



# **MAGICA**

***Maximizing the synergy of European  
research Governance and Innovation  
for Climate Action***

## **D4.6 Report on Lessons Learnt for Enabling Societal Transformation from Social Science and Humanities in the Face of Climate Change**

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## Key takeaway messages

- The value of engaging policymakers, non-academic experts, and citizens for knowledge production on societal transformation for climate action was demonstrated. Dedicated roles and personnel for stakeholder engagement proved effective. However, co-production with stakeholders was rare in the projects and often limited to advisory roles or dissemination activities. Involvement of marginalized groups was only done in a few projects. Resource constraints hindered sustained engagement for most projects.
- Transdisciplinary requires structural support such as time and budget resources. While interdisciplinarity was achieved, true transdisciplinary collaboration was limited. Explicit requirements and funding for co-creation would enable projects to move beyond multi-or interdisciplinary approaches. SOLSTICE calls enabled experimentation with new topics and methods, fostering innovation and interdisciplinary learning. Engaging in reflexive learning requires time and resources and is challenging. Creative dissemination (toolkits, videos, arts-based methods) enhanced outreach but lacked sustained funding for continuation.
- Justice dimensions need strong integration into research to enable societal transformation. Social justice was unevenly addressed in projects. Recognitional justice (acknowledging vulnerable groups) was common, but distributional justice (addressing the distribution among people of costs and benefits) and procedural justice (fairness of the process of decision-making) were less systematically integrated. Intersectional aspects of marginalisation (e.g. gender, ethnicity, disability) were largely absent. Explicit requirements to embed justice in all research projects should be integrated into research calls.
- Impact and scaling of the project results on societal transformation remain unclear. Projects attempted to have impact on policy or community level but lacked resources to monitor and evaluate the achievements. Few developed clear strategies for scaling results or influencing policy beyond local contexts.
- Structural barriers limit transformative potential. Short call deadlines, fragmented national rules, and limited budgets constrained projects ambitions. Geographic concentration in Western Europe reduces diversity of perspectives, potentially reinforcing recognitional injustice in the long term.
- Future calls should address emerging challenges to enable societal transformation. Geopolitical instability, misinformation and nature crises, amplify the complexity of climate action. Likewise technological developments (e.g. Artificial Intelligence) will impact societies profoundly. Future research must integrate these dynamics and emphasize innovative communication, intersectional understandings of marginalisation and global outlook to ensure societal relevance.



## Summary

The SOLSTICE program, funded under JPI Climate, aimed to enable societal transformation in the face of climate change through interdisciplinary and international research. This analysis of projects from 2013 and 2019 SOLSTICE calls highlights critical insights into their impact on societal transformation in terms of stakeholder engagement, and how this relates to systemic change, justice and scaling of impact.

The projects demonstrated the value of engaging policymakers, non-academic experts, and citizens for relevant knowledge production on enabling societal transformation for climate action. Dedicated roles and personnel proved effective for stakeholder engagement. The SOLSTICE calls also enabled experimentation with new topics and methods, fostering innovation and interdisciplinary learning. Creative dissemination (toolkits, videos, arts-based methods) enhanced outreach.

However, while interdisciplinarity was achieved, true transdisciplinary collaboration where stakeholders also informed development of research questions and design was limited by lack of competence, resources and time for sustained interaction. Stakeholder engagement was also mostly limited to advisory roles or dissemination activities.

Several projects addressed justice dimensions, which is a central component to societal transformation to ensure fair and effective decisions on climate action. However, involvement of marginalized groups was only carried out in a few projects and social justice was unevenly addressed in the projects. Recognitional justice (acknowledging vulnerable groups) was common, but distributional justice (addressing the distribution among people of costs and benefits) and procedural justice (fairness of the process of decision-making) were less systematically integrated. Intersectional aspects (gender, ethnicity, disability) were largely absent.

Further, few projects developed clear strategies for impact, scaling results or influencing policy beyond local contexts. Geographic concentration of SOLSTICE projects in Western Europe reduces diversity of perspectives, potentially reinforcing recognitional injustice in the long-term. Projects reported anecdotal evidence of influence on policy and practice but lacked resources for systematic monitoring and evaluation. Ambitions for societal transformation may also have been constrained by short call deadlines, fragmented national rules, and limited budgets.

Lessons learned for future research include explicit requirements and funding for transdisciplinary approaches to enable projects to move beyond multi- and interdisciplinary approaches. Research projects should also be required to embed justice dimensions across all research topics as this is equally relevant in all societal contexts. In future calls, new crises such as pandemics, geopolitical instability, misinformation, which amplify the complexity of climate action, need to be integrated to ensure societal relevance. Furthermore, future research needs to emphasize innovative communication, intersectional understandings of marginalization, and global outlook to strengthen legitimacy and actionable knowledge.



## List of abbreviations

EC	European Commission
EU	European Union
SOLSTICE	Enabling Societal Transformation in the face of Climate Change
SSH	Social Sciences and Humanities
SSH&A	Social Sciences and Humanities and Arts





## 1 Introduction

Impactful climate action requires societal transformations at all levels in society to enable the development of sustainable economies and societies (IPBES, 2024; IPCC, 2023). Societal transformation is here understood as a deep and sustained transformation of society to fundamentally redirect social organisation and human activities that maintain the current political, economic and social system that underpin current climate change (O'Brien, 2012). This goes beyond new technologies, improved management, policies or behavioral changes. Whereas numerous actions and policy measures to address climate change have been implemented, we are currently still not able to limit global warming to well below 2°C. The climate change challenge is amplified by a nature crisis where ecosystems are unable to sustain themselves because of humans' current way of life (IPBES 2024), as well as growing geo-political instability re-ordering priorities (Dodds et al. 2023; Mišák & Nosko, 2023) and eroding trust in multilateral processes (Swain et al., 2025; Vivoda et al., 2024,). Resistance and mobilization concerning climate measures or lack of environmental action are also prevalent in many contexts (Sovacool et al. 2022; Temper et al., 2020).

With this context as a backdrop, it is necessary to explore how research can foster societal transformation through knowledge bases for: Holistic, evidence-based policymaking, acknowledgement and participation of stakeholders and contributing to development of instruments needed to facilitate this. Social Sciences and Humanities (SSH) are in a key position for understanding human interactions with the environment and thus informing policy and engaging the public.

To deliver on this knowledge gap, this Deliverable explores the role of research-funded SSH projects in the JPI Climate programme 'Enabling Societal Transformation in the face of Climate Change' (SOLSTICE). As part of understanding the role of research projects to enable societal transformation, this analysis pays particular attention to how SOLSTICE funded projects have addressed aspects of stakeholder engagement and how this relates to systemic change, social and environmental justice, and scaling of impact.



SOLSTICE funded 13 research projects through two research calls (2013 and 2019). The projects analysed are presented in the table below:

**Table 1: Overview of SOLSTICE projects**

Project short title	Project full title	Countries involved	Research call
<b>202cm</b>	Overcoming Obstacles and Disincentives to Climate Change Mitigation	Belgium, France, Norway	2019
<b>CCC-CATAPULT</b>	Challenging the Climate Crisis: Children's Agency to Tackle Policy Underpinned by Learning for Transformation	UK, Ireland, Finland, Italy	2019
<b>CLEAN Cultures</b>	An approach for innovative Climate Learning, Evaluation and Action in Neighbourhoods	Austria, Finland, Norway, Italy	2019
<b>JUSTDECARB</b>	Socially Just and Politically Robust Decarbonisation: A Knowledge Base and Toolkit for Policymakers	Norway, UK, Austria, Czech Republic	2019
<b>Just Scapes</b>	Environmental justice analysis to advance rural landscape transformations in the face of climate change	UK, France Czech Republic	2019
<b>ROLES</b>	Responsive Organising for Low Emission Societies	Norway, UK, Italy	2019
<b>SOLARIS</b>	SOLidarity in climate change Adaptation policies: towards more socio-spatial justice in the face of multiple RISks	France, UK, Belgium, Finland	2019
<b>SELF CITY</b>	Collective governance, innovation and creativity in the face of climate change	Germany, Netherlands, UK	2013
<b>EPCC</b>	European Perceptions of Climate Change	UK, France, Norway, Germany	2013
<b>HOPE</b>	Household Preferences for reducing greenhouse gas emissions in four European high-income countries	Germany, France, Norway, Sweden,	2013
<b>MOBGIs</b>	Mobilizing grassroots capacities for sustainable energy transitions: path improvement or path change?	Sweden, Netherlands, Denmark	2013
<b>HUMANOR</b>	Social-Ecological Transformations: Human-Animal Relations Under Climate Change in Northern Eurasia	Finland, UK, Sweden, Norway, Russia	2013
<b>TRANS-ADAPT</b>	Societal transformation and adaptation necessary to manage dynamics in flood hazard and risk mitigation	Austria, Netherlands, France, Ireland	2013



The distribution of countries and geographical focus is related to the research funders joining the call. In one SOLSTICE 2013 project a Russian research partner joined covering their own expenses.

