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Policy brief on "social innovation in energy transition" in action

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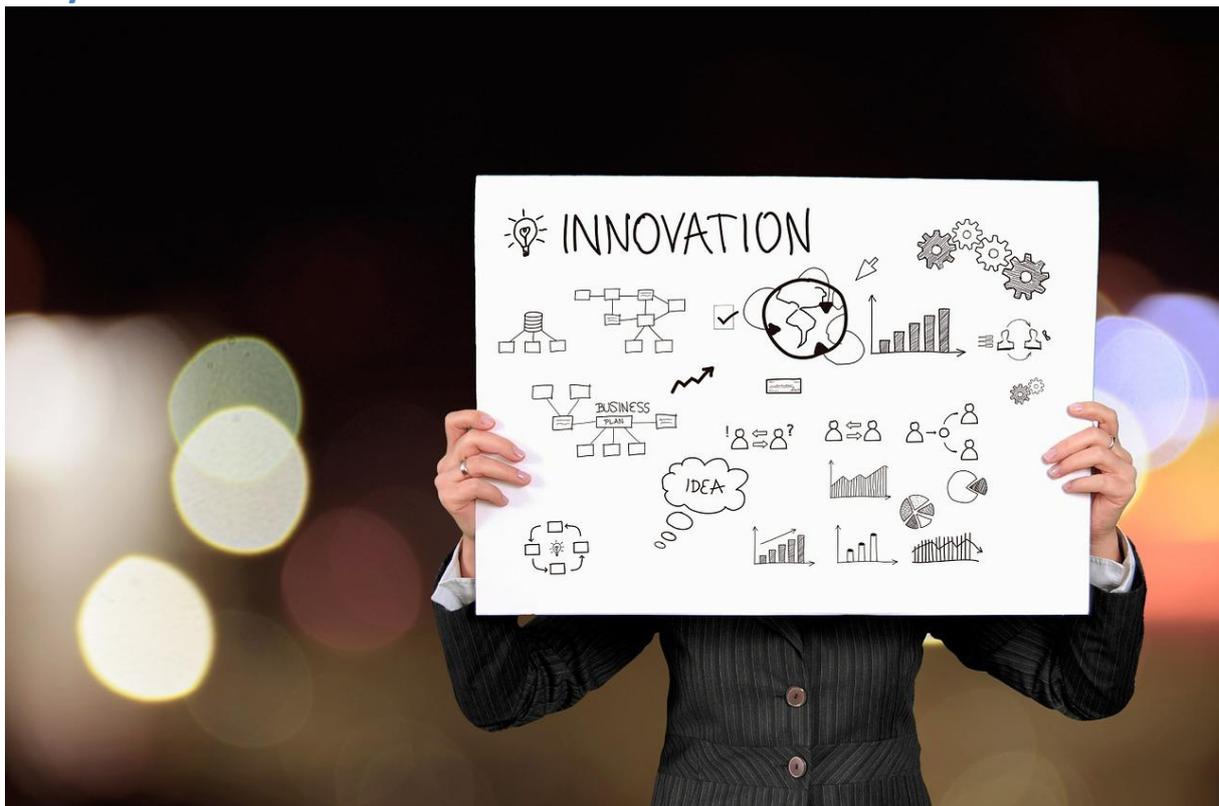
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SMARTEES
local social innovation

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INTRODUCTION

This policy brief is based on a Europe-wide study into communities that experimented (and still experiment) with some basic features of an actual low-carbon society at a local level (cities, neighbourhoods, islands) implemented in the frame of the SMARTEES project.[1] These communities differ concerning their location in Europe, the types of "technological" innovation (spanning from transitions in traffic to investment in insulation), their socio-economic and environmental context (with consequences for the behaviour of the involved people), and their duration and "seniority" (spanning from experiences starting in the '70s of the last century and experiences still at an early stage today). The whole picture can be helpful in order to study actual dynamics focusing on concrete elements of the energy transition, paying specific attention on societal dynamics underlying its local implementation. In this regard, we refer to the concept of "social innovation" and will therefore present concrete directions on how social innovation works in energy transitions at a local level. Policy implications arising from these outcomes will be proposed at the end of this document.

