

SI-DRIVE  
Social Innovation: Driving Force of Social Change

## SOCIAL INNOVATION IN ENERGY SUPPLY: SUMMARY REPORT

POLICY FIELD ENERGY SUPPLY

D7.4

June 2017

<b>Project acronym</b>	SI-DRIVE
<b>Project title</b>	Social Innovation: Driving Force of Social Change
<b>Grand Agreement number</b>	612870
<b>Coordination</b>	TUDO – Technische Universität Dortmund
<b>Funding Scheme</b>	Collaborative project; Large scale integration project
<b>Due date of deliverable</b>	06/2017
<b>Actual submission date</b>	06/2017
<b>Start date of the project</b>	1 <sup>st</sup> January 2014
<b>Project duration</b>	48 month
<b>Work package</b>	WP7 Energy Supply
<b>Lead beneficiary for this deliverable</b>	TNO
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<b>Dissemination level</b>	Public (PU)



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 612870.

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# 1 SI-DRIVE

In Europe and globally the concept of social innovation (SI) is becoming increasingly evident in debates regarding policy and science and in public debates. There is a growing consensus among practitioners, policy makers, the research community and others that widespread social innovation is required to cope with the significant challenges that societies are facing now and in the future. The EU funded project SI-DRIVE ([www.si-drive.eu](http://www.si-drive.eu)) contributed to a comprehensive understanding of how social innovations occur and under which conditions they flourish and lead to social change. One of the key objectives is to determine the nature, characteristics and impacts of social innovation and to identify its success factors, drivers and barriers in seven policy areas: Energy Supply, Education and Lifelong Learning, Employment, Environment, Transport and Mobility, Health and Social Care, Poverty Reduction and Sustainable Development. The current report is the final deliverable of the policy field Energy Supply. Within this policy field the relation between social innovation and social change is studied. More about the background of this field is explained in chapter 2.

The objective of the project was to study and analyse the field of Energy Supply in order to understand social innovations and their dynamics, to find out what and who drives social innovation, which stakeholders are doing what and how far energy policies and its formal structures can be barriers or facilitators to innovation. This results in a deepened understanding of different actors' roles and functions within social innovation.

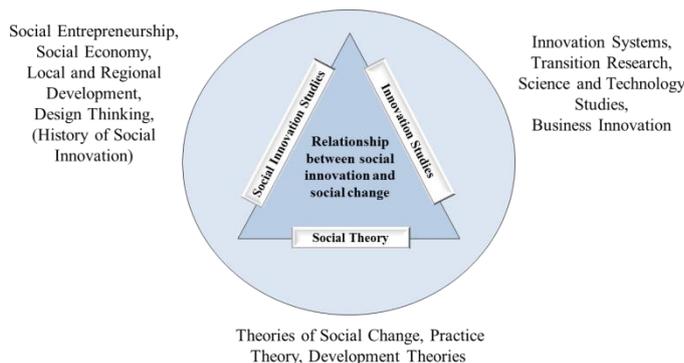
The SI-DRIVE project as a whole extends knowledge about social innovation in three major directions:

- Integrating theories and research methodologies to advance understanding of SI leading to a comprehensive new paradigm of innovation.
- Undertaking European and global mapping of social innovation, thereby addressing different social, economic, cultural and historical contexts in eight major world regions.
- Ensuring relevance for policy makers and practitioners through in-depth analyses and case studies in seven policy fields, with cross European and world region comparisons, foresight and policy round tables.

Based on these three pillars SI-DRIVE contributes to a deeper understanding of social innovations. Based on a comprehensive definition of social innovation and a theoretical framework for understanding social innovations empirical knowledge generated through global mapping and case studies helps to understand the role of social innovations for transformative changes in the policy field Energy supply and other areas.

## 1.1 THEORETICAL FRAMEWORK

Social innovation is a ubiquitous phenomenon, characterised by a high variety, diversity and plurality of concepts and understanding. Therefore the SI-DRIVE approach is going beyond pure social entrepreneurship being in the focus before. The former strong focus on social entrepreneurship excluded other key aspects and the potential of a comprehensive concept of social innovation and its relation to social change (Howaldt et al., 2017, p. 108).<sup>1</sup> SI-DRIVE elaborated (building blocks of) a theory of social innovation by integrating existing theories and research methodologies to advance understanding of social innovation - leading to a comprehensive new paradigm of



innovation.

Starting point of the development of such a theoretical framework was a review of existing theories relevant for Social Innovation (Howaldt et al., 2014): Social Theory, Innovation Studies and Social Innovation Studies form the three building blocks (including the main approaches of each block) for developing a Social Innovation Theory and the relationship of Social Innovation to social change (see figure 2). Based on this critical literature review of existing theories, Howaldt et al. (2016) developed a theoretical framework for the empirical mapping of social innovations based on mainly four pillars: (1) a comprehensive definition of social innovation and (2) practice fields combining similar initiatives, (3) five key dimensions and (4) mechanisms of social change.

The comprehensive **definition of social innovation** is focusing on “*new social practices* defined as a new combination or new configuration of social practices in certain areas of action or social contexts, prompted by certain actors or constellations of actors in an intentional targeted manner with the goal of better satisfying or answering needs and problems than is possible on the basis of established practices; at the end socially accepted and diffused (partly or

### Figure 1. Building Blocks towards a Theory of Social Innovation

widely) throughout society or in certain societal sub-areas, and finally established and institutionalised as social practices. This working definition also foresees that, depending on circumstances of social change, interests, policies and power, successfully implemented social innovations may be transformed, established in a wider societal context and ultimately institutionalised as regular social practice or made routine” (Howaldt et al., 2016: 4f).

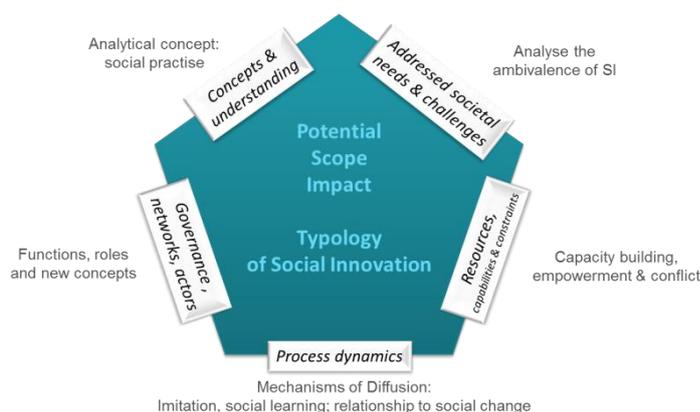
Based on this definition SI-DRIVE is differentiating between the macro level of policy fields and the meso level of “**practice fields**” and on the micro level related “**projects/initiatives**”:

- “practice field” is a general type or “summary” of projects and expresses general characteristics common to different projects (e.g. micro-credit systems, car sharing).
- “project/initiative” is a single and concrete implementation of a solution to respond to social demands, societal challenges or systemic change (e.g. Muhammed Yunus’ Grameen Bank which lends micro-credits to poor farmers for improving their economic condition, different car sharing projects or activities at the regional-local level).

