SI-DRIVE
Social Innovation: Driving Force of Social Change

SOCIAL INNOVATION IN ENERGY SUPPLY

STATE OF THE ART SUMMARY

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Introduction

This state-of-the-art report addresses the question what social innovation practices can be found in the policy field of energy supply. As the working definition the SI-DRIVE-project uses for social innovation is "*a new combination or figuration of practices in areas of social action, prompted by certain actors or constellations of actors with the goal of better coping with needs and problems than is possible by use of existing practices,*" social innovation in the policy field of energy supply relates to the challenges posed by the transition towards an increase in renewable energy and energy efficiency. Expectations are that the worldwide need for energy will multiply significantly, and that a continuation of the current dominancy of fossil fuels will be unable to meet these growing demands without risking major destabilizing economic effects and devastating environmental consequences. Therefore, a thorough revision of the current energy supply mix is deemed necessary, in which preference is given to renewable sources. This challenge has been recognized by the European Commission, and a profound European energy policy has been set up. With its current 20-20-20 targets, the EU seeks to satisfy 20% of its total energy consumption with renewable energy sources, with an additional target for a 20 % improvement in energy efficiency, and a 20 % reduction in total EU greenhouse gas emissions in 2012. So far, EU policy has been focussed on incentives to stimulate market uptake and awareness and actions by the national governments of the Member States. However, due to the financial and economic crisis of 2008 which has forced many public authorities to retrench and downsize their policy programs and public services, and due to the situation that many of the Member States seem to be (too far) behind on their initial targets, the empowerment and enhanced involvement of private stakeholders and civil society might be key to speed up progress needed to reach the 20-20-20 objectives. However, from a European perspective, 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). This makes social innovations, which are often civic-led, or at least dominated by civic actors (though public and business actors have a role too), all the more relevant.

Even within this tightly regulated and controlled domain, we can see that consumers, communities and SME's try to 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 is growing significantly (for instance led by civic (interest) groups or local communities). Still, challenges remain in the areas of customer engagement, social preferences towards direct energy consumption, perceived uncertainty in investments in renewable energy, and the social acceptance of behavioural innovations that aim to promote energy efficiency and conservation on the consumer side. Thus, the energy issue contains several dimensions interesting for our SI-DRIVE proposal: bottom-up action, sustainable futures, and different business models and modes of cooperation. Local initiatives are flowering, but upscaling seems difficult. The challenge for (European) public policy is therefore to find ways to stimulate social innovation in the domain of energy supply in the different countries. There is a great need to stimulate local initiatives in new technology development, new business models, services, demand response systems and pricing. Such innovations have the potential to improve energy supply security in Europe by proliferating sources of supply. Then, the question for European and national policies is to find a level playing field for major energy suppliers and local initiatives, without losing grip on the societal goals.

This State-of-the-Art report is a first step in that direction, as it provides a sector-specific survey on social innovation in energy supply in the different countries and country clusters. It comprises an analysis of the current situation e.g. how the 'market' and 'public policy' function and interact and what the main future challenges are. It also investigates what issues are not solved by this dominant (policy, delivery and innovation) model in twenty-two different countries. These included nineteen European Union Member State countries (Denmark, Sweden, Estonia, Latvia, Lithuania, Poland, Romania, Bulgaria, Austria, Germany, the Netherlands, Belgium, Luxembourg, France, Spain, Portugal, Italy, Ireland and the United Kingdom), the Balkans (of which Croatia is currently the only European Union Member State, and further included Serbia, Bosnia and Herzegovina, FYR Macedonia, Kosovo, Montenegro and Albania), and two countries outside the European Union (Turkey and Egypt). For these countries, the SI-DRIVE consortium partners have elaborated on the state of the art in the countries under their responsibility according the following structure. First, they identified several key aspects of the country: key facts and figures on the energy supply and the share of renewables within their energy mix, the relevant actor groups in energy supply, whether or not a transition towards renewable energy and energy efficiency is taking place, who is taking a lead in that transition, to what extent attention is being given to social innovation and to what extent the cross cutting themes of social innovation play a role in the energy transition. Secondly, the consortium partners identified several practice fields for social innovation per country. The energy supply sector, including the social innovation in the sector, differs in every country. Many elements contribute to differences in the organization of the sector: e.g. history, geography, the availability of indigenous energy resources, culture, environmental awareness of the population and their representatives, the degree of centralization or decentralization, the strength of local communities in general, the

quality of the energy networks and the incidence of breakdowns and population density. Each country has its own organization of the sector, of which social innovation is a part as well.

