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Societal challenge 5 : Sectoral relevance of sustainable innovations

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Public Participation in Developing a Common Framework for Assessment and Management of Sustainable Innovation, CASI

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CASI: Project description

PROJECT TITLE: Public Participation in Developing a Common Framework for Assessment and Management of Sustainable Innovation (CASI)

COORDINATOR: ARC Fund, Bulgaria: Zoya Damianova

CONSORTIUM: The CASI consortium consists of 19 partners representing 12 European countries. Country correspondents extend the reach to 28 countries

FUNDING SCHEME: Coordination and support action, funded under the 7th Framework Programme of the European Community, SCIENCE-IN-SOCIETY-2013.1.2

Societal challenge 5

Sectoral relevance of sustainable innovations

FOCUS OF SOCIETAL CHALLENGE 5: CLIMATE ACTION, ENVIRONMENT, RESOURCE EFFICIENCY, RAW MATERIALS

The H2020 research and innovation funding for Societal Challenge 5 focuses on preserving current resources, acquiring new ones and on sustainable management of natural eco-systems in particular raw materials. Regarding climate change, the objective is to keep global warming at the level of a maximum of 2 degrees while helping society to adapt to the current and the incoming environmental changes. In order to reach these objectives, encouraging and strengthening the innovation potential is necessary. New technologies should correspond to the challenges encountered but also consider the environment and people's overall well-being. The challenges and objectives of the Societal Challenge 5 have been clearly defined by the European Commission and the goals are ambitious. The current state of the art of sustainable innovation (SI) in this context is, however, unclear.

The CASI project responds to the Societal Challenge 5 with the main objective to develop a methodological framework for assessing sustainable innovation and managing multi-disciplinary solutions through public engagement in the RTDI system. This is done by ensuring the commitment of a broad spectrum of societal stakeholders into its implementation, including industry, policy-makers, research organisations and academia, civil society organisations and the general public. The developed methodology has proven to be effective, that among other is manifested through an online repository of collected sustainable innovation initiatives (over 500 cases coming from 28 EU Member States), named CASIPEDIA. It thus presents a wide selection of European sustainable innovation initiatives to experts and supporters of sustainability agendas.

This policy brief provides insights from the first assessment report of the Societal Challenge 5 and the issues observed followed by an analysis of sustainable innovation initiatives in the CASIPEDIA database, which showcases the sectoral relevance of the initiatives. Statistical analysis is used to identify differences in how sustainable innovation initiatives in the main sectors relate to the societal challenges. The findings show for example that it would appear worthwhile to consider if the distribution of sustainable innovation across industrial sectors meets the set policy targets. Furthermore, different policy implementation methods could be considered. For instance, funding can be considered particularly beneficial in societal challenges, which already attract sustainable innovation, while setting strict emission standards could steer to innovate in other challenges.

Introduction

THE CHALLENGE

It does not seem to be so long ago when natural resources seemed abundant. The end of the 20th century was certainly the end of one era but above all a wake-up call identifying new challenges for society to encounter. The H2020 Societal Challenge 5 aims at improving, protecting and securing well-being by focusing research and innovation resources towards climate action, environment, resource efficiency and raw materials. The current shortfalls need to be complemented with actions that contribute to climate resiliency and resource efficiency on the one hand, while on the other, the respective European economies should strive towards enhanced competitiveness with a heavy focus on the eco-innovation. Eco-innovation offers a new global dimension of opportunities in the amount of €1 trillion per annum that is expected to triple by 2030. The position of the European Commission is that eco-innovation offers a recovery pathway for the struggling European economies and disrupted employment market.

THE OBJECTIVE

The H2020 research and innovation funding for Societal Challenge 5 focuses at the specific objectives towards preserving current resources and acquiring of the additional ones. Furthermore, it strives toward the sustainable management of natural eco-systems, has a particular focus at raw materials, and raises global demand for both. Regarding climate change, an additional objective is to keep global warming at the level of a maximum of 2 degrees, while helping society and its related eco systems to adapt to the current and the incoming environmental changes. For these objectives to be achieved, encouraging and strengthening of the innovation potential is crucial. Hence, the new technologies must be able to correspond to the challenges encountered, but at the same time, they must further consider the environment and people's overall well-being. The role of science and the ICT's plays an important role in this ecosystem, whereas taken actions also need to be sustainable. The challenges and objectives of the Societal Challenge 5 have been clearly defined by the European Commission and the goals are ambitious. However, the question is, what is the current state of the art?

CASI REPOSITORY FOR POLICY AGENDA SETTING

CASI project responds to the Societal Challenge 5, with the main objective to develop a methodological framework for assessing sustainable innovation and managing multi-disciplinary solutions through public engagement in the RTDI system by ensuring the commitment of a broad spectrum of societal stakeholders into its implementation, including industry, policy-makers, research organisations and academia, civil society organisations and the general public. The developed methodology has proven to be effective, that among other is manifested through an online repository of collected sustainable innovation initiatives (over 500 cases coming from 28 EU Member States), named CASIPEDIA. The above noted initiatives have been further analysed and categorized in many ways such as according to key areas, type of innovations, success factor, geographical scope, and sectoral relevance. CASIPEDIA presents a wide selection of European sustainable innovation initiatives to experts and supporters of sustainability agendas.

