

Putting People at the Heart of Energy Transitions

Social Innovation in Energy:
four projects shine a light on the path forward

Prepared by the H2020 projects



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements No. 837722, No. 837752, No. 837758, No. 837498.

Authors (in alphabetic order): Audrey Abi Able, Kathrin Anger, Jacob Barnes, Regina Betz, Julia Blasch, Ellen Boije af Gennäs Erre, Chiara Candelise, Silvia Caneva, Nives Della Valle, Elisabeth Duetschke, Tessa Dunlop, Jan Fjornes, Winston Gilcrease, Nicolien van der Grijp, Marie-Charlotte Guetlein, Jakob Hoffmann, Sabine Hielscher, Christian Hoenow, Tanja Kamin, Volker Komrey, Jung Lin, Iban Lizarralde, Timothy Marcroft, Primož Medved, Sofía Mulero Palencia, Agatino Nicita, Daniele Paci, Jenny Palm, Angela Pereira, Ivan Petrov, Daniel Petrovics, Lucia Polo-Alvarez, Karoline Rogge, Basma Samir, Andreas Schneller, Alessandro Sciallo, Andreja Smole, Pieter Valkering, Sonja Wilhelm, Julia Wittmayer.

Citation: COMETS, NEWCOMERS, SocialRES and SONNET (2022): Putting people at the heart of energy transitions. Social innovation in energy: four projects shine a light on the path forward. Policy brief, April 2022. Brussels/Antwerp: COMETS, NEWCOMERS, SocialRES, SONNET H2020 projects.

Design: KOFEIN Dizajn

Brussels/Antwerp, April 2022

EXECUTIVE SUMMARY

Putting People at the Heart of Energy Transitions

Social innovation can serve as an important lever to empower citizens to be the pivotal agents for sustainable and just energy transitions in Europe.

WHAT IS SOCIAL INNOVATION IN ENERGY?

Social innovation in energy (SIE) fosters people-centred changes in the ways of doing, thinking, and organising energy. Across Europe, there is a wide variety of different types of such social innovations, ranging from energy cooperatives, local electricity exchange and energy crowdfunding to energy gamification, campaigns and experimentation, to name a few. There is also a large variety of socially innovative actors, with citizens and collective action initiatives (CAIs) gaining primary relevance. A key example are energy communities, which are based on forms of collective action and move towards the involvement of public and private actors to deliver new energy activities.

WHAT DO CITIZENS THINK ABOUT SOCIAL INNOVATION IN ENERGY?

European citizens have limited awareness of and knowledge about CAIs in energy transitions, such as energy communities. However, they perceive both the environmental and the economic benefits of such initiatives as particularly important. In addition, European citizens show interest in engaging in CAIs, thereby showing great potential for an increased role that various types of social innovation could play in sustainable energy transitions across Europe.

WHAT ARE THE BENEFITS OF SOCIAL INNOVATION IN ENERGY?

Social innovation in energy (SIE) in general and collective action initiatives (CAIs) in particular bring about a number of social benefits, such as supporting local economies, increasing opportunities to reduce energy poverty and raising awareness about sustainable energy, as well as promoting energy justice and social cohesion. Addressing such energy justice and social inequality issues is a key aspect for SIE, as is the engagement of marginalized groups in decision making. In addition, socially innovative CAIs can transform people from being passive consumers to empowered, proactive citizens who take responsibility for finding local solutions. Hence, SIE initiatives can drive forward sustainable energy transitions across Europe.

WHAT IS THE IMPACT OF SOCIAL INNOVATION IN ENERGY?

Quantifying and qualifying the impact of social innovation in energy is challenging but highly important. By reducing uncertainty and informing ongoing and future strategies, evaluation methods can help CAIs to shape their activities to attract more members, develop better financial models, improve environmental impact, and provide greater social benefits to the communities they serve. Better data availability can help improve the performance and impact of SIE.

WHAT IS THE ROLE OF POLICIES AND INSTITUTIONS FOR SOCIAL INNOVATION IN ENERGY?

Institutional openness and awareness of the multiple benefits of SIE is crucial for their development and success, but often still limited. In addition, social innovation and CAIs benefit from explicitly being embedded in legislation. This includes keeping policy support simple and easy to understand, with limited administrative and transaction costs. However, given that social innovation can challenge the status quo in energy systems, unbalanced power structures can impede effective policy support for SIE.

WHAT ARE KEY POLICY RECOMMENDATIONS?

- **Raising awareness among policymakers at all levels** about the significant potential of SIE for accelerating sustainable and just energy transitions across Europe
- **Harnessing the large potential of SIE initiatives through tailored policy support and legal frameworks across different governance and policy levels**, thereby appreciating the diversity of SIE initiatives ranging from clean energy communities' investment in renewables, storage or energy trading, including crowdfunding platforms and energy aggregators, to groups organising campaigns against specific energy pathways; these diverse types of SIE initiatives will benefit from tailored policy support
- **Acknowledging the multiple benefits of SIE and its role in just energy transitions**, recognizing that these benefits go beyond the financial return on investment, and include increases in social capital, energy literacy, and acceptance of sustainable energy transitions
- **Supporting SIE in measuring and evaluating their impact**, but also recognize SIE initiatives as an investment that will bear its fruits over the long term when properly tended
- **Designing legal and policy frameworks that provide simple and clear guidance** while allowing an adequate degree of freedom and implementation flexibility so as to facilitate the process of decentralized innovations like participatory business models, as well as social enterprises
- **Designing SIE-friendly policies** which help reduce financial risks while bundling technical skills and knowledge that benefit the successful development of SIE
- **Strengthening European networks around SIE**, as many initiatives find support through networks and umbrella organizations of other initiatives
- **Raising the general public's awareness about SIE**, as there seems to be a large untapped potential of new members of SIE initiatives; it is crucial to bring their beneficial outcomes (e.g. reducing costs, saving energy, building community trust, sustainable living, etc.) to the attention of citizens
- **Addressing unbalanced power structures in energy markets** in order to help social innovators thrive despite resistance from incumbent players interested in preserving the status quo
- **Launching public campaigns targeting social innovators and potential CAI members** in a user-friendly way, by using simple, non-technical language that also explains regulatory frameworks and its implications and reaches out on an eye-to-eye level
- **Supporting SIE initiatives through direct involvement at the local level**, such as initiation, provisional (e.g. through the provision of solar arrays on roofs of municipal buildings) and financial support, as this is a key enabler for the success of SIE initiatives and can increase trust in an energy project

→ see pages 17-19 for a more detailed and comprehensive list of policy recommendations

Four H2020 projects shine a light on the path forward

In early 2019, four research projects all funded under the same H2020 call seeking for research on social innovation in the energy sector embarked on their three-year journeys. Each of the projects started with the aim to study one or multiple forms of social innovation in energy (SIE), such as energy cooperatives, prosumerism, new financing, business and service models, as well as associated governance arrangements, to name a few.

What all 4 projects had in common was the mission to shed light on what drives social innovation in energy, in which environments social innovation flourishes and what factors determine whether social innovation successfully contributes to reaching the European Union's goal *to move towards a low-carbon energy system in which energy is more secure, sustainable and affordable - and that puts European citizens at its heart.*

SHARING THE ESSENCE OF 3 YEARS OF RESEARCH AND ENGAGEMENT WITH STAKEHOLDERS

Now, in April 2022, the 4 projects each look back on almost 3 years of intense research and engagement with various stakeholders, including citizens, companies, NGOs, energy cooperatives, municipalities and umbrella organisations. The 4 projects explored SIE from different angles, and analysed different case studies (from crowdfunding initiatives to energy cooperatives to innovative municipalities), collected data in large surveys among European citizens and collective action initiatives (CAIs) and engaged with a wide variety of different stakeholders.

This resulted in a rich set of insights on SIE collected, shared and compared among the projects. This policy brief offers a synthesis of key findings from these past 3 years, thereby providing insights on social innovation in energy for policymakers at all levels of governance. Moreover, this policy brief explores how SIE can be defined, what phenomena it includes, which values it potentially and actually creates for European citizens - including various social values - how its effectiveness can be measured, and how policies and regulations can support SIE now and in the future.