Country comparison

The dynamics of the energy supply in each country studied, as well as acitivites the amount of renewable energy in the energy mix, differs considerably. Many elements contribute to these differences. An important feature is, for instance, the geography: some countries have indigenous fossil energy resources (such as the Netherlands, Denmark, Poland and Romania), other countries have excellent conditions for wind power (such as Denmark), hydro power (such as Sweden) or even tidal power (such as the United Kingdom and Ireland). Another difference is related to the sources that are already present, as some countries have large capacities of nuclear energy (France and Belgium). Other countries depend heavily on the import of energy from non-European countries. These features determine to a large extent what the degree of renewable energy is within a specific country. Some countries, such as Bulgaria and Latvia are heavily dependent on import of Russian gas, but also score rather high with regard to the percentage of renewable energy supplied. This is largely due to the large amount of solid biofuels (wood) used. Other elements that contribute to the differences among countries are for instance the political and economic history, culture, environmental awareness of the population (this is for instance high in Germany and Denmark), the degree of centralization or decentralization (regional and local governments are for instance strong in Austria, Denmark, Belgium, Italy and Germany), the way in which the energy market has been liberalized (leading to a multitude of players in for instance Germany and Italy, but to only a handful of dominant players in most countries), the policy attention given to social innovation, citizen involvement and civic initiatives (high in the Netherlands, the United Kingdom and Belgium), the strength of local communities in general (strong in Denmark and Italy, and low in for instance Bulgaria and Poland), the quality of the energy networks and the incidence of breakdowns (low quality in for instance the United Kingdom), demographic and economic factors such as population density and levels of poverty. Each country has its own organisation, of which social innovation is part.

Despite all these differences, for this report we were able to distinguish five different groups of countries.

- The first category consists of countries with a relatively high share of renewable in the energy mix and well on track with the 2020 goals, but with only minor social innovation (Sweden and Austria).

- The second category consists of countries where civic and local initiatives are significant, and where cooperation at the local level effectively contributes to the overall energy transition within that country (Denmark, Italy and Germany).

- The third category consists of countries where social innovation is starting to appear, but is still in its infancy. Many citizens want to be active with respect to their energy supply, but it may be difficult for them to grow and to have a significant impact (The Netherlands, United Kingdom, Luxembourg and Spain).

- The fourth category consists of countries in which there are only a very few examples of social innovation. Unfortunately, this category comprises the largest number of countries (Belgium, France, Portugal, Ireland, Latvia, Lithuania, Estonia, Poland, Bulgaria, Romania, Balkan Countries (Croatia)).

- The countries that are not a European Union Member State are described in a fifth and last category (Balkan Countries, Turkey, Egypt).

Practice fields overview

Within the policy field of energy supply, several practice fields for social innovation have been identified so far (to be extended in the global mapping stage of SI-DRIVE).

- ‘Energy collectives’, or the collective consumption and/or self-production of energy. This can be done through collective purchases and/or local cooperatives of producers and consumers in various compositions. This 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. Some

examples are: collective purchasing, energy cooperatives, business collectives and energy efficient housing collectives.

- 'Local (domestic) production of energy', by individual households, businesses, industries, farmers, etc.. Such individuals can, for instance, be totally 'off the grid' and self-sufficient, or act as 'prosumers' who are feeding-in energy back to the network, and many times receive a financial reward for it. Local production therefore also implies different interactions with, and a new role for, grid administrators, local/regional/national governments, energy suppliers, etc. Depending on the technology used, the related investment costs and return on investment costs, individuals can choose to organize micro-generation individually or in (small) collectives (this overlaps with 'energy collectives'). Some examples of local production are: domestic energy production, local production of biofuels or biogas, local production of heat.

- 'Working with smart meters', that show consumers how much energy they are using each period of time, for example each quarter of an hour, at a given time. Smart meters are more a technology than social innovation in itself, however, their application by energy consumers can induce all sorts of new behaviour and relations and makes it possible to address the 'energy problem' in a new way. Increased awareness of energy consumption can stimulate individuals to reduce consumption, and can even stimulate comparative and competitive behaviour among citizens. When networked, smart meters can also have a role for 'Energy collectives' and 'Micro-generation', as they can show a community and an individual micro-generator how much energy is (collectively) consumed and produced, and allow individuals to compare their use to similar households in the same area.

- 'Energy services', which includes all initiatives that provide energy-related services to citizens, companies or governments. They are called social innovations when they use this in a new way to tackle the challenges of renewable energy and energy efficiency. Examples are: Energy Service Companies (ESCos). Energy advice, services and solutions for marginalized and socially disadvantaged groups (to prevent energy poverty), and International innovation networks.

- 'Providing examples and inspiration', which relates to public authorities, businesses, NGOs or others setting up campaigns or models that can inspire others to take action. Examples are: Innovative information campaigns, Renewable Energy Model Regions, and Award systems.

Cross cutting themes for social innovation

Several of the Cross cutting themes identified in the SI-DRIVE project, are especially valid in the policy field of energy supply, and therefore need some explicit consideration.