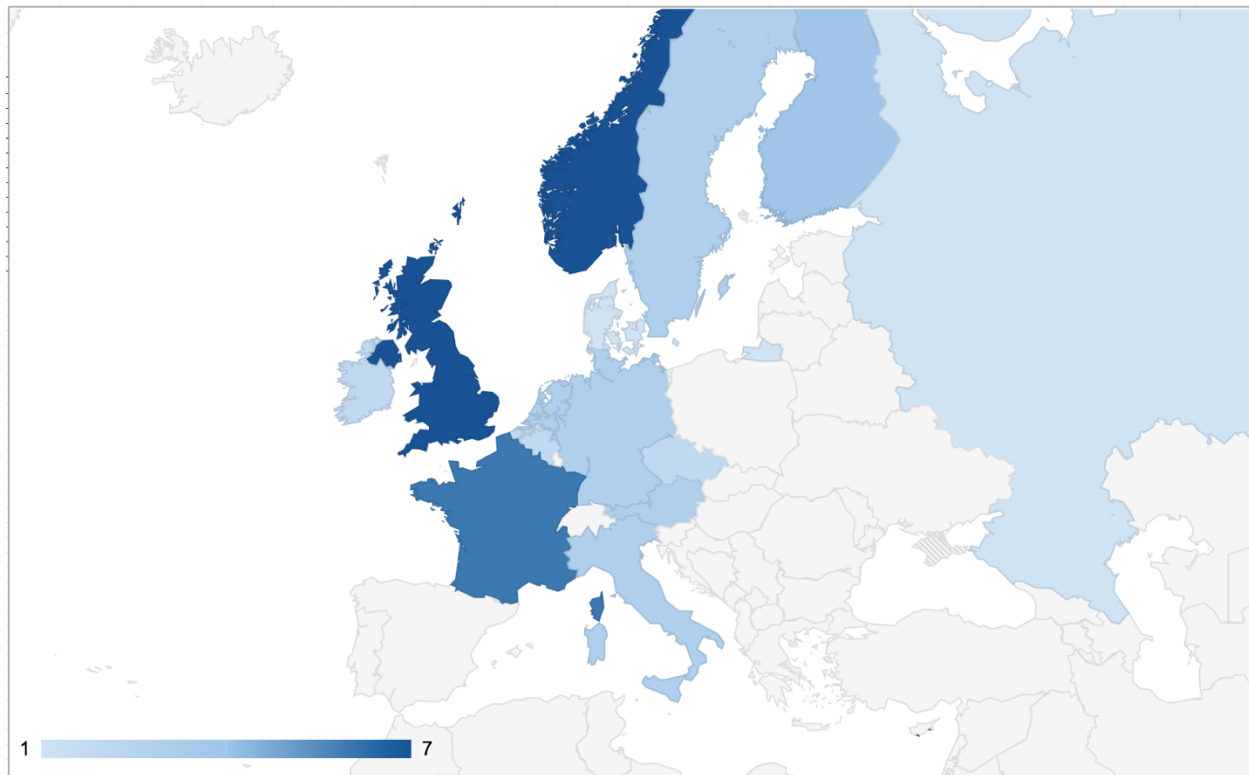


Figure 1: Distribution and frequency of countries in SOLSTICE projects

With the aim of providing knowledge on the SOLSTICE research program’s efforts at closing the gap between research and policy at different levels, as well as addressing the need for translating scientific knowledge to relevant stakeholder groups, this Deliverable provides lessons learned from the funded SOLSTICE projects. The findings from this Deliverable will form the basis for a concept note that provides recommendations to research funders to address identified research gaps (D4.7 Recommendations to Research Funders). Further, the results of both deliverables will also feed the 2025-2035 Strategic Research and Innovation Agenda on climate science, developed within the umbrella of the Equinox Process (carried out in close cooperation with JPI Climate) and one of the major MAGICA’s outputs.

## 2 Conceptualizing societal transformation and stakeholder engagement

The SOLSTICE programme is committed to promoting SSH research to enable a just and effective transition as a basis for knowledge-based policymaking to mitigate and adapt to climate change (West and Worliczek 2019, Blue 2015, Driessen et al. 2013). The JPI Climate's 2019 White Paper “Operationalizing knowledge on and for societal transformations in the face of climate change” (West and Worliczek 2019) identified a number of important research topics to pursue societal transformation. The White Paper further highlighted that transdisciplinary research was critical for developing effective



strategies for societal transformations. Transdisciplinary is generally understood as an approach to provide holistic knowledge for transformative outcomes that includes different knowledge systems and expertise, including non-research actors. The White paper recommended that all future SOLSTICE research calls required SOLSTICE projects to co-produce knowledge (through transdisciplinary), as well as communication and responsible research and innovation. This would enhance societal outcomes.

Recently, the SOLSTICE White paper was updated in a background note on ‘Thematic Areas for Research Call SOLSTICE 2 – Filling Research Gaps for Enabling Societal Transformations in the face of Climate Change’ (Standal, Legris and Revez 2025). This background note provides insight into new societal challenges that urgently need to be integrated into the existing (and still relevant) knowledge gaps to enable societal transformation. The new societal challenges refer to the contemporary multiple challenges in relation to geo-political turbulence, pandemics, nature and climate crisis. These challenges have taken focus away from climate policies, but also amplify these challenges, and thus require new knowledge concerning international cooperation, political mobilization, balancing difficult trade-offs and people’s agency to adapt to and influence climate policy decision-making (Dodds et al., 2023; Mišikand & Nosko, 2023). The acceleration of climate change also requires that mitigation and adaptation are addressed and solved in tandem, to build low-carbon and climate resilient communities and infrastructures (IPBES 2024; IPCC 2023). Lastly, climate communication is also challenged by serious legitimacy problems of media and social media in the public because of mis- and disinformation (Shahbazi & Bunker, 2024). To enable knowledge and expertise on these crises as interlinked, the background note suggests that a new SOLSTICE research call incentivize the research community to propose projects that integrate innovative communication of results, co-creation processes, intersectional dimensions of marginalisation (class, gender, disabilities, age, religion etc.), nature and climate adaptation, as cross-cutting dimensions research projects should address.

Also, the COST Action SHiFT SSH policy brief ‘Enhancing Climate Resilience through Social Sciences, Humanities, and Arts: A Strategic Framework for Action’, highlights the need for strengthening collaboration involving SSH and Arts (SSH&A) together with wide stakeholder engagement to develop comprehensive solutions that address the scientific and sociocultural aspects of climate change (Vidal & Alves, 2024). Climate communication strategies involving SSH&A are seen as needed to effectively engage a diversity of stakeholders, inspire action and open up new ways of understanding that enables real impact on societal transformation. In addition, the 2026-2035 Strategic Research and Innovation Agenda (SRIA), which is one of the main MAGICA outputs, identifies the Scientific Underpinnings of Societal Transformation for Climate Action as one of the key areas at EU level. The need to co-produce research with a diversity of stakeholders and explore topics with new frameworks is therefore highlighted as necessary to advance the knowledge frontier and provide actionable knowledge.

As mentioned above, stakeholder engagement, especially in the form of transdisciplinary, is perceived as critical for enabling societal transformations and sustainability, as solutions and strategies developed from the standpoint of a single discipline often provide inadequate and incomplete understandings of the complexity of climate change and sustainability (Oftedal et al., 2021, West & Worliczek, 2019). Though concepts concerning stakeholder engagement are debated there is a broad consensus concerning the benefits of integrating the knowledge from non-academic stakeholders. This refers to



engaging stakeholders in ‘processes of mutual learning between science and society, (...) which embodies a mission of science with society rather than for society’ (Seidl et al., 2013). This includes methods to produce ‘reliable knowledge’ but also extending to provide ‘socially robust knowledge’ (Nowotny et al., 2003). Stakeholder engagement (and related concepts of transdisciplinary and co-production) is also linked to opening spaces for policy experimentation (Ghosh et al., 2021; Howoldt & Borrás, 2023), risk-taking (Borrás & Serger, 2022) and integrating diversity of knowledges to foster new and broader perspectives on research questions (Newell et al., 2024). Stakeholder engagement thus also addresses epistemic justice (exclusion or undervaluing certain groups or perspectives) (Valkenburg, 2023).

Stakeholder engagement can take different forms, but meaningful engagement and increased impact is related to stakeholders’ contribution to adapting existing research methods and tools in novel contexts, the transfer or mobilization of knowledge into a wider platform or context, or the creation of experimental and innovative communication and education channels (West & Worliczek, 2019). Such cooperation should also address ethical and distributional issues associated with climate action measures and knowledge production processes and involve relevant stakeholders to ensure the societal relevance and applicability of the research. As described by West and Worliczek:

*For example, in developing further our understanding of strategies for governing societal transformations, transdisciplinary thinking can support the development of participatory and deliberative methods, which purposively bridge different knowledges and institutional cultures. Similarly, with respect to societal justice and responsibility in climate change, the development of new scenarios and visions for the future would need to be based on a comprehensive and interdisciplinary understanding of the implications of these visions for society in the short and long term. Transdisciplinary research moreover provides an opportunity for learning and reflexivity that can stimulate new methods and new paradigms for solving climate change issues, not just problematising them (West & Worliczek, 2019, 11).*

On the other hand, it is also necessary to explore limitations and potential negative implications that may emerge from transdisciplinary approaches in research. Literature has found that there are significant weaknesses in the conceptualizations of co-production within sustainability sciences concerning power, politics, and governance (Wyborn et al., 2019). Co-production processes may have unintended consequences and lead to unwanted outcomes and failures. According to Turnhout “an important reason for this lack of understanding of failure is that the co-production literature has not paid sufficient attention to the role of power and politics in shaping processes and outcomes” (Turnhout et al., 2020, 16). Therefore, this study incorporates power relations and social justice as a dimension in the study design and analysis.



### 3 Approach and methods

The SOLSTICE projects in this study were all within the thematic of the SOLSTICE calls for research proposals and thus answering relevant and carefully selected knowledge gaps. Based on the conceptualization above, the focus of this study is to address their impact on societal transformation in terms of how this knowledge was translated to relevant stakeholder groups and how stakeholder engagement has enabled holistic knowledge. We therefore explore how funded SOLSTICE projects have addressed aspects of stakeholder engagement and how this relates to systemic change, social and environmental justice, and scaling of impact. We posit the following research questions:

1. To what extent did the SOLSTICE calls encourage and enable stakeholder engagement?
2. What were the main barriers for integrating stakeholder engagement into the SOLSTICE call and proposals?
3. How did the SOLSTICE projects incorporate stakeholder engagement, what methods were used, and did they reach relevant stakeholder groups?
4. How were dimensions of justice, systemic change and policy relevance integrated into projects' focus and stakeholder engagement?
5. What were the factors for success or failures in stakeholder engagement in the SOLSTICE projects and were there any unintended consequences (e.g. dominant actors co-opting co-creation process or narratives, power asymmetries etc.)?

