Report of the MAGICA WP3 workshop

Co-designing an actionable JPI Climate Strategic Research and Innovation Agenda (SRIA) for ERA 2026-2035 in support of a climate resilient and neutral society

BELSPO, WTC III Boulevard Simon Bolivar 30 1000 Brussels – Belgium 1st February 2024

Workshop overview

This MAGICA Task 3.1 workshop drew participants from Europe with diverse interests in climate science and in co-designing the framework for an actionable Strategic Research and Innovation Agenda (SRIA) for a number of central research topics of high political importance for Europe. Participants included MAGICA partners, MAGICA Advisory Board and Horizon Board members, JPI Climate Governing Board members and JPI Climate Transdisciplinary Advisory Board members.

To facilitate the discussions, participants were presented with the SRIA framework document, resulting from the stock-taking exercise carried out by MAGICA WP3. Participants also were provided with an overview of the methodology applied for the stock-taking and SRIA process (Annex 1).

This background information was then used to engage participants in discussions through break-out sessions with the aim of prioritizing research needs among the list of research gaps. Participants were asked to address the 3 following questions:

- What are the most pressing issues for European climate science for period 2025-2034 with a high added value for decision making?
- Which national, European, and international networks should be gathered to forge the SRIA on these themes?
- What are foreseen opportunities for SRIA consultations in 2024-2025?

The outcomes of the discussions within the in-person break-out groups are summarised in the Annex 2. The Jamboards from the virtual break-out session are available here: MAGICA SRIA workshop online breakout session - Google Jamboard

Next Steps

The MAGICA Task 3.1 team will finalise the stock-taking exercise and prepare a report on stock taking and prioritisation of research and innovation needs and foreseen synergies which is due end of April 2024. Once this report is ready, MAGICA Task 3.1 team will launch thematic working groups to allow in depth consultations on the themes of the future climate science SRIA which is due in 2026.

Annex 2

Summary of Break-out Session Discussions: Research priorities, Networks, and Consultation opportunities

Theme	Research priorities	Networks	Consultation opportunities
1: Key climate processes, observations and modelling	• Build links between themes 1 and 3: perception of extremes and cascading impacts • Potential of AI in near-term climate projections • Wider range vs transparency in IAMs (ease of use, regional/sectoral downscaling) • long term support for closing gaps in systemic observation and data availability • Improve the communication/perception with non-scientists • solar radiation management* • tipping points to link with societal and financial topics • cryosphere issues in prominent mountain ranges in Europe • polar regions as indicators of rapid change • Strengthen interactions between ecosystem uses and changes with climate	• Climate Data Store C3S • Open Science Europe • EU Open Data regulations • Polar res • IASC • ISIMIP • (EURO)-CORDEX • CMIP • NEP's • DestinE • Digital twins (ECMWF) • Projects from 2023 Horizon Europe calls • WCRP • 10 New Insights in Climate Science (https://10insightsclimate.science) • ISIMIP	• Citizens at local/regional level • Trainings on data management • Biodiversa+/BiodivTransform • UK initiative on SRM

	• Improve understanding and constrains of processes involved in setting the higher bound of the climate sensitivity • Improve detection and attribution of extreme events • Develop de component on Mediterranean areas included in the partnership proposal • Implement CDR in line with Earth System and ecosystem (including agroecosystems) models • Monitoring of groundwater		
2: Scientific underpinning of greenhouse gas management and climate change adaptation	• link observation to on-ground management practises • Understanding community practises and behaviours • Reveal over- and underestimations of sources and sinks • Resolving the discrepancies of the different systems to report GHG observations	• JPI FACCE • ICOS • Global Carbon Project	• ICOS Science Conference 2024
3: Cascading impacts, vulnerability, risk and adaptation	• Social justice: research into how climate change can increase social diversion, and destabilisation through increasing rich-poor divide • Citizen science and indigenous knowledge about risks, mitigation and adaptation strategies	• Disaster risk groups • IPCC special report on cities • JPI Ocean • Climate Ocean working group • Sea'ties network • Urban: DUT Partnership, IPCC Special report on cities, ICLEI, UCLG, C40	• Digital with purpose global summit • conference on climate change impacts and responses • ECCA • WISG • Climateurope