- *Financial resources: a*lthough prices have been falling in recent years, investment costs in renewable energy technology are still high, with low, slow and unstable returns. Individual citizens often lack the financial resources to invest directly in energy efficiency measures or expensive technologies for renewable energy. While in some countries, citizens have high purchasing power and significant investment capital, in other countries this is very limited. Therefore, the availability of energy investment support schemes is often crucial in the field of energy supply.

- *ICT:* the further integration of ICT in the electricity grid is considered enabling and supportive in the energy transition, by offering new ways of ICT supported organisation and adaption of demand and supply, smart grids, smart meters and active/ remote heating control apps.

- *Social media:* play a role in stimulating and enabling collective action, and to assemble energy groups and knowledge exchange among initiatives.

- *Social entrepreneurship / economy / enterprises:* local producers of renewable energy can have an important socio-economic role in local development, through for instance the empowerment and involvement of disadvantaged groups (to prevent energy poverty, see below), through initiatives with a local socio-economic role, such as neighbourhood enterprises employing people with a distance to the labour market, or by stimulating the post-carbon economy, generating new businesses and new business models.

- *Gender, equality and diversity:* sustainable energy measures do suffer from some inequality issues, as often only resourceful groups have the capacity to invest in sustainable renewable energy.

- *Poverty: t*he issues of energy poverty and affordable energy are very prominent in some countries. For countries that have recently faced economic hardship, or have large populations living below the poverty level, energy poverty – meaning that "household expenditure on energy is greater than 10% of household disposable income" is a challenge.

- *Governance:* in the field of energy supply, and related social innovation, new methods of governance are crucial and are being developed. Within the energy domain, political and conflicting interest at the highest levels can have major influences on the actual transition towards sustainable and renewable energy. Assumably, governance will thus have to transform from centralised to de-centralised energy coordination, and from hierarchical steering, to governance in networks.

- *Innovation networks: i*nnovation networks (e.g. NGO's, European collaboration projects) can have major influence in the transition towards energy efficiency and renewable energy, thourgh community and capacity building.

- *Demographic changes:* Disparities in population density influence the energy transition, as in some parts of Europe substantial communities are not even well connected to the regular energy network.

Conclusions and recommendations

Based on the first impressions gained from the policy field country studies, some general remarks can be given on the relation between the context of social innovation and the nature of social innovation that relate to conditions that either favour of obstruct social innovation in energy supply. These remarks could best be seen as working hypotheses that will be researched in the further development of the SI-DRIVE project, and could be useful for the further development of the theory, methodology and mapping of social innovation.

- Social innovation in energy supply seems to depend heavily on **culture**, for instance sustainability awareness, but especially on a cooperative culture that comes together with trust among citizens and practices of collaboration.

- Social innovation in energy supply also seems to depend on **governance and market structures**. In some countries, the energy supply is strongly centralized and in other countries energy supply is more of a responsibility for either local or regional governments. In some countries, liberalization has led to a major emergence of new players and the end of state-owned companies. In other countries, several major players have become liberalized, but are still strongly controlled by the state and/or remain *de facto* monopolies and create a situation where it is still very difficult for new players to enter the market. There seems to be some correlation between countries where the market structure is fully liberalized, and countries were energy governance is organized on a more local level. It is especially these countries which seem to be much better at incorporating civic initiatives in the energy supply and social innovations.

- Despite the focus on social innovation as an additional path towards the 20-20-20 targets of the European Union Member States, the policy field country reports show how important **national governments** are in the energy transition. The way in which EU legislation is translated into actual national policy determines, to a large extent, the behaviours and expectations of the other actors in the energy market. Non-coherent or unstable energy policy hinders sustainable progress towards the energy transition, but it appears that extensive funding programs may help to achieve this. Policy attention for social innovation is perhaps not even that important except when this policy removes administrative barriers and offers institutional support.

- The presence of **indigenous fossil resources** can be a barrier to the energy transition and social innovation, but does not have to be so. In some countries, the presence of indigenous fossil resources is associated with strong economic interests which can obstruct an energy transition.

- **Financial support** is often mentioned as a crucial element in stimulating the energy transition towards renewable energy and energy efficiency, as support schemes enable people to make investments they would otherwise not have the resources for. However, this does not mean that people who are actually able to finance investments in renewables and efficiency by themselves take up more renewable / efficiency measures. On the other hand, poverty could sometimes even be a stronger reason for social innovation in energy supply, as this offers a clear and local urgency for a different way of energy supply. However, groups who suffer from energy poverty also often lack capacities for social innovation. In these cases, financial support schemes should go hand in hand with capacity building projects, knowledge dissemination, and innovation networks.

- **Technological and geographical challenges** remain crucial in the energy transition, and also in social innovation in energy supply. Storage capacity to deal with discontinuous production (over- and underproduction), secure access to the grid in remote areas, and the presence of smart grids, preferably combined with smart meters, are crucial to any renewable energy initiative.