This analysis addresses three dimensions of the stakeholder engagement in the SOLSTICE programme. This includes A) Research policy ambition and operationalization of stakeholder engagement in the SOLSTICE call (the research policy and how and why stakeholder engagement was included and operationalized in the call); B) The response of the research community and the selection of funded projects. C) Implementation of SOLSTICE projects and stakeholder engagement and outcomes of this in the projects. Dimensions A) and B) pertain to research questions 1 and 2 and here we draw extensively on Wicher's (2024) findings, which explores the translation of transformative policy ambitions in relation to the funding of research in the SOLSTICE 2019 call. Dimension C) pertains to research questions 3-4 where we draw on our document analysis and interviews described in section 3.2.



### 3.1 Applied assessment criteria

To answer the research questions, we utilize a framework that draws upon the above conceptualization and indicators used by IPCC, Future Earth and EU Transformative Research programs (European Commission, 2024; IPCC, 2023; Fazey et al., 2018; Future Earth, 2014). This framework applies five criteria explained in the table below:

**Table 2: Applied assessment criteria**

Criteria	Key dimension explored	Societal transformation link
Stakeholder engagement, participation and co-creation	Whether and how societal actors are actively involved in the research process and can benefit from the results	Brings in diversity of perspectives and knowledges for understanding. Enables feedback loops and informed decision/policymaking. Enables awareness and trust towards climate research
Vision and systemic change	How the project focuses on changing systems and structures (not just optimizing existing ones)	Addresses core roots of transformational enablers and barriers. Engagement with policy to facilitate knowledge-driven policy making
Justice and inclusion	How the project addresses and contributes to a fair and inclusive transformation	Linked to above: Addresses core roots of transformational barriers in terms of power dynamics and unjust outcomes on society and climate. Brings in diversity of perspectives and knowledges for enhanced understanding and informed decision/policymaking. Also relates to power dimensions in the stakeholder engagement and potential unintended effects
Impact and scaling	Whether and how the project has led to concrete societal change, knowledge exchange or scalable innovations or research activities	Visible impacts on policy, behavior, networks, transferable results and lessons learned are shared through knowledge exchange – in policy or regions. New opportunities to continue the work
Learning and knowledge exchange	How the project stimulates social or institutional learning processes	Experimentation with new ways of working. Systematic learning from this experimentation enables deeper and original understanding and problem-solving related to transformational barriers

Emphasis was put on the dimension of stakeholder engagement, participation and co-creation, where the types of stakeholders, as well as the timing of involvement and methods for engagement and co-production were assessed. Further, justice was understood mainly in terms of social justice and focused



on three dimensions (McCauley et al., 2013): (1) recognitional justice (injustices in terms of who are seen as legitimate stakeholders with decision-making power); (2) distributional justice (injustices in terms of distribution of burdens and benefits in the societal transformation for climate action. This includes inter- and intra-generational justice where coming generations will have to live with damaged ecosystems as a result of climate change) and (3) Procedural justice (injustices in fairness and transparency of the processes used to make decisions and resolve disputes in the societal transformation for climate action).

## 3.2 Applied methods

To explore the process and potential outcomes of the stakeholder engagement within the SOLSTICE projects, a qualitative approach was used that included document analysis and semi-structured interviews.

**Document analysis:** This analysis included the research proposal call texts of the 2019 and 2013 SOLSTICE, two publications examining the SOLSTICE 2019 call (Wicher, 2024; Göd et al., 2022) and the final reports of the SOLSTICE projects. Wicher (2024) analyses what she refers to as Translation 1: from policy ambition to the SOLSTICE call and Translation 2: the response of the research community and the selection and implementation of funded projects. We draw on Wicher's findings in combination with the SOLSTICE call evaluation conducted within the project SINCERE: Strengthening International Cooperation on Climate change for research questions 1 and 2.<sup>1</sup> We also present our own analysis of the call texts. For the remaining research questions and the analysis of implementation of SOLSTICE projects and stakeholder engagement in the projects we draw on the final reports and interviews.

As some of the projects from the SOLSTICE 2013 call were initiated more than 10 years ago, we experienced challenges in obtaining final reports of all projects as they were no longer archived. We therefore used other document materials available for some of the 2013 SOLSTICE projects, in particular Aalbers et al. (2019). The final reports and other documents used are public and therefore findings based on this are not anonymized.

**Semi-structured interviews:** This analysis draws on semi-structured interviews with Lead Principal Investigators (LPI) of the SOLSTICE projects. To enable an open and safe discussion all LPIs are anonymous in this publication. Our questions were based on the applied assessment criteria described in the previous section. We managed to recruit interviews with all LPIs from the 2019 SOLSTICE calls, but only one from 2013 SOLSTICE projects. This was due to busy calendars, and several did not respond. We sent a maximum of 3 reminders. We did not get any failed recipient notifications, but some may have moved on to new research institutions. Ethical approval was given by SIKT - Norwegian Agency for Shared Services in Education and Research, and all interviewees were provided information on the study and their rights as participants beforehand.

In addition to the document analysis and semi-structured interviews, the analysis has been supplemented by the review of existing material in the field of societal transformation research,

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<sup>1</sup> The SINCERE project evaluation of the call conducted interviews with four Austrian experts to investigate possible explanations for the lack of interest and expertise. Due to their limited number, the experts' response must be understood as indicative.



particularly the SOLSTICE White paper (West and Worliczek 2019) and background note for SOLSTICE 2 call (Standal, Legris & Revex 2025). A full list of data is presented in the table below:

**Table 3: Overview of data collected**

Data used	Reference
Interviews SOLSTICE project LPIs n=8 (7 for 2019 and 1 for 2013, October – November 2025)	Confidential
Final reports SOLSTICE projects n=8 (7 for 2019 and 1 for 2013)	<a href="#">Library - JPI Climate</a>
e-magazine with short project summaries 2013-projects	<ul style="list-style-type: none"> <li>• Aalbers et al. 2019. JPI Climate e-magazine.</li> </ul>
SOLSTICE project publications n= 5	<ul style="list-style-type: none"> <li>• Brisbois et al. (2025). Spaces, forms, and levels engagement: Using the Powercube to explore social inclusion in digital energy and mobility systems. <i>Research Policy</i>, 54(10). <a href="https://doi.org/10.1016/j.respol.2025.105323">https://doi.org/10.1016/j.respol.2025.105323</a></li> <li>• Forbes, B. (no date) Social-Ecological Transformations: HUMAN-ANIMAL Relations Under Climate Change in NORthern Eurasia (HUMANOR). Arctic Centre poster</li> <li>• Fuchs et al. (2017). TRANS-ADAPT Societal transformation and adaptation necessary to manage dynamics in flood hazard and risk mitigation. INTERPRAEVENT Journal Series 1, Report 4</li> <li>• Klöckner et al. (in review). Can neighbourhood interventions strengthen collective climate action?</li> <li>• Portus et al. (2025). Reflections on co-productive research in a youth-focused climate education project. <i>Geographical Research</i>, 63(1). <a href="https://doi.org/10.1111/1745-5871.12642">https://doi.org/10.1111/1745-5871.12642</a></li> <li>• Thaler et al. (2019). Drivers and barriers of adaptation initiatives: How societal transformation affects natural hazard management and risk mitigation in Europe. <i>Science of The Total Environment</i>, 650(1). <a href="https://doi.org/10.1016/j.scitotenv.2018.08.306">https://doi.org/10.1016/j.scitotenv.2018.08.306</a>.</li> </ul>
SOLSTICE call for proposal 2019 and 2013	<ul style="list-style-type: none"> <li>• <a href="#">solstice-guidelines-for-applicants (1).pdf</a> <a href="#">JPI Climate - Topic 1: Societal Transformation Pre proposal - Insights</a></li> </ul>
Wicher 2024 research article analysing call for SOLSTICE 2019 projects	Wicher, M. (2024). The translation of transformative policy ambitions in funding research for climate change. <i>Science and Public Policy</i> , 51(6), 1156–1168. <a href="https://doi.org/10.1093/scipol/scae055">https://doi.org/10.1093/scipol/scae055</a>



SINCERE Evaluation of SOLSTICE call	Göd, A., Worliczek, E., Haindl, M., and M. Malnaca (2022). Ex post analysis of the SOLSTICE Call. Deliverable 3.12, Internal report SINCERE project.
End term meeting report of SOLSTICE 2019	Confidential
Complementary documents	<ul style="list-style-type: none"> <li>• Standal, K., Legris M. and A. Revez (2025). Filling Research Gaps for Enabling Societal Transformations in the face of Climate Change. Background note on Thematic Areas for Research Call SOLSTICE 2.</li> <li>• West, J., and Worliczek, E. (2019). Operationalising Knowledge on and for Societal Transformations in the face of Climate Change. White Paper to the JPI Climate Governing board.</li> </ul>

### 3.3 Limitations of this study

This study provides a qualitative analysis of lessons learned from research projects funded under the SOLSTICE program of JPI Climate. Our findings provide nuanced and detailed understandings of mechanisms and experiences concerning stakeholder engagement in the research call and the research projects to give insight into how stakeholder engagement of SOLSTICE relates to societal transformation. However, the research findings have limitations. First, this study is conducted in 2025, and several projects had ended years in advance. For the 2013 call projects there was therefore very limited data, and consequently the analysis mainly concerns the 2019 call projects. For the 2019 call projects, the LPIs did not recollect all details of the projects. This problem was addressed through document analysis as a complementary method.

