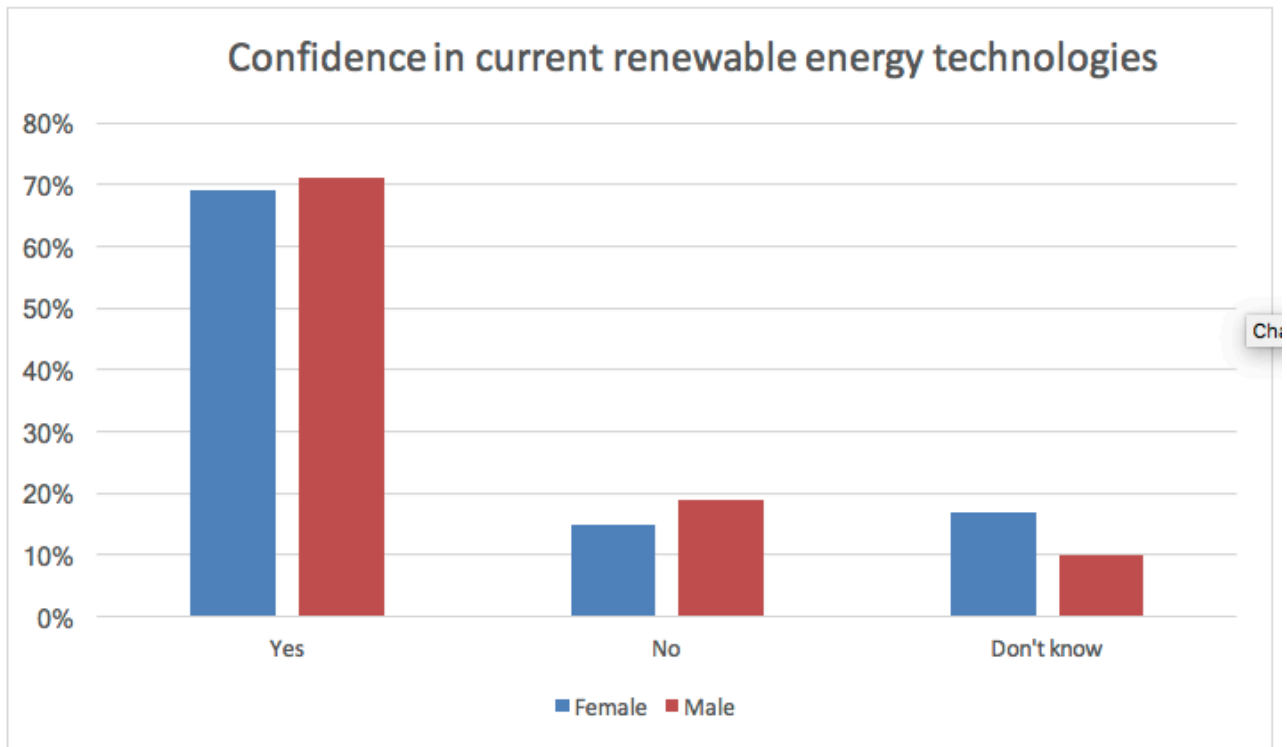


Figure 21: Confidence in current renewable energy technologies to provide sustainable energy system & tackle climate change

Further, as shown in Figure 22 below, most people expressed an increased confidence in the capacity for renewable technologies to produce a sustainable energy system in the future, rising to 79% and 76% respectively.

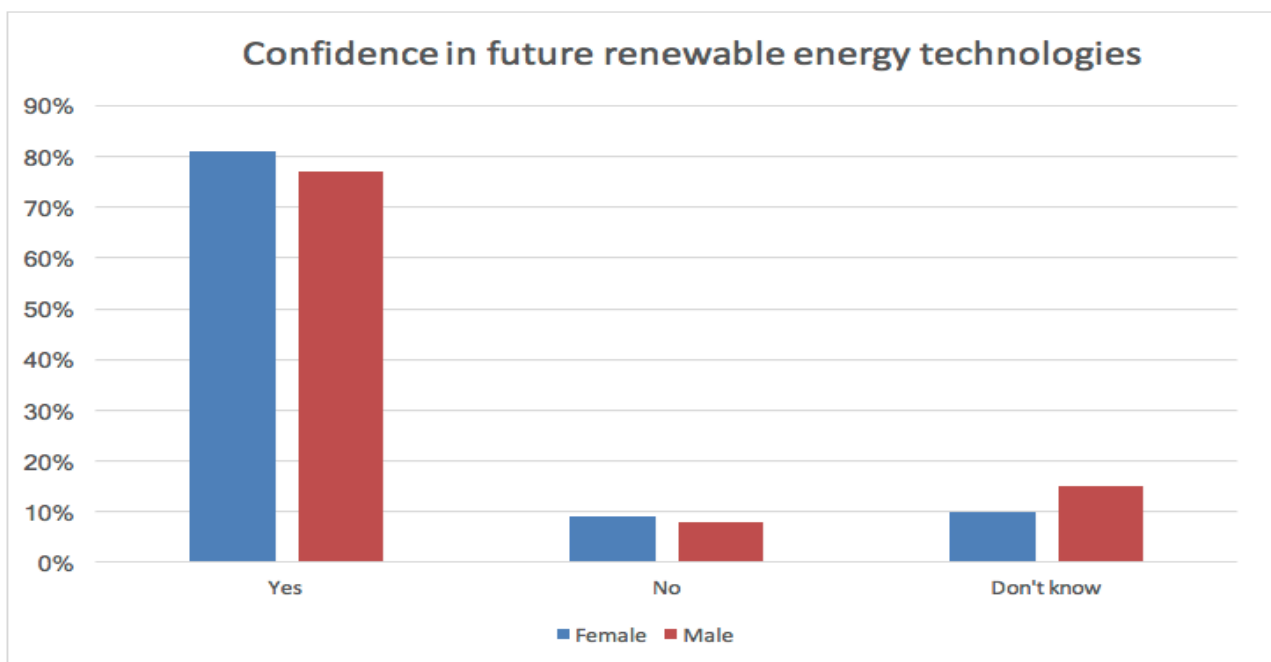


Figure 22: Confidence in future renewable energy technologies to provide sustainable energy system & tackle climate change

While, both women and men, had high level of confidence in the capacity of renewables to produce a sustainable energy system, there were some disparities across the communities as shown by Figure 23 below.