	• Assess risk of catastrophic sea-level rise from ice-sheet collapse and how to deal about it should it occur • Climatic and non-climatic risks (European Risk Assessment report to be published in March) • tipping points related to SLR on the coastline (preparedness) • new governance models for adaptation and managing risks • limits of adaptation – transforming to transformation • risk perception as a driver for risk management • rural-urban continuum	• Just adaptation network • Network of boundary organisation • SHIFT • Fridays for future • Network of national climate committees • Climalex • EIANet • City netowrks (C40)	• Horizon Europe (TRAMI, Mission forum, community of practice of the different missions)
4: Sustainable negative CO2-emissions	• See Annex 3	• IPCC Methodology Report on Carbon Dioxide Removal Technologies, Carbon Capture Utilization and Storage in this cycle • **Chapter 9 of the State of CDR**	• What Works Climate Solutions Summit • Negative Emissions Conference • ICOS Science Conference • Climate Neutrality Forum
5: Climate policy, finance and societal aspects	• Integrating goals for EU + UN nature restoration targets and net-zero targets (overlap with theme 1) • Social justice and intergenerational equity • Research on identification of finding value in investing in adaptation (value of NBS, cost of climate/cascading impacts, innovative financial instruments)	• Young Lawyers • Covenant of Mayors • Charters of the Mission • WEF • EAERE • Civil Society Networks	• Climate Neutrality Forum

	• business model transformation (internalisation of externalities) • integration of adaptation/mitigation issues • involve communities: co-development, co-responsibility • implement a One Health approach (health, environment and people nexus) including banks and insurance companies		

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Inès Alterio, Patrick Monfray, Anne-Hélène Prieur-Richard, Roland Séférian (ANR)

1st February 2024, Brussels

Funded by the European Union

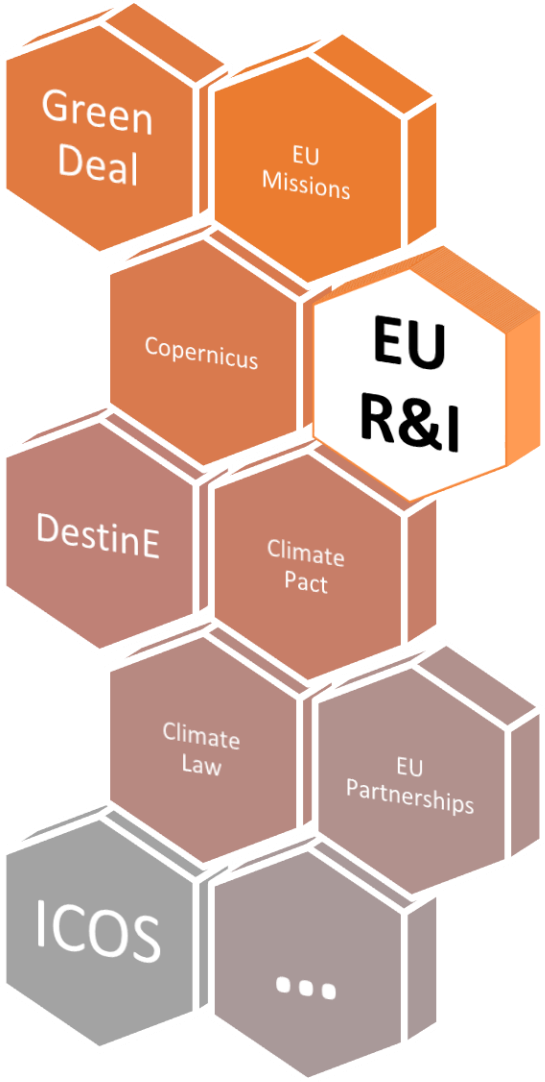
JPI Climate

MAGICA

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

Some context

To achieve climate neutrality by 2050, EU has strongly invested in R&I and advanced observation systems resulting in a variety of initiatives…



Our objectives

- Provide new momentum and mechanisms to bring the various initiatives together
- Ensure that European research is central to the provision of timely and authoritative knowledge for climate actions
- Establish a “single market” for such a climate science base for research policy
- Develop a Strategic Research and Innovation Agenda (SRIA) for a number of central research topics of high political relevance