<sup>1</sup> “What is needed is a differentiated perspective of the role of social entrepreneurs within the different phases of the social innovation process and the cross-sector collaboration with actors from the different societal sectors (private, public, universities, and civil society).” (Howaldt et al., 2017: 95).

The main theoretical frame for mapping and analysing social innovation cases is the operationalisation of the comprehensive definition of social innovation through **five key dimensions**:

1. Concepts and understanding (analytical concept: social practice)
2. Addressed to social demands, societal challenges (and systemic changes, if feasible)
3. Resources, capabilities and constraints including capacity building and empowerment and conflicts
4. Governance, networking and actors (functions, roles and sectors) for social change and development
5. Different phases of the process dynamics (mainly: mechanisms of diffusion: imitation, social learning; relationship to social change)



**Figure 2. Key Dimensions of Social Innovations**

In a fourth perspective, the process of social innovation is characterised by **mechanisms of social change** (Howaldt & Schwarz, 2016: 59f, based on Wilterdink, 2014): learning, variation, selection, conflict, competition, cooperation, tension and adaption, diffusion, planning and institutionalisation of change. To illustrate some of these mechanisms, *learning* is e.g. illustrating the mechanisms of cumulative knowledge improvement, capacity building and empowerment: Within mutual learning processes social innovators and other actors of the initiatives realise mistakes, apply new ideas and engage in processes of learning, leading to tacit and codified new knowledge (Cowan et al., 2000). *Selection* incorporates processes of adoption, diffusion and imitation, but also processes of decline and death of initiatives. *Institutionalisation* could be a planned or unplanned or even a not intended process, in congruence or in difference with existing institutions, interfered by unforeseen events.

## 1.2 METHODOLOGY

The SI-DRIVE methodology consists of a comprehensive and systematic analysis, focusing on the main societal challenges reflected by different policy fields and mapping social innovations all over the world. The developed methodology combines qualitative and quantitative research fulfilling the gaps and constraints of each methodology in a complementary and interrelated way. Apart from qualitative research (more than 80 in-depth-case studies) SI-DRIVE conducted a quantitative mapping of more than 1.000 social innovation cases all over the world spread across the policy fields.

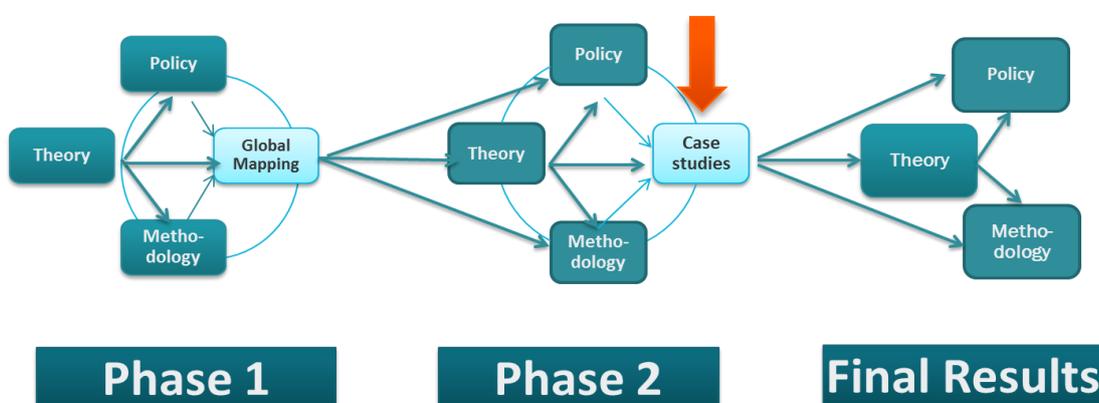
The SI-DRIVE methodology<sup>2</sup> is constructed as an iterative research process characterised by two empirical phases based on and feeding the three central research pillars of SI-DRIVE: theory, methodology and policy. Starting with a first theoretical, methodological and policy and foresight framework the empirical phase 1 lead to a global mapping of social innovation: comparative analysis of 1.005 cases worldwide, seven policy field reports, global regional report, external database screening, and eight first policy and foresight workshops. These results led to the improvement of the three pillars and set the ground for the second empirical phase: the in-depth case studies in each of the seven policy fields of SI-DRIVE and the second round of policy and foresight workshops. Finally, the results of both empirical

<sup>2</sup> A detailed description can be found in Howaldt et al. 2016, chapter 3.

phases are summarised in each of the policy fields and across, contributing to the final theoretical framework, the methodology and the policy and foresight recommendations of SI-DRIVE.

The chosen triangulation and combination of quantitative and qualitative methods has also a sequential aspect: While the quantitative approach is more appropriate for the analysis of 1.005 mapped social innovation cases, the qualitative methodology is more relevant for the 82 conducted in-depth case studies (based on the quantitative and qualitative analysis of the first empirical phase).

## Iterative Process: Two Empirical Phases Based on and Feeding Theory – Methodology – Policy Development



**Figure 3 Continuously Updated Research Cycle**

While the focus of the global mapping was on exploring the multifaceted world of social innovation, the focus of the subsequent qualitative research was on the dynamic interrelation between social innovations, the practice field and various mechanisms of social change. Related to the five key dimensions of SI-DRIVE the case studies explored further Governance, Networks and Actors as well as Process Dynamics, mainly asking for factors of success (and failure) and considering mechanisms and degree of social change: diffusion in society, degree of institutionalisation, and importance of the practice field and initiative for everyday life and local communities.

Based on the global mapping of 1.005 social innovation initiatives all over the world 82 cases were selected from the database and in-depth case studies were performed. The cases were nominated on the background of given theoretical framework, the results of the mapping and the partners' knowledge and experience. Beneath practical points like access to and willingness of the initiatives to participate a general regional variety was taken into account. Additional selection criteria were the relevance of the practice fields, the representativeness of the single case for the practice field showing its variety in terms of social demands and regions and an advanced development phase (cases that are already in the implementation, impact phase).<sup>3</sup>

### 1.3 RESEARCH ACTIVITIES IN ENERGY SUPPLY

This 'Policy Field Summary Report' of social innovation in Energy Supply is based on research in the years 2014-2017 within this specific policy field. This covers several research activities, corresponding to the methodology:

<sup>3</sup> Detailed information about the case study methodology and selection could be found in Schröder & Kuschmierz (2016), chapter 1.