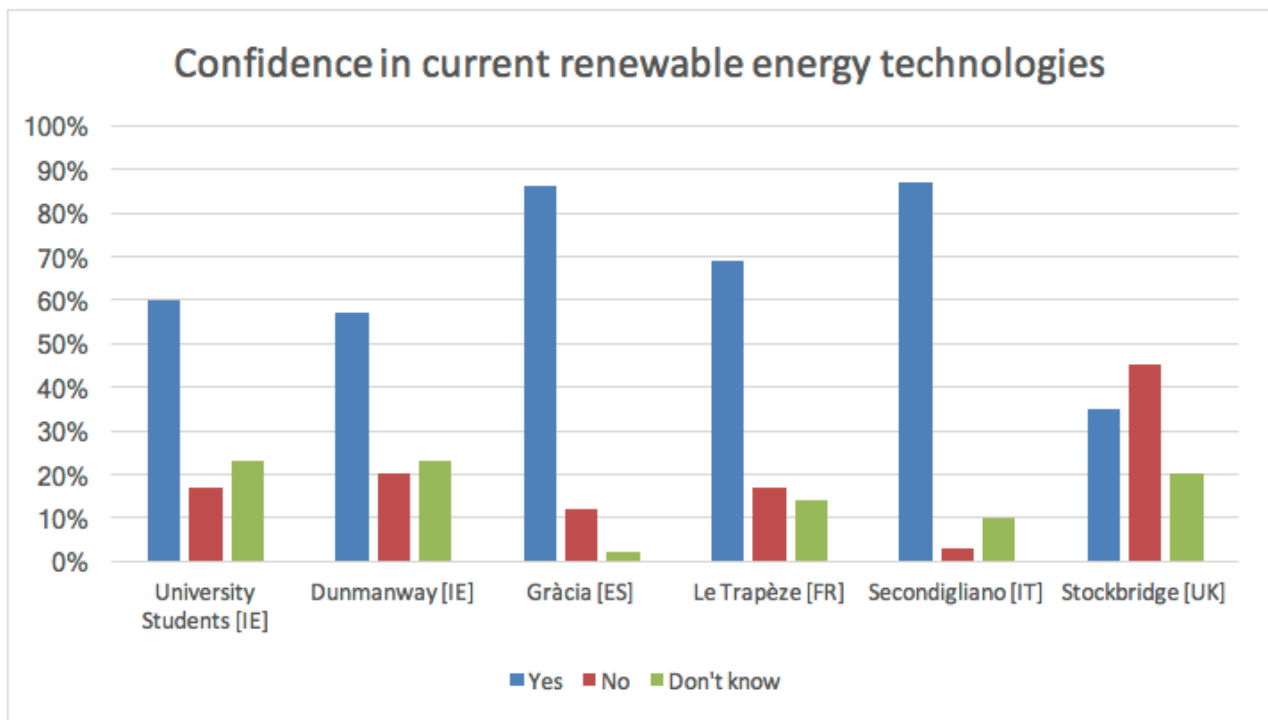


Figure 23: Confidence in current renewable energy technologies to produce a sustainable energy system, by community

Across all of the communities there was a strong level of confidence in the capacity of renewables, at the present time, to produce a sustainable energy system – with the exception of the ‘urban fringe’, socioeconomically deprived, area of Stockbridge in the UK. Not only does the community of Stockbridge show the lowest level of confidence in renewables, at 43%, it also shows the strongest level of negativity, with 39% of respondents expressly demonstrating that they do not have confidence. In contrast to Stockbridge, the community with the strongest degree of confidence in renewables is the socioeconomically deprived Italian community, Secondigliano. This can partly be explained by the negative experience Stockbridge residents have had in relation to the introduction of a biomass district heating scheme that also saw significant increases to their monthly energy costs. As was experienced elsewhere, the issue of cost and the specific technology involved became conflated in the discussions. The fact that the landlord introducing the new heating scheme chose to change the pricing structure for household energy bills, while at the same time lauding the new scheme as “green” and renewable, was not lost on those living there. The new pricing structure was based on a pay-for-use model, in contrast to the previous flat weekly tariff. The results from Stockbridge were in stark contrast to the results from Secondigliano, where attitudes diverged considerably to those in Stockbridge – with Secondigliano being the most optimistic of all the communities with regard to the capacity of renewable technologies to provide a sustainable energy system. Attitudes towards the capacity of renewables to produce a sustainable energy system in the future are generally positive across the communities, with the exception of Gràcia, which showed a decrease in confidence for the capacity of renewables in the future in comparison to

present capacity. However, in contrast to the rest of the communities, excepting Gràcia, the confidence of the Stockbridge residents increased by the small amount, rising from 43% to 48% – a rating that remains significantly lower than in any other community.

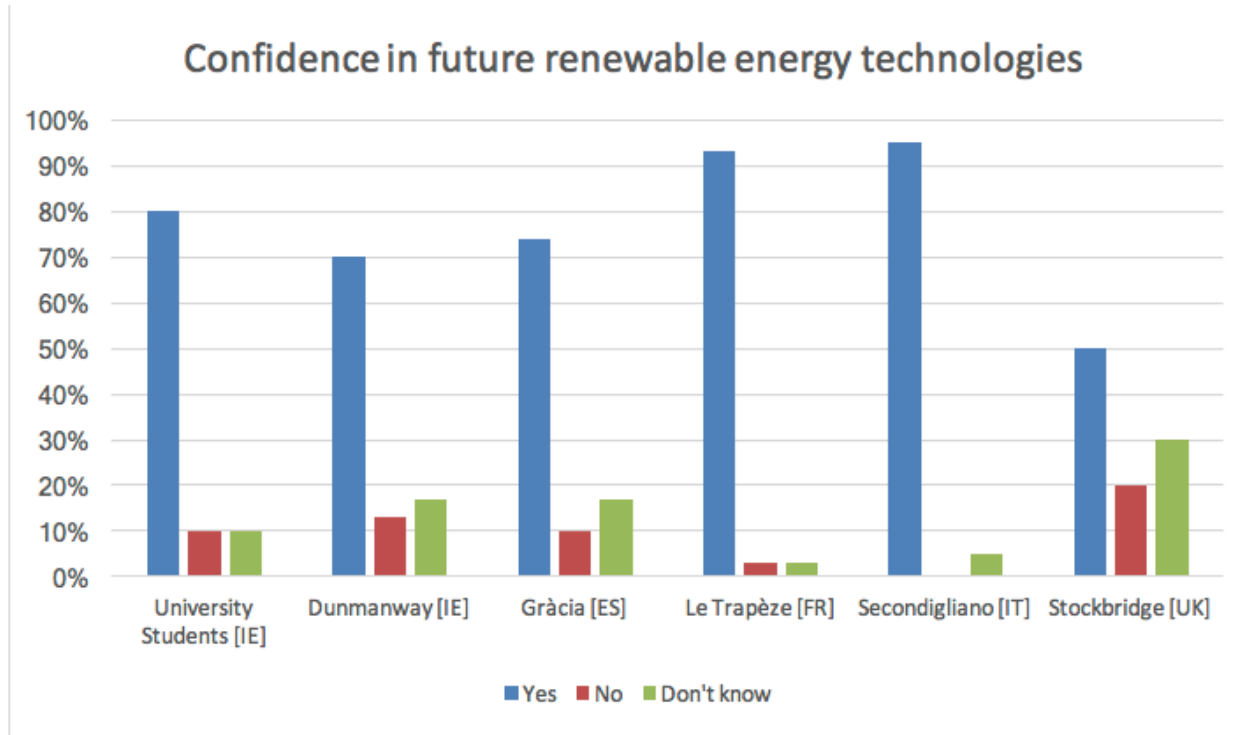


Figure 24: Confidence in future renewable energy technologies to produce a sustainable energy system, by community

The fact that there is such a significant level of negativity towards renewables in Stockbridge is particularly noteworthy, and drawing on the qualitative engagements with residents, it seems evident that the imposition of a new biomass system with what appears to be minimal consultation with local people has had a significant impact on local attitudes. During their interviews, the participants from Stockbridge discussed the entirely negative impact that the imposition of the biomass heating system had on their quality of life because of the added expense of the system, and problems with efficiency. It can be surmised that their negative outlook on the capacity of renewables to produce a sustainable transition reflects their poor experience of the imposition of an expensive biomass system in the tower blocks, with little to no meaningful consultation with the residents. As a result, that Stockbridge participants had the lowest level of confidence in the potential for renewables to provide a pathway to sustainability. While there were low numbers of respondents in Stockbridge, close to half of both men and women lacked confidence in renewables. Amongst women, the level of confidence in the capacity of renewables to produce a sustainable energy system at present is 44%, with men at 50%.