1. ENERGY TRANSITION IN A CHANGING SOCIETY

The energy system is changing...

The energy system is changing. In order to define what is at stake with the social aspects connected to the Energy Transition, it is important to relate the study of this issue with the status of the ongoing energy transition process in Europe.

As stated by the EC,[2] the energy system is reaching a tipping point,[3] at which renewable become cheap enough to drive fossil fuels out of the electricity mix. This statement is supported by hard facts: renewable energy costs are falling, making renewable increasingly competitive and the share of renewable energy in the EU energy mix is continuously rising.[4]

...but it remains unclear when the transition to low-carbon energy systems will actually happen

Even though there is a common understanding that technical progress and economic penetration of renewable energy and energy efficiency measures are leading to such a tipping point, what remains unclear is when this shift in energy production and consumption will actually happen to a significant degree. Under the threat of climate change, which effects accumulate and to a certain extent are not reversible, the issue of "When" a decarbonisation of the energy system

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[1] SMARTEES – Social Innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability – is a transdisciplinary research project which aims to support the energy transition and improve policy design by developing alternative and robust policy pathways that foster citizen inclusion and take local peculiarities into account (see: http://local-social-innovation.eu/).

[2] EC, *Accelerating Clean Energy Innovation*, COM(2016). 763 final, 30.11. 2016. European Commission, Brussels.

[3] Other authors talk about a crossroad; see Smil, V. (2005). *Energy at the crossroads: global perspectives and uncertainties*. MIT press.

[4] EC, *Third Report on the State of the Energy Union*, COM(2017) 688 final, 23.11.2017, European Commission, Brussels.

will (significantly) happen is pivotal[5] for preventing and mitigating damages at many different levels (environmental, economic, etc.). That is the reason why the EU – in line with the COP21 declaration – is strongly engaged in favouring a significant acceleration of the Clean-Energy Transition.

Society is also changing....

Society is changing in parallel. The ongoing changes in the energy system can be better understood in the wider framework of the profound transformations experienced in contemporary societies. Usually, such transformations are described as a shift from a modern society to a new kind of society (often called "post-modern society") characterized by the changing of relationship between social structures and individual actors.

Spurred by various factors (such as globalisation processes, broader access to education, widely accessible computer-based technologies), such structures are becoming weaker while the autonomy of individuals (to make their own choices, to shape their own identities, to develop their own worldviews, etc.) and the groups they belong to is increasing.

... and social changes are making the transition to low-carbon energy systems increasingly complex to manage

This complex shift is accompanied by an array of long-range social and cultural transformation trends such as: the rising of other actors with their own agenda that goes beyond the boundaries of national (or even supranational) sovereignty, such as multinational companies, transnational environmental movements, and many other collective groups including the energy transition in their own agenda; the increased circulation of knowledge and information as well as the possibility for everyone to reach a wide audience due to the digitisation process; a general and continuous increase in the average per-capita energy use of citizens in the last 50 years, mirroring the increasing standard of living and its progressive share with larger parts of the population. These transformations continuously interact and influence the energy system, as well as the general governance of contemporary society.

The problem is no longer technical but ...

Once the technical and economic conditions for decarbonisation will be achieved, the capacity, readiness and willingness of European societies to pursue this change cannot be taken for granted. Many scholars[6] underline that energy transition cannot be considered a linear process. It is neither a necessary step towards a new technological system nor a mere output of a system of policies.

...of a social and political nature

On the contrary, the transition to low-carbon energy production, consumption and distribution systems cannot be but the result of continuous interactions involving different actors, factors and processes (as the ones mentioned above), and, therefore, it should be understood as a complex series of leaps and starts, subsequent revisions and additions. The understanding of such dynamics is pivotal for identifying in advance possible blockages, resistances or even push-backs that can emerge from society. Examples of such discontinuities are frequently observed both at the local scale (e.g., the continuous emergence of

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[5] Sovacool, B.K. (2016). How long will it take? Conceptualizing the temporal dynamics of energy transitions. In *Energy Research & Social Science*, 13, 202-215.
[6] On the complexity of energy transition see: Burns, T.R. (2012). The sustainability revolution: A societal paradigm shift. In *Sustainability*, 4(6), 1118-1134.