- Constructing an internal report about the 'State of the art: social innovation in Energy Supply' (Boonstra et al., 2015),
- Collecting close to 100 cases of social innovation in Energy Supply (Howaldt et al., 2016),
- Performing up to ten in-depth case studies out of the larger number of cases in the report 'Social innovation in Energy Supply: case study results' (Ooms et al., 2016),
- Organising two 'Foresight and Policy Workshops' with internal and external experts to the project concerning the future of social innovation and options for policy makers in relation to social innovation in energy
- Writing two policy briefs on the results that are interesting for policy makers (Ooms, et al., 2015; Ooms et al., 2017).

The deliverables related to these research activities provide a more detailed picture of the results. In this report, highlights are provided of these results.

## 1.4 PARTNERS

A total number of eight partners contributed to the deliverables of the policy field Energy Supply within the SI-DRIVE project. The following organisations and people contributed greatly with their skill and expertise:

- Austrian Institute of Technology, Austria: Wolfram Rhomberg, Alexander Berger, Björn Budde
- Applied Research and Communications Fund, Bulgaria: Zoya Damianova, Desislava Asenova, Adriana Dimova, Blagovesta Chonkova, Robert Hickey
- Lama Development and Cooperation Agency, Italy: Dario Marmo, Bernardo Provvedi
- Istanbul Technical University, Turkey: Sencer Ecer
- Heliopolis University, Egypt: Maximilian Abouleish-Boes, Dalia Abdou, Naglaa Mohamed Hassan
- Universidad de la Iglesia de Deusto, Spain: Olatz Ukar, Marta Enciso
- The Young Foundation, UK: Charlotte Heales, Victoria Boelman, Susie Finlayson, Rachel Schon, Amy Kwan
- The Netherlands Organisation for applied scientific research (TNO), The Netherlands: Merel Ooms, Annelies Huygen, Stephanie Bijnsdorp, Beitske Boonstra, Ottilie Nieuwenhuis

## 2 ADRESSED SOCIETAL NEEDS AND CHALLENGES

This report is summarizing the results of the policy field Energy Supply within the SI-DRIVE project. Despite the chosen name for the policy field, the social innovation initiatives studied were not limited to only the supply or production of sustainable energy, but also deal with energy efficiency as both are important in the broader energy transition. In this chapter, the societal needs and challenges that are addressed by social innovation initiatives in the energy field are described. More on these needs and challenges can be found in the 'State of the art: social innovation in Energy Supply' (Boonstra et al., 2015), the two policy briefs (Ooms et al., 2015; Ooms et al., 2017) and the report 'Social innovation in Energy Supply: case study results' (Ooms et al., 2016).

### 2.1 GLOBAL SOCIETAL CHALLENGES IN ENERGY SUPPLY

Expectations are that the worldwide need for energy will multiply significantly, and that a continuation of the use of fossil fuels will lead to destabilizing economic effects and environmental consequences. As a response to this, a European renewable energy policy has been set up that includes goals to achieve a sustainable energy system based on renewable energy. However, many EU Member States are behind on their targets. Therefore the so-called energy transition needs to speed up.

Following global and European policy goals, the energy system is in a transition from a central, fossil fuel dominated system to a renewable energy based system including more local and decentral production. The need for a sustainable system and the technological possibilities for producing energy locally have inspired many social innovation initiatives to develop. Consumers, communities and SME's develop their own solutions to fit the goals of a sustainable energy future. In Europe, not only conventional actors in the energy sector but also farmers and private homeowners initiate wind and solar energy projects, and the number of energy cooperatives led by for instance communities is growing significantly.

### 2.2 LOCAL SOCIETAL NEEDS IN ENERGY SUPPLY

On a more local level countries, provinces, municipalities and neighbourhoods strive to make their transition to sustainable production of energy and energy saving. However, next to the high level societal challenge mentioned in the previous paragraph, there are local societal demands that can be at least partially met by social innovation initiatives.

From the reports and workshops in this project we conclude that countries are looking for ways to become independent of foreign energy suppliers, stimulate sustainable behaviour in their citizens, address energy poverty and stimulate technological progress and innovation. At an even more local level municipalities and neighbourhoods formulate goals and tasks connected to social innovation for renewable energy. Examples of goals are to become self-sufficient and independent of energy suppliers, to stimulate the local economy, contribute to an open energy market, learn to cooperate on different levels, realise local energy plans and make the energy transition more democratic.

### 2.3 ROLE OF SOCIAL INNOVATION IN ENERGY SUPPLY

In the discussions particularly during the second Policy Workshop in the spring of 2017, it was stated that SI initiatives can play a unique role in the energy transition, adding additional values to activities of governments or companies. Several roles were mentioned, such as: (1) change the energy behaviour of consumers, (2) achieve other outcomes next to energy, such as liveability and empowerment, (3) create action on realising a sustainable system, (4) enable investment in renewables, (5) increase transparency in energy prices and (6) create independence from fossil energy producers.

## 3 CONCEPTS AND UNDERSTANDING

In this chapter, it is discussed what social innovation in energy is, what is its role in reaching the goals described in the previous chapter and what kind of social innovation in energy exists. In the SI-DRIVE project, practice fields are constructed to be able to characterize different types of social innovation within one domain.

### 3.1 DEFINITION OF SOCIAL INNOVATION IN ENERGY SUPPLY

Social innovation (SI) is understood in the SI-DRIVE project roughly as ways in which actors or groups of actors try to address societal needs and problems in different ways than existing practices. In the energy sector this translates into achieving a sustainable, renewable energy system in other ways than the existing top-down, central, mostly fossil-fuel based way. Citizens, local communities, civic initiatives or collaborations between these parties and market players and/or government can have a major role by deploying renewable energy sources complementary to those developed solely by the market or governments. Furthermore, these initiatives add additional values, such as increased local liveability or quality of life, local investments and jobs, more involvement of private stakeholders and civil society and empowerment of citizens.

### 3.2 PRACTICE FIELDS

In the SI-DRIVE project, SI initiatives that have general characteristics in common are clustered in 'practice fields'. In the policy field Energy Supply seven practice fields were identified based on the social innovation cases that were collected in the Global Mapping 1 phase. These are described in the table below.

