

SOCIALRES: SOCIAL INNOVATIONS AS THE PATHWAY TOWARDS ENERGY DEMOCRACY AND AS SUSTAINABLE SOLUTION FOR THE MITIGATION OF THE GLOBAL WARMING

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ABSTRACT

The actual climate crisis generated by the global warming requires a strong civic participation to find a sustainable solution to overcome this critical time. The COP26, the UN climate conference, which took place last year in Glasgow, has the highest participation rate in COP's history despite the global pandemic. The world was expecting more ambitious actions for a clean global energy transition to achieve the 1.5 degree-goal. It is now clear that this ambitious goal cannot be achieved only by political decisions. A strong civic participation is required to make sure that the global warming will not lead to an irreversible status of the climatic crisis characterized by climate events, which will make the life of human beings not more sustainable on this planet. Social innovations are the key to overcome this crisis and provide a sustainable solution to the mitigation of global warming towards the achievement of 1.5 degree-goal.

Social innovations are defined as “*New ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. In other words, they are innovations that are not only good for society but also enhance society's capacity to act*”¹.

In the renewable energy sector, social innovations are identified as the business models able to support the production of renewable energy and, at the same time, the cooperation among citizens. As common denominator they have the concept of “power of many” to highlight that, through the union of small contributions, it is possible to have an impact on the society. The business models implementing social innovation in the renewable energy sector are cooperatives, aggregators and crowdfunding platforms. The development of renewable energies and a greater civic participation will be the two pillars of the clean energy transition. Social innovations can combine these two fundamental aspects and lead to the energy democracy and, as consequence, to a mitigation of the global warming. This paper has been prepared in the framework of the European project SocialRES (Fig. 1), which has the aim to investigate the business models of social innovations in the renewable energy sector to provide the owners or managers of crowdfunding platforms and cooperatives and aggregators, named “the facilitators of energy democracy”, with new tools to further support the production of renewable energy and the participation of citizens.

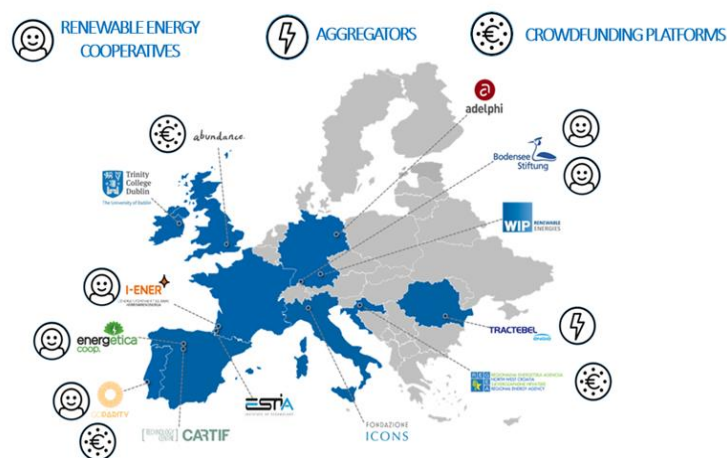


Fig. 1 SocialRES geographical and social innovation coverage

Keywords: Energy Democracy, Civic Participation, Social innovation, Business Model, Crowdfunding, Aggregation, Cooperatives, Global Warming, Climatic Crisis

¹ Source: Empowering people, driving change, Bureau of European Advisers (BEPA), Brussels (2011)

1 AIM AND APPROACH USED

This paper to be presented at the EUPVSEC2022, the WCPEC8, aims to provide the facilitators of energy democracy, i.e. the owners or managers of crowdfunding platforms, cooperatives and aggregators, with two new tools to further support their businesses in the production of renewable energy and the participation of citizens to the clean energy transition.

The tools presented with this paper have been developed in the frame of the H2020 European project SocialRES. The aim of SocialRES is to close non-technological research gaps that impede the widespread uptake of social innovation business and service models in the European energy sector.

The SocialRES consortium brings together thirteen partners who have been chosen specifically for their expertise and experience to ensure the successful implementation of the novel research proposed in this project and to guarantee a widespread geographical coverage (Fig.1). The SocialRES project partners are briefly described in the following paragraph.