NIMBY[7] phenomena) and at the global scale (e.g., the emergence of populism and the dropping out of the Paris agreement).

2. SOCIAL INNOVATION AND ENERGY TRANSITION

Hence the key role played by social innovation...

Driving societal processes towards desirable objectives has ever been problematic. In a context of rapid changes like ours with the energy transition characterised by pervasive scientific and technological advancements, realizing a positively steered social process is even more complex. This puts the issue of social innovation in the forefront, as a means to combine societal dynamics with technological changes. As the experts of the SI-DRIVE project rightly highlight:

"There is a growing consensus among practitioners, policy makers and the research community that widespread social innovation is required to cope with the significant challenges that societies are facing now and in the future".[8]

As a matter of fact, this concept is becoming increasingly evident in policy, scientific and public debates, and, in the last decade, many different interpretations of social innovation have been developed.[9]

Social innovation (SI) may be defined as "new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. They are innovations that are not only good for society but also enhance society's capacity to act".[10]

Within the SMARTEES project, the following operational definition of Social Innovation was finalized at the end of a negotiation process:

"Social innovation in energy transition is a process of change in social relationships, interactions, configurations, and/or the sharing of knowledge leading to, or based on, new environmentally sustainable ways of producing, managing, and consuming energy that meet social challenges/problems".

...in the energy sector

The study of SI should present information on the complex interactions among actors involved with the energy transition and on the different trends and processes they produce or are exposed to.

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[7] Acronym for the phrase "Not In My Back Yard"; i.e. a characterization of opposition by residents to a proposed development in their local area. It often carries the connotation that such residents are only opposing the development because it is close to them, and that they would tolerate or support it if it were built farther away.

[8] SI-DRIVE (2014). Theoretical approaches to social innovation. A critical literature review. Available at: https://www.si-drive.eu/wp-content/uploads/2014/11/D1_1-Critical-Literature-Review.pdf

[9] See for example the projects funded under FP7 such as TRANSIT, SI-DRIVE, CRESSI, SIMPACT, EFESEIIS, ITSSOIN, SOCIETY.

[10] EC (2011), Empowering people, driving change, European Commission, Bureau of European Policy Advisors (BEPA), *Brussels,* p. 33*.*

So far, in the highly uncertain and transitional situation determined by the intersection of energy transition and social change, many different forms of social innovations have been identified in the energy sector,[11] corresponding to a set of cases emerging around Europe and worldwide, experimenting with new socially and environmentally sustainable ways of producing, managing and consuming energy.

... using energy transition as a catalyst to activate larger transformation processes

These experiences are characterised by the formation of new configurations of actors, processes, forms of governance, rules, business models, ideas emerging around the energy transition. The underlying feature of such social innovations is the lean of their promoters to use the energy transition as a catalyst for combining and harnessing different changes occurring in society with the aim to couple decarbonisation and energy efficiency with societal, behavioural and economic needs. Even if these experiences are few, scattered around Europe (and worldwide) and developed mostly at the local level, they have shown the capacity of activating radical modifications in both the energy systems and in social structures. Furthermore, a scaling up process of many SI can also be observed.

...in experiences highly contextualised...

These experiences have been differently labelled, such as constellation of actors[12] or anticipatory experiences (e.g., in a certain sense a SI may be also considered as an "anticipation" of a wider transition toward a low carbon society).[13]

These experiences are usually highly contextualised, i.e., connected to specific social and economic contexts, focussed on a particular domain of the energy transition and on specific needs.

... as through five domains in SMARTEES Project

Specifically, in SMARTEES **five domains** of energy transition have been considered. For each domain, two SI reference cases (a "main" and a "supporting" case) have been taken into account.