Practice field	Examples of sub practice fields	Description
Energy collectives	Energy cooperations, Collective purchasing, Business collectives, Energy efficient housing collectives	This practice field is about collective saving and/or production of energy. This can be done by different parties in various compositions. The defining characteristic of this practice field is that there is a collective aspect to the initiatives. Such collectives are often new combinations or figurations of social constellations, often including 'new' actors in new governance arrangements.
Local production of energy	Domestic energy production, Local production of biofuels or biogas, Local production of heat	This practice field regards the local (domestic) production of renewable energy by individuals or 'microgeneration'. These can be individual households, businesses, industries, farmers, etc. By producing energy they start to be 'prosumers'. Individuals can choose to organize microgeneration individually or in (small) collectives (this overlaps with the practice field 'Energy collectives').
Working with smart meters	Reduce consumption, Stimulate behavioural change, Networked, remote management	This practice field relates to the recent (or: ongoing) introduction of smart meters in various European countries. Smart meters are not a social innovation by themselves, but their implementation can induce all sorts of new behaviour and relations and makes it possible to address the 'energy problem' in a new way.

Energy services	Energy Service Companies (ESCOs), Energy advice, services and solutions for marginalized and socially disadvantaged groups, International innovation networks	This practice field includes all initiatives that provide energy-related services to citizens, companies or governments. They can be considered as social innovations when they use this in a new way to tackle the challenges of renewable energy and energy efficiency.
Providing examples and inspiration	Innovative information campaigns, Renewable Energy Model Regions, Award systems	This practice field relates to public authorities, businesses, NGOs or others setting up campaigns or models that aim to inspire others to take action. Awareness raising projects or projects aimed at changing the behaviour of stakeholders such as businesses or consumers are also part of this practice field.
District and neighbourhood energy systems	District heating projects, energy systems in neighbourhoods	This practice field includes initiatives from citizens, companies or governments to set up and operate district heating projects or other neighbourhood energy systems.
Energy efficient mobility	Bike sharing, electrical cars systems	This practice field includes social innovations which result in energy efficient transport solutions for human mobility. This could be in the form of multi-modal approaches to transport or, in principle, any social innovation that shifts transportation to modes that use less energy and emit less carbon than traditional modes. This practice field overlaps with the policy field of Mobility.

Because of the disruptive and quickly changing nature of the energy system it was found to be complicated to create a complete and meaningful list of practice fields for social innovation in the energy sector. Apart from the technological innovations making this transition possible, a lot of social innovation is taking place as well. Several types of social innovation have the potential to be at the heart of the newly developing renewable energy system. For instance there is a lot of collective action going on. But because of the relative recentness of many developments in social innovation in the energy system it is difficult to pin down established and detailed practice fields of social innovation. Other challenges in defining practice fields are that energy is a very comprehensive topic that plays a role throughout society. Therefore it is sometimes difficult to distinguish energy initiatives from initiatives in other domains (for example the link energy-environment, energy-poverty, energy-mobility, and so on). Next to that the initiatives differ a lot in terms of partners, methods, activities and goals.

Therefore, the above list of practice fields is a first attempt of creating a typology of social innovation in energy that should be developed further. As it is now there are some rather vague boundaries between the different practice fields. As can be concluded from the description above, the definition of 'Energy Collectives' is for instance very broad. There are energy collectives that can also be placed in the practice field 'Local Production of Energy' when they generate energy locally. Other energy collectives can be placed in the practice field 'Energy Services' when they provide energy-related services to citizens, companies or governments. The main difference between the practice field 'Energy Collectives' and the other practice fields is that energy collectives are basically an initiative of a group of citizens, possibly in cooperation with the government. This practice field is a form of social innovation since such collectives are often new combinations or figurations of social constellations, often including 'new' actors in new governance arrangements. The initiators of energy collectives combine their knowledge and ideas to change their own way of living and show others that renewable energy becomes a new standard.

### 3.3 EXAMPLES OF INITIATIVES STUDIED

In this paragraph some examples of social innovation initiatives in energy are provided that have been studied in SI-DRIVE. These examples give a glimpse of how widely diverse the initiatives are in terms of activities, structure,

involved parties and goals they strive for. In the State-of-the-Art report it was already stated that as the situation in countries differs a lot in terms of for example history and policy, also what can be seen as social innovation differs between countries. Something that is seen as very common in some countries can be very innovative in another country.

### **GoiEner**

GoiEner is a non-profit citizen energy cooperative in Spain that promotes the implementation of installations to generate renewable energy. It is an interdisciplinary organization open for those who want to work in favour of an alternative, renewable model for the current energy sector. It is mainly based on cooperation and volunteerism, in which the partners take part actively in each of the decisions of the cooperative. Although the Spanish electricity market was liberalized in 1997, it is still organized mainly around large electricity companies. GoiEner seeks to change the configuration of the electric mix in favour of a market where there is a majority of renewable energy. An important characteristic of GoiEner as Energy Collective is that it invests only in renewable energy generation local projects and has only local partners. GoiEner started in 2012 and they won the New Business Ideas Award from GOIEKI (a local new projects promoting agency), which meant their launch. It started with 32 partners and in September 2016 there were more than 5000 partners. Since 2013 the partners can subscribe for a contract to get electricity from GoiEner.

Because of the collective nature of the initiative and the focus on production of sustainable energy this initiative is considered part of the practice field Energy Collectives.

### **Model Region Thayaland**

The *Climate and Energy Model Region Zukunftsraum Thayaland* (KEM Thayaland) wants to strengthen local economy and sustainability in fifteen communities of the district Waidhofen in Austria. They strive to become energy self-sufficient through a mix of measures in the fields of heating, power generation and mobility. Besides traditional agricultural holdings, also innovative technology companies and modern handicraft businesses are settled in the region. With the foundation of the association Zukunftsraum Thayaland in 2006, the structural and economic strengths of the 15 communities of the district Waidhofen an der Thaya were combined. The main action fields of this concept were electric mobility, power storage, wind power, building refurbishments and energy contracting. Later other activities were added such as project management, networking, communication, photovoltaic systems and solar heat. A practical example of their activities is to provide consulting services for private individuals in the community. On a regular basis, they organise information events which cover themes like the usage of RES solutions for private households, e-mobility and the use of car-sharing, LED usage, solar power installations, RES funding and energy saving devices.

Because the initiative is not producing of saving energy itself but stimulates other people and organizations to do so it is considered part of the practice field Providing Examples and Inspiration. This particular initiative also goes further than that by changing existing institutions.

