

Joint Programming Initiative Connecting Climate Knowledge for Europe (JPI Climate) Strategic Research Agenda, 2016-2025

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1. JPI Climate Vision and Mission

JPI Climate (www.jpi-climate.eu) is a European Joint Programming Initiative of EU **Members States** and **Associated Countries**, in cooperation with the **European Commission**. JPI Climate, comprised of representatives of **ministries and organizations for research funding**, aims through its programme of activities to **connect research**, performers and funders **across Europe** to promote the **creation of new knowledge** in the natural and anthropogenic climate change domain that is **fundamental** and **relevant for decision support**.

The Vision of JPI Climate is to actively inform and enable the transition to a low emission, climate resilient economy, society and environment that is aligned with Europe's long-term climate policy objectives. JPI Climate shall therefore **develop and coordinate a pan-European research programming platform** to provide useful climate knowledge and services.

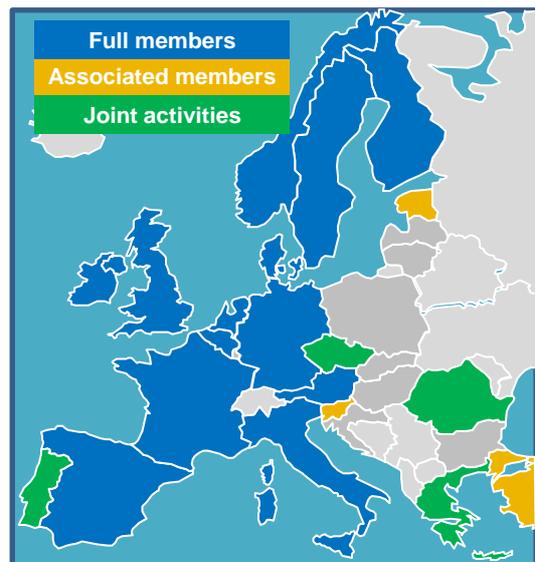
To support and inform EU, Member States and Associated Countries on climate change, including assessment of climate policies and actions (European and national climate strategies and plans, contributions to the UNFCCC, including post COP21 Climate Action),

JPI Climate's **mission** is to promote commitments to:

- **align** strategies, instruments, resources and actors **at national and European levels**;
- **foster** an **excellent science** base, world-class research **infrastructures** and a **new generation** of researchers;
- **cooperate** with partners in **advanced, emerging and developing countries**;
- **achieve greater impacts** through involvement of the public and private sectors in **knowledge creation**, with a stronger focus on **open innovation** and the **role of end-users**.

JPI Climate aims to **connect** the various research **communities** with research **fundors and performing organisations, within and across European countries**, and beyond Europe.

JPI Climate provides a **platform for smarter alignment of national research** priorities and a **support for high impact initiatives** at the European level.



2. Strategic focus areas

This Strategic Research Agenda (SRA) sets out **three overarching challenges and one Strategic Mechanism for developing and supporting excellent, innovative, relevant and informative climate research**. The framing – especially the emphasis on connectivity and synergy – reflects the priorities and approaches of researchers, funders and practitioners in the countries participating in JPI Climate. Our framing principles are:

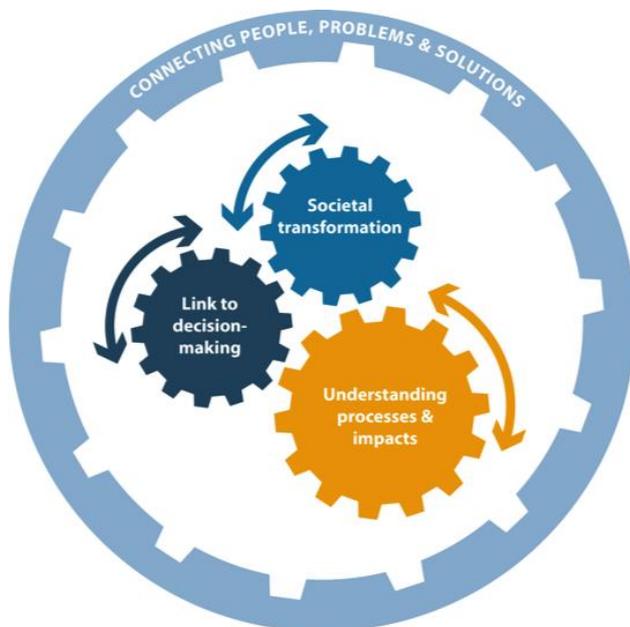
- a reflexive approach to climate change itself and attention to the way in which it is framed;
- self-reflection on knowledge itself;
- investigation that explicitly considers policy and decision processes in their framing;
- integration and coherence across all the modules that compose JPI Climate.