1. Holistic, shared and persistent mobility planning *(cases: Zürich/Switzerland and Groningen/The Netherlands)*. This SI is using the mobility plan as a way of mobilizing and coordinating many societal actors (different branches of local authorities, citizens, constructors, transport companies, etc.) towards the common goal of a more sustainable and efficient city transport system.

2. Island renaissance based on renewable energy production (*cases: Samsø/Denmark and El Hierro/Spain*). This SI is based on the mobilization of the citizens and innovative partnerships set-up of an island to achieve energy independence through renewable and energy efficiency measures as means to overcome the factors that put the community itself in danger and revive island communities.

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[11] See for example SI-DRIVE project map of social innovation. Available at https://mapping.si-drive.eu/
[12] See also the topic New constellations of Changing Institutions and Actors, SwafS-05-2017.
[13] See Quinti, G., Caiati, G., Gruenig, M., O'Donnell, B., Amerighi, O., Baldissara, B., & Felici, B. (2016). European Distributed Renewable Energy Case Studies. In Low-carbon Energy Security from a European Perspective (pp. 135-180); and Caiati, G.; Kazakopoulos, P.; Sitko, I. Report on Integrated Analysis of Local Anticipatory Experiences in Energy Transition, D2.1 of MILESECURE-2050 Project. 2013. Available online: http://www.milesecure2050.eu/en/public-deliverables/2

3. Energy efficiency in district regeneration *(cases: Malmö/Sweden and Stockholm/Sweden)*. This SI includes hard and soft measures to transform the district, such as local energy production and energy efficiency measures, urban green spaces, transport system transition measures and citizen participation.

4. Urban mobility with superblocks *(cases: Vitoria-Gasteiz/Spain and Barcelona/Spain)*. This SI is based on an urban innovation (superblocks) that introduce low-carbon mobility practices through the organization of urban space, which minimizes the use of motorized modes of transportation. The city is reorganised into superblocks, i.e. areas designed to maximize public space and keep private cars and public transport outside of the neighbourhoods, redesigning the inner streets for use by pedestrians.

5. Co-ordinated, tailored and inclusive energy efficiency schemes for fighting fuel poverty *(cases: Aberdeen/Scotland and Timisoara/Romania)*. This SI is characterized by public authorities working in coordination with supply companies and civil society organisations in order to implement energy efficiency measures for houses and buildings with the aim of fighting fuel poverty with a tailored and inclusive approach.
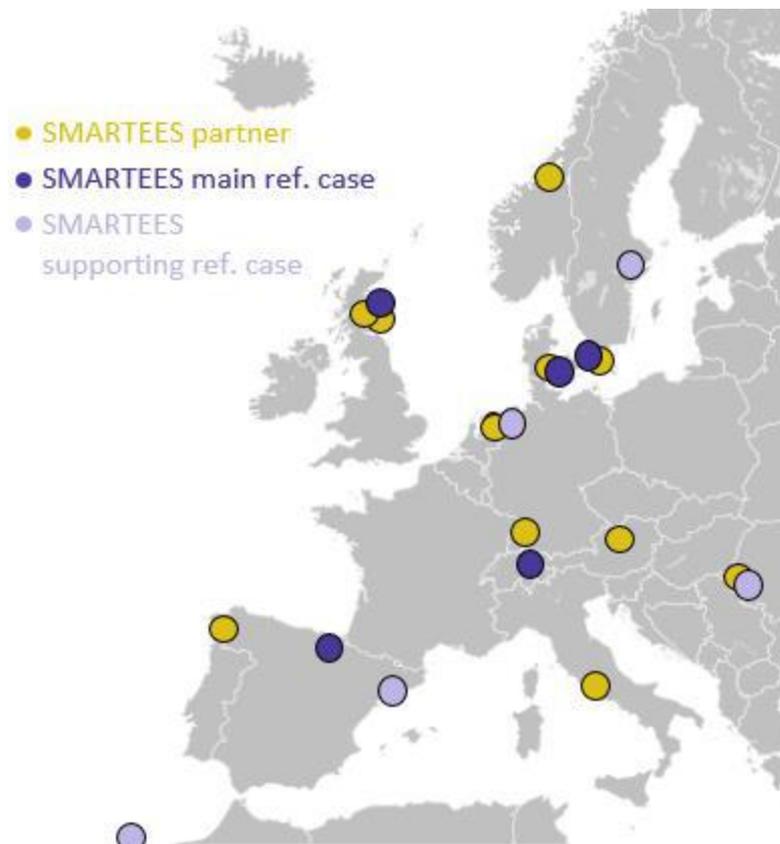
Figure 1: SMARTEES partners and reference cases