1. WIP – Renewable Energies (WIP), based in Germany, the project coordinator.
2. ESTIA Institute of Technology (ESTIA), based in France, with extensive experience in research aspect of social innovation and innovative business models.
3. CARTIF, energy expert based in Spain.
4. Bodensee-Stiftung - Lake Constance Foundation (LCF), based in Germany, as networking and innovation expert and providers of case studies for RES cooperatives.
5. Adelphi, policy think tank based in Germany.
6. Fondazione iCons (ICONS), communication, dissemination and exploitation expert based in Italy.
7. Trinity College Dublin (TCD), University based in Ireland, with extensive experience in behavioural and energy economics, and consumer engagement.
8. I-ENER, RES cooperative based in France, involved in social innovation research projects.
9. EnergEtica, RES cooperative based in Spain.
10. Power Parity, RES cooperative and crowdfunding platform based in Portugal.
11. Abundance, RES crowdfunding platform based in United Kingdom.
12. REGEA, RES crowdfunding platform based in Croatia.
13. Tractebel, RES aggregator based in Romania.

The first tool described in this paper is the [SOGUI framework](#) developed by the SocialRES partner ESTIA in cooperation with the representatives of the SocialRES case studies of crowdfunding, cooperatives, and aggregator above-mentioned. The SOGUI framework can be seen *as a guideline for actors that are willing to launch a social innovation in the energy sector*.

The second tool is [toolkit for policy assessment of social innovations](#) developed by adelphi with the support of the SocialRES case studies. The toolkit has been developed in the form of a *taxonomy for measuring impacts of social innovations*. The taxonomy provides information for each impact, including indicators, scope of the impacts, methodological approaches, as well as potential data sources for the measured impacts. The taxonomy also illustrates the social economic and environmental impacts that select case study partners from the SocialRES project have had.

2 SCIENTIFIC INNOVATION AND RELEVANCE

Social innovations for the renewable energy sector will become more and more important in the upcoming years to ensure the achievement of the ambitious target of 1.5 degree to mitigate the global warming and provide a sustainable solution for the climatic crisis. The social innovations investigated in this paper are the business models of Cooperatives, Aggregators and Crowdfunding platforms, which have been established in the market since several years (aggregators) or even decades as crowdfunding platforms and cooperatives. Nevertheless, further support is required to make sure that these forms of civic participation can further be optimized to involve more citizens in the future. The tools described in this paper provide a fundamental support to the establishment of new business models of social innovations (*SOGUI framework*) and to assess, and therefore optimize the existing social innovations (*Toolkit for policy assessment of social innovations*).

3 PRELIMINARY RESULTS AND CONCLUSIONS

3.1 The SOGUI framework for launching a social innovation

The SOGUI framework has the aim to support stakeholders in the creation of social innovations, such as cooperatives, crowdfunding platforms, or business models for aggregation, in the renewable energy sector.

After a period of reflection on a specific topic related to energy (from production to consumption), initiatives and projects are created to face the problematics related to it. To facilitate and support the implementation of these energy-related projects, the SOGUI framework allows to define the pathway of the energy project to be developed. This will help to anticipate the organization of the different activities to be undertaken and the definition of different stakeholders depending on the needed skills and used technologies.

The SOGUI framework is divided in four parts (Fig. 2):

- The technologies that can be used for each activity in the energy field are proposed: solar PV, wind, wood, solar thermal, biogas, hydro, sea energy, biofuel, electric vehicle, batteries, hydrogen and thermal.
- Different activities in the energy field are listed, to choose the ones that will be used to develop the defined project: electricity generation, electricity retailers, energy savings, heat generation, self-consumption, storage, mobility, demand response, electricity distribution, heat distribution, energy poverty, community building, citizens meet local authorities, aggregation and funding.
- The needed competences/skills to accomplish these activities are also proposed: finance, planning and governance, energy efficiency, renewable technics, energy flexibility, digital, logistics and transport, smart grid, energy markets, communication, legal skills, teamwork and conflict management, commercial and information analysis.
- Involved stakeholders for the different activities are defined: end user, energy cooperative, crowdfunding platform, aggregator, local authority, DSO, ESCO, SME, digital service provider, social institutions.