METHODOLOGIES OUR FINDINGS ARE BASED ON

The methodologies used across the four projects range from qualitative to quantitative, from macro-level analysis to micro-level analysis of SIE initiatives. The methods included the building of an EU-wide inventory of CAIs, multiple surveys across several European countries, as well as in-depth case studies covering diverse SIE initiatives across Europe.

OUR SYNTHESIS OF KEY FINDINGS

This synthesis reflects the entire spectrum of SIE and demonstrates the variety of forms it can take. It shows that European citizens are generally open to engage in SIE initiatives and that SIE has the potential to support and accelerate sustainable energy transitions in Europe in many ways. Yet, at the same time, it is evident that citizens are often not aware of SIE initiatives and their potential benefits, which hinders them from actively engaging. Nor do current energy and climate policies across Europe sufficiently include any provisions on the potential of SIE.

We conclude that SIE initiatives are well aligned with many social, economic, environmental, and energy security targets and therefore clearly offer potential to support the goals of the Energy Union. To tap into this potential, tailor-made policies and an overall well-designed policy mix for SIE is necessary. After all, enabling SIE initiatives means unlocking a significant new source of capital (both social and economic) and increasing public support for the energy transitions in Europe.

COMETS, NEWCOMERS, SocialRES and SONNET



COMETS – Collective Action Models for Energy Transition and Social Innovation (May 2019 – April 2022) investigated Collective Action Initiatives (CAIs) in energy (such as energy cooperatives, purchasing groups, energy villages, etc.) as a leverage to empower citizens and to foster their shift to being active participants and providers of energy. CAIs have been facing major challenges for their establishment, maintenance, and diffusion. COMETS aimed at contributing to the identification of solutions to these. Two main objectives were: building knowledge about CAIs' potential in the energy transitions, starting from an estimate of their current relevance in the EU energy system, and investigating obstacles, barriers and enabling factors for CAIs to flourish. COMETS built an inventory of around 8400 CAIs from the EU27 countries, surveyed around 300 CAIs in 6 COMETS countries and carried out 30 case studies to identify the pathways of different CAIs in various national contexts.



NEWCOMERS - New Clean Energy Communities in a Changing European Energy System (June 2019 – May 2022) had its focus on analysing new forms of clean energy communities ('newcomers'), characterised by novel forms of value creation, novel associations of actors and/or novel technologies and business models, including distributed renewable energy generation, distributed storage and electricity trading. The consortium explored the emergence and operation of these 'newcomers', the benefits they create for their members and for society at-large, as well as the regulatory, institutional and social conditions which are favourable for their emergence, operation and further diffusion. The project will close with a set of practical recommendations on how the European Union, as well as national and local governments, can support new clean energy communities to help them flourish and unfold their potential benefits for citizens and the Energy Union.



SocialRES – Fostering Socially Innovative and Inclusive Strategies for Empowering Citizens in the Renewable Energy Market of the Future (May 2019 – August 2022) aims at fostering energy democracy through social innovation and active collaboration between cooperatives, aggregators of renewable energy and crowdfunding platforms. This is done by closing the non-technological research gaps that impede the widespread uptake of social innovation business and service models in the European energy sector. SocialRES sets the basis for a better understanding of the socio-economic, socio-cultural, socio-political and gender factors that influence the behaviour of consumers in the energy system. SocialRES fosters the development of new cooperation patterns among the key enabling actors for energy democracy: cooperatives, energy aggregators and crowdfunding platforms. SocialRES provides policymakers with recommendations to create a more favourable legal and regulatory framework for social innovation.



SONNET – Social Innovation in Energy Transitions: *Co-creating a rich understanding of the diversity, processes, contributions, successes and future potentials of social innovation in the energy sector* (June 2019 – May 2022) SONNET aimed to create an inter- and transdisciplinary understanding of the diversity and processes of social innovation in the energy sector and to assess their success, contributions and future potential towards sustainable energy transitions in Europe. The consortium investigated how, to what extent and under which enabling conditions diverse types of social innovation in the energy sector may result in new breakthroughs or successfully help to overcome transition barriers. In an innovative, multi-method research design, it carried out a mapping of over 500 social innovation initiatives, 18 qualitative case studies in six European countries, 6 transdisciplinary city labs (Grenoble, Mannheim, Antwerp, Warsaw, Basel, Bristol) and 3 large-scale representative citizen surveys.

1 Diversity and Relevance of Social Innovation in Energy

Social innovation in energy serves as an important lever to empower citizens as the pivotal agents for fair and sustainable energy transitions. In the following, we describe the heterogeneity and relevance of social innovation in energy (SIE).

Key takeaways

- SIE fosters people-centred changes in ways of doing, thinking, and organising energy
- The heterogeneity of SIE is growing with citizens' empowerment gaining centre stage
- Energy communities are based on collective action and move towards new collaborations between public and private actors to deliver new energy activities

CHANGING THE SOCIAL DYNAMICS OF THE ENERGY SYSTEM

Rather than viewing 'social' as an afterthought of technological innovation, we start from the perspective that energy system transitions are also driven by the changes in the manifold relations and roles of actors and the different activities they engage in. These changes need to mobilise and empower citizens to make them the pivotal agents of sustainable energy production and consumption. To capture the diversity of possible social innovations, we take a broad approach towards social innovation in energy (SIE) and consider it as "(combinations of) ideas, objects and/or activities that change social relations, involving new ways of doing, thinking and/or organising energy".

ACKNOWLEDGING A VARIETY OF DIRECTIONS AND ACTORS DRIVING ENERGY TRANSITIONS

SIE captures a broad array of socio-technical configurations which especially transform the social and cultural dimensions of energy systems, all of which come with their own underlying values and desirable pathways. Figure 1 shows the diversity of SIE, distinguishing between 18 different types. We start from such a diverse picture of SIE to open up discussions regarding the desirability or undesirability of certain innovations in relation to public values such as affordability, reliability, sustainability, and accessibility of energy.

	Cooperation	Exchange	Competition	Conflict
DOING	Local energy production & consumption Cooperative energy production & consumption Collaborative eco-efficient housing	Local peer-to-peer electricity exchange	For profit services and technologies	Action against specific energy pathway
THINKING	Advocacy for specific energy pathways	Energy education Non-profit consulting Peer to peer learning	For-profit consulting	Campaigns against specific energy pathways
ORGANISING	Participatory energy dialogues Participatory experimentation and incubation	Platforms for direct energy transactions Investment and finance mechanisms	Energy gamification & nudges	Networks against specific energy pathways

Figure 1: Map of 18 different types of social innovation in energy. Source: SONNET⁴

SIE AS A MULTI-ACTOR PHENOMENON

The diverse aspects of SIE, including the underlying standard orientations and future directions, are an added value in exploring different directions of SIE and hence of transition dynamics. We argue that social innovation needs to be considered as a multi-actor phenomenon: While citizen initiatives play an important role at the grassroots level, social innovation can originate in any institutional context, including civil society, state, or market.⁵

MOBILIZING COLLECTIVE ACTION FOR JUST AND SUSTAINABLE ENERGY SYSTEMS

Collective Action – as opposed to individual action – promotes principles of environmental and social justice, inclusion, poverty alleviation and resource sharing as a form of mutual support. It is the resources, interests, and community relations that enable collective action initiatives (CAIs; e.g. energy cooperatives, purchasing groups) to challenge privatization and individualization. Through a wider definition of social welfare, collective action shows us ways to restore energy as a common that had been monopolised, captured by market forces, or privatised. Applied to energy, this process means reinforcing the role of citizens in energy transitions.^{6,7}

Ever since the beginning of the 1900s, *energy communities* have been a form of CAI that are characterized by open and voluntary participation of community members that combine non-commercial economic aims (usually prioritising non-profit economic activity), with environmental and social community objectives.⁸ Recently with the ongoing transposition of EU directives 2001/2018 and 944/2019, their relevance is increasing across Europe.