3. HOW SOCIAL INNOVATION WORKS IN ENERGY TRANSITION AT THE LOCAL LEVEL

Some Characteristics of Social Innovation

Based on the analysis of the cases mentioned above, it was possible to identify some of the characteristics of SI in the context of the energy transition at the local level.

a. Operation model configuration in the public administration

The municipality seems to be always the main (or one of the main) promoters of energy transition experiences at the local level. That said, in the public administration, often many bodies are involved (different local authorities, different departments in the same local authorities, etc.). These bodies are often actually or potentially in conflict (for political reasons, due to overlapping and/or divergence of interests, etc.).

Therefore, a main change facilitating SI is the improvement of cooperation among these bodies thanks to a permanent process of negotiation, possible thanks to: (i) a common recognition of the objectives to be achieved (although differences "on how" persist); (ii) go beyond the formal level through frequent informal and, often, friendly contacts; (iii) set-up of "service conferences" (or equivalent) where all the concerned bodies are represented.

Another important model configuration change in the public administration is the recognition and subsequently emphasis of the "bottom" level of administration (e.g., through the set-up of neighbourhood-councils).

b. Governance configuration

In this regard, the main change is the switch from a governance system based only on various kinds of partnership between different institutional stakeholders (e.g., the municipalities and their companies as well as other public authorities), to a model of extended partnership (sometimes formal, sometimes informal) involving a wider set of actors, such as NGOs, environmental movements, universities/schools, citizens groups, local businesses, cultural and sport centres, "common citizens", etc. This shift is more or less quick and can meet hindrances. This shift does not only happen if a strong system of direct democracy is already in place.

c. Inclusive decision-making

The analysed cases are characterized by an extensive and direct involvement of societal actors (from business to common citizens) also in the decision-making process. In some cases, this has happened from the beginning, in others after a "paradigm shift", which entails the renunciation of a uniquely top-down approach (which, however, is not totally abandoned). Occurrence of more or less intense conflicts in relation to top-down approaches and "push" actions (i.e., actions consisting in prohibitions), or in relation to the lack of consideration of the viewpoint of some concerned actors are often an initiator or motor of such "paradigm shifts". Inclusive decision-making can be more or less (de)centralized (from a "citizen forum" to "neighbourhood dialogs") and can be also "informal".

d. New symbols and identity

Environmental sustainability is a core issue of the analyzed SI since the '90s. Since then, the rising of a new identity as environmentally sustainable place is

important for the cases. A set of symbolic and demonstrative actions can been carried out to represent and to strengthen such a new identity: annual environmental days or weeks, cleaning days, bike days and projects, demonstration sites, symbolic street signposts, organised visits, etc. A further symbol can be the signature (or the adoption) of a Pact (specifying objectives, actions and "rules of the game") among the involved actors.

e. Sharing of knowledge among involved actors

Configuration changes described above are accompanied by a sharing-of-knowledge process, inherent, of course, an increase of cooperation or in the change of decision-making structures. Knowledge sharing and management improves also by:
- o Considering citizens as experts and bearer of specific and territorially grounded knowledge
- o Establishing of study group for the different aspects of a project
- o Through the capitalization of experience and lessons learned and their sharing at the local, national and also international level
- o Through a more or less strong attraction of the international scientific community to the experience of specific cases.