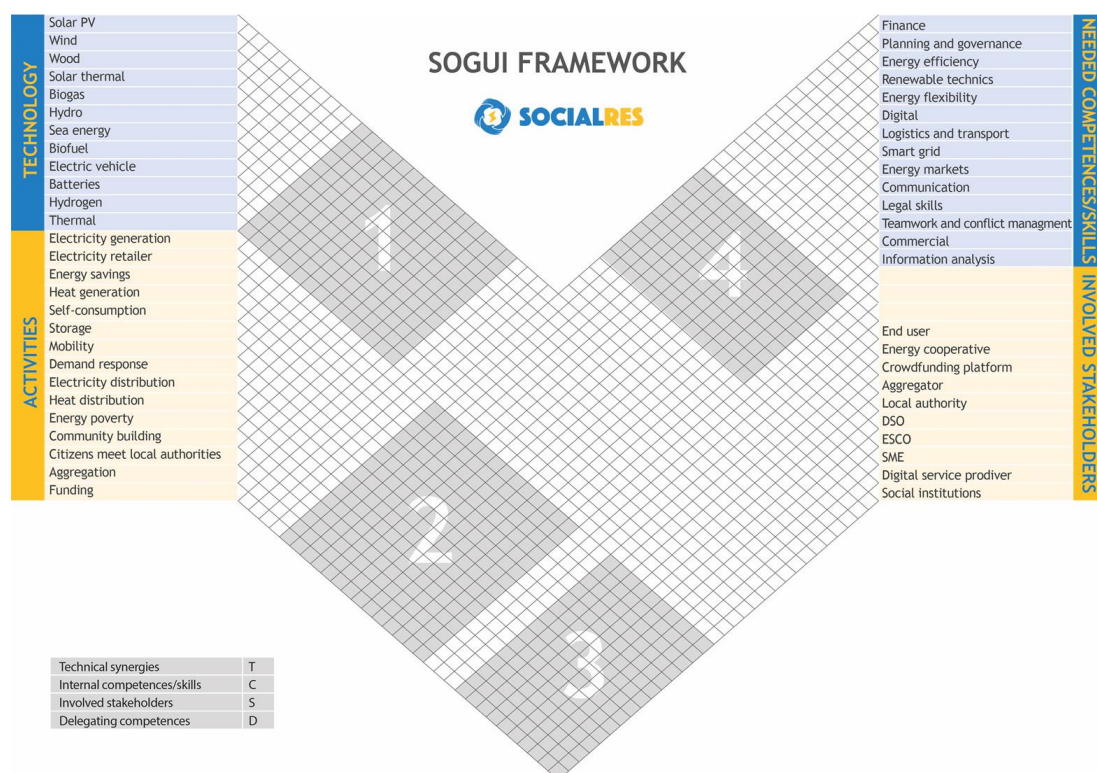


Fig. 2 The SOGUI Framework

Those four parts are cross-referenced according to four criteria:

- Technical synergies (T) defines the specific technologies used for each activity of the project.
- Internal competences/skills (C) defines which are the needed competences that should be kept internally for each activity.
- Involved stakeholders (S) defines the involved stakeholder for each activity.
- Delegating competences (D) defines which are the needed competences that are planning to be subcontracted.

The following four steps will help to define the framework of the project.

1. In the first step we are looking technical synergies between activities and technologies that are applied.
2. The second step is to identify the competences we need internally in the energy community. There are two choices:
 - to keep the competences internally
 - these competences are subcontracted.
3. The involved stakeholders are defined for each activity. For instance, as example, planning to fund the battery system with a crowdfunding platform.
4. The 4th step defines the delegating competences for those activities that have been defined in the 2nd step. For example the part of electric vehicles can be subcontracted to an agency for communication, legal skills and commercial. Digital skill will be managed by an external digital service provider.