The three overarching challenges are:

- 1. Understanding the processes and consequences of climate change.**
- 2. Improving knowledge on climate-related decision-making processes and measures.**
- 3. Researching sustainable societal transformation in the context of climate change.**

and the Strategic Mechanism is:

Connecting people, problems and solutions in a systemic approach



3. The first challenge deals with building the knowledge base on the climate system and climate impacts that is relevant for strategic planning. The next two challenges deal with linking research and decisions, albeit on different scales. While the second challenge deals with the short-term/incremental decisions and understanding decision making processes themselves, the third challenge deals with decisions in a wider and more holistic perspective, in terms of the long-term transition and development of society. The Strategic Mechanism frames the task of the JPI Climate of enhancing con-

nections as a research topic in itself. JPI Climate aims to work in an international context for all of these three challenges and Strategic Mechanism of its SRA, with a user-

oriented approach and with a focus on integrating research and decision making. The Added Value of JPI Climate

JPI Climate aims to develop coherent research activities across its membership **whilst maintaining creative diversity**. It aims to facilitate cross-border interactions and enable a broader level of research. JPI Climate will help **ensure maximum impact from European research efforts** to respond to information and analysis needs that arise from the challenge of climate variability and change. In terms of process it will specifically contribute to:

1. Enhanced societal relevance. JPI Climate's multi-, inter-, and trans-disciplinary nature will consolidate, strengthen and amplify current climate research, delivering usable knowledge for decision support at all levels across public, private or community sectors.

2. Higher scientific quality. Intensified cooperation between researchers from different countries, scientific traditions, disciplines and perspectives enhances innovation and scientific quality.

3. Long-term continuity. An international collaborative joint programming initiative over decades can transcend the limitations of short-term research programmes and projects, and provide more stability and continuity in research collaboration.

4. Higher effectiveness. Transnational research collaboration avoids fragmentation and duplication of research, takes advantage of diversity and can use resources more effectively, through national alignment or transnational support, by sharing and jointly developing new data from observational networks and modelling, tools, methods and research infrastructure.

5. Stronger global position. A well-coordinated JPI Climate will provide a competitive edge in the global climate change science arena. By providing strong science support, it can also foster Europe's role in international climate policy development.

These five core elements are to be seen in the context of [JPI Climate Governance Principles](#): sustainability, stakeholder orientation, adaptability, transparency and cost efficiency.

Activities will draw upon the [JPI Climate's guidelines on Open Access and Open Knowledge](#).

4. The three main challenges of JPI Climate

CHALLENGE 1: Understanding the processes and consequences of climate change

Aim

Understanding the processes that drive climate variability and change – physical, biological, and societal – is a necessary basis for developing strategies to mitigate and adapt to a changing climate. The aim of this challenge is to **develop a deeper process-level understanding of the multiple drivers and interconnected consequences of climate change** – and to do so with an explicit focus on making new knowledge useful for decision support.

Activities

Activities in this challenge may vary from research projects focused on specific climate processes to investigations of the entire spectrum of human-climate interactions. The degree of multi-, inter- or transdisciplinarity of the projects will be determined by the nature of the questions being addressed and of the desired impacts of the individual project.

Activities under this challenge should ultimately help society to address **current and future climate variability and environmental change** (i.e. from season to century) through a better understanding of trends, potential impacts and response options in order to prevent or limit

climate-related risks (economic, social and ecological) while at the same time addressing other challenges and opportunities. Results from activities supported through this challenge should help us to adapt to the impacts of climate which are now unavoidable, or better anticipate and prepare for those that can be avoided.

Further, this challenge also focuses on understanding the connections and interdependencies between natural and human systems critical for dealing with climate change.

Role of JPI Climate

JPI Climate will strive to promote and define visible flagship activities in those areas where it can add value to existing initiatives through its institutional strength as a transnational platform of research funding organisations (RFOs) and research performing organisations (RPOs), and where it can mobilise national research communities from environmental and life sciences to social sciences and humanities across Europe. JPI Climate will also aim to enhance the effective use of existing infrastructures for research and observation and a better coordination of new infrastructure development. Beyond providing transnational research funding opportunities, it can foster comparison of ideas and approaches from across disciplines, regions and sectors in Europe and beyond to identify best practices, which can be further developed, compared, strengthened and applied to yield potentials for mutual learning.

CHALLENGE 2: Improving knowledge on climate-related decision-making processes and measures

Aim

JPI Climate aims to support society in mitigating, adapting to and reducing risk, to current and near future climate variability and change (typically from months to decades), through **better informing decision-making as part of pathways to sustainability** (see challenge no. 3) in the context of a variable and changing climate.

Activities

Activities addressing this challenge are intended to produce the knowledge and evidence needed at different spatial and governance scales and to provide a better understanding of the use of this knowledge in mitigation, adaptation and resilience decision-making. The activities should also recognize the related nature and potential synergies in risk reduction for climate change and sustainable development.