f. Social support

Gaining social support appears crucial in the analysed SMARTEES cases and this is facilitated by what has been said above. More generally, the following strategies for gaining social support are frequent:
- o Strong involvement of citizens (not only those acting in CSOs or other groups, but also simple people) in decision-making
- o Constant negotiation with citizens and/or specific groups (e.g., "opponents", such as shopkeepers or "hard" environmentalist movements)
- o Credible and constant communication (two-ways where relevant)
- o Capitalization on the experience and sharing of lessons learned
- o Generation of pro-environmental behaviours among citizens (e.g., through environmental education activities)
- o "Celebration" of the new identity of a neighbourhood (e.g., as an environmentally sustainable district)
- o Transparency procedures adoption (e.g., the whole implementation process became "open access")
- o Cultural sensitivity in promoting and communicating a project through translating the published materials in the different languages spoken, using translators, leveraging on cultural mediator, taking different groups' perspectives into account
- o Create the experience of a city, a neighbourhood, or an island as a pleasant, friendly, clean and accessible place (more broadly, experience of an increased social cohesion)
- o Citizen ownership of the renewable energy production and the related economic gains.

g. Conflict/ resistances management

It is not all roses. Quite the contrary. As already mentioned, the actions functional to the energy transition have opponents and meet resistance more or less strongly. Conflicts also often occur. In "older" interventions this was sometimes even partially ignored through prescriptive interventions and a "top-down" approach in the beginning. More recently, attempts have been made to manage these conflicts and oppositions through a more inclusive approach in decision-

making and real negotiations between divergent interests.

Other useful measures (beyond the ones already mentioned in the paragraph "social support") can be:

o Proceed gradually, step by step, avoiding too fast and too big changes within a short time, avoiding almost always radical measures (such as impeding cars circulations in specific areas of the city or between the sectors of the city)

o Adopt targeted policies with specific groups, that are already or potentially "resistant", or that are already or potentially "opponents" (e.g., car drivers, large companies, etc.)

o Give priority to "pull" measures (such as intensive improvement of public transport or the set up of bike lanes) over "push" measures, which have however to be implemented, but with less emphasis (such as the increase of the parking price)

o Implement periodic consultations on measures (through referenda or local meetings) particularly on conflictive measures.

h. Further critical issues management	Beyond conflicts and resistances, other critical issues can manifest (e.g., in our cases, slowing down of the decision-making processes to meet the deadlines of consultations; cuts in the availability of financial resources due to local/national/international crises; lack of regulation stimulating citizen's involvement in energy self-production prevent the development of self-consumption; criminality rates increase; gentrification process; other unexpected economic and social effects). These critical issues are managed, essentially, through a more or less permanent monitoring and assessment of the social, economic and environmental context and through an "open design" by modifying, where necessary, the actions to be implemented and the duration of the interventions.
i. Integrated approach	A tendency towards the adoption of a territorial integrated approach can be perceived. Often, several domains of energy use (from mobility to housing heating) and, sometimes, energy production, too, are taken into account simultaneously, considering their mutual interactions, with a holistic vision and a focus, also on education, culture, management of the environmental risks, etc. And even when the focus is just on one "energy" area (e.g., mobility/transport), a successful SI process also pays attention to side issues such as education for sustainability or the promotion of social cohesion.
j. Up-scaling	A tendency towards an up-scaling of local experiences is widespread in the cases analysed in SMARTEES, although not generalized in all cases. As a matter of fact, few local experiences are feasible *only* in specific political or cultural contexts, but even these cases (and, *a fortiori*, the others) are very well known and attract many people eager to learn from their experiences (with visitors coming from local authorities, scientific communities, as well as common citizens). What is more, the analysed cases show that often relatively small amounts of policy funds can be used to initiate much greater processes with impact far beyond the initial local dimension.

POLICY IMPLICATIONS

Policy implications arising from the outcomes of this stage of SMARTEES project are summarized below.