CLEAN ENERGY COMMUNITIES PROVIDING SPACE FOR MULTI-ACTOR COLLABORATION

As a new way of organizing, *energy communities* change social relations through new ways of doing, thinking, and organizing energy. Contemporary energy communities rely upon collective action, having evolved to incorporate and, in turn, rely upon a wider variety of state and public actors to deliver new energy activities and services. In most instances, multi-actor collaborations open a wider variety of business activities than CAIs alone can deliver. Energy communities are the influential tool in this transition while SIE can arise outside this scope by taking a more systemic view for a multi-actor social innovation to foster energy transitions.

VIALE ENERGY COMMUNITY BUSINESS MODELS FACILITATE CITIZEN EMPOWERMENT

Energy communities operate within and, in some cases, seek to transform existing marketplaces. Their rapid growth and innovative activities, which include generating, consuming, saving, trading, storing and/or selling energy, makes them increasingly important actors in energy markets. Whilst their viability is dependent on the provision of benefits to members and the energy systems in which they operate, a core strength is their potential to facilitate citizen empowerment. Beyond the boundaries of energy communities, attention should be made to exploit the potential of the interaction among different common businesses associated with social innovation in the energy sector: energy communities, aggregators and crowdfunding platforms, to name a few. These businesses facilitate an increase in citizen empowerment by increasing the number of local, decentralised clean energy projects and, by allowing the consumer to take a more active role in the electricity system.⁹

2 Citizens' perception and support of SIE

The citizen perspective on collective actions initiatives (CAIs) for social innovation in energy (SIE) highlights the general population's awareness, interest and engagement in CAIs, focusing on electricity generation. What are citizens' perceptions of potential benefits that motivate participation in such initiatives? What characteristics of CAIs, such as energy communities, do citizens prefer and what are the barriers that prevent the upscaling of CAIs?

Key takeaways

- There is limited awareness of and knowledge about CAIs among European citizens
- Citizens perceive both the environmental and the economic benefits of CAIs as particularly important
- Citizens show interest in engaging in CAIs and reveal clear preferences relevant for the development and upscaling of CAIs

STRONG SUPPORT AMONG THE GENERAL EUROPEAN POPULATION FOR A TRANSITION TO CLEAN AND SUSTAINABLE ENERGY PRODUCTION

Results from our citizen surveys reveal that citizens from all participating European countries see environmental issues, especially climate change, as serious problems (e.g., 93% (Newcomers D6.3)¹⁰, 71% (SocialRES D3.3)¹¹ and 80% (Sonnet D5.2¹²)¹³). Consequently, measures that promote a transition towards clean, renewable energy sources are generally widely accepted.¹⁴ The transition to clean energy production is also seen as important for local economies, as well as a countries' energy independence, hence their national security.¹⁵ While the phase-out of coal as an energy source is widely supported, the use of nuclear power and natural gas remains somewhat controversial.¹⁶ Solar, wind and hydropower are the most endorsed energy sources across all countries.¹⁷

A WILLINGNESS TO ENGAGE IN CAIS, EVEN WITH LIMITED AWARENESS AND PARTICIPATION

We find that there is limited awareness and knowledge about existing CAIs, such as energy communities, in the energy/electricity sector among citizens across all European countries. Only about 16% of citizens are, on average, aware of such initiatives.¹⁸ Levels of citizen engagement in CAIs across all European countries included in the involved studies range from 4 to 14%.¹⁹ Citizens engaged in CAIs are, on average, younger, more likely to be male, have higher levels of education, are more likely to be employed or self-employed and tend, according to a self-assessment, significantly more to the political right than people who are not engaged in CAIs. They earn slightly higher incomes, are more likely to live in larger cities rather than in towns or in the countryside, have more general investment experience and care more about environmental problems.²⁰ Overall, there is a great deal of interest among citizens in CAIs, with about 30% of the general population indicating that they would consider joining an initiative and 22% indicating that they could even imagine starting one or taking an active role.²¹

CITIZENS AT THE CORE OF CAIS INITIATION AND DEVELOPMENT

As for the creation of CAIs, citizens are found to be the initiators of most formations followed by municipalities (Figure 2).²² Other initiators include (existing) energy cooperatives, private, commercial energy providers and energy-related NGOs.²³ Citizens also tend to be the main financiers, followed by public grants and private banks.²⁴ Concerning the size of CAIs, more than half of the initiatives are rather small, i.e., below 100 members.²⁵ Medium-sized CAIs consisting of 100 to 999 members account for 28% of one studies' research sample and 10% for larger organizations with more than 1,000 members.²⁶

ENVIRONMENTAL AND ECONOMIC BENEFITS AS MAIN MOTIVATIONS TO ENGAGE

We find two strong main motivations to engage in CAIs in the energy sector: environmental and economic benefits.²⁷ In particular, CAIs enable access to electricity from sustainable sources, thus contributing to faster energy transitions, to reducing the consumption of fossil fuels and to mitigating climate change.²⁸

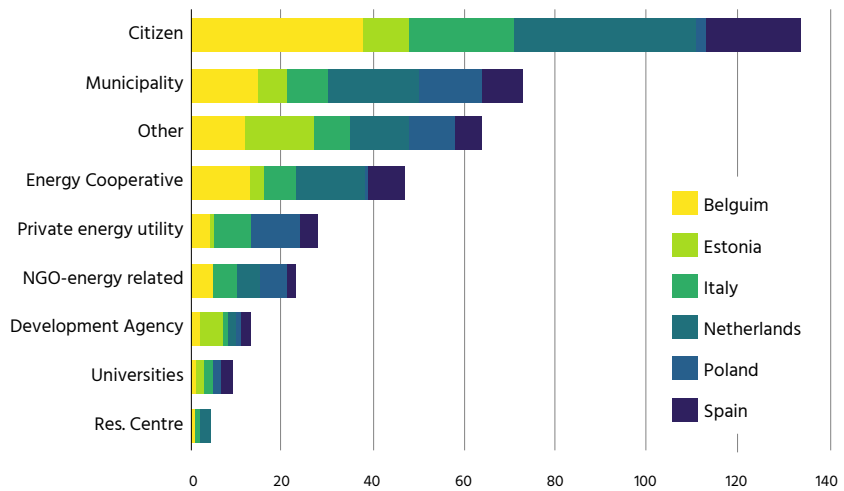


Figure 2: Origin of CAIs in the energy sector (Lupi et al., 2021)

Additionally, citizens value the potential reduction in households’ electricity costs²⁹ and consider CAIs as investment opportunities.³⁰ There are, however, mixed views on whether investing money is an important or, on the contrary, an undesirable element of CAIs, especially if minimum investments are high, long-term and mandatory.³¹ Further important economic benefits of CAIs include fairer energy prices, energy security and energy independence.³² Regarding other CAI characteristics, transparently organized legal structures are considered highly important by citizens.³³ Ideally, technical, commercial and legal frameworks also allow the self-consumption of generated electricity.³⁴ Citizens prefer to be the owners of CAIs and are motivated by engaging democratically in decision making processes.³⁵ However, evidence is inconclusive on citizens’ views how CAIs should ideally be organized and governed, including whether CAIs should be regional, or if additional community services should go beyond the economic and environmental benefits.³⁶

LIMITED AWARENESS, KNOWLEDGE, AND FUNDING AS BARRIERS TO JOINING OR STARTING CAIS

With only a limited share of citizens knowing about existing CAIs, the lack of awareness of such initiatives turns out to be the single most frequently mentioned reason for not joining or initiating one (Figure 3).³⁷ Also, the benefits of engagement in CAIs are not clear to many.³⁸ Further barriers against joining or starting a CAI include the perceived lack of skills and knowledge, as well as the lack of financial resources,³⁹ including high pre-development funds.⁴⁰ Additional barriers found in our studies include a lack of time, a lack of trust in potential collaborators, as well as an overall satisfaction with the current energy system.⁴¹ Other concerns for participating in CAIs include the (absence of) legal frameworks, as well as administrative and bureaucratic barriers.⁴²