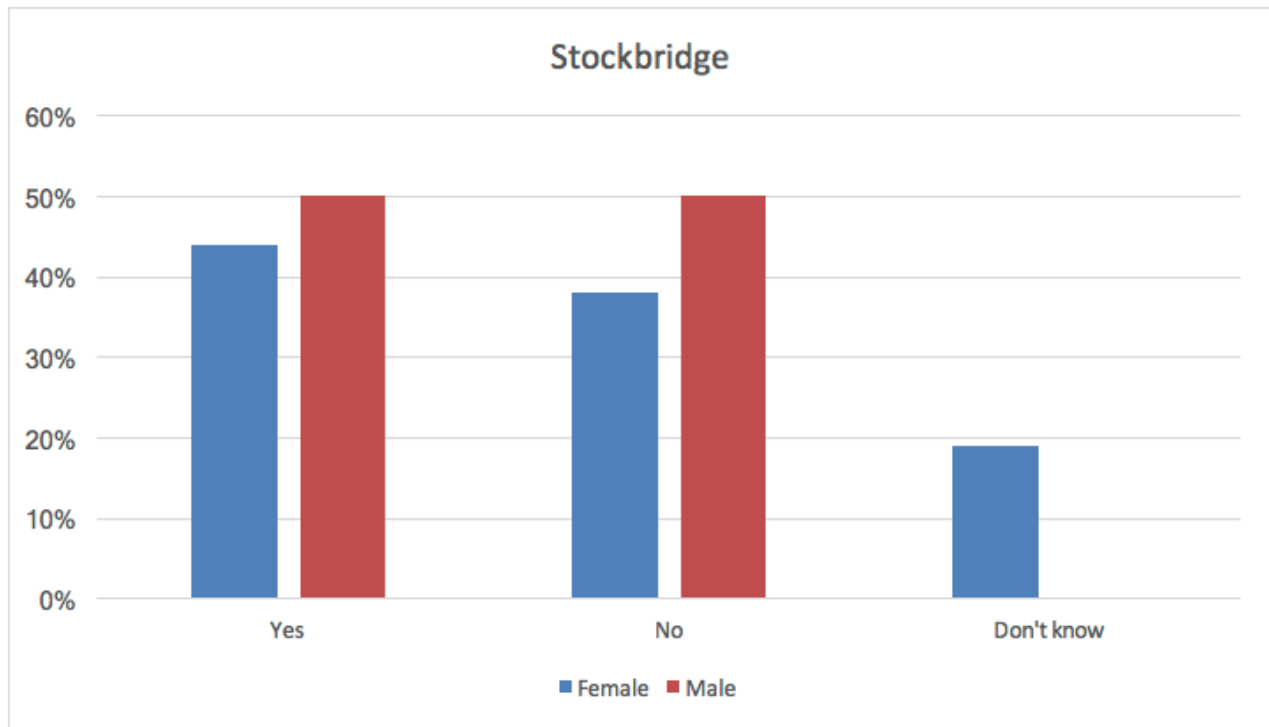


Figure 25: Confidence in current renewable energy technologies, Stockbridge

The level of confidence in the capacity of renewable energy technologies in the future to produce a sustainable energy system was only slightly better for women in Stockbridge, rising to 50%; but remained unchanged at 50% for men. The results show that the residents from Stockbridge who participated in the survey had little added optimism for the future with both groups at 50% – the lowest level of confidence across all of the communities.

As discussed above, the survey is a simple “snapshot” of opinion within the communities, nevertheless, the degree of difference in levels of confidence in the capacity of renewables to produce a sustainable energy system is noteworthy. The depth of ill-feeling in Stockbridge should not be underestimated given the way the new pay-per-use system effectively plunged a significant number of residents into varying levels of extreme energy poverty. For some it resulted in them having to make quite fundamental decisions in their day-to-day choices.

The biomass, but like I was saying, I can't afford to turn it on, so I don't use the central heating system at all, 'cause it's ridiculous. It's so expensive. So, what I tend to do if it's really cold, I've got like thermals and stuff.

Henry, Stockbridge

One disabled resident spoke of how he chooses between heating and eating:

We can't afford it, 'cause some – like I only get paid a fortnight ... £20 goes in that right away and that doesn't run, sometimes I have to just cut down on my food.

William, Stockbridge

The participants described the highly negative impact on their standard of living of the new system, plunging some of them into extreme energy poverty.

Returning to the question of the capacity of renewable energy to deliver a sustainable energy system in the future, while overall there were high levels of confidence across all communities, the rise in confidence was not uniform. While most people had increased confidence for the future, some were more pessimistic. Particularly noteworthy in this regard was the community in Gràcia which showed an overall slight decrease in confidence – from 84% down to 70%, where women had a slightly lower drop from 82% to 77%, while men dropped more sharply from 86% to 64%.

4.10 Community capacity for sustainability

Turning now to the issue of the community capacity for sustainability, participants in the communities were asked if they thought that they as individuals, and or their communities can make a difference in promoting a sustainable energy system. Overall, there was a high level of confidence in community capacity, for both women and men, at 73% and 72%, respectively.

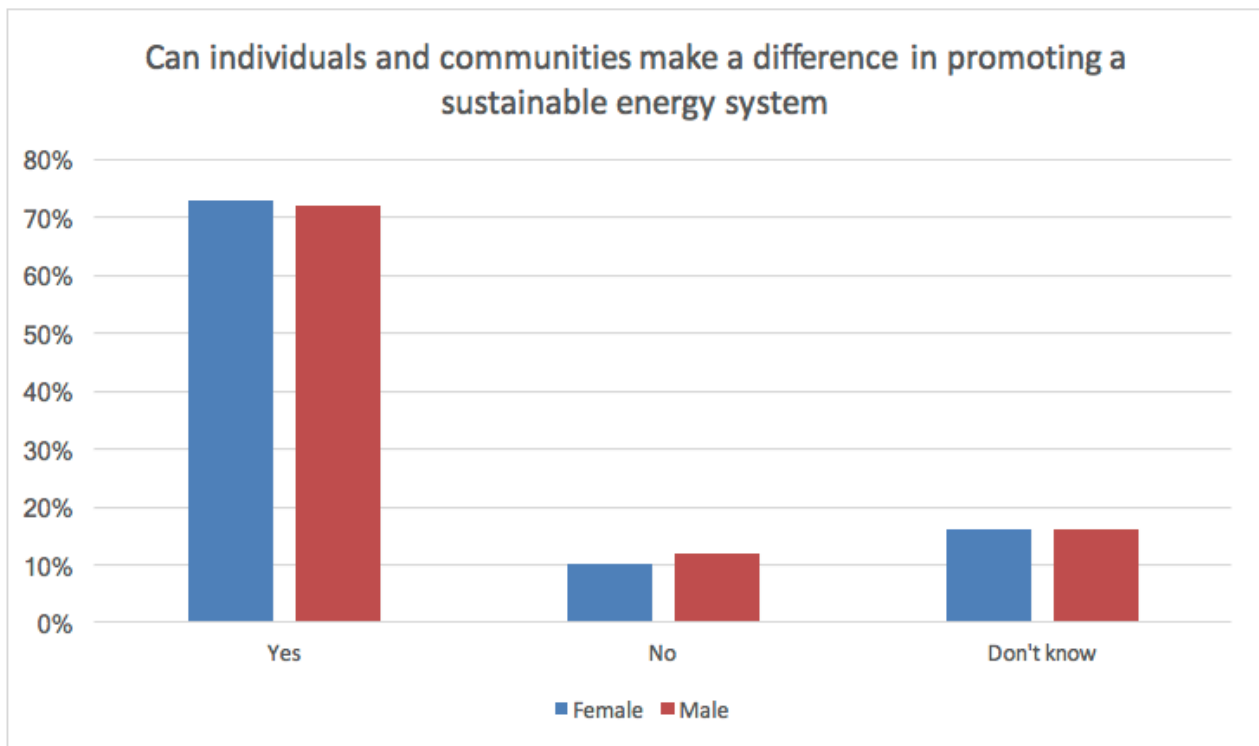


Figure 26: Perceived capacity to positively contribute to the energy transition

However, there was a significant level of disparity between the communities as shown in Figure 27 below.