Another challenge concerns providing quantitative information of stakeholder engagement across the projects. The final reports and interviews do not provide uniform information to allow for an assessment of the resource requirements of engagement efforts (e.g. approximate number of stakeholders involved per project, the duration and frequency of engagements, and the types and number of interactions). This makes it difficult for research funders to assess budget needs in future calls. Further, the complex nature of societal transformation and stakeholder engagement makes generalizable and quantitative assessments very challenging. The efforts used in different projects may have been roughly the same, but the outcomes very different, as the outcomes depend on a number of internal and external factors. In the lessons learned, the need for monitoring and evaluation of societal outcomes is taken up. A more uniform approach to reporting results may be an integral part of this.



## 4 Results and analysis

In this chapter, we present the findings and our analysis thereof. First, we present the findings from the SOLSTICE calls and proposals with the aim of answering research questions 1 and 2 (cf. chapter 3). Thereafter, we present findings from interviews and document analysis of the SOLSTICE projects with the aim to answer research question 3-5 on stakeholder engagement, justice, systemic change and policy relevance of the projects. At the end of the chapter, we provide a more in-depth view of stakeholder engagement and impact on societal transformation in two SOLSTICE projects that worked specifically on transformative learning.

### 4.1 The SOLSTICE research policy and project proposal selection

This section explores the SOLSTICE calls and the incentives and barriers for stakeholder engagement in the calls.

Both calls on “enabling societal transformation in the face of climate change” (hereafter SOLSTICE calls<sup>2</sup>) for research proposals were joint calls for transnational collaborative research projects within the overarching theme of enabling societal transformation in the face of climate change, organized through the JPI Climate. The foundation of SOLSTICE is described in JPI Climate’s Strategic Research Innovation Agenda 2016–2025, which identified activities explicitly addressing the social and economic sciences and the humanities as a knowledge gap in climate change research (Wicher, 2024; JPI Climate, 2016). Linked to this, the JPI Climate working group ‘Enabling Social Transformation’ initiated the development of the White Paper ‘Operationalizing knowledge on and for societal transformations in the face of climate change’ (West & Worliczek 2019). This process involved representatives from nine participating European countries, with input and advice from the JPI Climate Governing Board and Transdisciplinary Advisory Board. According to Wicher, the White Paper promoted three epistemic dimensions: ‘(1) social sciences and humanities driven, (2) interdisciplinary, and (3) transdisciplinary research—along with preferred outcome-focused approaches to underpin a coherent policy design to fill the research gap identified’ (2019, 1160). This effectively put SSH research at the forefront with the rationale that mobilizing SSH research perspectives and interdisciplinarity would enable knowledge for societal transformations in the face of climate change.

The 2013 SOLSTICE call had two main topics where one aimed to ‘facilitate research activities in the European Research Area that inform and support societal transformations in the face of climate change and in line with sustainable development in Europe and globally’.<sup>3</sup> The call sought to go beyond the European scale and encouraged researchers from countries others than those participating in the funding of the call to join the research projects at their own expense. Interdisciplinarity was not a requirement but stated as preferable. Envisaged societal relevance and impact, goals and objectives aligned with the call theme and contribution to the overall JPI Climate vision were included in the evaluation criteria. The proposal projects should address normative and social justice dimensions of

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<sup>2</sup> Whereas the name ‘SOLSTICE’ was only used in the 2019 call, in this report it is used as a short name for both the 2013 and the 2019 call.

<sup>3</sup> JPI Climate Topic 1: Societal Transformation at NordForsk portal: [Application portal](#)



climate change, the role of knowledge and risk perception in climate-related policies and show clear links to decision-makers and users of climate knowledge as well as potential change agents in society. Involvement of partners from civil society, policymakers, public administration or industry for co-designing research questions and co-production of knowledge were encouraged. Utilizing approaches to the co-design full proposals with stakeholders (e.g. change agents and knowledge partners such as policymakers, regulators, local authorities, business and industry, civil society organizations) were listed as part of the evaluation criteria, as well as added scientific value to be expected from the international research collaboration.

The 2019 SOLSTICE Call specifies the SSH research community to take the lead in understanding and contributing to solving the societal challenges of climate change and opening up new perspectives and understandings on the societal aspects of climate change.<sup>4</sup> The call puts interdisciplinarity as a requirement and the participation of research communities who may not have engaged with climate change research was welcomed. The call lists three main topics to be addressed: A) Social justice and participation, B) Sense making, cultural meaning and risk perception and C) Transformative finance and economy. Further, the projects were required to address a minimum one of the following aspects: 1) Operational upscaling: transfer or extend concrete examples on a micro level (communities, regional, national) to a wider context. 2) Deliberating norms: New analysis opening visions for setting new norms. 3) Systemic approach: where structures and interdependencies between components should be analysed on a macro level without losing sight of the transformative dynamics of the system. In terms of stakeholder engagement, the call asks for effective communication and engagement with stakeholders, as well as creative and innovative routes to impact. Engagement of societal actors in co-production was highly encouraged where appropriate. The SOLSTICE White Paper, which laid the foundation for the 2019 call suggested that transdisciplinary research should be incorporated as a requirement in all future calls for proposals. However, in the 2019 call text this was only stated as an encouragement and not a requirement. The call states, however, that projects should “have an impact on society and policy; impact should not be limited to scientific publications but should have the potential to trigger change in behavior and attitudes at any level of society”. These aspects were included in the evaluation criteria in terms of strategies for disseminating and discussing the results of the project with a range of societal actors, including decisionmakers, and ways to diffuse results (co-creating by-products and support of the research consortium to policy development, economic benefits, change of practice, awareness of the general public, cooperation with NGOs or citizen initiatives, etc.).

The peer-reviewed research paper from Wicher (2024), applies the 2019 SOLSTICE funding call as a case on transformative policy ambitions in funding climate research.<sup>5</sup> This research article provides highly valuable insights into the potential for improving the transformative outcomes of SOLSTICE. Wicher pays particular attention to the dimension of transdisciplinary research and projects’ outcomes in terms of

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<sup>4</sup> [solstice-guidelines-for-applicants \(1\).pdf](#)

<sup>5</sup> The material for the article is the publicly available documents related to the SOLSTICE call, confidential documents including material related to the call writing workshop, successful project’ proposals as well as interviews with people involved in the development of the SOLSTICE call, the proposal evaluation procedure, and the development and implementation of funded proposals. Wicher (2024) interviewed three JPI representatives and the LPIs of the funded projects



societal impact in her analysis. According to Wicher (2024, 1167): “The most significant barrier identified is the national-level criteria that limit the ambition of fully involving non-scientific partners and stakeholders as eligible project participants”. The reasons for not including transdisciplinary in the call text were stated to be the limited funding available for private sector among some of the funding countries. According to Wicher, this resulted in multi- and interdisciplinary projects, rather than transdisciplinary co-creation. Four of the SOLSTICE 2019 projects spanned a high degree of disciplinary diversity, and collaboration between disciplines that are further afield from each other, e.g. including both SSH and environmental and water engineering. There was a diversity within the social sciences, but the humanities were less integrated.

Wicher (2024) notes that in the starting phase individual research partners worked separately on different discipline-based tasks, with selective activities of collaboration and co-creation with stakeholders. Wicher’s study ends after the mid-term review, while several projects were planning to increase interdisciplinary collaboration towards the end of the projects. To quote Wicher:

*“Most projects indicated that the final year of the projects would serve to bring together their distinctive (partner and discipline-based) contributions and collectively produce outputs dedicated to reaching project goals. At the same time, interviews also showed the perceived added value of the necessary efforts to build understanding and communication between the participating disciplinary partners—even if only for activities such as scientific publications that typically occur relatively late in the project cycle” (Wicher, 2024, 1166).*

Wicher (2024) argues that the call text should be clearer on the distinction between projects outputs and outcomes. Projects that received funding focused on research outputs and publication of scientific articles rather than on societal impacts. The projects’ ambitions for how the output (knowledge produced) could mobilize societal outcomes were mainly through “individual or workshop-based presentation of results, collection of feedback, or how further work on outputs (such as toolkits, handbooks, policy briefs, or dissemination materials like videos) could be structured and prepared from the stakeholder’s perspective” (Wicher, 2024, 1164). According to Wicher, only a few projects were planned to engage more directly with local communities, neighbourhoods or schools and use visualization techniques and arts-based methods to capture interest. Further, Wicher argues that “the Call text seemingly did not motivate an intensified effort to develop a strategy for generating societal impact pathways for the most successful consortia “(2024, 1164). This may also be connected to a need to conceptualize whether the research is to be transformative research or research about transformation. Limited funding of projects also requires trade-offs in how resources are spent, and in this context, publishing articles may be prioritized as it is vital to build new knowledge that is peer reviewed.

On the positive side, Wicher (2024) notes how the SOLSTICE 2019 call encouraged experimentation with SSH leadership, which is important from the perspective of transformative research and innovation policy. Widening the interdisciplinarity may lead to more innovation and learning between disciplines. The end-term meeting report of SOLSTICE 2019 also highlights experiences with the call and implementation of SOLSTICE 2019 projects. One key message is that SSH have played a vital role as critical enablers for a just transition and can significantly influence policymaking when outcomes are



effectively disseminated. According to the report, SOLSTICE 2019 projects were successful in attracting both experienced and non-experienced researchers, emphasizing the clear added value through interdisciplinary interaction. In this regard, various projects within SOLSTICE have incorporated interactive materials such as toolkits, videos, comics, and blogs in their dissemination activities, enhancing outreach to a wider and more diverse audience. The report also notes that some SOLSTICE projects were keen to continue dissemination but lacked funding for this.

The SOLSTICE 2019 call was also evaluated through the project SINCERE: Strengthening International Cooperation on Climate change.<sup>6</sup> This evaluation focused mostly on the lack of applicants for the topic of transformative finance and economy. However, it also points to a short call deadline, which may have been insufficient to deliver well-thought-out proposals, especially for younger researchers. Further, it mentions that different rules to partners from different countries may be problematic. The evaluation also suggests that non-academic stakeholders should be eligible for funding to increase outreach and motivation for collaboration and that more funding organizations should be invited to participate in the call to enhance collaborations across countries. Further, outreach should extend beyond usual networks to diversify applicants.