In identifying and developing these activities, the overarching requirement is that they are the result of a deep and differentiated understanding of societal needs and the potential benefits to be delivered for decisions to address a changing climate with distinct temporal and spatial characteristics. As such, critical to success in addressing this challenge is an understanding of the relative roles and direct interaction between science and practice in defining, developing and delivering the required research and knowledge exchange activities, as well as a clear understanding of the associated barriers and enablers to the exchange and uptake of such knowledge and information within a competitive and interconnected world.

Activities under this challenge necessarily comprise research and knowledge exchange into the efficacy of different decision-making framings and processes at and across spatial scales (from local to global) and sectors in the context of addressing the issues associated with a changing climate. In addition, these activities should include evaluation and assessment of the resulting decisions, climate policies and climate actions in delivering the required outcomes in terms of addressing climate change, including an understanding of their unintended consequences

(positive and/or negative).

Role of JPI Climate

A particular focus of JPI Climate is supporting the development of effective, innovative, relevant and high quality knowledge and information, including through research and other activities (e.g. supporting the development in a broad sense of climate services where the focus is on linking users' needs to climate knowledge). JPI Climate aims to play a fundamental role in facilitating and structuring interactions between excellent science and practice through implementing collaborative research programmes and other activities with a particular and demonstrable value for better informing policies and decisions.

A unique feature of JPI Climate in this context is its capacity to mobilise the breadth of relevant disciplines from across and beyond the wider climate change research communities to provide systemic knowledge and information relevant for various contexts within and across sectors. Activities explicitly addressing the social and economic sciences and the humanities are considered a gap in climate change research, so JPI Climate will continue its efforts to mobilise these disciplines.

The activities comprising this challenge address the link of methodologies and approaches of the natural and social sciences and humanities including behavioural sciences, as well as those of professional associations and groups in a structured and trans-disciplinary way. As such, success will require that activities connect researchers and other experts across disciplines and perspectives in a solution-oriented manner. In addition, a critical requirement is connecting with those making decisions (e.g. through existing networks), as well as engaging others supporting decision makers (e.g. other JPIs with interests in addressing climate change) or others that have explored or are exploring knowledge and evidence needs and possibilities, and the efficacy of decision-making. The latter includes working internationally with those funding and undertaking related research and knowledge exchange activities.

These connections will be instrumental in identifying and effectively understanding and addressing the activities that should be part of this challenge (including through targeted and joint activities), in monitoring and evaluating the results of these activities from the perspective of the intended audiences, and in disseminating the results with the aim of maximising the impacts.

CHALLENGE 3: Researching sustainable societal transformation in the context of climate change

Aim

JPI Climate aims to provide the knowledge and guidance needed by society to respond effectively to the long-term challenges of climate change, while also considering the implications (positive and/or negative) for the other global challenges that society faces. In order to achieve this, it is necessary to prudently **frame climate change in the context of a larger sustainability agenda** and in conjunction with other socio-economic, environmental, cultural and geopolitical goals.

Activities

This challenge is about exploring, assessing and evaluating innovative solutions for climate change mitigation and adaptation in the broader context of integrated pathways toward a sustainable Europe, as well as research on transformation processes themselves.

Climate change and transformation towards a climate-friendly and climate-resilient Europe take place in a multifaceted socio-cultural context. Sustainability objectives need to meet the

various people's visions and needs, and research and other activities undertaken should reflect and investigate actors' diverging interest, values and resources.

Especially within this challenge, there is a need for reflexivity of research, by carefully considering the use of concepts and underlying paradigms as well as considering the dimensions of transformation that are not explicitly linked to climate change research. Research topics include understanding processes and pathways through which positive transformations may take place and understanding the feedback loops between different levels (e.g. bottom-up vs. top-down, local vs. global) and different time frames (short term vs. long term) and magnitude (incremental vs. transformational). Activities in this area also investigate the barriers and enablers for transformation, including cultural and institutional lock-in, the roles of the finance, politics and "bottom-up" movements from communities and organisations.

This challenge requires approaching knowledge generation, exchange, and innovation in a multi-, inter- and trans-disciplinary manner, drawing on input beyond the wider climate change research community. JPI Climate activities will draw in particular upon the results of the [JPI Scoping process 'Societal transformation in the face of Climate Change'](#).

The role of JPI Climate

Within this challenge JPI Climate aims to foster processes and encourage research that goes beyond disciplines and climate alone, and look for innovative research activities and practices.

JPI Climate can add value here through shaping and facilitating research to service sectoral (if not yet developed by another initiatives) or regional information needs, but also identifying in particular cross-sectoral and/or inter-regional interactions and interdependencies.