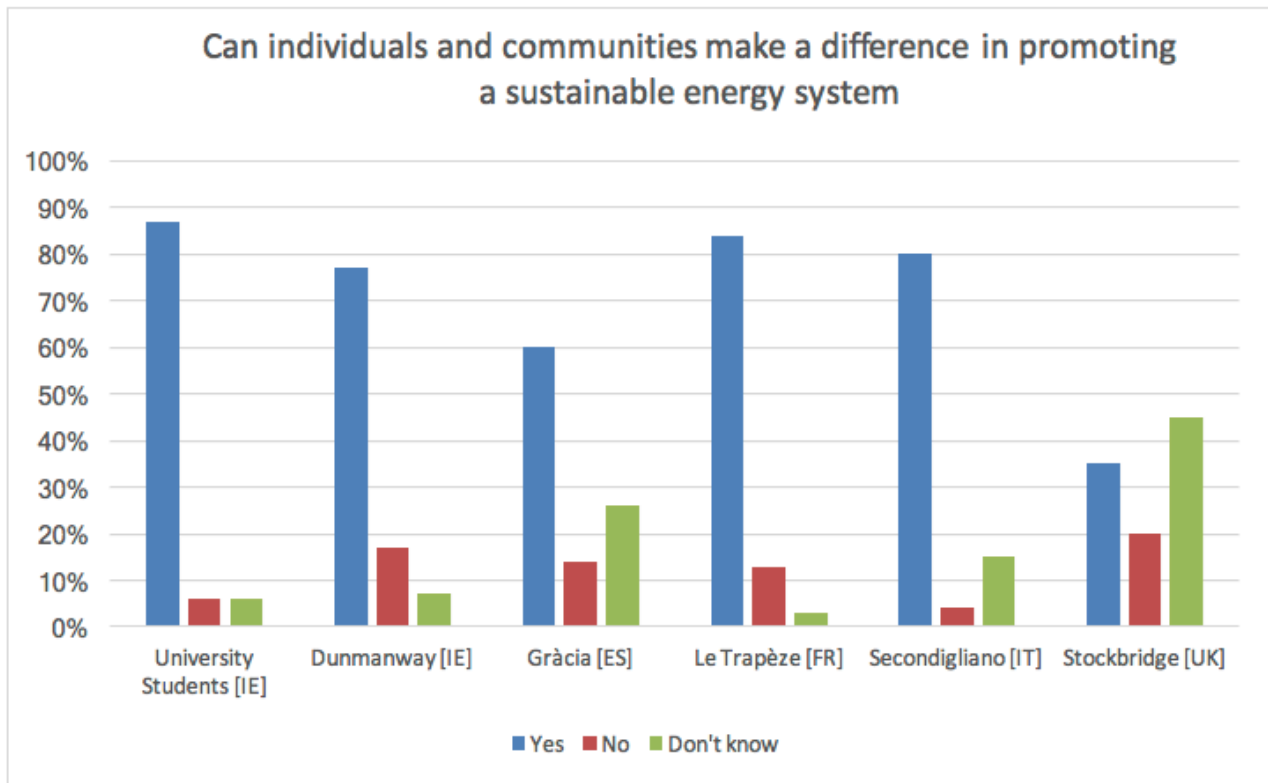


Figure 27: Perceived capacity to positively contribute to the energy transition, by community

The impact of the negative experience with renewables in Stockbridge was reflected in the very low level of confidence that the community has in its capacity to contribute to promoting a sustainable energy system. The negative impact of poorly implemented sustainability measures has significant implications for managing the transition to sustainability across other communities, pointing to the dangers of implementing top-down change without consultation with those affected. The adverse effects of the Stockbridge experience are reflected in the exceptionally low level of confidence expressed in the ability of individuals and communities to make a difference in promoting a sustainable energy system. Clearly feeling disempowered, in Stockbridge little more than one third of the respondents, 35%, thought that they and their community had the ability to make a difference – contrasting very sharply with the attitudes in the other communities, as shown below.

The community in Stockbridge demonstrated the lowest level of belief in their personal, and/or their community's ability to make a difference in promoting the sustainable energy system. Their experience demonstrates the catastrophic effect that imposing a badly thought out and crippling expensive renewable technology on a community can have. In addition to considerable levels of energy poverty, the participants in this community had the most negative attitudes towards both the capacity of renewables, as well as reduced belief in the capacity for individual or community resilience to produce and promote the transition to sustainability. This was in significant contrast to the similarly deprived community in Italy, Secondigliano, where respondents demonstrated a very positive attitude towards the capacity of renewables, as well as personal and community capacity, to effect change.

4.11 Views on the future of the energy system

In contrast to the optimistic outlook most respondents seem to have in the potential capacity for a technological solution to the current challenges facing the energy system, as was demonstrated in the community survey, this perspective was more nuanced when explored by the community members who participated in the interviews. When asked about their fears with regard to the energy system in the future, the most significant fear expressed by participants was of “running out” of fossil fuels. One participant in Stockbridge put this way:

So, again I'm forced into paying high costs for electricity and, and we're running out of electricity because of the North Sea Gas ... All the other resources, you know, nuclear power stations, are closing down, so we need to try and save energy if we can

Henry, Stockbridge

Gabriel, in Le Trapèze, provided a more intergenerational perspective that demonstrates both the expectations people have grown to expect from our energy system, and the anxiety many of us have in terms of sustaining the levels of comfort and convenience we have as a result.

I use energy with way more caution. Well, it depends, my grand-parents didn't have everything running with electricity, they used candles and oil lamps. But my parents, since the 1960s, with the creation of fridges, etc. they were very happy, it was like a miracle. So, they went all the way. And I was like them in the excitement. Taking a bath when we wanted, having hot water as we wanted, put whatever we wanted in the fridge. Compared to my grandparents, I now recognise that they wasted a lot of energy. For my grandparents, it was different, they didn't have access to all of this. For them, it was all about candles, oil lamps, and coal. It was the time of the “Germinal”, the beginning of 20th century. I remember my first house, there was a coal-burner, it smelled of coal dust in the whole house. Everything smelled of the coal, it was awful. I can't stand this smell. Then, there was the wood-burner, it was better. They replaced coal with wood, and then electricity and oil.

Gabriel, Le Trapèze

In addition, strongly connected with the fear of running out of fossil fuel, participants expressed concern at the potential for being vulnerable to energy poverty.

It's not a hugely active fear, but there would be a niggle about, will it run out, will, you know, this finite limit we have on fossil fuels and all that. The point will come where it's just so prohibitively expensive that you can't access it. Or it's just not there at all and, in the meantime we haven't really filled the gap because we've just been blind to the fact that it's going to happen, or that at some point will happen, and that we haven't filled the gap. That would be the fear that we haven't come up with better solutions fast enough.