The interviews with LPs also provide insight into their experiences of the SOLSTICE calls. Several LPs expressed that the SOLSTICE calls enabled opportunities to use the projects as a testing ground for new approaches to research topics and disciplines/theories. The flexibility of the SOLSTICE calls (2013 and 2019) was seen as a catalyzer for exploring such experimentation (as opposed to other research funding channels). Opportunities for research to experiment is an important building block towards enabling societal transformation as it brings new perspectives into research fields on mitigation and adaptation, thus advancing the knowledge field. Further, the financial model for the projects ensured that all national partners were invested in the administrative parts of the projects and not just the LPI. However, some LPs also experienced challenges concerning different requirements from different national research funders. In two projects this caused a year of delay and problems of financing. Further, the context of COVID-19 was seen as a barrier for reflexive learning and interdisciplinarity within projects and between projects by many. This was related to the difficulty of meeting in person.

Some LPs suggested reforming the way SOLSTICE projects engage with each other, to contribute to more effective and meaningful knowledge exchange enhancing the projects' impact. A concrete suggestion was to organize joint meetings between researchers to facilitate learning and more organic dialogue. This would allow such meetings to be used for problem-solving concerning mutual problems (such as recruitment of stakeholders for research activities etc.) instead of 'showcasing' exercises. Other suggestions were skill-training on stakeholder engagement from experts (externally or within the projects). Finally, some LPs stressed that the call texts should be very explicit on expectations of how stakeholder engagement should be carried out to ensure equal footing between applicants who are well-versed in co-production and those who are not.

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<sup>6</sup> The SINCERE project evaluation of the call conducted interviews with four Austrian experts to investigate possible explanations for the lack of interest and expertise. Due to their limited number, the experts' response must be understood as indicative.



## 4.2 Stakeholder engagement in the SOLSTICE projects

This section explores how the SOLSTICE projects incorporated stakeholder engagement and factors for success or failures. This includes how the projects addressed power asymmetries in the engagement process.

The document analysis of the SOLSTICE 2019 projects shows that key stakeholder groups were policy makers, non-academic experts, citizens and NGOs. All projects included stakeholder engagement with policy makers and non-academic experts. Policy makers (including politicians and administrators at local, regional and national levels) were mainly involved as recipients of results, and they were typically involved through seminars and meetings. In some cases, policy makers also provided input on problem definitions in the early phases of the project. While policy makers were engaged in all the projects, they appear as an important stakeholder group in four of the projects, and as a secondary/less important stakeholder group in the three remaining projects.

Non-academic experts include a wide range of experts, for instance national park managers, energy system experts, librarians, and artists. They were typically involved in organizing events or producing materials for the broader public or main target group of the project, and in reaching out to the relevant target groups. The engagement of non-academic experts is largely described as a cooperation between equals, where the researchers and the non-academic experts contribute with their different expertise and network. The cooperation is in general described as successful, where the participation of the non-academic experts has contributed to getting in touch with relevant target groups (citizens/ particular groups of citizens) and communicating with them in tailored and user-friendly formats relevant. Examples of cooperation with non-academic experts include production of films/videos (Just Scapes and 202cm) and musical performances (CLEAN Cultures).

Citizens were engaged in five out of the seven projects, in four of them as a primary stakeholder group. In several of the projects, engaging with groups that were perceived as under-represented in climate policy discussions, for instance young people (CCC-CATAPULT) or the rural population (202cm) was at the core of the projects. Other projects aimed at reaching citizens in specific communities more widely, including those who would not necessarily go to a climate change event. A variety of methods were applied for engaging with citizens. In most projects, surveys and/or individual or group interviews were used in combination with more creative work. In some projects, a group of citizens was involved over time and participated in workshops with co-production of communication materials or toolkits targeted at policy makers. A wider range of citizens were engaged in activities where they could drop by, for instance climate cafés or events at local markets. Artistic performances, quizzes, games and bicycle repair offers were used for initiating conversations with the broader public. In one project, some of these activities were targeted to children and teens.

NGOs were engaged in at least four projects and religious communities in one (CLEAN Cultures). They were sometimes involved in expert roles, for instance providing input on research questions, and sometimes as informants, participating in interviews and workshops. The NGOs involved appear mostly to have been climate or nature NGOs, although this is not fully clear in all the projects.



Several projects emphasize the involvement of groups that are under-represented in climate discussions or aim to reach out to a broad audience. In this respect, aspects of procedural justice are identified. On the other hand, none of the projects specifically involves stakeholders from vulnerable groups (though several had these groups included in the area of research). The selection of NGOs seems to contribute to hearing voices that represent climate and environmental interests, while a broader range of NGOs could have been relevant stakeholders based on the objectives of the projects. For instance, organizations representing low-income groups, local industry or farming interests could have been relevant stakeholders in some projects.

The timing and methods of involvement varies between the projects. In at least four projects, stakeholders were involved in early phases of the project, including to some extent in providing input on research questions, methods or selection of case studies. The stakeholders involved early are mostly non-academic experts, NGOs and to some degree policy makers, while citizens are mostly involved at a later stage. The degree of co-production varies significantly between the projects: in certain projects co-production activities were a central part of the projects, while in other cases stakeholders were involved in providing input through for instance interviews, and as recipients of results, but not (or only to a small degree) through active co-production.

The interviews with the LPIs provided a deeper insight into LPIs' experiences and understanding of applied stakeholder engagement. As noted, most SOLSTICE projects engaged with policymakers, but also government administration at all levels, different regulators or institutions responsible for e.g., nature protection (national parks and directorates). In addition, some projects brought in perspectives from other experts such as architects, consultants, enterprises that develop risk management infrastructures, transport companies etc. Further, some projects were engaged with civil society organizations, local communities, residents or consumers. However, according to the LPIs, most projects did not have non-academic partners that engaged in the decision-making process of the project or included in the research team throughout the project period. The choice of stakeholder engagement was according to LPIs done with reference to their relevance for the project topic, or in some cases to deliberately include voices not often heard in the climate action debate/dialogue. Some LPIs also reflected on how the projects 'were missing' some stakeholders. This was related to consumers, local communities or vulnerable groups, those that most often have fewer opportunities to influence policy processes and public discourses on climate action. The need to engage with these groups was sometimes discovered in retrospect. Often these groups can also be harder to recruit and to engage in meaningful engagement (together with policymakers and experts).

*What we were missing was the communities themselves - the residents, vulnerable groups and so on. They were included in interviews, but not as stakeholders in the project. This is very important and something I would like to address in future research (LPI SOLSTICE 2019 project).*

The question of resources for stakeholder engagement was frequently taken up by the LPIs. Engaging with stakeholders requires time to build trust and to ensure meaningful dialogue that leads to results. Many LPIs mentioned stakeholder engagement as something that happens when co-producing publications (both popular science and in publications e.g., in CCC-CATAPULT).



*The toolkit was an important resource for stakeholder dialogue, and we had several interactions with policymakers that provided input on focus and design, enhancing the relevance (LPI SOLSTICE 2019 project).*

The time used for stakeholder engagement also comes in addition to the time needed to ensure reflexivity and learning across disciplines in the projects. Some projects had designated personnel in the team to handle stakeholder engagement:

*An important dimension for engaging successfully with the policymakers was the hiring of a policy advisor who worked on the toolkit and who coordinated the talks with policymakers (LPI SOLSTICE 2019 project).*

Several LPIs also emphasized the benefits and challenges of stakeholder engagement. Projects that included stakeholders as partners in the research team (informally as they were not included in project budgets etc.) did not always experience that this led to co-production in terms of developing research design etc.

*They [Stakeholder partners] were included but had a more advisory board and gatekeeper function and not co-production on research design. This was something that happened without any plan or intent. Co-production is challenging (LPI SOLSTICE 2019 project).*

The project referred to above did integrate co-production through established and tried methods (visionary workshops). But these were integrated in the project in terms of specific research outputs. Some projects also experienced that stakeholder partners did not have interest in engaging in research design. For one project this was due to disagreement on the project focus:

*The stakeholder partner (...) wanted the project to have a narrower focus on justice in the project. When our scope was decided to also include other vulnerable groups, as we (researchers) felt important, they lost interest (LPI SOLSTICE 2019 project).*

In the interviews LPIs were also asked about unintended or negative consequences of stakeholder engagement. This aspect is often overlooked as stakeholder engagement has become a norm that is rarely questioned. Power relations between stakeholders, and between stakeholders and researchers can result in some dominating narratives. Building trust, long-term engagement and managing conflicts were important strategies used by LPIs to ensure that all stakeholders participated on equal footing. Also, creative methods through arts or co-producing in workshops and writing were used for these purposes.

While only a few LPIs reported that some stakeholders dominated the narratives or the process, some LPIs experienced engagement with stakeholders challenging because their work was related to values and norms people are invested in. This was a common challenge for many projects, but especially those dealing with land issues and nature conservation, which require new uses of land that have distinct historical, cultural and power dynamics attached to their ownership and use. As described by one project:



*There were hard tensions between some groups, especially NGOs and public policy. In two cases we had to have separate sessions to get input from them, because they refused to talk to each other. We had many difficult discussions and in one case there were a lot of emotions, and some from the policy administration cried in the workshop. We tried, but we are researchers - not peacekeepers. It is important to be realistic of what research can achieve (LPI SOLSTICE 2019 project).*

Other negative and unexpected events were related to stakeholders going out of business and difficulties in handling stakeholder emotions. These events were useful data for the research, but nevertheless challenging. One example mentioned by an LPI was how the engagement process can put a strain on stakeholders and reinforce feelings of frustration and distrust:

*In some of the workshops and focus groups, stakeholders expressed disappointment because they had several times provided their perspectives in different contexts – but despite our research findings the transformation is dependent on political decisions. This leads to frustration for stakeholders contributing. It can also lead to a lot of time and resources into knowledge building and exchange - which is never implemented since political decisions concerning the concrete case-studies might go a totally different way (PI SOLSTICE 2019 project).*

Some projects also had surprising findings where their theories and methods were not in line with expected results:

*An unintended effect of the interventions was that often there was coherence in opinions and people therefore were not challenged to reflect on their own perspectives versa others. It was positive for participants that felt a unity, but not the outcome that was intended from research side (PI SOLSTICE 2019 project).*

In line with previous findings on the LPIs experience with the SOLSTICE research calls, some LPIs also highlighted that stakeholder engagement can be difficult to manage in interdisciplinary research projects. Many LPIs described a strong expectation to engage in transdisciplinary research and co-production with stakeholders; however, they also noted that this is a science field in itself and requires specific skills and expertise. As a result, not all members of interdisciplinary research teams felt a sense of ownership or sufficient competence in this area.