1. Progress in reaching technical and economic conditions for a low-carbon society are crucial but does not guarantee the energy transition

In recent years, Europe's energy system has become incrementally lower-carbon, more competitive, and more secure,[14] thanks to important technical and economic achievements.[15] This does not mean that progress in the process of technological innovation is no longer necessary or that we should not identify and implement more appropriate mechanisms of financing that make the energy transition easier. However, all this positive development alone does and cannot guarantee that an energy transition with larger societal impacts will actually take place.

2. Social conditions for a low-carbon society are still largely to be built

The issue is predominantly social: there are many promising initiatives involving different actors, factors and processes characterizing the evolution of the societies in parallel to energy systems combining technical efficiency and social sustainability, but they are scattered, extremely diversified, context-sensitive and sometimes institutionally isolated. Therefore, it remains difficult to harness these experiences on a large scale.

3. A main step to take now is "repositioning" the human factor

This should reposition the "human factor" in the energy transition process from being marginal (e.g., it occurs too often only downstream in the process of change) to being at the core of low carbon energy policy (e.g., upstream in the process of change).[16] This is not only an ethical issue or a merely political question. The new technological solutions and changes in societal dynamics appear as closely intertwined so that what is really at stake is the same technical capacity of low-carbon solutions to be effective and sustainable in the long run. Repositioning the human factor substantially means being aware of the socio-technical nature of the energy transition.

4. There is the need of thinking in terms of social

Hence the importance of start thinking also in terms of social innovation[17] rather than only in terms of technological solutions. In fact, it is at this level that innovation can (and should) substantially happen, e.g. at the level of social

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[14] Milesecure 2050 (2014). Policy-brief n.1. Available at: www.milesecure2050.eu

[15] E.g. in the document "European Commission (2017) – The strategic energy technology (SET) plan; 2007-2017 – SET PLAN 10th anniversary, chapter 2 "Research & Innovation achievements" presents relevant examples of technological progress achieved over the last decade across the low-carbon energy technology sectors the SET Plan cover.

[16] E.g. the SET-Plan, during his implementation has placed the consumer "at the centre" (see European Commission (2017), cit.), underlying, among other, the importance of the transformation consumers → pro-sumers. However, this declaration of principle appears only to a small extent supported by a discussion of the social dimensions that this entails or of the social conditions that can actually make this repositioning of the consumer practicable. On the other hand, it should be emphasized that a reflection in this sense has been promoted by the EU Commission through multiple research projects (including SMARTEES itself).

[17] E.g. the term: "social innovation" is not mentioned in the main SET Plan documents (mostly understood as an innovation in relation to the advancement of scientific and technological research). Moreover, the same terms "social" and "societal" are mentioned a few times: Conversely, the term "innovation" is widespread (mostly understood as an innovation in relation to the advancement of scientific and technological research). Conversely, as has also been emphasized in this policy brief, the European Commission has been promoting a profound reflection on social innovation for some years now. This reflection, in particular, is also connected with that on the energy transition (also in other projects, besides SMARTEES itself).

innovation, which has its own features and dynamic, such as:

innovation. In this perspective, a social innovation usually entails a set of distinctive elements, including those presented below.

A proactive public administration

- Modifying, where needed, the operational mechanisms of involved local authorities and their related bodies, such as the municipal companies (the main promoters of the energy transition at the local level), so as to make them actual transformational agents able to mobilise and coordinate many actors and stakeholders together; this also means improving cooperation and promoting continuous negotiation processes among the many emerging interests.

Extended and consolidated mechanisms of co-decision

- Enlarging the participation to all the interested actors (from business to common citizens; from civil society to the academy) through an extended partnership, entailing not only communication and debates, but above all an actual involvement, as far as possible, in the decision-making processes[18], and, where relevant, a sharing of ownership (e.g., "pro-sumerism" in renewable energy production and related economic gains).

A knowledge-sharing approach

- Sharing knowledge, without limiting it to the dissemination of information, but considering involved actors as possible bearer of grounded knowledge and useful points of view and experiences to capitalize on.