### **Energy lady and energy kid (Enerji Hanım)**

The Energy Efficiency Association ("The Association") is a non-governmental organization founded in 2008 in Turkey. Its project "Enerji Hanım" (Energy Lady) along with Energy Kid are outreach efforts to raise energy efficiency awareness in home-maker women. The association also aims to continually conduct scientific research and to increase public knowledge by sharing those findings with public enterprises and citizens. The project is carried out as a series of well-organized lectures in schools and at home, reaching an audience of 34,000 in 21 provinces of Turkey between 2013-2015. As an innovative aspect, the lectures were carefully organized in collaboration with local government authorities, their content was well-crafted including lecturer personality selection, and introduced practical methods of energy saving such as "unplug your iron five minutes before you are done with ironing," and thereby aim to improve Turkey's energy deficit directly through the efforts of households.

Because the initiative is not producing of saving energy itself but stimulates other people to do so it is considered part of the practice field Providing Examples and Inspiration.

## 4 RESOURCES, CAPABILITIES AND CONSTRAINTS

In this chapter, a selection of positive and negative influences is discussed that can make a social innovation initiative in energy a success or a failure. The positive influences can be described as drivers, resources or capabilities. And the negative influences as barriers or constraints. Naturally, the absence of a certain driver can also be a barrier to an initiative and the other way around. These results are mostly retrieved from the Foresight & Policy workshops and the in-depth case studies. Therefore more drivers and barriers can be found in the two policy briefs (Ooms, et al., 2015; Ooms, et al., 2017) and the case study results (Ooms et al., 2016).

### 4.1 DRIVERS, RESOURCES AND CAPABILITIES

In order for social innovation initiatives to be able to fulfil the roles described before, several drivers, resources and capabilities play a role. A selection of these that were identified during the SI-DRIVE project are:

- **Strong motivation** of the involved actors or initiators to work on solutions for sustainable energy or related goals. This is key to starting an initiative and to keep pushing the development.
- **Collective knowledge** that is available among the people/actors involved in an initiative. This helps to develop the initiative and overcome barriers. Ideally there is a mix of knowledge from different disciplines present, such as technical knowledge about renewable energy solutions, financial/economical knowledge and knowledge/skills of how motivate or involve others.
- **An open energy market** with equal access for both traditional players (incumbents such as energy suppliers) and new players such as social innovation initiatives is essential for these initiatives to be able to have a role of importance.
- **Support by the government**, whether financial or non-financial, creates possibilities for investment, networking, knowledge building, materials, etc.
- **Social consensus** on the need for energy efficiency is important to be able to form a collective and find like-minded people.
- **Established structures and networks** that initiatives can connect to helps to build up knowledge and connections to bring the initiative further.
- **Generation of results and outcomes** by an initiative can help to promote the provided solution and prove other parties (such as the local government) of its use.
- **Professional and effective management and leadership** within an initiative helps to continuously develop an initiative and keep it stable, find the right funds and to be taken seriously by other actors.

### 4.2 BARRIERS AND CONSTRAINTS

During the project also several barriers and constraints were identified. Often these are the flip side of the drivers mentioned before. A selection of these are:

- **Low interest in energy** for the general public that makes it hard to start an initiative and get people or companies involved.
- **Lack of knowledge** within the initiative can lead to slow progress and to making unnecessary mistakes that others have already learned from.
- **Dominance of traditional parties** (incumbents) in the energy market makes it hard for social innovation initiatives to start and find their place in the market. In many countries energy markets are dominated by a few large companies that are quite powerful.
- **Lack of funding and capital** makes it difficult to start an initiative or to continue one once it runs out of funding. At the moment most social innovation initiatives need some form of compensation or support to be able to run.

- **Regulatory burdens** in an energy market that is at the moment more designed for larger, professional companies than for social innovation initiatives make it difficult to start. For instance for the production of energy in a collective there are many regulations. This requires a high level of professionalism from initiatives.
- **Volunteer fatigue** can play a role when people who start an initiative are successful but then asked to do a lot for free such as meetings with stakeholders and presenting their work. They can become tired of having to do everything voluntarily or it can be unfeasible financially.
- **Shifts in policy and subsidies** can have a large impact on the business case of a social innovation initiative. In several countries there are examples relating to the change of policy measures (for example stop providing solar PV subsidies) that made the case a lot harder for initiatives (both citizen cooperatives and businesses). When policy is unstable it makes the development of a financially viable initiative that is dependent on that policy too risky.
- **Absence of quick results** that an initiative can show to promote their activities can lead to decreased trust by other parties or participants in the initiative that the goals will be reached.

## 5 GOVERNANCE, NETWORKS, ACTORS

This chapter discusses the context in which the social innovation initiatives develop in the energy system and the policy aimed to stimulate this development. It is discussed which actors are involved in social innovation in energy, how they cooperate, in what kind of structures they work and what could be the role of policy to stimulate social innovation.

### 5.1 POLICY AND CONTEXT

In 2004 the European Union defined ambitious goals during the European Conference for Renewable Energy in Berlin. By 2020, the EU would seek to obtain 20% of its total energy consumption requirements with renewable energy sources. Additionally, in the 'Action Plan for Energy Efficiency: Realising the Potential' (EC, 2006), the European Commission set the target of 20% improvement in energy efficiency by 2020. In March 2007, the European Council adopted these so-called 20-20-20 targets, which comprised three key objectives:

- A 20 % reduction in total EU greenhouse gas emissions (including both energy and non-energy related sources) from 1990 levels;
- A 20 % increase in energy efficiency by 2020 against a baseline estimate;
- Increasing the share of EU energy consumption produced from renewable resources to 20 %. (EC, 2007).

According to the European Commission, renewable energy should be gradually integrated into the market with decreasing or no public support, and should over time contribute to the stability and security of the grid on a level footing with conventional electricity generators and competitive electricity prices (EC, 2012). Still, specific policies are important for achieving these the EU energy targets, in particular measures that reduce administrative burdens, provide clarity for planning, define planning and permitting procedures for infrastructure development and operation to avoid delayed investments in infrastructure as well as disruptive changes to support schemes. In addition policies aiming for an increase in energy efficiency (lowering total energy demand and therefore raising the share of renewable energy) are crucial to enable and facilitate the transition towards renewable energy (EC, 2013).