Caoimhe, Dunmanway

While the “fear of running out” of fossil fuels was the greatest fear expressed by participants, it was noteworthy that none of them made reference to the fact that the more pressing problem facing the planet with regard to the burning of fossil fuels is that all of the fossil fuel that is currently available cannot be burnt – if there is any possibility of reaching the targets agreed in the Paris Accord.

The faith in renewable technologies to provide a sustainable energy system, both at present and in the future, was in contrast to attitudes towards the powerful energy actors – both those directly connected to the energy system, as well as the political powers that wield the power to develop policies, and allocate licences, funding, and taxation. Amongst participants there was no doubt about the existence of global warming and the necessity to move energy production to renewable sources, there is a strong degree of cynicism with regard to the rationale behind governmental strategies and policy-making – and an awareness of the power of the energy lobby to influence how the transition will be implemented.

It should be noted, that when people are asked to reflect on the energy system, they do appreciate the enormous benefits that it has brought to industrialised countries, and across all the communities, there is a significant level of appreciation for the benefits of electricity, in particular. This is particularly true for the older cohort of participants, particularly amongst those who could recall the days before the introduction of electricity, or who had heard the stories of their parents about the massive change that had been brought about by the development of the energy system. While there was a degree of nostalgia expressed about the “olden days”, and some of the more negative changes that have happened across communities since, there was no longing for an electricity free world. As one elderly woman put it in her focus group, with the agreement of all, “I wouldn’t go back, do you know what I mean?”

One anecdote that is, perhaps, particularly pertinent for how the transition to sustainability can be achieved was an observation that was made with regard to the introduction of new “technologies” that offers a sharp contrast between the practices of the past compared to the practices of the present. Discussing the electrification of rural Ireland in the middle of the 20th century, an elderly female focus-group participant in Dunmanway remembered “when they were canvassing for the electricity to come in the year”, with workers from the semi-state electricity company calling door to door. She recalled that there had been much discussion locally with regard to its introduction, and whether to accede to it or not. However, the consensus developed in the community to “sign up” for electricity, and so it was introduced to the benefit of all. This is in distinct contrast with the underhanded tactics regarding the introduction of wind energy in the same community described above, and contrasts strongly with the imposition of the biomass system on residents in Stockbridge. It seems clear that while there is great optimism for the capacity of renewables to provide the wherewithal for the transition to sustainability, and a great optimism that the transition will happen – imposing poorly planned, and badly implemented technologies on communities very rapidly dissipates optimism, and forges a pessimism towards the capacity of both renewables and communities to produce the transition to sustainable energy.

Table 9 Factors observed to impact on attitudes toward energy technologies

	Key Communities	Personal Factors	Other Factors
Solar	Gràcia Dunmanway Le Trapèze	<ul style="list-style-type: none"> • Perception of privilege linked to use of solar • Perception of solar energy as the most natural source of energy 	<ul style="list-style-type: none"> • High expectation of greater tax incentives • Concerns over security, maintenance and longevity of solar technology at household level
Wind	Dunmanway, Stockbridge, UCC	<ul style="list-style-type: none"> • Largely divided stance on value of wind energy • More evenly spread intersectional response rate 	<ul style="list-style-type: none"> • Energy justice debates linked to extraction of local resources • High energy visibility: links to both negative and positive impacts to landscape
Nuclear	Le Trapèze, Secondigliano, Stockbridge	<ul style="list-style-type: none"> • Male dominated theme • Divided opinions with significant numbers of those in favour and against 	<ul style="list-style-type: none"> • Proponents largely favouring an energy mix policy • Less visible form of energy
Fossil Fuel	Le Trapèze, Secondigliano, Stockbridge	<ul style="list-style-type: none"> • Suggestive of gender differences in attitudes • Strong perception of increased oil dependency 	<ul style="list-style-type: none"> • Energy security and peak oil framing most narratives • Growing concern regarding use of dirty and polluting energy fossil fuel sources

5 Conclusions

Attitudes towards technology among the six communities are somewhat diverse, as illustrated by Table 9 above. An analysis of such divisions suggests that social aspects such as gender, so-called socio-economic status and age may have a role to play. The experiences conferred by one's gender, disparities in socio-economic privilege, and stage of life all effect the manner in which people (both individually and as communities) respond to and perceive specific energy technologies. Research suggests that a diversity of socio-demographic characteristics such as age and education in different variations also potentially impacts on experiences and attitudes towards energy sources. By considering these different aspects influencing attitudes toward energy technologies we are thus able to capture a wider and more in-depth understanding of the complex social contexts that intersect with experiences and perceptions among individuals and communities. These findings are supported by previous research which demonstrate that public attitudes and acceptance of energy technologies are heterogeneous and often confined to smaller groups of people which distinct socio-demographic characteristics (*e.g.*, Devine-Wright, 2007; Rijnsoever, Mossel, & Broecks, 2015).

The principal gendered difference on attitudes towards large-scale technologies was in respect of nuclear power which was somewhat suggestive of gendered variation in attitudes. Male respondents exhibited a greater propensity for supporting nuclear energy in comparison to female respondents. The differences are

considerably more marked on the question of government investment where men are five times more likely than women to give priority to nuclear energy, albeit that the total numbers in favour of state investment in nuclear energy were small – accounting for just 6% of the respondents, with this support concentrated in two of the six communities: Le Trapèze in Paris, France and the cohort of students in Cork, Ireland. The evidence of some support for nuclear energy in Le Trapèze is probably not that surprising given the prominent place of nuclear power within both the energy system and the energy discourse in France. The support exhibited by some of students in Ireland is perhaps somewhat unexpected, and may be indicative of preference for a silver bullet solution (to reducing GHG emissions) – such large-scale technology solutions can often be favoured by students of certain disciplines. Of course, one needs to be careful that too much is not made of this support for nuclear energy for as said above the overall support levels were extremely modest. It should also be noted nuclear was not favoured over other energy technologies in any community, and was accorded the highest number of lowest preferences by both females and males alike (although women did exhibit the most dislike).

Of course, attitudes to technology intersect with other important variables beside gender and therefore transcend binary explanations associated with gender and similar categories. Building on some of these intersectional dynamics the findings highlight the significance of institutional, structural, market and political factors as forging specific interactions with energy production and energy sources. Debates focused on energy innovation social acceptance models introduced recently by Wüstenhagen, Wolsink, & Burer (2007) have sought to develop a greater understanding of energy diffusion practices by expanding on largely techno-centric approaches to energy innovation and public acceptance of same. Wüstenhagen *et al.* suggest that social acceptance of energy innovation is linked to three key dimensions: (i) socio-political acceptance; (ii) market acceptance; and (iii) community acceptance. These recent concerns and efforts towards highlighting and understanding the value of public attitudes towards energy production and consumption in various ways have demonstrated that this is an emerging theme with significant value in terms of aiding a transition to alternative sources of energy. For instance, analysis of the data suggests that public attitudes towards renewable energy are often constrained by market dynamics which are seen to discourage the uptake of these new technologies. Equally the lack of innovative governance models which would guide a transition and offer stable and equitable models for the production and consumption of renewables is a factor which respondents have highlighted as negatively affecting their views of alternative energy sources. For instance, the ‘sun tax’ issue in Spain was highlighted by many of our respondents in Vila de Gràcia, and it was articulated as a problematic obstacle due to a lack of political coherence around the promotion of cleaner energy sources. On a more positive note some of our communities are becoming aware of the potential value of renewable energy as a resource for the local area, in the sense that community projects focused on either energy conservation measures or energy production could enable and empower existing community projects to offer more to their residents. For instance, the Community Resource Centre in Dunmanway is actively seeking new ways of sourcing energy, conserving energy and reducing costs.