A strong involvement of local identities

- Fostering the surfacing of a new local identity (also through symbolic and demonstrative actions representing the local community as environmentally sustainable).

5. Social innovation requires wide forms of involvement and coordination

In such a context, citizens' support and consensus building processes are not sufficient to manage these complex mechanisms. Increasingly, innovations in energy policies implementation are co-produced and co-managed through wide forms of involvement and coordination (thanks to the "conditions" listed in the previous paragraph), generated by a multiplicity of factors, allowing to capture, harness and strengthen pro-environmental behaviours among citizens and other concerned actors (condition sine quae non for an effective energy transition).

6. Social innovation inevitably brings tensions and conflicts to be managed through multiple measures

Due to the complexity of the processes we are talking about, it is quite obvious that any action promoting energy transition inevitably brings with it constant situations of tension and conflict, difficult to regulate, which often cause slowdowns, setbacks and stalemates. However, tensions and conflicts that arise, despite the above mentioned social support, should be managed through a series of continuous, coordinated and simultaneous actions (again) of negotiation, participation in decision-making, consultation, etc. Such approach, coupled by an

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[18] E.g. in a governance perspective. "The concept of governance expresses the aspiration to manage affairs in a collective and integrated way, once we recognize that those affairs cannot be handled by single actors or by single sites of political power. Good governance is about connecting stakeholders, about making decisions collectively and with inclusion of all relevant stakeholders, about creating legitimacy, and about attributing accountability justly. It is thus more than only establishing formal democratic institutions". Cfr. Valkenburg G., Bijker W.E., Swierstra T.E., Bichard E., Caiati G., Cassen C., Cotella G.,Grünig M. Quinti G. (2015). Secure and low-carbon energy is citizens' energy. A Manifesto for human-based governance of secure and low carbon energy transitions. Available at: https://www.researchgate.net/publication/303242528_Secure_and_low-carbon_energy_is_citizens'_energy_-_A_manifesto_for_human-based_governance_of_secure_and_low-carbon_energy_transitions

"open design" procedure, should facilitate the management of other possible critical issues too.

7. Social innovation expansive trends should be consolidated

Finally, the cases of SMARTEES seem to show an expansive trend of social innovation initiatives geared towards the energy transition. This expansive tendency manifests itself in two tendencies, which it is necessary to appropriately manage and guide for consolidating this transition process:

- The adoption (if it is not already pre-existing in essence) of an integrated approach of the energy domains and other relevant issues (e.g., the management of environmental and social risks). This issue becomes essential in a climate change management frame.

- A scaling-up process, which allows to transcend the local dimension and multiply the concerned actors. However, this process should be based on a re-contextualisation of successful local experiences, avoiding a direct "transfer" to surrounding communities and beyond.

8. Bringing better together multiple research and action paths

What has been said so far is the result (still immature) of a research project (SMARTEES) funded by the European Commission, together with many others that, in recent years, have dealt with issues such as the role of the human factor or the social innovation in the energy transition. It would be necessary, first of all, for the results of such research to be capitalized (even by comparing them and "cumulating" them). Furthermore, these results should have a greater impact on policies in the energy sector. At the European level, for example, in the SET-Plan (strategic energy technology plan) there is already a strong openness of principle on these topics, which, however, to be more operationalised, should better address the issues of these policy recommendations. Only in this way "reposition the human factor in the energy transition process" from an excellent declaration of principle can become (more) actual, making it easier that an energy transition with larger societal impacts will actually take place.

9. A visionary leadership for energy transition

"Visionary leadership is needed to keep track of the overall direction of energy transitions. At the same time, strategies must be open-ended and foster processes of continuous learning, negotiation and adaptation, and leave room for innovation at the local level and offer methods for transfer of innovation across regions and contexts".[19]

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[19] Valkenburg G., Bijker W.E., Swierstra T.E., Bichard E., Caiati G., Cassen C., Cotella G., Grünig, M. Quinti G. (2015). Op. Cit.