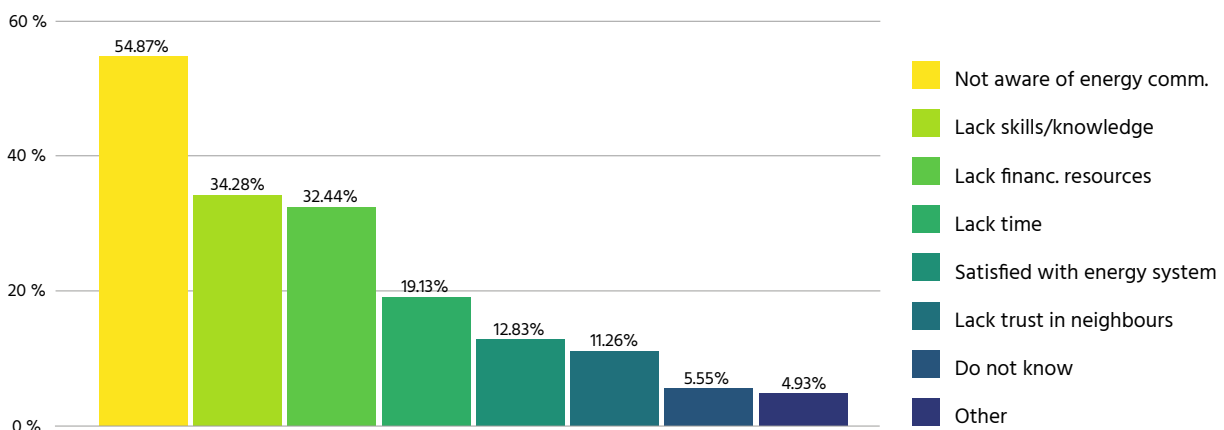


Figure 3: Reasons for not joining an energy community (Source: Newcomers D6.3 p.60)

3 Social benefits of SIE

There are a number of benefits that social innovation in energy (SIE) bring about: support for local economies, increased opportunities to reduce energy poverty and to raise awareness about sustainable energy, as well as opportunities to promote energy justice and social cohesion. The issues all encompass an energy justice lens that can help support improved policies to scale up SIE. We see energy justice as a conceptual tool that policymakers can use to guide policy choices that address social inequalities.⁴³

Key takeaways

- Energy Justice issues, especially engaging marginalized groups (women, low-income households, etc) in decision making, are key aspects in addressing SIE
- It is important to build and maintain trust among community members, as well as between CAIs and institutions
- CAIs can transform people from being passive consumers to empowered, proactive citizens who take responsibility for finding local solutions and can drive forward SIE

CREATING GENDER BALANCE IN ENERGY

In the renewable energy industry, including in CAIs, women are:

- rarely found in leadership and professional roles, as well as among the most active energy community members⁴⁴;
- less likely to have previously participated in a CAI (such as energy crowd funders or cooperatives);
- less likely to show intentions to participate in CAIs (survey results).⁴⁵

THE CLEAN ENERGY TRANSITIONS DEPEND ON THE INVOLVEMENT OF ALL MEMBERS OF SOCIETY

Strategies should be expanded to engage women more systematically in decision making. This includes removing structural barriers that make it harder for women to get engaged. Further, women need to be recognized as equal players to foster technical improvements, especially as they are just as capable and knowledgeable on technical and economic issues.

EXAMPLES OF ENERGY INJUSTICES:

- Inequality between women and men arising out of assumed gendered roles in society
- Inequality in power distributions inhibiting access to relevant decision-making process that, in turn, deteriorates trust
- Inequality in the ability to access socially and materially necessitated energy service levels, e.g. energy poverty

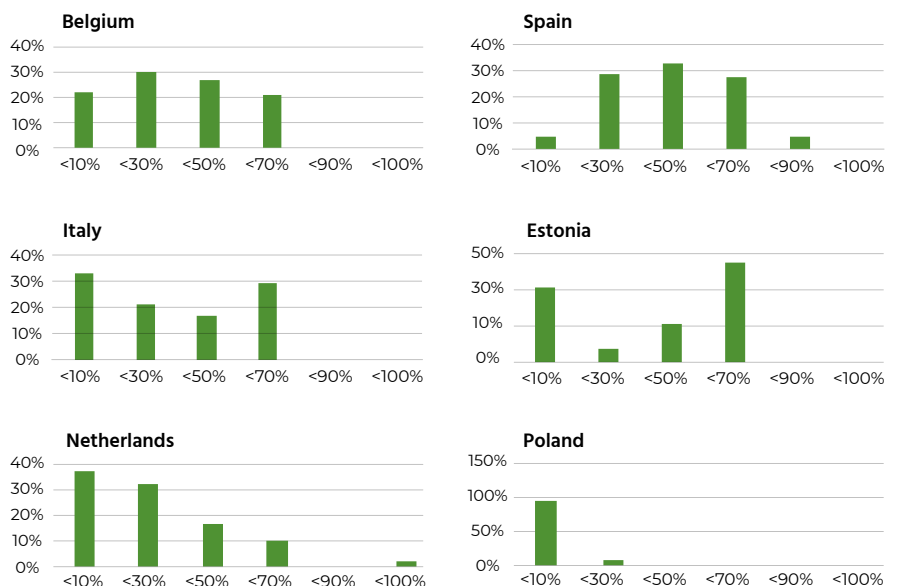


Figure 4: The share of women in the decision bodies of CAIs across six EU countries. Source: COMETS

ADDRESSING ENERGY POVERTY

Communities with less resources tend to be left behind in energy transition initiatives. Such barriers include (but not limited to):

- *Financial constraints, which are seen as a significant barrier to participating in SIE and/or investing in CAIs.*
- *Limited opportunities for tenants to participate in some types of SIE, in particular when they entail investments in homes that they might be renting.*
- *Highly complex regulatory frameworks that de facto exclude marginalized groups; the regulatory framework has been cited as too difficult and hard to understand.*

At the same time, more than 50% of energy communities declared to be active in promoting energy poverty alleviation and can thus contribute to mitigating this challenge.

TRUST AMONG CITIZENS AND INSTITUTIONS

Trust appears to be an important factor in explaining both previous and future participation in SIE initiatives.⁴⁶ Those who indicate that they have participated in a such an initiative are more likely to trust the environmental benefits of decarbonization claims by energy organizations. At the same time, lack of trust or interest by the general public can be a big limitation to expanding CAIs. A general mistrust of business developers and banking institutions may also spill over into the realm of CAIs, such as energy cooperatives and crowdfunding platforms.⁴⁷

Furthermore, in contexts characterized by problems of social marginalization and a weak sense of community, the intermediary role of CAIs is important for building trust. Studies show that community-driven energy projects bring about high levels of trust and acceptance among citizens, thus increasing social innovation in energy.

BUILDING DEMOCRATIC AND EMPOWERING PROCESSES

SIE can increase public awareness of the energy transitions, in particular for their members and investors, but also to society at-large. As such, they are a mechanism that can transform people from passive consumers to empowered, proactive citizens who take responsibility for finding local solutions to their energy issues in a collective and democratic way.⁴⁸ Analyses of the dynamics of initiatives show that most of the communities surveyed can be characterized as democratically participative, involving citizens (i.e., members) since the first stage of development. Surveys find that such democratic structures are also valued in the wider population.⁴⁹ CAIs members believe to a great extent that their participation in their energy community strengthens their social solidarity.

Knowledge and skills seem to be at the forefront as one of the important sources for empowerment processes of community members, as well as the basis for the smooth operation of new CAIs, thus driving forward SIE.

IMPROVED COMMUNICATION BETWEEN COMMUNITY AND INSTITUTIONS IS KEY

There is a need for bridging the informal CAI networks with policymakers, thereby establishing formal communication channels with political institutions on different levels (local, regional, state government). Many politicians and policymakers are not energy literate and sufficiently informed about the benefits and barriers related to CAIs, such as energy communities, and SIE.⁵⁰ Therefore, more opportunities are needed for engagement and trust building between community members and decision-making bodies.

4 Impacts of SIE on energy transitions in Europe

What impact does social innovation in energy (SIE) have on energy transitions? Our findings underline the difficulty of quantifying and qualifying the impact of SIE initiatives, as well as its importance. By reducing uncertainty and improving strategy, SIE initiatives can better shape their activities to attract more members, develop better financial models, improve environmental impact, and provide greater social benefits to the communities they serve.