The prominence of the themes of (in)visibility and control over the energy system demonstrate that public participation and inclusion can have a substantial effect on how people perceive emerging technologies. In the first instance these findings remind us that transitions from one source of energy to another need to be carefully managed. Everyday fossil fuel energy production, distribution and consumption has become largely normalized in our societies and this accounts for the (in)visibility that is often associated with the way people consume energy and relate to the energy system. We would also argue that this (in)visibility has a range of socio-political implications as they strongly suggest that individuals and communities currently have a minimal role to play as citizens in the development of the energy system. Regulations, policies and the deployment of energy technologies have largely been restricted and reliant on expert based inputs and has in the process reinforced and even promoted a more passive attitude toward energy production and consumption. The decoupled manner in which energy issues are often portrayed in policy, in terms of separating technical and social factors, reinforces the misconceived notion that these are indeed independent entities. This is a problematic approach which routinely marginalises social factors in favour of technical based approaches (Luque-Ayala & Silver, 2016; Whitehead, 2014). However, emerging research has provided compelling arguments that demonstrate that energy grids are not apolitical structures, and further that the social experience of energy is indeed shaped by material energy infrastructure (Luque-Ayala & Silver, 2016). For example, Harrison (2016) traces the historical development of electricity networks in Southern cities in the USA and demonstrates how the emerging energy landscape was (and still is) illustrative of racial divides and segregation of minorities. Situating our analysis at the intersection of social and technical processes is therefore a means toward understanding the layered and interdependent way in which people's attitudes are shaped, reproduced and enacted by a range of structuring social and physical factors. It also provides the means towards critiquing emerging energy landscapes by highlighting its social and political contours.

The case study communities reveal a range of experiences which demonstrate how the energy landscape can be largely structured by social factors such as class divides. Notably, the UK community in Stockbridge where a Biomass heating system was imposed on social housing residents. Our engagement with the community strongly suggests that this new source of energy thus becomes of new form of exclusion, disempowerment and subordination of people's wellbeing to ill-conceived and socially blind policies. This is in keeping with our survey results, which show Stockbridge as the community which has the lowest ranking in terms of confidence in renewable energies (see for instance, Figure 25 on page 64). This is interesting if we compare the attitudes of respondents from Stockbridge with those of the community in Le Trapèze (our eco-neighbourhood) which also has considerable experience of recent implementation of new energy technologies. Both neighbourhoods have expressed concerns and un-met expectations with regards these technologies however the shortcomings identified in Le Trapèze were not articulated in terms of hardship and privation whereas in Stockbridge this was a key concern for households. We would argue that the key characteristic which distinguishes these two communities is social class background. Le Trapèze is an affluent community where the majority of the residents are relatively wealthy and well educated. Stockbridge on the other hand is a neighbourhood with a

very high unemployment rate and where a large proportion of the residents are dependent on state subsidies for their livelihood. There is therefore a greater degree of financial resilience and adaptability in Le Trapèze, features that are much lower in Stockbridge. This affects how transitions are perceived by each community and how shortfalls in terms of performance can be reconciled with existing social and financial circumstances. Conversely, solar energy while it is positively perceived as a clean technology and favoured as a potential alternative to fossil fuels it is also largely seen as out of reach for many participants and its use and deployment is largely associated with more privileged households and communities. The notion of privilege associated with solar energy emerged from our qualitative materials in most of our communities. This issue was further aggravated in the Vila de Gràcia community in Spain where controversial energy strategies have tilted from policies which encouraged the private installation of solar panels through grants to a sizeable shift in approach which now looks to tax the households for the use of this form of energy. This lack of coherence has proved detrimental with regard to attitudes to renewable energies.

Epilogue

As outlined earlier, this report on ‘Intersectional Analysis of Perceptions and Attitudes Towards Energy Technologies’ should not be considered as solely a stand-alone report, but rather as part of a series of reports exploring the relationship people have with energy. In particular we would point to a forthcoming report detailing intersectional analysis of energy practices (D3.2) and a report which will synthesise these intersectional analyses along with a range of socio-economic, technical, market and policy analyses produced as part of this research project. Finally, as noted in the introduction to this report, this document is not intended to be a static ‘final’ report. Based on continued dialogue with the communities; continued reflexive analysis of the collected data; and insights from complementary outputs (not least those mentioned above) an update of this report will be released in quarter one, 2018.

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Appendix 1: Participant profiles – interviews

Code	Name	Sex	Age	Occupation	Community
EN-UCC-IN-1	Emily	Female	18-24	Student	UCC
EN-UCC-IN-2	Emma	Female	18-24	Student	UCC
EN-UCC-IN-3	Jack	Male	18-24	Student	UCC
EN-UCC-IN-4	Aoife	Female	18-24	Student	UCC
EN-UCC-IN-5	Ava	Female	18-24	Student	UCC
EN-UCC-IN-6	Adam	Female	18-24	Student	UCC
EN-UCC-IN-7	Daniel	Male	18-24	Student	UCC
EN-DUN-IN-1	Lucy	Female	45-65	Professional worker	Dunmanway
EN-DUN-IN-2	Conor	Male	45-64	Unemployed/underemployed	Dunmanway
EN-DUN-IN-3	Ciara	Female	45-64	Professional worker	Dunmanway
EN-DUN-IN-4	Marianne	Female	45-64	Professional Worker	Dunmanway
EN-DUN-IN-5	James	Male	45-64	Unemployed/underemployed	Dunmanway
EN-DUN-IN-6	Grace	Female	25-44	Maternity Leave	Dunmanway
EN-DUN-IN-7	Caoimhe	Female	25-44		Dunmanway
EN-DUN-IN-8	Liam	Male	25-44	Farmer	Dunmanway
EN-DUN-IN-9	Niamh	Female	25-44	Professional worker	Dunmanway
EN-TRA-IN-1	Lucas	Male	45-64	Professional Worker	Le Trapèze
EN-TRA-IN-2	Louis	Male	25-44	Professional Worker	Le Trapèze
EN-TRA-IN-3	Camille	Female	25-44	Professional Worker	Le Trapèze
EN-TRA-IN-4	Ethan	Male	25-44	Professional Worker	Le Trapèze
EN-TRA-IN-5	Gabriel	Male	65+	Retired	Le Trapèze
EN-TRA-IN-6	Nathan	Male	65+	Retired	Le Trapèze
EN-TRA-IN-7	Sarah	Female	25-44	Home-maker	Le Trapèze

EN-STO-IN-1	George	Male	45-64	Unemployed/underemployed	Stockbridge
EN-STO-IN-2	Olivia	Female	45-64	Professional Worker	Stockbridge
EN-STO-IN-3	Jessica	Female	45-64	Unemployed/underemployed	Stockbridge
EN-STO-IN-4	William	Male	45-64	Manual Labourer	Stockbridge
EN-STO-IN-5	Lily	Female	25-44	Home Maker	Stockbridge
EN-STO-IN-6	Thomas	Male	25-44	Professional Worker	Stockbridge
EN-STO-IN-7	Henry	Male	45-64	Professional Worker	Stockbridge
EN-SEC-IN-1	Riccardo	Male	45-64	Unemployed/underemployed	Secondigliano
EN-SEC-IN-2	Leonardo	Male	65+	Retired	Secondigliano
EN-SEC-IN-3	Sofia	Female	45-64	Home maker	Secondigliano
EN-SEC-IN-4	Davide	Male	18-24	Student	Secondigliano
EN-SEC-IN-5	Alice	Female	45-64	Semi-skilled worker	Secondigliano
EN-SEC-IN-6	Francesca	Female	65+	Retired	Secondigliano
EN-SEC-IN-7	Anna	Female	25-44	Part-time worker	Secondigliano
EN-GRA-IN-1	Giulia	Female	25-44	Manual Labourer	Vila de Gràcia
EN-GRA-IN-2	Agnès	Female	25-44	Professional Worker	Vila de Gràcia
EN-GRA-IN-3	Alba	Female	25-44	Professional Worker	Vila de Gràcia
EN-GRA-IN-4	Albert	Male	25-44	Professional Worker	Vila de Gràcia
EN-GRA-IN-5	Agustí	Male	45-64	Professional Worker	Vila de Gràcia
EN-GRA-IN-6	Enric	Male	25-44	Professional Worker	Vila de Gràcia
EN-GRA-IN-7	Felip	Male	65+	Retired	Vila de Gràcia