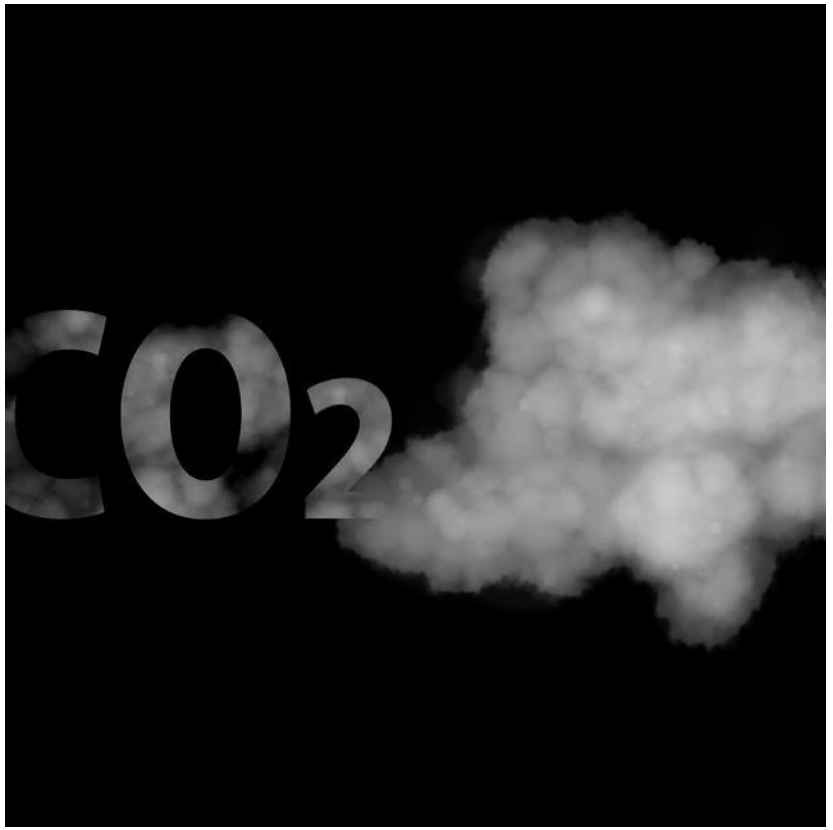
Methodology

- Stock-taking of climate science research gaps from past events and reports (EU, IPCC, etc)
- Interactions with communities of climate science researchers and stakeholders to prioritise of R&I needs

1. Key climate processes, observations and modelling

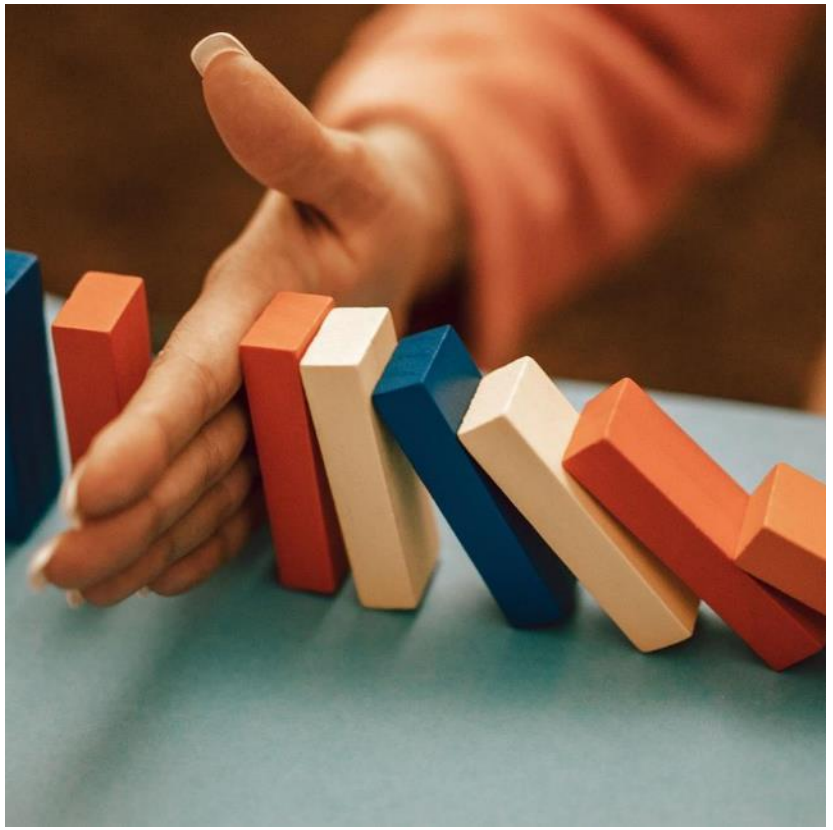
- Improve process understanding of the climate system
- Data collection and management
- Methodological development for modelling and scenarios
- Focus on Polar Regions, Ocean & Cryosphere

2. Scientific underpinning of GHG management and climate change adaptation



- Observation-based monitoring of greenhouse gas emissions
- Develop operational system for integrated GHG monitoring
- Develop science to support smarter, systemic and accelerated mitigation and adaptation