Key takeaways

- Quantifying and qualifying the impact of SIE initiatives is difficult but important
- Data on SIE initiatives are currently scarce, as many initiatives do not have the resources and time required to quantify their contributions
- With an inventory of CAIs in Europe and several surveys produced by the 4 projects, new comprehensive data sets on European SIE initiatives are available
- Data will improve the performance and impact of SIE initiatives

The methodologies used across the 4 sister projects range from the broad, macro-level to the specific, micro-level focus on individual initiatives. These methods included the building of an EU-wide inventory⁵¹, multiple surveys across several European countries⁵², as well as in-depth case studies covering diverse SIE initiatives across Europe.⁵³

EUROPE-WIDE INVENTORY OF CITIZEN-LED ENERGY INITIATIVES

COMETS has built the first Europe-wide inventory of citizen-led energy initiatives – or energy Collective Action Initiatives (CAIs). This inventory includes dimensions such as administrative, membership, and financial data. In addition, the inventory charts the initiatives' physical contribution to energy transitions (e.g. installed renewable energy capacity, grids operated, energy trading). With this database, it is possible to evaluate the impact of these initiatives on a variety of quantitative dimensions. Some initial high-level estimates are given in Table 1, and final figures will be available when the database is published end of April 2022⁵⁴:

Initiatives	Projects	People involved	Finances mobilized	RE capacities installed	Activities of CAIs
8400 - 900	20900	1.27 million - 1.79 million	3.08 billion € - 3.37 billion €	7.5 GW - 11.5 GW	RE production, energy efficiency renovation, awareness raising, promotion of RE technologies, mobility services, consulting services.

Table 1: Aggregate Europe-wide estimates for CAI involvement in the energy transitions. Source: COMETS.

SURVEYS OF PERCEIVED CONTRIBUTIONS TOWARDS ENERGY TRANSITION

In a SONNET survey of SIE initiatives (SURVEYS of Perceived Contributions towards Energy Transition), they found initiatives contribute significantly higher towards their own aims than towards EU-aims or even aims shared by both the SIE initiatives and the EU (Figure 5). The initiatives' aims mostly contributed to goals such as to "strengthen local community" and "provide support for other energy-related initiatives or projects". The shared SIE and EU aims with the highest contributions were "increased renewables production" and "reduced greenhouse gas emissions". The perceived contribution towards other EU-aims or shared aims was significantly lower. To a large extent, the contribution scores reflect the importance that SIE initiatives attach to these aims.⁵⁵

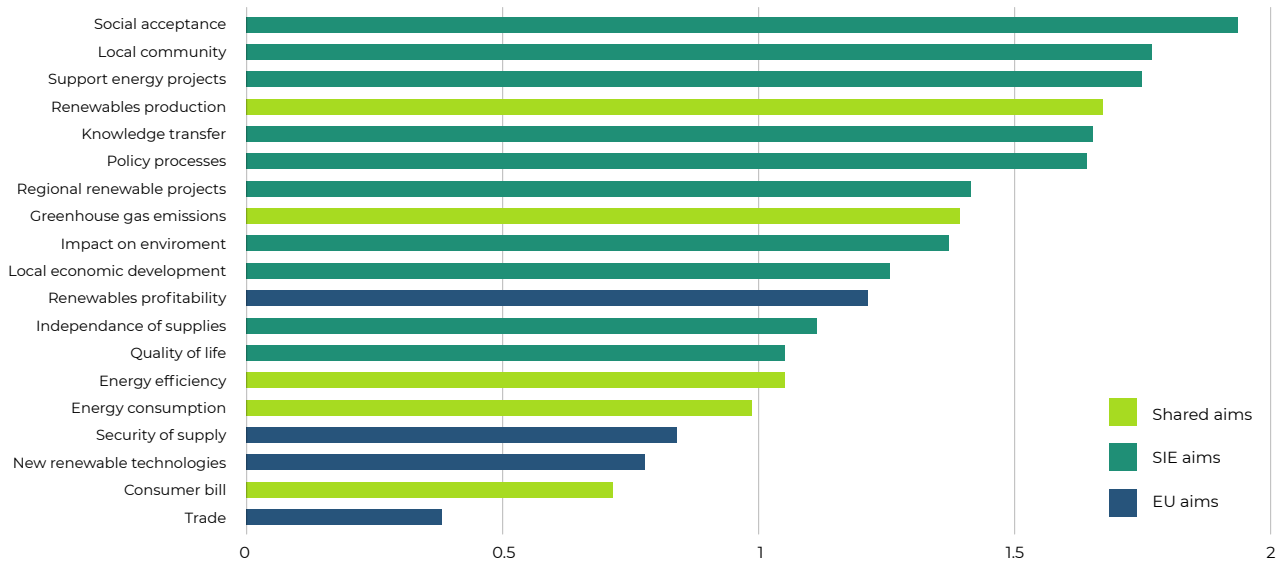


Figure 5: Average contribution scores to various aims of SIE initiatives. Source: SONNET.

CASE STUDIES: SWOT ANALYSIS

SocialRES used a standardized SWOT analysis as a method for moderated self-evaluation. Eight (non-representative) CAIs participated in the process and used the results to improve their impact in various fields. The results (Figure 6) showed that the strengths and weaknesses vary strongly and that an individual-focused approach is necessary for effective improvements on the perceived and actual impact of the CAIs. For example, about half of the organizations saw communication as a strength and just as many saw it as a weakness.⁵⁶

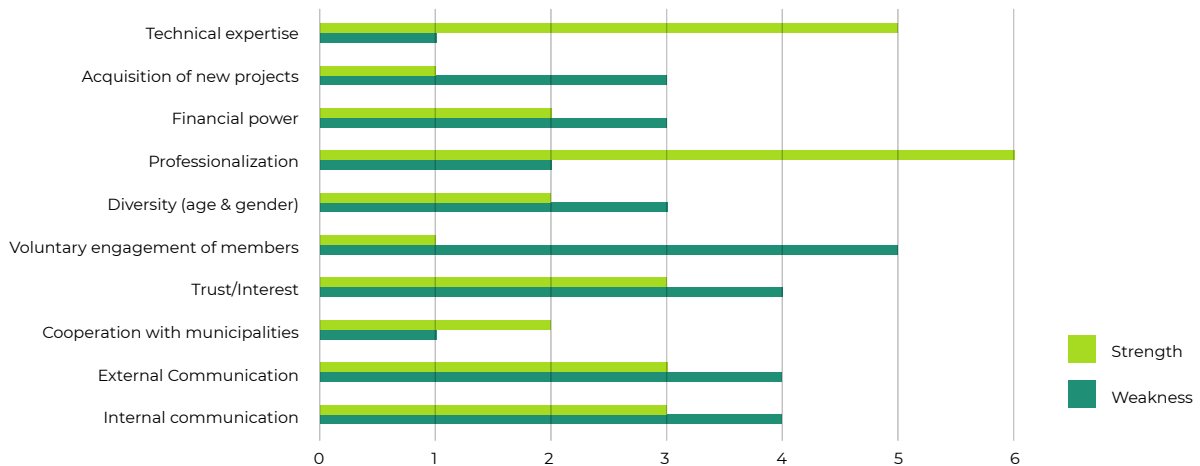


Figure 6: Results of SWOT analyses. Source: SocialRES.⁵⁷

ASSESSING THE IMPACT OF SIE INITIATIVES IS PARTICULARLY CHALLENGING BECAUSE:

- aims of SIE initiatives are subjective and heterogeneous
- they are hard to compare across different SIE initiatives, due to their diversity
- contributions and successes of SIE initiatives are hard to quantify, as some impacts occur subjectively (such as impacts on opinions and preferences), which cannot be inferred from objective actions (i.e. raising awareness and increasing acceptance)
- data is scarce, as many SIE initiatives do not have the resources and time required to quantify their contributions
- there’s a lack of trust from both sides that time and efforts spent for evaluation would benefit the initiatives
- there’s a lack of knowledge on evaluation methods and their utility for SIE initiatives