FEEDING IN THE EU ANALYSIS

In the following sections of this brief we first provide insights from the assessment report of the Societal Challenge 5, which identified sectoral challenges to be addressed. This is followed by an analysis of sustainable innovation initiatives in the CASIPEDIA database, which showcases the sectoral relevance of the initiatives. Furthermore, statistical analysis is used to identify differences in how sustainable innovation initiatives in these sectors relate to the societal challenges. We are thus, connecting the latest EU analysis on Societal Challenge 5 with evidence based analysis, in an attempt to provide input to strategic and programmatic policy agenda setting. Furthermore, the intent is also to demonstrate that coordination of different EU initiatives as well as cross-linkages of actions could compliment well each other when targeting impacts.

THE FIRST ASSESSMENT OF THE SOCIETAL CHALLENGE 5

The first and so far the only report of the Horizon 2020 Advisory Group for Societal Challenge 5 (SC5): 'Climate Action, Environment, Resource Efficiency and Raw Materials' dates back to 2014. The task of the Advisory Group was to provide an initial assessment to the European Commission regarding the set targets within the framework of the SC5 and to determine if the European Commission is on the right track with delivering solutions through the set H2020 programme. For the purpose of this assessment, the Advisory Group broke down the SC5 into 4 key priority areas, which it considered the most relevant for the European Union and should be the subject of further investments and actions. If the Advisory Group's propositions were to be accepted and implemented as such, the group was confident the set goals for SC5 would be reached. The key priority areas that were at focus were the following: Systemic Eco-innovation, Climate Services, Nature-based Solutions and Sustainable Supply of Raw Materials. The overall result of the assessment was positive, even though it was highlighted that the SC5 represents a novel agenda and that any mistakes that are made along the way, would be an important part of the learning process.

INITIAL ASSESSMENT OBSERVATIONS

The first observations made in the report addressed the multi-stakeholder group that was engaged in the design of the SC5 programme. There was a call for a better understanding of the governance of such platforms for the purpose of further utilisation of such models, and initiation of continuous discussion. The purpose is to validate the initial design as well as to provide solutions for the challenges encountered during the programming period. Furthermore, the need for more inter-disciplinary actions across different sectors and even beyond research and innovation with strategic vision of the actions and goals to be achieved in short and long term was observed as a necessity. This agenda should not be technology driven but based on synergies between research and innovation with a specific focus at social innovation. This novel agenda requires a novel set of financial instruments designed according to the needs identified. The tailor made financial instruments go in hand with capacity building and strategic building of profiles and skills required for the future. The inter-disciplinary actions require inter-, cross-, sectorial-, and linked decision making processes that are influenced by the following helix: science-society-political processes.

CROSS-CUTTING AREAS

The links between this societal challenge and that of Health, Demographic Change and Well being were highlighted several times in the report. These cross linkages were, in particular, observed from the perspective of innovation contributing to the health and well-being. The report pointed out the issue of where and how to address specific sectoral challenges, in particular those that may contribute to the change of an industry and relating consequential social problems. Migration, geopolitics and cultural heritage were highlighted as the additional cross-cutting areas that were in particular important for the climate change point of view.

TOWARDS PRIORITISATION

The assessment report was concluded by further endorsing roadmaps that addressed each of the 4 key priority areas, highlighted key objectives and proposed recommendations through a set of actions, target groups of stakeholders to be engaged, and expected outcomes. The road map for the key priority area concerning raw materials was the most comprehensive one. The extent of challenges was observed in the lieu of the high dependency of Europe on imports of raw materials, but also from the point of coordination of EU initiatives such as the European Innovative Partnership (EIP) on raw materials, and Public Private Partnership initiatives.

As mentioned above, the assessment report saw the four key priority areas of the Societal Challenge 5 as the main subjects of further investments and actions. The CASI project presents the state of the art of European sustainable innovations, CASIPEDIA in relation to SC5. This policy brief analyses the key sectors of European sustainable innovations in relation to the priority areas of the Societal Challenge 5. This analysis will be presented in the next section.



CASI EVIDENCE BASED ANALYSIS

CASIPEDIA LISTS SI CASES

CASIPEDIA includes over 500 sustainable innovation (SI) initiatives at www.casi2020.eu/casipedia. The initiatives have been collected by the CASI project partners representing 12 countries and by CASI country correspondents representing an additional 16 countries. In effect, the CASIPEDIA covers at least 21 sustainable innovation initiatives from each of these EU-28 countries. The initiatives have been categorized in many ways such as according to key areas, type of innovations, success factor, geographical scope, and sectoral relevance. Almost one third of the initiatives embrace an international scope. CASIPEDIA represents a wide selection of European sustainable innovation initiatives to experts and supporters of sustainability agendas.