All those steps will permit to define the framework of the project and will help the different initiatives/associations/companies to define the

framework of their social innovation project in the energy field.

A practical example on how to implement the four steps is provided in the report "[Guidelines for successful social innovations in the energy sector](#)" developed by ESTIA and available on the SocialRES website.

3.2 The toolkit for policy assessment of social innovations

The toolkit for policy assessment developed by the SocialRES partner adelphi outlines a taxonomy to be used by stakeholders to quantify and assess the multiple impacts of social innovations.

The taxonomy has been developed based on the literature on social innovations in the energy sector (Barbiero, Blasi and Schwidtal, 2021; Bauwens and Defourny, 2017; Bauwens and Devine-Wright, 2018; Hoppe and Vries, 2019; Kirsch et al., 2015; Koltunov and Bisello, 2021; Preenen et al., 2014; RESCoop Mecise, 2019), as well as the applied impact assessments of Koltunov and Bisello (2021) and van der Waal (2020) who conducted impact assessments of RE communities in Italy and Scotland respectively using different methodologies. The methodology used for this assessment toolkit is based on the work of Koltunov and Bisello (2021), the taxonomy approach was one that can easily be translated across social innovations.

The proposed taxonomy identifies a range of indicators in the broad categories of economic, social, environmental, and health impacts. The following table gives an overview of the measured impacts, which social innovation they are measured for and the reasoning behind their inclusion.

Table 1 Description of Indicators for Social Innovation Impact Assessment

Indicator	Social Innovation Indicator is Measured for	Reasoning
Consumer Savings	RECs, Aggregators	RECs can lead to financial savings for members due to reduced energy prices compared to traditional utilities. Aggregators can improve energy efficiency at home and reduce expenditures that way.
Job Creation	RECs, Aggregators, CrowdFunding	Jobs created both during the implementation and construction phase of the projects, as well as during the operation phase which included management and maintenance.
Participant Income	RECs, CrowdFunding, Aggregators	RECs may pay out dividends to their members if profits are achieved in a fiscal year. CrowdFunding platform provide a return on investment usually in the form of an interest payment on a loan. Aggregators may pay participants based on how much energy they can produce or how much flexibility they make available.
Government Income	RECs, CrowdFunding, Aggregators	All three pay taxes. This can include land/property taxes, income taxes, corporate tax, and trade tax
Capital Investment in RE Infrastructure	RECs, CrowdFunding, aggregators	RECs install RE infrastructure via generating units, storage capacity, charging infrastructure or other initiatives. CrowdFunding platforms raise financing to fund RE projects. Aggregators may not directly invest in RE infrastructure but may motivate participants to invest in further RE generation or storage.
Avoided GHG Emissions	RECs, CrowdFunding, Aggregators	RECs and CrowdFunding provide a RE supply which may previously have stemmed from fossil fuels. Aggregators increase energy efficiency at the household level and can contribute to peak shaving across the entire grid.
Energy Savings	RECs, Aggregators	Some RECs engage in energy efficiency projects for their members and the wider community. Aggregators save energy through optimized energy usage.
Political Mobilization	RECs, CrowdFunding, Aggregators	In all three expose citizens to RE, and active participation can increase
Energy Literacy	RECs, CrowdFunding, Aggregators	Owning or investing in an energy asset increases consumer's understanding of the energy market. It can change attitudes towards energy consumption and understanding of meter readings and bills.
Clean Energy Generated	RECs, CrowdFunding, Aggregators	RECs and CrowdFunding build generating units and thus it is important to see how much RE is produced by these units. Aggregators do not directly generate RE but the amount produced by members can be measured.

Further detailed information is available in the report available on the SocialRES website "[Toolkit for Policy Assessment](#)", which provides a detailed description on applications for use of the taxonomy, for policymakers, who may want to assess their social innovation support policies by looking beyond the outcomes at the impacts of the social innovations. Applications for use are also suggested for practitioners, as owners or managers of the social innovations in question.

The toolkit also includes the evaluation of the impacts for each SocialRES case study representing cooperative, crowdfunding and aggregator.

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