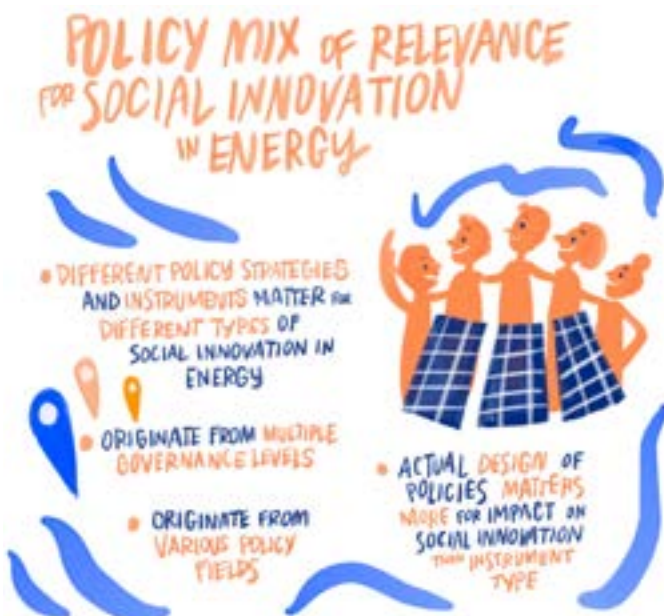
5 Policies and institutions related to SIE

How can SIE initiatives contribute to energy transitions and how are they influenced by energy and climate policies? We outline institutional aspects that SIE initiatives are struggling with, and present policy principles to effectively support SIE.

Key takeaways

- Institutional openness and awareness of the multiple benefits of SIE are crucial for their development and success
- SIE initiatives benefit from being explicitly embedded in legislation: by their consideration in policy strategies providing guidance, and by the design of tailored policy instruments that support enabling conditions for their development
- SIE initiatives as challengers to the status quo tend to be impeded by unbalanced power structures which call for recognition in policies that support SIE
- SIE initiatives benefit from simple and easy to understand government support limiting administrative and transaction costs

The EU's policy shift to more explicit support and recognition of SIE initiatives, particularly for energy communities as found in the Clean Energy Package, has been promising, yet the implementation of the "enabling framework" across Member States has been uneven. This is problematic as the combination of policies from different governance levels (i.e. the policy mix relevant for SIE) plays a crucial role in allowing SIE initiatives to emerge, as well as enabling their survival, upscaling and diffusion in competitive markets (Figure 7).⁵⁸ However, there is limited awareness among energy and climate policymakers about the benefits of social innovation and the critical role that targeted policies play for their success. In addition, SIE initiatives pursuing social and environmental goals deserve special attention and preferential treatment by policymakers for their critical role in promoting energy democracy.



In light of the war in Ukraine and the renewed political push for energy independence, SIE should receive more attention as it represents a critical tool that policymakers have at their disposal for accelerating sustainable energy transitions across Europe and thereby moving towards greater energy independence. The current salience of the topic presents a window of opportunity to move SIE initiatives from the niche level into mainstream debate by offering people simple avenues to get involved. A common vision for a transition towards sustainable and just energy systems therefore should consider the strategic role of SIE initiatives, thereby harnessing the full potential of social innovation, including by tapping into private household investments as an important source of capital.^{59, 60}

Figure 7: Priorities for a relevant policy mix for SIE. Source: SONNET, D2.4.

EXPLICITLY EMBEDDING SIE IN LEGISLATION GIVES THE NECESSARY SUPPORT

A central aspect in policymaking around social innovation and CAIs in energy is the institutional openness towards these innovations and new, emerging actors.⁶¹ Interviews with policymakers and social innovators suggest that SIE initiatives benefit from institutional environments where policymakers are aware of the multiple benefits SIE provides and where they are considered in policy design. Projects that are evaluated beyond the financial return on investment reveal the environmental and social impacts of SIE, such as increases in social capital, energy literacy, and acceptance of energy transitions that all have multiple benefits across various policy areas and political goals.⁶² Our consortia found that being explicitly embedded in legislation enables socially innovative initiatives to survive as serious actors in the energy system. For that reason, the implementation of EU and national legislations on participation and ownership appears to be crucial.⁶³

Economic support policies are central in ensuring financial sustainability of SIE initiatives and de-risking the investments of citizens and other socially innovative actors. In addition, we find policies that are simple and easy to understand act as drivers of SIE development. Policies not following this principle can quickly pose a barrier.⁶⁴ For example, feed-in-tariffs and premiums have been acknowledged for their simplicity and risk reduction since they offer planning security, while the reduced exposure to market price risk makes projects more attractive for risk averse, small investors.⁶⁵ However, when policies are not targeted at SIE initiatives and are awarded via competitive auctions, SIE initiatives often cannot compete with the larger, well-established incumbents as they struggle with burdensome administrative processes and high transaction costs, in turn presenting an important barrier to increasing citizen participation in energy transitions.⁶⁶

DIRECT GOVERNMENT SUPPORT AT THE LOCAL LEVEL IS KEY

Our research further shows that while the EU and national enabling frameworks are pivotal in providing orientation for policymakers and funding for social innovators, governmental support and direct involvement at the local level is a key enabler for the success of SIEs.⁶⁷ Lastly, in our case studies we find that SIEs face resistance from incumbent players interested in preserving the status quo.⁶⁸ Hence, social innovators benefit from policies addressing the unbalanced power structures in the energy sector.⁶⁹

POLICIES SHOULD SUPPORT CITIZENS' APPETITE FOR MORE

Citizens across Europe have been involved in various types of social innovation in energy, and there is appetite for more. For example, 30% of citizens in Poland and 20% in France plan to invest in a renewable energy cooperative, compared to approximately 4.5% who have already done so. Similarly, nearly 26% of citizens in Poland and more than 21% in France are interested in investing in a green or sustainable crowdfunding project, a significant increase compared to current shares of roughly 4 and 6% respectively.⁷⁰ With tailored policy, the potential of social innovation can be harnessed, stimulating further interest.⁷¹ Supporting SIE initiatives will allow them to build up competences necessary for participation in an ever more complicated energy market and will further increase their competitiveness.

CONCLUSIONS & POLICY RECOMMENDATIONS

Achieving the global goal of net zero greenhouse gas emissions by 2050 will require a “wholesale transformation of the energy sector [...], which cannot be achieved without the active and willing participation of citizens.” as declared by the International Energy Agency (IEA).⁷² Therefore, putting people at the heart of energy transitions is crucial to achieving this ambitious goal. SIE can play a big role in driving the necessary changes, such as improving how investment decisions are made, as well as increasing acceptance for high shares of renewable sources. SIE initiatives can also enable behavioural changes as they motivate change in the way people are thinking about energy ownership.

SIE initiatives are aligned with many social, economic, environmental, and energy security targets and thus represent underutilised tools that policymakers have at their disposal. Tailor-made policies and a well-designed policy mix for SIE is necessary to tap into this potential, unlocking a significant new source of capital and increasing public support for the energy transitions.

The current situation with the war in Ukraine and all of its devastation has revealed a greater impact on global energy markets, especially the need for accelerating sustainable energy transitions, ensuring energy security and affordability as well as being independent from external sources. The changed geopolitical circumstances are not yet reflected in our results, as data was collected before the current crisis unfolded. It can, without a doubt, be expected that all of the aspects for alternative energy structures are coming to the forefront right now and will continue to do so in the near future. At the same time, citizens' awareness of energy related problems and their desire to find community-led solutions is gaining traction.

For policymakers at all governance levels, we strongly encourage:

Understanding the significant potential of SIE for accelerating sustainable and just energy transitions across Europe; this potential needs to be harnessed through tailored policy support across different governance and policy levels. In particular, a greater awareness among energy and climate policymakers and their willingness to engage with social innovation in energy is crucial for the upscaling and diffusion of SIE initiatives.⁷³

Acknowledging the role of people in sustainable energy transitions and that SIE initiatives can serve as an important tool for increasing people's involvement, thereby enhancing multi-actor collaborations and increasing societal acceptance for changes in the energy system.

Appreciating the diversity of SIE initiatives ranging from clean energy communities' investment in renewables, storage or energy trading, including crowdfunding platforms and energy aggregators, to groups organising campaigns against specific energy pathways; these diverse types of SIE initiatives will benefit from tailored policy support.