As expressed by one LPI:

*Social science has distinct approaches to co-production which are challenging for other disciplines. The natural scientists in the project just wanted to talk to the stakeholders. We had many discussions on methods (PI SOLSTICE 2013 project).*

Another important point mentioned in relation to impact of stakeholder engagement on enabling societal transformation was the aspect of systemic monitoring and evaluation. Measuring impact of stakeholder engagement (and research in general) on societal transformation is difficult. Most LPIs had



experiences and stories of ‘real impact’, but they felt they did not have the resources for following up and making a systematic assessment of impact.

In the document analysis of the SOLSTICE 2013 projects, we found that the projects predominantly maintained a citizen-focused perspective. Two had a focus on individual citizens or households (EPCC, HOPE), two focused on a community level (MOBGIs, TRANS-ADAPT), and one (HUMANOR) on certain subgroups within society (indigenous people). The stakeholders involved directly represented these groups. Only in one project, policy makers were directly involved, according to the available information. One project (MOBGIs) relied on media analyses to examine grassroots initiatives, involving no direct engagement during the data collection phase; stakeholder engagement occurred only in the recommendation phase, where policy advice was discussed with NGOs and leading grassroots initiatives.

HUMANOR states that stakeholders were engaged in all phases of the research. In the other projects, the engagement seems limited to the data collection phase and for MOBGIs to the recommendation phase. Data collection is mostly done by qualitative surveys or interviews. One project used the method of case studies (TRANS-ADAPT), which also included workshops that gathered stakeholders to the relevant cases of local flood risk management. The HUMANOR project involved a mixed methods approach within the ethnographic field (study of human society and culture through immersion in the field) and natural science/biology. This included participant observation in the field (reindeer herding communities); GIS mapping of cultural heritage sites as well as contemporary human-animal agency and landscape use; reconstruction of past human-animal relationships and environmental histories through means of e.g. terrestrial and lacustrine pollen records; soil-based analyses and lastly visual anthropology, including audio-visual documentation of oral histories (myths, legends).

In the information available, we did not find clear evidence of deliberate (or normative) co-production (cf. Bremer & Meisch, 2017) in any of the projects. However, for TRANS-ADAPT and HUMANOR, there are some indications of such co-production, but information is lacking about the way these projects approached co-production. The various projects aimed primarily to collect citizens’ views, build public support and awareness, and enhance willingness to act.

### 4.3 Dimensions of systemic change and policy relevance in SOLSTICE projects

This section explores how dimensions of systemic change and policy relevance were integrated into projects’ focus and stakeholder engagement.

The document analysis of the SOLSTICE 2019 projects shows that all projects had ambitions to influence deep structural change (instead of short-term improvements) and pathways to reach these changes. While some projects focus mostly on transition (improving the existing), other projects emphasize transformation (doing things fundamentally differently). In some projects, the concept of transformation was also mentioned in the objectives (CCC-CATAPULT, Just Scapes, CLEAN Cultures). In most projects, the method of case studies was used. However, simply having case studies is not enough to show systemic ambition, and we observe that in various projects conclusions were formulated above



the individual case level. This also indicates a move towards systemic thinking, as it shifts the attention from individual cases to underlying structures and dynamics and supports development of more generalizing insights and not just local improvements. For instance, the project ROLES organized monthly consortium meetings to work towards synthesizing project outputs. Most projects analysed institutional barriers, governance structures, economic and political frameworks.

Regarding *policy change*, the level of engagement was also uneven. JUSTDECARB and CCC-CATAPULT both worked directly with policymakers and produced tools, workshops, and policy briefs designed to influence policy thinking. ROLES demonstrated concrete policy influence through the transfer of a mobility scheme between cities. SOLARIS also provided practical tools—the Practitioners’ Guide and Justice Box—to support fairer policy development in climate adaptation. Other projects engaged policymakers more indirectly: Just Scapes supported communities in drafting ‘just transition manifestos’ used to influence local authorities. 202cm and CLEAN Cultures highlighted political relevance but did not articulate explicit policy-change strategies.

The interviews with the LPIs provided a detailed and nuanced understanding of how visions of systemic change and policy relevance were operationalized in the projects. Across the projects, the visions to enable societal transformation were primarily knowledge oriented rather than aiming for societal transformation directly with stakeholders, according to the LPIs. Several projects aimed to provide deeper understanding of transformation processes in different contexts – and a few projects explored scientific methods case by case to enable stakeholders to reflect on their perspectives and roles and thus facilitate change of practices (see also chapter 4.6 for in-depth analysis of projects engaging in transformative learning). Some projects worked to provide analytical frameworks for climate transition relevant for policymakers or other actors (e.g. toolkits). Interviews with PIs also emphasized the limitations of what research projects can achieve in terms of societal transformation and systemic changes and the need to balance expectations for research and to respect the role research plays in society. Several LPIs also expressed how their research projects pushed the research frontier in many respects. This included exploring new topics or using new disciplines and theoretical approaches to a topic, or test out more practical solutions in co-production – thus using existing knowledge in new ways. The flexibility of the SOLSTICE calls (2013 and 2019) was seen as a catalyzer to explore such experimentation, as opposed to other research funding channels. Opportunities for research to experiment are an important building block towards enabling societal transformation as they bring new perspectives.

How projects are aligned with policy processes and policymakers is also highly relevant for understanding their potential impact on enabling societal transformation. In all projects the engagement was consultative and often on a general level, rather than targeting particular policy processes. However, several PIs described how working with policymakers or government administrations at different levels was a core element of the project stakeholder engagement and influenced policy processes. This seemed to develop organically through dialogue from interviews, workshops, conferences. Several PIs stated that this contact was continued after the project ended (particularly contact developed through local or national case studies). Some researchers are still consulted as group of experts for advancing policy in the domains of the project topics.



*The JPI SOLSTICE call opened the door for interdisciplinarity and making use of existing research in new ways. It provided a test ground for ideas that were totally new back then... Now we see that these ideas have entered into (...) management strategies (PI 2013 SOLSTICE project).*

From the documents available, little evidence of visions regarding systemic change was found for the 2013-call projects. Some projects touched on aspects of societal change, such as calls for a new public discourse (e.g., on mobility in the HOPE project, on modern nomadism in HUMANOR). In others, the connection to societal transformation was limited to formulating recommendations for governments on how to communicate effectively to the public, based on the available information. Regarding institutional change, one project (TRANS-ADAPT) mentioned the added value of citizens and local communities' initiatives, in the sense that it may complement existing top-down initiatives by local governments. Their findings showed that success and failure of community-based initiatives rely on resources and capacities at local, regional and national level. HOPE similarly highlighted the importance of governmental investments to make the healthy and sustainable modes of mobility easy and affordable. Together, these findings underscore that both communities' initiatives and sustainable behaviors among citizens rely on adequate support and resources across multiple levels. Several projects recommended involving civil society in policy decision making by fostering a public discourse about sustainable topics (HOPE, HUMANOR) or by addressing local governments to facilitate community initiatives (MOBGIs). Some projects (EPCC, MOBGIs) provided recommendations for policymakers on how to communicate more effectively with citizens.

#### 4.4 Dimensions of justice in the societal transformation in the SOLSTICE projects

This section explores how dimensions of justice were integrated into projects' focus and stakeholder engagement.

In terms of social justice, the document analysis of the SOLSTICE 2019-call projects shows that social justice received attention in various ways across the projects. In our analysis we have paid attention to the 'three tenets' of social justice: distributional justice, recognitional justice and procedural justice (including inter and intra-generational justice). In all projects justice was directly linked to the engagement of citizens. Several projects (JUSTDECARB, CCC-CATAPULT, SOLARIS, JUSTSCAPES) explicitly addressed vulnerable groups in society. They examined which communities face heightened risks or disadvantages and how these groups might be more fairly included or protected in transition processes. 'We explore which actors are vulnerable to adverse impacts from decarbonization and in what ways, and how they could benefit from opportunities created by the transition' (JUSTDECARB).

In these projects, social justice was closely linked to recognizing and responding to inequalities within the population. Other projects framed social justice primarily around the fact that citizens were included (ROLES, 202cm, CLEANCULTURES), alongside other actors such as policy makers, experts and NGOs. Where SOLARIS integrated all three dimensions of social justice - recognitional, distributional, and procedural - other projects addressed only one or two dimensions. Several projects showed attention to *Recognitional justice* through distinguishing certain social groups and mentioning barriers to their



inclusion. These projects explicitly paid attention to which groups within society were included, vulnerable or overlooked. JUSTDECARB identified which actors were vulnerable to adverse impacts from decarbonization. CCC-CATAPULT emphasized better understanding the views of young people. It acknowledged difficulties in securing diversity within Youth Advisory Panels. Therefore, a youth-focused Climate Café was organized, that aimed at widening participation and designing more inclusive engagement spaces. ROLES also identified groups vulnerable to exclusion. The project recognised the importance of including diverse users of energy systems, among these everyday citizens. Their final-end report mentioned social inclusion briefly several times. SOLARIS examined which citizens are invited into public policy and which remain excluded. The project noted that some groups lack equal capacities to engage. Clean Cultures, although not mentioning justice or related terms (equity, fairness, ...), demonstrated a recognitional orientation by actively reaching out to citizens of different ages, including children and teens, and involving different religious communities through activities designed to appeal to a broad audience.