3. Cascading impacts, vulnerability, risk and adaptation



- Improved understanding of climate-related risks and adaptation
- Improved understanding of interaction between climate and ecosystem
- Understand socio-economic impacts of climate change
- Focus on cities

4. sustainable negative CO2-emissions

- Enable a portfolio of sustainable CDR approaches and methodologies
- Enable market development for sustainable CDR

5. Climate policy, finance and societal aspects

- Climate Resilient Development (CRD)
- Assessing mitigation and development pathways (including CRD pathways)
- Economics of climate change

Some first feedbacks:

- Should adaptation and mitigation be treated together ?
- continue to support basic collaborative climate research in addition to applied research
- add multidisciplinarity at every step
- embrace creativity and diversity in climate science research

Next steps

- we are seeking feedback from communities of climate science researchers and stakeholder
- We are looking for people willing to help us codesign our Strategic R&I Agenda

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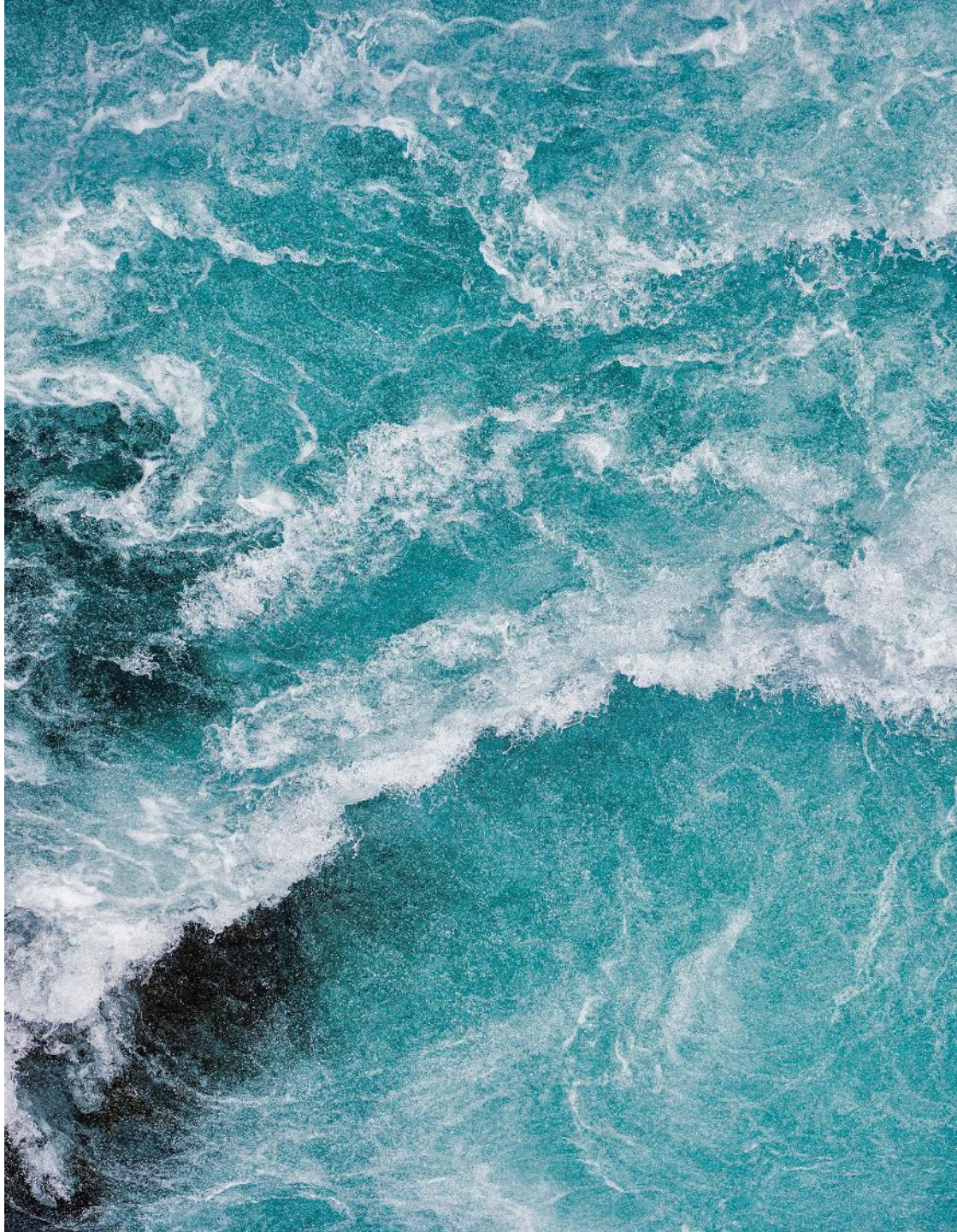