Furthermore, JPI Climate will aim to play a key role in linking research on adaptation and on mitigation with the [2030 Sustainable Development Goal on Climate](#) and addressing connectivity of development pathways across and beyond Europe. Such inter-linkages need to be explored, assessed and evaluated across scales and objectives.

JPI Climate will make a difference by providing unique opportunities and a transnational space of interaction between communities of researchers and practitioners that would otherwise not necessarily get engaged. Unlike other sector oriented JPIs, it supports and informs their efforts while offering a unique forum to recognise and bring together the various existing expertise and knowledge (across sectors and disciplines), as well as decision-making focus. It targets sharing practical experience and expertise across many boundaries and will contribute to a common framing of successful transformation to sustainability.

5. JPI Climate's STRATEGIC MECHANISM: Connecting people, problems and solutions in a systemic approach

Aim

This strategic, cross-cutting mechanism aims to move climate change science forward in all fields, by enhancing connectivity between currently fragmented or disparate realms of climate change research as well as a **better understanding of the interlinkages and relationships** across this highly complex landscape. The aspect of "connection" should be a transversal selection criterion in JPI Climate's activities and be promoted in activities within and interactions between the three challenges.

Activities

JPI Climate aims to facilitate increased interaction and connection of researchers working with

conceptual, narrative or observational approaches, tools and models. This focus helps to track complex interrelations between social and natural systems and to understand the underlying forces and interdependencies driving systems' dynamics, as well as to envision scenarios and trajectories into the future.

To do so, the member countries of JPI Climate commit to investing in understanding the underlying structures, barriers and enablers in the European climate change research system. This includes the use of a large variety of incentives from transnational calls to national alignment and smart specialisation, involving both RFOs and RPOs. Dedicated actions will be identified and implemented to fill the knowledge gaps on how to link different data, models, trends, impacts, risks and response actions, stemming from all kinds of science, in order to develop a holistic understanding about the mechanisms in place in the climate change research community.

Furthermore, to support these directions, JPI Climate will provide the space to experiment with innovation, where failure is seen as part of the innovative process and good practices are put into action in order to find new, creative ways to respond to challenges. The intention is to provide opportunities for intensive exchange between a diversity of researchers and stakeholders in specific areas to build trust and to address the needs of selected communities within the realm of climate change, but also to build the required trust; and for learning from other successful initiatives.

The role of JPI Climate

Through this Strategic Mechanism, JPI Climate acts as an enabler of connections between different parts of the research community on the European level and beyond, while contributing to achieve results in JPI Climate's three challenges. There are many actors involved in European climate change research in one way or the other, and JPI Climate aims to improve its already very substantial knowledge of the concerned actors, mechanisms, developments and present limits. It can draw from the experience of interaction with existing initiatives and networks¹ in this area and stays open to adapt and react to new developments in this highly complex landscape to reduce fragmentation. JPI Climate brings a platform of dialogue, including cross-sector and cross-regions. Over the years, JPI Climate has built a significant expertise in stakeholder interaction; drawing from this knowledge, JPI Climate aims to be a pioneer in exploring new ways of addressing their needs and requirements.

Definitions:

Alignment: Strategic approach taken by Member States to modify their national programmes, priorities or activities as a consequence of the adoption of joint research priorities in the context of Joint Programming with a view to implement changes to improve efficiency of investment in research at the level of Member States and ERA (see examples [here](#)).

Climate Change Research: Includes natural and social sciences, including behavioural sciences and the humanities to the degree they address and support an integrated understanding of climate change as physical, economic, political, social and cultural phenomenon, and the barriers to actions and approaches to addressing these.

¹ Including [H2020](#), [C3S](#), [Climate-KIC](#), [EEA](#), [CIRCLE-2](#), [ECRA](#), [Science Europe](#), [GFCS](#), [WWRP](#), [WCRP](#), [Future Earth](#), [Belmont Forum](#), [IPCC](#), etc.



Decision making: The concept of ‘decision-making’ refers not only to policy making, business and investment planning in the broad sense, but also includes interactions between decision-making processes on different levels (EU, national, sub-national) and in different institutions, sectors and contexts. It includes also ex-ante and ex-post capacity to assess effectiveness, efficiency and efficacy of policies.

Innovation: For JPI Climate ‘innovation’ means ‘societal innovation’ referring to all strategies, efforts and interventions that could lead to the successful climate-friendly (through mitigation) and climate-resilient (through adaptation) development of European society and, at the same time, could open up new and promising social and economic pathways. JPI Climate does not focus on engineering sciences and technologies.

Societal transformation: The concept of societal transformation refers to societies’ systemic changes and encompasses social, cultural, technological, political, economic and legal changes.

User: The term ‘user’ refers to protagonists from governmental organisations, business, NGOs and civil society operating on various levels that can be considered as the main stakeholders and addressees of the joint research facilitated by JPI Climate.