Acknowledging the multiple benefits of SIE and its role in just energy transitions, recognizing that these benefits go beyond the financial return on investment, e.g. by enabling producer-consumers (“prosumers”) to share their energy surplus with citizens that are vulnerable or excluded from the energy system. Therefore projects should be evaluated beyond the financial return on investment and put *social value* at the forefront of decision making. Increases in social capital, energy literacy, and acceptance of sustainable energy transitions have multiple benefits across various policy areas and policy goals.

Understanding that the key impacts of SIE initiatives are often either qualitative or difficult to measure quantitatively. This does not, however, reduce their importance, and these factors should be given special consideration in evaluating the contributions of these initiatives.

Viewing evaluation as a way to help SIE initiatives improve their impacts, rather than to decide whether or not they should receive public support. Socially innovative initiatives should be seen as an investment that will bear its fruits over the long term when properly tended.

For policymakers at the EU-level, we recommend:

Recognising and enabling the potential of SIE by designing tailor-made policy and legal frameworks (e.g. EU Taxonomy, Energy Directive, Green Deal). Such frameworks should provide simple and clear guidance while allowing an adequate degree of freedom and implementation flexibility so as to facilitate the process of decentralized innovations like participatory business models, as well as social enterprises.

Designing SIE-friendly policies which help reduce financial risks while bundling technical skills and knowledge that benefit the successful development of SIE. This could include:

1. insurances, tailored financial instruments or alternative approaches, such as crowdfunding.⁷⁴
2. policies which lower minimum investment amounts as well as safeguards against total loss, as this is likely to incentivize citizen participation.⁷⁵
3. increasing general financial literacy as a less targeted, yet still effective measure, that would allow citizens to make autonomous informed decisions, including de-risking their investments.⁷⁶
4. developing alternative and participatory finance instruments such as different models of crowdfunding as well as other finance mechanisms (e.g. revolving funds), especially ones that allow for a small minimum investment to also allow low-income groups to participate.

Strengthening European networks around SIE, as many initiatives find support through networks and umbrella organizations of other initiatives.

Investing in capacity-building for the evaluation of impacts, for example developing quantitative and qualitative indicator measurements, as well as human resources for regional networks and umbrella organizations, thereby increasing the capacity to engage in evaluation of SIE impacts, especially over the long term.

Raising the general public's awareness about SIE, as there seems to be a large untapped potential of new members. Improving communication to the general public about beneficial outcomes (e.g. reducing costs, saving energy, building community trust, sustainable living, etc.), and positive past experience of investors in community energy projects, can help to tap into this potential. The four sister projects contributed to this effort through knowledge-building platforms, such as *Our-energy.eu* and *Communitiesforfuture.org* and *eecip.eu*.

For policymakers at the national level, we recommend:

Implementing clear tailor-made policies which are simple and easy to understand. For example, Feed-in-tariffs and premiums are very promising approaches. In conjunction with eased regulations for the initiation of projects (i.e. energy communities) and regulation targeted on participation and citizen ownership in the energy sector, this can significantly boost SIE development.

Policies that address unbalanced power structures in order to help social innovators to thrive despite resistance from incumbent players interested in preserving the status quo. France, for instance, launched the "bonus participatif" that is paid out to energy projects that involve local citizens.

Raising sub-national policymakers' awareness of SIE initiatives' multiple benefits and provide opportunities for funds that support local action.

Launching public campaigns targeting social innovators and potential members in a user-friendly way, using simple, non-technical language that also explains regulatory frameworks and its implications and reaches out on an eye-to-eye level.

Developing evaluation indicators and objectives at the national level, as this will allow each Member State to adapt their evaluation criteria not only to their national objectives, but also to their local SIE ecosystem. This can address how SIE initiatives differ widely across borders in terms of their activities and potential impacts, as well as that each state's energy system and transition objectives differ considerably.

For policymakers at the regional/ local level, we recommend:

Supporting SIE initiatives through direct involvement at the local level, such as initiation, provisional (e.g. through the provision of solar arrays on roofs of municipal buildings) and financial support, as this is a key enabler for the success of SIE initiatives and can increase trust in an energy project.

Setting up neighbourhood and technical offices as means of communication and support for energy communities, which in turn provides access to participate by all community members, especially vulnerable groups.

CONCLUDING REMARKS ON THE OPPORTUNITIES OF CONSIDERING SOCIAL INNOVATION IN THE FIT FOR 55 PACKAGE:

In this joint policy brief, we have drawn attention to the role of social innovation in energy (SIE). In conclusion, we want to link these considerations to the EU's 'Fit for 55' package which aims to encourage transformational change by creating "new opportunities for innovation" (European Commission, 2021). However, as of yet, the policy proposals included in the package largely under-recognise social innovation – not even mentioning the term once.⁷⁷ However, we welcome that some policy proposals refer to specific types of SIE, such as recognising the potential of renewable energy cooperatives and directly addressing it as part of the foreseen revisions of the Energy Efficiency Directive and the Renewable Energy Directive. Nevertheless, other types of SIE appear to be neglected completely, such as gamification or the role of peer-to-peer learning. Also, in the cases where specific types of social innovations are noted, their recognition tends to be limited in being mentioned in only a few policy proposals – most often the Energy Efficiency Directive and/or the Renewable Energy Directive, followed by the Social Climate Fund. This implies that social innovation is partly recognised as important for creating acceptance for sustainable energy, but that much room for improvement remains to fully harness the large potential that social innovation has to offer for accelerating just energy transitions, addressing energy poverty, enhancing energy democracy, and empowering citizens. With this policy brief it is our hope that social innovation will be more widely recognized by energy and climate policymakers as a promising opportunity to support the achievement of the EU's 55% reduction target.