*Distributional justice* was addressed more unevenly across the projects. It appeared mainly in two projects that examined responsibilities, and risks of exclusion in socio-technical or policy transitions. SOLARIS explored distributional questions most directly: it investigated whether fairness was “brought to the table” and examined how responsibilities and capacities for self-reliance—particularly in the context of flood risk management—are distributed across different social groups. ROLES also implicitly touched on distributional justice by identifying users vulnerable to exclusion in energy transitions. ROLES highlighted the effectiveness of formats that facilitated exchange between diverse stakeholders and emphasized fair deliberation around socially just energy digitalization. This suggested at least awareness that benefits and burdens of digitalization may not be shared evenly. In contrast, the other 2019-projects had limited or no explicit treatment of distributional impacts.

*Procedural justice* was a concern across multiple projects that focused on participation and inclusion (fair processes), though with varied approaches. SOLARIS made procedural justice a core analytical lens: one of its central research questions focused directly on participation procedures, and its findings were that not all citizens are equally able to speak, be heard in participatory spaces, or influence policy. Just Scapes focused on procedural justice through engaging with rural communities that may be under-represented in climate policy discussions. 202cm did not explicitly address justice, but the project did raise procedural concerns by identifying differences between lay people and politicians. Also, the influence of commercial lobbyists on political decision-making was identified as something that might distort fair representation of public interests. These observations contribute indirectly to debates on procedural fairness. CCC-CATAPULT sought to create meaningful participatory procedures through Youth Advisory Panels and inclusive Climate Cafés.

*Epistemic justice* concerns were acknowledged but not deeply addressed.

The interviews with the LPIs provided a deeper insight into how the projects operationalized and understood social justice and how it related to their overall vision for enabling societal transformation. In the interview with the LPIs, the projects varied extensively in terms of how they addressed social justice in the context of societal transformation. Six projects answered to the call’s thematic focus on



justice and contributed to the theoretical and empirical research field on justice and climate action transformation. Also, some of the projects that did not have this as an explicit focus were aware of justice challenges in their work and indirectly dealt with justice issues (e.g. distribution of costs for climate action measures) in stakeholder engagement. The projects worked in different ways to highlight distributional justice from climate policies, inclusion of stakeholders from a diversity of groups or marginalised voices/perspectives in climate change discourse, to just procedures in climate policy implementation. Some projects also explored new conceptualizations of justice and highlighted how justice dimensions are missing from conventional approaches in their fields and how justice is linked to deep-rooted local cultures and history. Very few of the projects included intersectional approaches to marginalisation (gender, functionality, ethnicity etc.) beyond descriptive results based on indicators such as income, geography/exposure etc.). Several LPIs expressed that addressing justice dimensions had been a space for learning (bringing it into new policy or academic fields) and some had also been challenged by stakeholders in this process, which again prompted a deeper understanding. Several also expressed a wish that the work on justice could and should be expanded in new research in this field as understanding justice elements is essential to ensure relevant climate action policy outcomes in terms of efficient adaptation and from a moral standpoint concerning costs and impacts of climate change.

*How justice was operationalized was linked to the dimensions brought out in the workshops with the different stakeholders. This revealed how justice is enmeshed in the history and culture of landownership and practices. Further the project also deals with incorporating and recognizing different types of knowledge – such as local knowledge (PI SOLSTICE 2019 project).*

Another issue concerning SOLSTICE program's ability to enable societal transformation in terms of systemic change and justice is the geographical aspect. As shown in the introduction (Figure 1) partners of the project consortia are predominantly from Western-European countries. Central, Eastern, or Southern European countries (apart from Italy) are almost absent, and only one examining EU-Eurasia relations (West Siberia, Russia). This pattern is consistent across projects of both calls and is linked with national research funders priorities in the joint calls. This is understandable, but climate change and the need to ensure mitigation and climate resilience are global issues that require global outlook. The geographic distribution of partners reflects a strong Western-European focus, which may shape the perspectives, priorities, and expertise embedded in the projects, and a wider geographic focus will enable societal transformation in important ways. Further, a narrow geographical focus can be seen as a form of recognitional injustice because some realities and voices are systematically left out.

## 4.5 Reflexive learning, trans- and interdisciplinarity and scaling of SOLSTICE projects

This section explores the projects implementation of learning and collaboration, as well as scaling of the results. These dimensions provide an understanding of potential systemic change.

The interviews with SOLSTICE projects LPIs also provided insight into how they had worked with dimensions of reflexive learning in interdisciplinary and co-production methods. Most projects did not have a specific focus on reflexive learning beyond common exchange within the research teams in



regular meetings. These meetings were often used to update each other on progress and challenges in the different national contexts, and each country had their own research team and often their own case-study or work package/research activities. Learning was then mostly taking place within national teams. However, several of the LPs explained that their project had spent considerable time on interdisciplinarity (often more than expected). This occurred in projects that ventured into new approaches or fields. Then discussions concerning disciplines and conceptualizations and development of new frameworks took considerable time and needed to be aligned within the larger research groups. Some projects also encountered significant challenges in recruiting participants for interviews, workshops etc. and thus also spent considerable time discussing and learning across (national) cases to solve these issues. Further, some projects also had co-production or transformative learning as a premise, and knowledge exchange across levels and actors, as well as reflexive learning, had a natural place in the projects' practices and work. Only one project mentioned making use of a particular software platform for learning, while others primarily used workshops and similar formats. CCC-CATAPULT also used methods of storytelling.

Some LPs also referred to this learning as impact of the project:

*The learning process of working with stakeholder engagement and in building the research group was really positive and valuable outcome of the project. We could have had even more effect with more impact if we had a larger audience. Instead, we managed to build deep relations. The project had a pedagogical effect, leading to new relationships, new working methods, and new networks. (LPI SOLSTICE 2019 project).*

The LPs also related their experience and views on the scaling of their projects into concrete societal change, knowledge exchange or scalable innovations or research activities. Reflexive learning mentioned above was one dimension of scaling. Since all projects involve several countries, SOLSTICE has pushed for knowledge exchange across a selection of European countries. Other stories of scaling concerned development of technology (platform for tool sharing) with stakeholders, expert consultancy for policy processes (nationally) or toolkits and frameworks attracting interest from local governments and actors such as the UN. However, most scaling was presented in terms of expanding the research activities and early career development. As noted by two different LPs:

*A major output of the project was the practical learning that came out – knowledge of budgets, handling consortium problems, building research groups and involving stakeholders and so on (LPI SOLSTICE 2019 project).*

*The project had a very good network and led to career development for many researchers – also leading to permanent positions. We managed to maximize synergies and spin-off projects with Master students, art collaboration, numerous extra publications and also a new project (LPI SOLSTICE 2019 project).*

None of the projects had led to direct changes in policy, new technologies (except one) or patents. But this is expected as SSH projects offer deeper insights into power relations and mechanisms that



influence human behavior and the frameworks and knowledge produced are not easily transferable to all contexts, the business or policy sector.

## 4.6 SOLSTICE projects exemplifying transformative learning

This section presents two of the projects from the 2019 call in more detail to exemplify the use of co-production methods and visions for societal transformation. These projects both applied approaches for transformative learning (Portus et al., 2023; Mezirow, 2008) to co-produce results with groups from civil society, which have been less included in the SOLSTICE projects and climate research in general.

### 4.6.1 Challenging the Climate Crisis: Children's Agency to Tackle Policy Underpinned by Learning for Transformation - CCC-CATAPULT

Young lives are impacted by climate change and will continue to be impacted by climate change for the foreseeable future and CCC -CATAPULT responded to the societal and academic need for examining how to incorporate young people's meaningful involvement in climate research (Portus et al. 2024). The project utilized a mixed-methods approach including 1) an international survey of young people; 2) interviews with teachers and other supporters of young people's learning; 3) focus groups with young people; 4) narrative activities combining deep mapping and storyboarding techniques with young people (McEwen et al., 2020). Using these methods, the project has explored how young people and key educational actors understand the value-action gap in tackling the climate emergency, and how legitimate transformation can help reduce this gap. A major component of the project was the formation of Youth Action Partnerships (YAPs) with 15-to-18-year-olds from each partner country (UK, Ireland, Finland, Italy), which engaged in co-production activities.

*Central to CCC-CATAPULT is a commitment for the research design to be developed by and with young people, crossing generational boundaries to bring their experiences and perspectives into communication with work by adult researchers (Portus et al. 2024, 120).*

For example, YAPs engaged in development of the survey, interviews and focus group questions and piloted narrative activities through deep mapping and storyboarding exercises before providing feedback to the researchers. YAPs also co-led interviews with educators, contributed to analysis, reviewed key findings and critically reflected on outputs. Lastly, they engaged in communicating and disseminating the research through writing, policy-focused workshops, helping in developing a youth climate café toolkit, and toolkit for climate education (Portus et al., 2024).

The CCC-CATAPULT project thus has co-production and transformative learning at the core and has published scientific articles and a toolkit highlighting this process. Further, CCC-CATAPULT engaged with educational actors within local and national policymakers and administrators in advisory board functions.



CCC-CATAPULT addresses societal transformation in many ways in terms of recognitional and intergenerational justice through including a group that has less opportunities to influence climate decision-making, though they face climate change impacts consequences made by previous generations' actions. Further, by building the empowerment and knowledge of the young generation concerning climate change and climate action, the project helps educate climate literacy needed for future climate actions.