Spurred on by the adoption of the 2009 Renewable Energy Directive and the legally binding renewable energy targets, the share of renewable energy has grown strongly in the European community. However, various Member States are rather behind on their initial targets. Even though the growth potential of renewable energies has become widely recognized within the European Union, additional efforts are needed to further enhance the contribution of renewable energy to the EU's energy mix. So far, the 20-20-20 objectives are largely drawn, implemented and enforced by public authorities at different levels of scale in all Member States. But, especially in the light of the increased need for public authorities to retrench and withdraw and downsize their policy programs and public services, the empowerment and enhanced involvement of private stakeholders and the civil society might be key to reach the 20-20-20 objectives in 2020. However, so far, EU incentives have been addressing mostly market development and governments. In the Renewable Energy Directive, no policy measures are taken that specifically address civil society, and no difference seems to be made between civic initiatives for renewable energy or market initiatives (EC, 2009).

The important role of civil society within the transition away from the fossil-fuel based energy system, is acknowledged by both the World and European Energy and Environment Transition Outlook (WETO-T report: Chateau & Di Valdalbero, 2012) and by the Renewable Energy Directive (EC, 2009a). The WETO-T report stresses the importance of social innovation next to technological innovation, and that the transition towards renewable energy and energy efficiency would also have to include human behaviour and lifestyle (Chateau & Di Valdalbero, 2012). In addition, the WETO-T report argues that a post-carbon society would also minimize energy supply from centralized technologies (Chateau & Di Valdalbero, 2012). Renewable energy would lead to a structural decentralization of the energy system through the introduction of micro generation. The Renewable Energy Directive does acknowledge the benefits of a decentralized nature of renewable energy, including the utilisation of local energy sources, increased local security of energy supply, shorter transportation distances and reduced energy transmission losses. Such decentralisation also fosters community development and cohesion by providing income sources and creating jobs

locally. The move towards decentralised energy production would also lead to a decrease of dependence for consumers since photovoltaic, micro wind, biomass and geothermal power and combined heat and power systems can reduce the need for power from the grid significantly. As consumers become "prosumers" it is expected that they will also gain a stronger sense of ownership and control over their energy use (EC, 2012), which can ultimately contribute to the decoupling of economic growth and energy consumption (Chateau & Di Valdalbero, 2012). These developments create opportunities for social innovation initiatives.

Following the global and European policy goals, the energy system is in a transition from a central, fossil fuel dominated system to a renewable energy based system including more local production. The current situation differs strongly per (European) country in terms of the mix of energy sources and policy, as shown in the SI-DRIVE State-of-the-Art report. In most European countries the energy markets were also liberalised, which causes the governments to have less influence over the energy companies than before. The transition involves many disruptive changes. Consumers are changing from passive consumers of energy to prosumers (consumers producing their own energy). New parties are entering the energy market, incumbents see their business models being threatened. Technology is being developed further. National governments adapt their policy continuously. What the future energy system will look like is still open, to a large extent because of these rapid changes.

## 5.2 ACTORS IN SOCIAL INNOVATION IN ENERGY

With the growth of sustainable technologies that enable smaller scale local production, opportunities developed for new parties to enter the market. Citizens, local communities, civic initiatives or collaborations between these parties and market players and/or government can have a major role by deploying renewable energy sources complementary to those developed solely by the market and governments. However, the traditional energy market is very centrally organised in most countries with a number of large players operating independently, either (partly) government owned or not. This organisation does not leave much room for new players from social innovation initiatives who often operate more locally, based on cooperation and striving for environmental/societal rather than commercial goals. In most countries at the moment there is no level playing field in the energy market in which incumbents and newcomers have equal chances.

Typical actors that are involved in social innovation in energy and their roles are:

Actor	Role
Citizens	Starting social innovation initiatives
Cooperatives, associations	Starting social innovation initiatives
Agencies, intermediaries	Supporting social innovation
Civil society organisations	Starting SI, supporting social innovation
Universities, research institutes	Providing knowledge, stimulating knowledge exchanging between initiatives
Technology developers	Providing RES (Renewable Energy Solutions)
Policy makers (state, provincial or local level)	Stimulating and supporting social innovation
Politicians	Providing acknowledgement for need of social innovation
Incumbents (such as energy suppliers, district operators)	Improving business models, innovating, networking

### 5.3 GOVERNANCE STRUCTURES

The governance structure is the way in which an initiative is internally steered and organised. The different types of SI initiatives in energy as described in the practice fields can have widely differing governance structures. The practice fields that are most complex in terms of governance are energy collectives and in some cases providing examples and inspiration because there are normally more people or organisations involved. The governance is often dependent on one or a few people (often volunteers) which makes it fragile. In many cases an association is set up by a group of citizens. Often initiatives become more complex as they grow more mature. They start transforming into more institutionalised forms.

In some initiatives there is only a strategic alliance between parties, and in others there is intensive cooperation. Often an initiative is started by one actor that starts looking for alliances. An energy cooperation can be started by one or two citizens that start looking for support from the government and/or companies. Or a local government can start looking for local partners to start a project.

The cases described in paragraph 3.3 form a representation of initiatives that have different governance structures. Therefore to get an idea of possible structures we discuss the governance structure of each initiative here briefly.

In the **Thayaland case** as can be seen in the figure below, the TRE<sup>4</sup> Thayaland GmbH was founded by the two associations Zukunftsraum Thayaland and Zukunftsclub Thayaland in the beginning of 2016. This organisation (Ltd.) acts as an implementation structure for RES measures in the KEM region and its main financing source is a citizen's participation model only for members of the Zukunftsclub Thayaland. The TRE Thayaland GmbH establishes itself as energy service provider and project owner within the the Climate and Energy Model Region. The business areas vary from energy conservation projects to energy production projects culminating in energy storage projects. Already financed and successfully started projects are for example regional E-Car sharing and photovoltaic systems on roofs of community buildings<sup>5</sup>.