Appendix 2: Participant profiles – focus groups

Code	Name	Sex	Age	Occupation	Community
EN-GRA-FG1-P1	Arnav	Male	25-44	Manual Labourer	Vila de Gràcia
EN-GRA-FG1-P2	Montserrat	Male	25-44	Semi-skilled worker	Vila de Gràcia
EN-GRA-FG1-P3	Aniol	Male	25-44	Self-employed	Vila de Gràcia
EN-GRA-FG1-P4	Aran	Female	25-44	No answer	Vila de Gràcia
EN-GRA-FG1-P5	Arnau	Male	45-64	Professional Worker	Vila de Gràcia
EN-GRA-FG1-P6	Bru	Male	25-44	No answer	Vila de Gràcia
EN-GRA-FG2-P1	Assumpta	Female	25-44	Professional Worker	Vila de Gràcia
EN-GRA-FG2-P2	Cerni	Male	25-44	Professional Worker	Vila de Gràcia
EN-GRA-FG2-P3	Xita	Female	65+	Professional Worker	Vila de Gràcia
EN-GRA-FG2-P4	Nadal	Female	25-44	Student	Vila de Gràcia
EN-GRA-FG2-P5	Remei	Female	25-44	No answer	Vila de Gràcia
EN-GRA-FG2-P6	Manela	Female	18-24	Student	Vila de Gràcia
EN-UCC-FG1-P1	Una	Female	18-24	Student	UCC
EN-UCC-FG1-P2	Iseult	Female	18-24	Student	UCC
EN-UCC-FG1-P3	Mona	Female	18-24	Student	UCC
EN-UCC-FG1-P4	Aisha	Female	18-24	Student	UCC
EN-UCC-FG1-P5	Aidan	Male	25-44	Student	UCC
EN-UCC-FG2-P1	Ailis	Female	18-24	Student	UCC
EN-UCC-FG2-P2	Aisling	Female	25-44	Student	UCC
EN-UCC-FG2-P3	Alana	Female	18-24	Student	UCC
EN-UCC-FG2-P4	Alan	Male	25-44	Student	UCC
EN-UCC-FG2-P5	Bridget	Female	18-24	Student	UCC

EN-DUN-FG1-P1	Caitlin	Female	45-64	Professional Worker	Dunmanway
EN-DUN-FG1-P2	Doreen	Female	45-64	Professional Worker	Dunmanway
EN-DUN-FG1-P3	Eamon	Male	45-64	Unemployed/underemployed	Dunmanway
EN-DUN-FG2-P1	Muriel	Female	65+	Retired	Dunmanway
EN-DUN-FG2-P2	Mary	Female	45-64	Unemployed/underemployed	Dunmanway
EN-DUN-FG2-P3	Ciaran	Male	45-64	Self-Employed	Dunmanway
EN-DUN-FG3-P1	Maeve	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P2	Maura	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P3	Mairgherad	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P4	Nora	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P5	Noreen	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P6	Orla	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P7	Patricia	Female	65+	Retired	Dunmanway
EN-DUN-FG3-P8	Shawna	Female	65+	Retired	Dunmanway
EN-SEC-FG1-P1	Aida	Female	18-24	Student	Secondigliano
EN-SEC-FG1-P2	Annah	Female	45-64	No answer	Secondigliano
EN-SEC-FG1-P3	Cristina	Female	25-44	Student	Secondigliano
EN-SEC-FG1-P4	Eva	Female	45-64	Home Maker	Secondigliano
EN-SEC-FG1-P5	Enrico	Male	25-44	Semi-skilled worker	Secondigliano
EN-SEC-FG1-P6	Elisa	Female	25-44	Professional Worker	Secondigliano
EN-SEC-FG1-P7	Emilio	Male	18-24	Student	Secondigliano
EN-SEC-FG1-P8	Lucia	Female	18-24	Student	Secondigliano
EN-SEC-FG1-P9	Enzo	Male	45-64	Manual Worker	Secondigliano
EN-SEC-FG1-P10	Fabio	Male	25-44	Semi-skilled worker	Secondigliano
EN-SEC-FG2-P1	Letizia	Female	18-24	Semi-skilled worker	Secondigliano

EN-SEC-FG2-P2	Niccolo	Male	45-64	Professional Worker	Secondigliano
EN-SEC-FG2-P3	Tulio	Male	25-44	No answer	Secondigliano
EN-SEC-FG2-P4	Mila	Female	45-64	Home Maker	Secondigliano
EN-SEC-FG2-P5	Oriana	Female	18-24	Semi-skilled worker	Secondigliano
EN-SEC-FG2-P6	Rosa	Female	45-64	Semi-skilled worker	Secondigliano
EN-SEC-FG2-P7	Rosetta	Female	45-64	Semi-skilled worker	Secondigliano
EN-SEC-FG2-P8	Valentina	Female	65+	Home Maker	Secondigliano
EN-SEC-FG2-P9	Traviata	Female	45-64	Semi-skilled worker	Secondigliano
EN-SEC-FG2-P10	Venezia	Female	65+	No answer	Secondigliano
EN-STO-FG1-P1	Adele	Female	25-44	Professional worker	Stockbridge
EN-STO-FG1-P2	Adriane	Female	18-24	Home Maker	Stockbridge
EN-STO-FG1-P3	Alison	Female	25-44	Home Maker	Stockbridge
EN-STO-FG1-P4	Brenda	Female	25-44	Home Maker	Stockbridge
EN-STO-FG1-P5	Jane	Female	45-64	Professional Workers	Stockbridge
EN-STO-FG1-P6	Mildred	Female	25-44	Unemployed/underemployed	Stockbridge
EN-STO-FG1-P7	Margery	Female	25-44		Stockbridge
EN-STO-FG1-P8	Marsha	Female	25-44	Semi-skilled worker	Stockbridge
EN-STO-FG2-P1	Heather	Female	45-64	Unemployed	Stockbridge
EN-STO-FG2-P2	Ellen	Female	45-64	Unemployed	Stockbridge
EN-STO-FG2-P3	Ida	Female	45-64	Unemployed	Stockbridge
EN-STO-FG2-P4	Allister	Male	45-64	Unemployed	Stockbridge
EN-STO-FG2-P5	James	Male	45-64	Unemployed	Stockbridge
EN-TRA-FG1-P1	Amber	Female	25-44	Professional Worker	Le Trapèze
EN-TRA-FG1-P2	Adrien	Male	25-44	Professional Worker	Le Trapèze
EN-TRA-FG1-P3	Lorraine	Female	45-64	Professional Worker	Le Trapèze