The project also identifies important issues for future research in the field. Overcoming obstacles for recruiting young people, particularly ensuring diversity was a challenge for CCC-CATAPULT. Their experience suggests that incentivizing participation (e.g. financially) and allowing sufficient time to build trust may help address these challenges. The importance of ensuring equal power dynamics in engaging with young stakeholders is also an important finding of the project:

*Achieving 'best practice' requires researchers to break with traditional power dynamics and help young people guide the process; it is an aspiration that requires substantial and ongoing reflection to achieve (Portus et al. 2024, 129).*

One of the results of the co-production process in CCC-CATAPULT was development of theory and methods for co-production with young people with regards to climate action. The project provided valuable insights on the stories of young people experiencing climate change and transformation, and engagement with young people in a co-productive process, with a focus on critical reflections from young people who were engaged as co-producers on experiences into the research process.

#### 4.6.2 An approach for innovative Climate Learning, Evaluation and Action in Neighborhoods – CLEAN Cultures

A major component of CLEAN Cultures was transformative learning in interventions where neighborhood actors were met with different perspectives to broaden their own understanding and potentially adopt new practices in everyday life (Klößner et al., in review). The interventions were built upon the Transformative Learning Theory (Mezirow, 2008), which is prescribed to enable personal transformation through critical reflection of one's perspectives and beliefs. The theory links to people's stable frames of reference such as e.g. habits of mind, viewpoints, and established cognitive response patterns, which function as barriers for responsiveness to new situations. Encountering other perspectives (disorienting dilemmas) that challenge an individual's frames of reference strong enough to cause discomfort enable critical reflection and transforming the reference frames.

CLEAN Cultures engaged in these interventions within neighborhoods where people interacted in safe environments where they were challenged with different points of opinion on climate change and (in)action on the neighborhood level. The selection of neighborhoods was conducted in each partner country (Austria, Finland, Norway and Italy) with a focus on diversity of living conditions and established contact with local governance actors. The topics were identified in surveys and interviews. The interventions aimed to make actors reflect on their world understanding and the role they play, to ultimately make changes in roles and practices. In the Austrian case the interventions were combined with artist performance (singers performing with songs based on the topic). The artistic performance



helped to create atmosphere for dialogue by ‘breaking the ice’. Similarly, (based on identification of topics) interventions were also done through engagement of religious communities.

The findings of the project show that there is a small positive effect of participating in the interventions on changes in climate friendly behavior in some fields, but less to no effects in others (Klößner et al. in review). In general, the findings support the idea that practices are formed by many dimensions and hard to change. The findings support that the interventions impacted on making social norms salient and building a deeper identification with the neighborhoods. On the unintended effects:

*Participants of the intervention events seem to have less positive attitudes to individual climate action after the event than before, which might indicate that especially very motivated people adjust their attitude levels to the lower average level of the group (Klößner et al. in review)*

CLEAN Cultures did not directly target policy processes, but extended dialogue and engagement with local policymakers within the project to raise their awareness on how climate change affects the lives of their constituents.

The project attempted to enable societal transformation by expanding the range of voices in public dialogue on climate action, and to enable local impact through its interventions, as well as raising awareness of local perspectives among local policymakers. In terms of inclusiveness and recognitional justice, the project had a focus on engaging actors who were less present in the climate action dialogue. This was operationalized through ensuring diversity of neighborhoods. Including rural and urban-rural communities was essential to this but also engaging religious minorities and low socio-economic groups. As an example, in one of the interventions they teamed up with a local gathering event where people who are challenged in terms of their own cooking (e.g. poor) can come and cook together. The outcomes of the co-production in CLEAN Cultures include insights into different societal groups and how they respond to transformative learning in the context of climate action. Further, to facilitate exchange of knowledge and experience, CLEAN Cultures has published guidelines of their methods used for replication elsewhere. The research team has also been asked to do these interventions in other neighborhoods, but this was after project completion and exhaustion of funds.

## 5 Lessons learned on enabling societal transformation in funded research projects

The purpose of SOLSTICE is to enable societal transformation in the face of climate change which requires engagement with a wide range of actors to ensure findings are useful and known. The projects demonstrated the value of engaging policymakers, non-academic experts, and citizens for relevant knowledge production on enabling societal transformation for climate action. The SOLSTICE calls also enabled experimentation with new topics and methods, fostering innovation and interdisciplinary learning. Creative dissemination (toolkits, videos, arts-based methods) enhanced outreach. However, while interdisciplinarity was achieved, true transdisciplinary collaboration where stakeholders also informed development of research questions and design was limited by lack of competence, resources



and time for sustained interaction. We also observe that incorporation of social justice and particularly involvement of marginalized groups was unevenly addressed in the projects. Further, few projects developed clear strategies for impact, scaling results or influencing policy beyond local contexts. Geographic concentration in Western Europe reduced diversity of perspectives, potentially reinforcing recognitional injustice. Ambitions for societal transformation may also have been constrained by short call deadlines, fragmented national rules, and limited budgets. In conclusion, unlocking the added value of SOLSTICE depends on wide stakeholder engagement and co-creation and focus on achieving societal outcomes during project implementation. This requires that these dimensions are clearly outlined in the call text and addressed in eligibility criteria and budgets of the projects. However, even well-designed and well-implemented research projects with state-of-the-art deliberate co-production can never resolve fundamental conflicts of interest. Co-produced research-based knowledge is just one ingredient in democracy. Further, impact takes time and is difficult to measure and prove causally (Turnhout et al., 2020; Wyborn et al., 2019), but we know that co-produced knowledge often increases relevance, and thus increases the chances of impacts, though not always in anticipated directions.

Below we describe the main lessons learned and implications for research policy. As mentioned in the introduction, these results will inform the development of the Deliverable 4.7 “Recommendations to Research Funders” and will feed the design of the 2025-2034 Strategic Research and Innovation Agenda (SRIA), under the umbrella of the Equinox Process.

### **1. Stakeholder engagement is essential but challenging**

- All projects recognized the importance of engaging policymakers, non-academic experts, and citizens for knowledge production on societal transformation for climate action. However, co-production was rare and often limited to advisory roles or dissemination activities.
- Involvement of marginalized groups was only done in a few projects, thus limiting societal transformation in terms of providing holistic knowledge and addressing epistemic justice.
- Stakeholder engagement requires competence and resources. Projects that integrated stakeholders over time achieved deeper relevance and trust. Dedicated roles for stakeholder engagement (e.g., policy advisors, designated research staff) proved effective.
- Resource constraints and lack of clear or limited guidance in call texts were seen as a barrier for stakeholder engagement and may hinder systematic engagement

### **2. Transdisciplinary requires structural support**

- While interdisciplinarity was achieved, true transdisciplinary collaboration was limited in the projects.
- Lack of transdisciplinary as a requirement and budget restrictions on non-academic partners were seen as barriers for transdisciplinary. LPIs also saw required competence for transdisciplinary as a barrier.
- Research calls should explicitly require and support co-creation, including funding for non-academic actors, to move beyond multi- and interdisciplinary approaches.



- Expected outcomes of co-production activities should be stated in calls to enable monitoring whether and how such targets are met.

### **3. Justice dimensions need stronger integration**

- Social justice was addressed unevenly in the projects. Though justice is relevant to the projects in many aspects it was mainly acknowledged in terms of recognitional justice (acknowledging diversity of stakeholders related to the research topics). Deeper understandings of justice dimensions concerning intersectional aspects (e.g. gender, ethnicity, disability) or generational, distributional and procedural justice were less systematically integrated
- Projects rarely engaged with vulnerable stakeholders in their stakeholder engagement processes, thus reducing this group's feedback to research to being research subjects and not as stakeholders with decision-making power (influencing the research design).
- Research calls should require projects to engage with social justice in terms of how research topics are addressed, stakeholder participants in co-production and communication of results to enhance potential for a fair and effective societal transformation on climate action

### **4. Impact pathways and scaling remain unclear**

- Few projects developed clear strategies for scaling results or influencing policy beyond local contexts. Projects lacked resources for systematic monitoring and evaluation of impact.
- Timing of stakeholder engagement is important to provide holistic knowledge on complex societal challenges. Active participation with stakeholders is needed from the onset of the projects to ensure integration of different knowledge systems, but most projects involved stakeholders later in the projects, thus limiting the potential for feedback on research questions and design.
- SOLSTICE projects experimented with creative dissemination (toolkits, videos, arts-based methods) that enhanced outreach to various and potential for application in real-world contexts. However, the main focus was on scientific publications and main outcome was centered on advancing research.
- To include longer term effects, development of a framework to guide the upscaling of outputs and monitoring should be continued after the end of the projects, which requires structural support from research funders and clear guidance and requirements in the calls.

### **5. Learning and reflexivity drive innovation and deeper understanding**

- SOLSTICE calls enabled experimentation with new topics and methods, fostering innovation and interdisciplinary learning, which is essential for new outlooks and original research that can solve complex societal challenges of climate action.
- Few projects had a particular focus on reflexive learning internally or in collaboration with stakeholders, but for several projects the need came up organically. However, several projects



worked in disciplinary or geographical silos thus limiting the inter- and transdisciplinary focus and transformative outcomes.

#### **6. Structural barriers limit transformative potential**

- Short call deadlines, fragmented national rules, and limited budgets constrained projects ambitions for societal transformation.
- Research funders in funding partnerships should ensure a common body of rules that apply to all partners from different countries concerning budgets and transdisciplinary and justice requirements to avoid delays and enable uniformity across projects with different national partners.
- Lacking eligibility of non-academic partners as full partners limits transdisciplinary and inclusion of relevant societal partners.
- Geographic concentration in Western Europe reduced diversity of perspectives, potentially reinforcing recognitional injustice. Research funding partnerships should work towards integration of funding organizations across Europe and beyond to enhance collaborations across countries; and reach out beyond usual networks to diversify applicants

#### **7. Future calls should address emerging challenges**

- New crises (pandemics, geopolitical instability, misinformation) amplify the complexity of climate action. Future research must integrate these dynamics into transformation strategies.
- Calls should emphasize innovative communication, intersectionality, and global outlook to strengthen legitimacy and resilience.





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## Project partners