ENDNOTES

1. COMETS Deliverable 2.1
2. SONNET Energy Read #1. Mischkowski, N. & J.M. Wittmayer (2020) Social Innovation meets Energy: About the social dimensions of Energy Transitions. Freiburg: ICLEI.
3. SONNET Wittmayer, J.M., Hielscher, S., Fraaije, M., Avelino, F. and K. Rogge (2022). A Typology for Unpacking the Diversity of Social Innovation in Energy Transitions. *Energy Research & Social Science* 88, 102513.
4. SONNET Deliverable 1.1
5. NEWCOMERS Deliverable 2.2.
6. COMETS Deliverable 2.1
7. SONNET Wittmayer, J. M., de Geus, T., Pel, B., Avelino, F., Hielscher, S., Hoppe, T., Mühlmeier, S., Stasik, A., Oxenaar, S., Rogge, K. S., Visser, V., Marin-González, E., Ooms, M., Buitelaar, S., Foulds, C., Petrick, K., Klarwein, S., Krupnik, S., de Vries, G., (...) Härtwig, A. (2020). Beyond instrumentalism: Broadening the understanding of social innovation in socio-technical energy systems. *Energy Research and Social Science*, 70(December 2019), 101689.
8. REScoop.EU (2019). Q & A: What Are 'Citizen' and 'Renewable' Energy Communities?, Policy Paper, 2019
9. SocialRES Deliverable 2.2
10. NEWCOMERS Deliverable 6.3
11. SocialRES Deliverable 3.3 (forthcoming)
12. SONNET Deliverable 5.2 - Report on key descriptive findings from SONNET citizen survey on individuals' perceptions and acceptance of SIE and EU energy transitions (available on demand).
13. NEWCOMERS Deliverable 6.3 p.36; SocialRES Deliverable 3.3 (forthcoming); SONNET Deliverable 5.2 (available on demand)
14. NEWCOMERS Deliverable 6.3 p.38
15. NEWCOMERS Deliverable 6.3 p.39
16. NEWCOMERS Deliverable 6.3 p.38; SONNET Deliverable 5.2 (available on demand)
17. SocialRES Deliverable 3.3 (forthcoming); SocialRES Wu, H., Carroll, J. and Denny, E. (2022) Harnessing citizen investment in community-based energy initiatives: A discrete choice experiment across ten European countries. *Energy Research & Social Science* 89, 102552; SONNET Deliverable 5.2 (available on demand)
18. COMETS Deliverable 3.3 p.47; NEWCOMERS Deliverable 6.3 p.50; SONNET Deliverable 5.4
19. NEWCOMERS Deliverable 6.3 p.53; SocialRES Deliverable 3.3 (forthcoming); SONNET Deliverable 5.2 (available on demand)
20. NEWCOMERS Deliverable 6.3 (tables available upon request); SocialRES Deliverable 3.3 (forthcoming)
21. NEWCOMERS Deliverable 6.3 p.59
22. COMETS Deliverable 3.3
23. COMETS Deliverable 3.3
24. COMETS Lupi, V.; Candelise, C.; Calull, M.A.; Valkering, P.; Delvaux, S.; Hubert, W.; Sciuillo, A.; Ivask, N.; van der Waal, E.; Iturriza, I.; et al. (2021). A Characterization of European Collective Action Initiatives and their Role as Enablers of Citizens' Participation in the Energy Transition. *Energies* 14, 8452.
25. COMETS Lupi, V.; Candelise, C.; Calull, M.A.; Valkering, P.; Delvaux, S.; Hubert, W.; Sciuillo, A.; Ivask, N.; van der Waal, E.; Iturriza, I.; et al. (2021). A Characterization of European Collective Action Initiatives and their Role as Enablers of Citizens' Participation in the Energy Transition. *Energies* 14, 8452.
26. COMETS Lupi, V.; Candelise, C.; Calull, M.A.; Valkering, P.; Delvaux, S.; Hubert, W.; Sciuillo, A.; Ivask, N.; van der Waal, E.; Iturriza, I.; et al. (2021). A Characterization of European Collective Action Initiatives and their Role as Enablers of Citizens' Participation in the Energy Transition. *Energies* 14, 8452.
27. NEWCOMERS Deliverable 6.3 p.56; SocialRES Deliverable 2.1
28. COMETS: Lupi, V.; Candelise, C.; Calull, M.A.; Valkering, P.; Delvaux, S.; Hubert, W.; Sciuillo, A.; Ivask, N.; van der Waal, E.; Iturriza, I.; et al. (2021). A Characterization of European Collective Action Initiatives and their Role as Enablers of Citizens' Participation in the Energy Transition. *Energies* 14, 8452; NEWCOMERS Deliverable 6.3 p.56
29. NEWCOMERS Deliverable 6.3 p.56; SocialRES Deliverable 2.1; SocialRES Wu, H., Carroll, J. and Denny, E. (2022) Harnessing citizen investment in community-based energy initiatives: A discrete choice experiment across ten European countries. *Energy Research & Social Science* 89, 102552; SONNET Deliverable 5.3
30. NEWCOMERS Deliverable 6.3 p.56; SocialRES Deliverable 3.3 (forthcoming); SONNET Deliverable 5.3
31. NEWCOMERS Deliverable 6.3 p.68; SocialRES Deliverable 3.3 (forthcoming)
32. COMETS Deliverable 3.3; COMETS Lupi, V.; Candelise, C.; Calull, M.A.; Valkering, P.; Delvaux, S.; Hubert, W.; Sciuillo, A.; Ivask, N.; van der Waal, E.; Iturriza, I.; et al. (2021). A Characterization of European Collective Action Initiatives and their Role as Enablers of Citizens' Participation in the Energy Transition. *Energies* 14, 8452; NEWCOMERS Deliverable 6.3 p.56; SocialRES Deliverable 3.3 (forthcoming)
33. SocialRES Deliverable 3.3 (forthcoming)
34. NEWCOMERS Deliverable 6.3 p.56; SONNET Deliverable 5.3
35. NEWCOMERS Deliverable 6.3 p.68; SocialRES Deliverable 5.1; SONNET Deliverable 5.3
36. NEWCOMERS Deliverable 6.3 p.68; SONNET Deliverable 5.3
37. NEWCOMERS Deliverable 6.3 p.60, COMETS Deliverable 3.3, p.47
38. NEWCOMERS Deliverable 6.3 p.60
39. COMETS Deliverable 3.3 p.42; NEWCOMERS Deliverable 6.3 p.60; SocialRES Deliverable 3.3 (forthcoming); SONNET Deliverable 5.3
40. SocialRES Deliverable 3.3 (forthcoming); SONNET Deliverable 5.3
41. NEWCOMERS Deliverable 6.3 p.60
42. SocialRES Deliverable 2.1
43. McCauley, D. (2014). Energy justice in a changing climate: social equity and low-carbon energy, edited by Karen Bickerstaff, Gordon Walker, and Harriet Bulkeley. *Environmental Politics*, 23(4).
44. SocialRES Wu, H., Carroll, J. and Denny, E. (2022) Harnessing citizen investment in community-based energy initiatives: A discrete choice experiment across ten European countries. *Energy Research & Social Science* 89, 102552.
45. SocialRES Deliverable 4.1
46. SONNET Deliverable 5.3
47. COMETS Deliverable 4.2
48. SONNET Deliverable 5.3
49. NEWCOMERS Deliverable 4.3 (available on demand)
50. COMETS Schwanitz, V. J., Wierling, A., Zeiss, J. P., von Beck, C., Koren, I. K., Marcroft, T., Müller, L., Getabecha, M., Dufner, S. (2021). The contribution of collective prosumers to the energy transition in Europe - Preliminary estimates at European and country-level from the COMETS inventory. Preprint, August 2021.
51. SONNET Deliverable 6.2; NEWCOMERS Deliverable 7.1, COMETS Schwanitz, V. J., Wierling, A., Zeiss, J. P., von Beck, C., Koren, I. K., Marcroft, T., Müller, L., Getabecha, M., Dufner, S. (2021). The contribution of collective prosumers to the energy transition in Europe - Preliminary estimates at European and country-level from the COMETS inventory. Preprint, August 2021.
52. SocialRES Deliverable 4.1; COMETS Schwanitz, V. J., Wierling, A., Zeiss, J. P., von Beck, C., Koren, I. K., Marcroft, T., Müller, L., Getabecha, M., Dufner, S. (2021). The contribution of collective prosumers to the energy transition in Europe - Preliminary estimates at European and country-level from the COMETS inventory. Preprint, August 2021.
53. COMETS Schwanitz, V. J., Wierling, A., Zeiss, J. P., von Beck, C., Koren, I. K., Marcroft, T., Müller, L., Getabecha, M., Dufner, S. (2021). The contribution of collective prosumers to the energy transition in Europe - Preliminary estimates at European and country-level from the COMETS inventory. Preprint, August 2021.
54. SONNET Deliverable 6.2
55. SocialRES Deliverable 4.1
56. SocialRES Deliverable 4.1
57. SONNET Deliverable 2.4 Co-creating strategies for navigating multi-level policy dynamics to encourage SIE – reflections (available on demand)
58. COMETS Deliverable 5.2 (forthcoming)
59. SONNET Deliverable 2.4 (available on demand)
60. NEWCOMERS Deliverable D3.3
61. SocialRES Deliverable D5.2
62. COMETS Deliverable 4.1
63. ibid.
64. NEWCOMERS Deliverable D3.3
65. ibid.
66. SocialRES - White Paper on Good Policy Practice
67. ibid.
68. SONNET Deliverable 2.3
69. SONNET Deliverable D5.2 (available on demand)
70. SONNET Deliverable 2.4 (available on demand)
71. SONNET Deliverable 2.4 (available on demand)
72. International Energy Agency (2021). Net Zero by 2050: A Roadmap for the Global Energy Sector. Flagship report, Paris: IEA.
73. SONNET Deliverable 2.4 (available on demand)
74. SocialRES Deliverable 2.1
75. SONNET Deliverable 5.3
76. SONNET Deliverable 5.3
77. SONNET Deliverable 2.4 (available on demand)

For more resources and project results,
see the official project websites:



<http://www.comets-project.eu/>



<https://socialres.eu/>



<https://www.newcomersh2020.eu/>



<https://sonnet-energy.eu/>

Information and inspiration for citizen and
communities wanting to get involved in SIE:

EESIP - THE EUROPEAN SOCIAL ENERGY INNOVATION PLATFORM



<https://eesip.eu/>

OUR ENERGY



<https://our-energy.eu/>

COMMUNITIES FOR FUTURE



<https://communitiesforfuture.org/>