Breakout sessions at Belspo

Morning

- Theme 1: Key climate processes, observations and modelling, Joonas Merikanto (FMI) and Patrick Monfray (ANR)
- Theme 2: Scientific underpinning of greenhouse gas management and climate change adaptation, Gregor Laumann (DLR) and Kanika Singh (BELSPO-SC)
- Theme 3: Cascading impacts, vulnerability, risk and adaptation, Roger Street (CMCC/University of Oxford) and Anne-Hélène Prieur-Richard (ANR)

Afternoon

- Theme 4: Sustainable negative CO2-emissions, Gregor Laumann (DLR) and Michael Depuydt (BELSPO-SC)
- Theme 5: Climate policy, finance and societal aspects Giulia Galluccio (CMCC),Patrick Monfray (ANR), Mimi Amaichigh (BOKU)

Breakout sessions at Belspo

- Rotation every 30min
- Each participant attends all sessions
- Report back in plenary
- Objective: identify research priorities and synergies with other initiatives

Guiding questions:

- What are the most pressing issues for European climate science for period 2025-2034 with a high added value for decision making ? (~15min)
- Which national, European and international networks should be gathered to forge the SRIA on these themes ? (~10min)
- What are foreseen opportunities for SRIA consultations in 2024-2025 ? (~5min)

Online breakout session

- One session for all themes
- Rotation every 10-15min
- Jam Boards: https://jamboard.google.com/d/1tbFd7FKuHRSjbXskP7BsYGMaxGSXq-oXCohhKSUcjD0/edit?usp=sharing

- Chaired by Inès Alterio (ANR) and Lola Kotova (GERICS)

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Brussels, 1st February 2024

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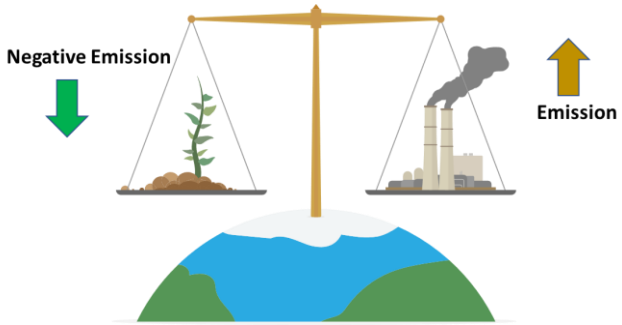
DLR Projektträger

GHG -emissions: Analysise and verifcation of inventories



Decarbonization Pathways and Scenarios

Negative Emissions and Carbon Dioxide Removal

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Take home messages: research needs and gaps (1)

from JPI CDR-Workshop September 2023 (Brussels)

➡ **Top level demand:**

Technology development / prototypes and scalability in various technology areas

However: very different in terms of socio-technological, market and governance prerequisites plus need for international cooperation.

➡ **Specific research gaps**

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Take home messages: research needs and gaps (2)

Institutional development and governance

- Transparence : who pays, who benefits, who accounts
- Institutions to accelerate technology, market development and management
- Effective and efficient policy instruments e. g. for transparent and simple certification

Monitoring, Reporting, Verification as reliable framework for market development

- Common methodological principles and standards for MAV
- Issue of permanence of technical or natural carbon sinks
- Standardised rules (worldwide): the more fragmented, the more expensive.
- Link to GHG-Monitoring

Economic effects of CDR

- Effects on labour markets and jobs, growth and value creation
- Relationship between private and public investment
- Incentive structures and market potentials on a highly subsidised market
- Where comes the industry into the picture

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Take home messages: research needs and gaps (3)

Co-deployment / synergies:

- Exploring synergies to determine actual potentials of individual technological solutions
- Scale of additional benefits, emergence of other problems limiting potentials.

International scenario assessments

- coordinated portfolio analyses and feasibility assessments incl. unintended side-effects
- adequate level of residual emissions
- storage capacity is needed
- build the infrastructures

Scientific exchange/research on acceptance, transparency and public dialogue

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Guiding Questions

- What are the most pressing issues for European climate science for period 2025-2034 with a high added value for decision making?
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- What are foreseen opportunities for SRIA consultations in 2024-2025?

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