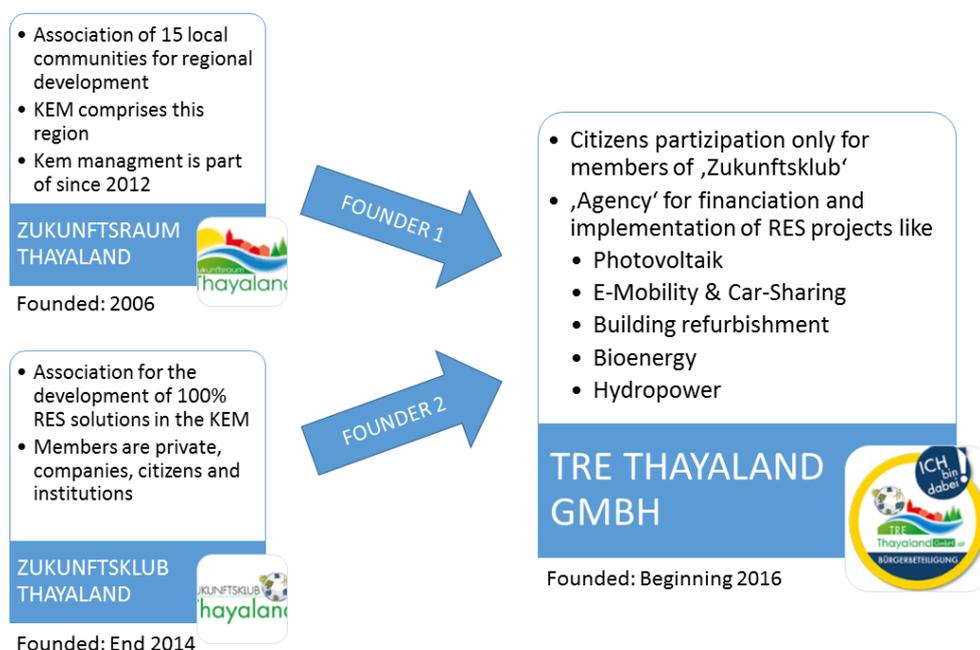


Figure 4 Structure of the Thayaland case

<sup>4</sup> TRE stands for ‚Thayaland Regional Entwicklung‘

<sup>5</sup> <http://www.thayalandgmbh.at/page.asp/-/42.htm>

In the **GoiEner case**, in the beginning there was one initiator and a group of 32 volunteers, currently (in 2016) there are 13 paid employees and 100 volunteers working for GoiEner. It is a citizen cooperative and therefore the members have an equal vote in decisions. They are represented in a governing council. The most important decisions are taken at general meetings. The most important work however is carried out by the volunteers. Members can be only members or also volunteers. Volunteering work is divided into 4 main areas: renewable energy generation, marketing, communication and administration.

**The Energy Lady and Energy Kid case** is a project of the Energy Efficiency Association, a non-governmental organization from Turkey. The idea of the project originated in the board of this association, which consists of wealthy businessmen. The general secretary of the Energy Efficiency Association has a background in energy and environmental policy. Next to that there is a project group with the same expertise.

## 5.4 NETWORKS AND COOPERATION

A large number of initiatives that were studied in SI-DRIVE involve networks in the initiative. These are national, European or global networks related to for instance ecovillages or sustainability in general. They are part of these networks to learn from each other. Almost all initiatives include some kind of cooperation, whether it is between citizens or between organisations. In this paragraph examples are provided of the networks and cooperative relations in the initiatives described in paragraph 3.3.

In the **Thayaland case** many networks play a role and cooperation is taking place with several (institutional) actors. Firstly, the Federal state of Lower Austria is a general supporter that organises and promotes networking, diffusion, exchange and tools for energy monitoring. Mayors in the region of the initiative and other community politicians are serving as political community representatives. The mayors are also chairmen and members of the association Zukunftsraum Thayaland. They play a key role in the actor landscape since they are local implementation partners, decision makers and local multipliers. Other important actor groups for the initiative are regional community institutions that are represented by Head officials and Energy commissioners of the community. Their role is the operational support of the KEM management by concrete measures, activities and projects as well as the support and execution of tenders, financing and applications for funding. The “Energy Agency of the Regions” plays also an important role by providing important support functions like capacities and know-how for the KEM management in the starting- and resubmission phases of the projects. Last but not least, the Climate and Energy Funds Austria (KLIEN) which is financed by the federal government is also an important networking partner and funding body for the KEM. It also provides quality assurance by allocating consultants for the duration of the program runtime and auditors for the transition period between project completion and resubmission.

The **GoiEner case** is connected to networks and other actors in different ways. First of all they cooperate with other associations and enterprises, such as Rescoop (European Federation for Renewable Energy Cooperatives), Fiare Banca Etica (an ethic bank) and REAS Euskadi (solidarity economy). Also, they cooperate with associations that want to start a similar initiative as them in other areas. Next to that they are in contact with political representatives to discuss the implications of electricity reforms.

**The Energy Lady and Energy Kid case** was started by The Energy Efficiency Association, set up by the Ministry of Energy and Natural Resources and the Ministry of Family and Social Policies. Partly because of that, the project gained support from governmental authorities (Ministry of Energy and Natural Resources, Ministry of Family and Social Policies and Ministry of National Education) at the very early stages of the project. Pilot studies in the project were approved by the Ministry of Energy. The Ministry of Family and Social Policies was involved in the project and helped organise training sessions. The Ministry of National Education was involved in seminars and plays for students. The ministries had a critical role as they smoothed out procedural issues and access to public schools. A mobile network operator became the communication sponsor of the project. Also, a research firm joined the team to measure performance. Finally, many local associations such as Women Entrepreneurs Association of Turkey supported the activities of the project by reaching women in their cities and advertising the events of the project and the campaign as a whole by distributing flyers, brochures and hanging posters etc.

These examples show that the initiatives are often a cooperation between government, businesses, citizens and civil society, or a selection of those actors. These is not one typical mode of networking and cooperation, as often these projects are started and then develop gradually.

## 5.5 ROLE OF POLICY

The increase in the amount of energy collectives and other new players in the energy market changes the role of local and regional governments since they need operate in a different way towards them compared to the large energy companies they are used to work with. Their role regarding energy collectives can be to cooperate with them and to facilitate their development. They can provide important support functions like capacities and know-how for the management of initiatives. Energy collectives often cooperate with a local or regional government to realise their goals.

In order to have a higher chance to be successful, the initiatives need strong network partners with leverage. In particular political and public support as well as the embeddedness in existing local structures and networks is important for success and sustainability of an initiative. Particularly the cooperation with regional political multipliers like majors, heads of local administration but also with representatives from political interest groups (e.g. chamber of agriculture and chamber economy) is important to gain support and trust in projects.

Overall, a precondition for the blooming of social innovation initiatives is the opening up of the existing largely traditional energy market for new players and the transition towards renewable energy. In order for social innovation to prosper, reorganisation of the actor landscape including new actor groups such as social innovation initiatives is necessary. Therefore, policy makers who want to support these initiatives need to have instruments to arrive to a level playing field that allows both established parties and newcomers in the market. To achieve this level playing field some institutional impediments need to be addressed. One impediment is (tax) regulation related to entering the energy market that is currently often restricting for social innovation initiatives. Another impediment is that there are insufficient local and supra-regional networks between government, incumbents of the market and newcomers.