SI ACROSS KEY SECTORS AND SOCIETAL CHALLENGES

This section looks at the relationship between the key priority areas of H2020 Societal Challenge 5 (SC5) climate action, environment, resource efficiency and raw materials and the sectoral relevance of the SI initiatives. Five key sectors, i.e. those with the greatest number of initiatives, are included in the analysis: Manufacturing (284 initiatives), Energy (235), Water (177), Agriculture (160) and ICT (127). Some SI may belong to more sectors than one, which explains the great numbers. Statistical analysis is used to identify differences in how SI initiatives in these sectors relate to the priority areas of SC5. There are several policies at the EU and national level that target these sectors, which makes them important to be analysed.

Number of CASIPEDIA sustainable innovation initiatives across key sectors (left) and societal challenges (top). (+) indicates major over-representation, (-) major under-representation.

	Climate action	Environment	Raw materials	Resource efficiency
<i>Manufacturing</i>	81	8 (-)	94 (+)	101
<i>Energy</i>	86 (+)	11	54	84
<i>Water</i>	53	8	45	71
<i>Agriculture</i>	50	25 (+)	34 (-)	51 (-)
<i>ICT</i>	39	6	24 (-)	58 (+)
<i>Total</i>	309	58	251	365

TABLE 1

Table 1 lists how CASIPEDIA initiatives are distributed across the key sectors emerging from the database and the topics of the fifth societal challenge. Statistical analysis shows that it is meaningful to examine the distribution of sustainable innovations, because the observed variation in the distribution of cases across sectors and challenges is not created by chance (Pearson's chi-square test for independence, p-value <.000).

Major over- and under-representation of CASIPEDIA sustainable innovation initiatives in cells uniting sectors and societal challenges merits policy interest. It can be observed in CASIPEDIA that sustainable innovation initiatives in the manufacturing sector are over-represented in the challenge of raw materials and under-represented in the challenge of the environment. This indicates that sustainable innovations in manufacturing would be more likely to take place in the challenge concerning raw materials and less likely in the challenge on environment.

MANUFACTURING SECTOR SI FOCUSES ON RAW MATERIALS

In policy terms at a strategic level, it would appear worthwhile to consider if this is the sought distribution of sustainable innovation to meet set policy targets CASI analysis indicates that sustainable innovation as a policy option at a programmatic level would appear to fit the manufacturing sector in challenges relating to raw materials much better than to those on environment challenges. Furthermore, different policy implementation methods should be considered (Baldwin & Cave 1999). For instance, funding can be considered particularly beneficial in societal challenges, which already attract sustainable innovation while setting strict emission standards can steer to innovate in other challenges. Such policy measures can take place in many ways, i.e. through incentives, charges, planning, standards, and the control of risks.

A number of other, sectoral observations can be made in CASIPEDIA in terms of societal challenges:

- Sustainable innovation initiatives in the energy sector focus on challenges relating to climate action.
- In contrast, sustainable innovation initiatives in the water sector address all four societal challenges in a balanced way.
- The agricultural sector is heavily over-represented in sustainable innovation initiatives that focus on the environmental challenge. Correspondingly, its SI initiatives are under-represented in challenges on resource efficiency and raw materials.
- Sustainable innovation initiatives in the ICT sector are over-represented in the challenge on resource efficiency but under-represented in raw materials.
- Overall, the environmental challenge has attracted less sustainable innovation initiatives than the other challenges.

KEY SECTORS HAVE DIFFERENT SI PROFILES



CONCLUDING INSIGHTS

STRATEGIC AND PROGRAMMATIC POLICY RESPONSES

Concludingly, an analysis of the over 500 initiatives from EU-28 countries in CASIPEDIA shows that sustainable innovation is distributed unevenly across key industrial sectors and the main priority areas of H2020 Societal Challenge 5. The sectors all have their particular profiles in how sustainable innovation addresses societal challenges, highlighting a need for various kinds of policy response. At a strategic policy level, it should be considered what kinds of challenges sustainable innovation can address in the different industrial sectors. Concerning environmental challenges, it should also be reconsidered if sustainable innovation can provide sought policy targets also outside the agricultural sector.

At a programmatic policy level, the analysis provides early insights on how to foster sustainable innovation. In some sectors and challenges, it might be worthwhile to encourage sustainable innovation through support while in others it would be better to set demands. For instance, it should be considered how sustainable innovation related to the challenge of raw materials could be made more prevalent in the agricultural and ICT sectors. For similar reasons, the fostering of sustainable innovation initiatives should be complemented with an assessment of their potential and impacts.



Further Reading and References:

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3. PEER response to the stakeholder consultation on HORIZON 2020 Societal challenge 5. Priorities for research and innovation of the work programme 2018-2020



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DURATION: 42 months, 1/2014-6/2017

BUDGET: 4.5 M€, 428 person month

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