EN-TRA-FG1-P4	Nadya	Female	45-64	Self-employed	Le Trapèze
EN-TRA-FG1-P5	Nichol	Female	25-44	Professional Worker	Le Trapèze
EN-TRA-FG1-P6	Rafaelle	Male	45-64	Professional Worker	Le Trapèze
EN-TRA-FG2-P1	Raquelle	Female	45-64	Home Maker	Le Trapèze
EN-TRA-FG2-P2	Remi	Male	45-64	Managerial/Technical Worker	Le Trapèze
EN-TRA-FG2-P3	Susette	Female	25-44	Unemployed/underemployed	Le Trapèze
EN-TRA-FG2-P4	Elaine	Female	45-64	Professional Worker	Le Trapèze
EN-TRA-FG2-P5	Rene	Male	25-44	Professional Worker	Le Trapèze
EN-TRA-FG2-P6	Eloise	Female	45-64	Retired	Le Trapèze
EN-TRA-FG2-P7	Jean	Male	25-44	Professional Worker	Le Trapèze
EN-TRA-FG2-P8	Jaspar	Male	65+	Retired	Le Trapèze

Appendix 3: Interview schedule

Interview Questions Opinions on Energy Use

- How do you feel about energy?
- What is your opinion on energy use?
- How do you use energy in comparison to your parents and your grandparents?
- Has your parents' use of energy changed over time, say from when you were a child to now?
- Has your energy use changed over the years? And if so, in what way?
- How would you compare how you use energy to your children's use of energy?
- What is your opinion of your neighbours' energy use?
- What is your opinion of the use of energy in your community?
- Have you seen much change in energy use in your area?
- What do you want from the energy system?

Activities/Routines

- Could you describe your daily routine, or typical activities, over the course of the day?
- Thinking about your day-to-day activities, which would you identify as being the most energy intensive?
- Thinking about a longer period, perhaps a week or a month, or even longer, can you describe other less regular activities that involve energy?
- When you think about your daily or weekly activities, include household, what would you identify as being the most energy intensive?
- Thinking about your day to day energy use, are there any particular energy-saving measures that you or your family have undertaken?

Rural/Urban

- With regard to energy, are there particular issues that rural dwellers experience in comparison to urban dwellers?
- With regard to energy, are there particular benefits to living in a rural area in comparison to living in an urban area?

Networks/Communities

- What have you learned or gained from visiting other communities?
- How do you think that members of a community can develop their awareness of energy and energy use?

Consumption/Purchasing

- When it comes to buying large household items, such as washing machines, or fridges, how do you decide what to buy, and what criteria do you use — price, energy efficiency, appearance etc.
- When it comes to buying a car, how do you decide what to buy, and what criteria do you use — price, fuel consumption, make/model etc.?
- Do you think that hygiene practices have changed over your lifetime?

Future of the Energy System

- Have you thought about how the energy system might change in the future?
- How would you like to see it change?

Appendix 4: Focus group plan

Refreshments to be made available to participants on arrival

Introduction

We will introduce ourselves to the participants and give a brief explanation of the project.

Warm up exercise

Ask participants to introduce themselves and tell the group a little about themselves (interests, hobby etc.). I will start off.

Questions part 1

- How do you feel about energy?
- What is your opinion on energy use?
- How do you think that members of a neighbourhood or a community can develop their awareness of energy and energy use?

PLA exercise

Participants to complete Page1 of the PLA exercise. Identify what categories scored highest and scored least.

Follow up questions

- We will:
 - discuss as a group the participants' views on the results of the ranking exercise. Particularly the highest and lowest scored categories in the exercise
- Do you think if we were to do this exercise 20 years ago would the results be similar?
- Which of the categories do you think would be the easiest to change, as **an individual**, in order to improve energy efficiency and decrease consumption?
- Which of the categories do you think would be the easiest to change, as **a community**, in order to improve energy efficiency and decrease consumption?

Additional themes for group discussion

- Are there any national or community led initiatives that you can identify that centre on energy issues? (*prompts: protests against new policies, environmental awareness information campaigns; new technologies, educational programmes etc.*)
- What are your thoughts concerning new energy production and consumption technologies?
- Can you share with us your views and experiences regarding the energy supply system in your locality?
- In your opinion how do different life stages (i.e. childhood, marriage, old age, onset of disability) affect your attitudes towards energy? Can you provide specific examples?
- If you think back to the recent elections in your area, was energy a major factor in the political debates? Were there any significant policies or concerns highlighted at the time?

Questions part 2

- After having taken part in this focus group have your views changed on energy?
- Are you involved in any energy projects in your neighbourhood?
 - If so, can other neighbourhoods learn from your experience.
 - If not, do you think you might get involved in something like this in the future?

Appendix 5: Energy technologies survey

1. Would you use a smart meter if it was provided for you?

- Yes ☐ I already have a smart meter and I use it ☐
No ☐ I already have a smart meter and I do not use it ☐

2. Are you confident that the current renewable energy technologies can produce a sustainable energy system and help to tackle climate change?

- Yes ☐ Don't know ☐
No ☐

3. Are you confident that the renewable energy technologies that may exist in the future will be able to produce a sustainable energy system and help to tackle climate change?

- Yes ☐ Don't know ☐
No ☐

4. Do you think you as an individual and/or your community can make a difference in promoting a sustainable energy system?

- Yes ☐ Don't know ☐
No ☐

5. Which large-scale power generation technologies should the State most heavily invest in?

6. Which micro-power/domestic generation technologies should the Government support through grants and investments?

(This section is to be completed by the respondents, with help from the surveyor if needed)

LARGE-SCALE ENERGY GENERATION TECHNOLOGIES

- 7. Please rank the types of large-scale electric power generation, presented below, in order of preference with 1 indicating the most preferred, and 9 the least preferred:**

Solar power _____

Oil-fired _____

Coal-fired _____

Geothermal _____

Wind power _____

Nuclear _____

Hydro-electrical _____

Gas-fired _____

Biomass _____

DOMESTIC ENERGY SOURCES

8. Apart from grid electricity, what sources of energy do you use in your home? Please tick all that apply.

- | | |
|----------------------------|--------------------------|
| Solar water heating | <input type="checkbox"/> |
| Micro wind turbine | <input type="checkbox"/> |
| Oil-fired boiler | <input type="checkbox"/> |
| Air source heat pump | <input type="checkbox"/> |
| Coal (open fire/stove) | <input type="checkbox"/> |
| Micro hydro power | <input type="checkbox"/> |
| Natural Gas | <input type="checkbox"/> |
| LPG (Liquid Petroleum Gas) | <input type="checkbox"/> |
| Wood (open fire/stove) | <input type="checkbox"/> |
| Biomass | <input type="checkbox"/> |

Other (please specify) _____

9. Please rank the types of micro domestic power and/or heat generation you would like to have in your home in order of preference with 1 indicating the most preferred, and 10 the least preferred:

Solar power _____

Oil-fired boiler _____

Coal-fired stove _____

Air-source heat pump _____

Micro-wind turbine _____

Water turbine _____

Natural Gas Boiler _____

Biomass boiler _____

Wood-fired stove _____

LPG (Liquid Petroleum Gas) boiler _____

ENERGY TECHNOLOGIES IN THE HOME

10. Do you have access to domestic energy technologies? Please tick all that apply:

- | | |
|-------------------|--------------------------|
| Solar panels | <input type="checkbox"/> |
| Wind turbine | <input type="checkbox"/> |
| Geothermal | <input type="checkbox"/> |
| Electric Car | <input type="checkbox"/> |
| Electric Bike | <input type="checkbox"/> |
| Hydro power | <input type="checkbox"/> |
| Smart meter | <input type="checkbox"/> |
| None of the above | <input type="checkbox"/> |

Other (please specify) _____