Against this background, the local government can play a stimulating role in the development of SI. From the case studies and workshops several existing and also possible future roles for the government and policy makers were further discussed of which a selection is shown here:

- **Create a level playing field** in the energy market. Take away boundaries for SI to enter the market.
- **Provide stable policies** and manage expectations, create policy focusing particularly on SI.
- **Reach out to the initiatives** and try to become an active part of their network. Support SI initiatives proactively.
- **Build on existing structures** and networks to speed up the development of SI initiatives, focus on the local community.
- **Provide in-kind resources and funding** to stimulate the development of existing social innovation initiatives or the setup of new initiatives.
- **Support SI initiatives** in organising themselves and form networks by providing network partners and connecting people with similar interests. Enable know-how transfer.
- **Promote good practices** of SI.

## 6 PROCESS DYNAMICS

In the process of social innovations developing, institutions are created and structured and behavioural change is taking place. A large number of social innovations together can foster social change in a society. In theoretical terms, there are mechanisms that bridge individual social innovation initiatives (micro level) and social change (macro level). Within each policy field of the SI-DRIVE project such “mechanisms of social change” were investigated. These are discussed in this chapter. Also, possible perspectives for the future development of social innovations in energy are described.

### 6.1 MECHANISMS OF SOCIAL CHANGE

At the moment there are disruptive changes occurring in the policy field of Energy Supply that are reflected in many mechanisms of social change. These changes are driven by the need for a more sustainable energy system to prevent further climate change and damage to the earth caused by the use of fossil fuels, and by the need to become more independent from existing energy sources and systems of supply and distribution. These are the two main societal needs that are primarily addressed by the social innovation initiatives (among other actors) in energy and that have stimulated the overall development of these initiatives.

We have identified the following mechanisms in the SI-DRIVE project:

- Learning
- Variation
- Selection
- Diffusion of innovations
- Conflict
- Competition
- Cooperation
- Tension and adaptation
- Planning and institutionalisation of change
- External development
- Societal needs
- Intrinsic motivation
- Culture

More detail regarding the mechanisms of social change can be read in the report ‘Social innovation in Energy Supply: case study results’ (Ooms et al., 2016).

### 6.2 FUTURE PERSPECTIVES FOR SOCIAL INNOVATION

Experts involved in the International Round Table of the overall SI-DRIVE project that covers multiple domains agree that social innovation will become more important in the future. One of the reasons that they expect this is that social innovations address multiple needs, such as a combination of energy production and local liveability in the energy field. This role of combining these needs and addressing them will not diminish in the future. Another reason why it is expected to become more important is because possibilities to start an initiative are increasing. In the energy field social innovation is enabled amongst other things by technologies for local production of energy that keep developing, by growing levels of knowledge about renewable energy solutions, and increasing awareness of the need for sustainability.

Specifically in the energy sector, several societal issues can be distinguished that will only increase in the future and therefore stimulate the need for SI. Such as the dangers of climate change and bad air quality, energy poverty in low-income households, rural liveability and lack of social cohesion in neighbourhoods. As these issues will continue to

come up in different areas, social innovation can be a solution to those issues. It will be interesting to see in what directions these initiatives will develop, given that they mostly develop where there is no solution being provided in the system that is in place.

The question is how central social innovation initiatives will become to the sustainable energy system of the future. This depends on a number of factors. For one thing, the barriers described in paragraph 4.2 and the other SI-DRIVE deliverables should be overcome. Room should be created for newcomers in the energy market, governments need to review their role and become supporters and facilitators, policy makers should include SI in their policy, the awareness of the need of a sustainable system needs to increase further and potential social innovators should be able to gain the knowledge and capabilities to start an initiative. Then social innovation can have a significant role in the energy sector, connecting people and organisations, and providing an opportunity for every person to participate in a way that matches their talents and interests.

# 7 CONCLUSIONS

In this chapter the main conclusions of the policy field Energy Supply within the SI-DRIVE project and further implications for research are laid out.

## 7.1 MAIN CONCLUSIONS

The main message related to social innovation in the policy field Energy Supply is that the energy transition needs to speed up and that social innovation can play a unique role by both stimulating sustainable energy production and energy saving and adding additional values such as local liveability and mutual learning. Within the project internal and external experts agreed that social innovation is becoming more important and present in various countries. Following that, SI initiatives are expected to have a growing role in the transition towards a sustainable energy system.

Still, we have seen that there are significant barriers that hinder the growth of SI such as regulatory and funding barriers. Next to that, in most countries there is no policy directed at SI in place. Given the value of social innovation it is surprising that no policy measures were found in this project that currently address this specifically. Therefore there is an overall need for a specific SI policy approach and strategy to foster drivers and overcome barriers. This policy approach should be multilevel, however the regional level is of main importance because that is where the initiatives are active. In this approach (local) governments and policy makers can take up a facilitating role including different types of support to initiatives. Such an SI energy policy should be characterised by flexibility, inclusiveness and the will to foster collaboration and learning between and within the involved stakeholder groups.

Considering the uniquely contributing role that social innovation initiatives can play in the transition towards a renewable energy system, it is important that policy makers work on taking away barriers and stimulate drivers. Policy makers can help them fulfil their role by working on overcoming these barriers and stimulating drivers by giving support and putting social innovation policy in place.

The expectations on the development of SI are positive however, since growing technological possibilities and knowledge create increasing room for initiatives. Next to that, issues such as climate change, energy poverty, local quality of life will only become more important in the future. Especially if initiatives can connect with allies and partners they can have an increasingly positive impact on these issues. SI has the potential to further develop and democratise the energy market by involving other stakeholders than the traditional parties, such as citizens and civil society.

## 7.2 IMPLICATIONS FOR FURTHER RESEARCH

The SI-DRIVE project has provided a large amount of information but has also raised additional questions that should be explored in order for social innovation to flourish. One question is how social innovation initiatives can be integrated in the energy system so that they can become a natural part of the system instead of a rarity. Other questions are: How can SI initiatives professionalise and at the same time keep the same societal goals and authenticity? What is the best strategy for learning between initiatives? What are good practices of SI in energy and how can they inspire others? What kind of tools would be beneficial for the development of social innovation initiatives? Lastly we have found that social innovation in energy is widely different depending on the country where an initiative developed. It would be interesting to study systematically the differences between countries in terms of social innovation in energy. So that recommendations can be given about the type of social innovation that could be successful in a certain country.

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