

HORIZON 2020 The EU Framework Programme for Research and Innovation

Climate Science: From projects to policy and decision making



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HORIZON 2020

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Climate change in Horizon2020 The 2014-2020 EU framework programme for research and innovation

The EU is committed to spend at least 35% of the overall budget of Horizon 2020 for climate-related research and innovation actions

This includes: physical and social sciences, climate services, energy and transport innovation, earth observation, sustainable food production and water management, etc.





Horizon 2020 – the 3 priorities

Excellent science Science sets the agenda

Business sets the agenda

> Industrial leadership

Societal challenges Society sets the agenda

Societal Challenge 5: Climate action, environment, resource efficiency and raw materials



Objective: "to achieve a resource efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems."



Societal Challenge 5: Approach and principles



Challenge-driven and solution oriented

- ✓ Assess risks & seize opportunities
- ✓ Not just furthering our knowledge for the sake of knowledge (other parts of H2020 have this mandate).

but....

 Harnessing knowledge to come up with effective solutions that can be put into practice.



Societal Challenge 5: new focus for 2016-17



- ✓ Increased emphasis on delivering innovative solutions
- Systemic approach to innovation
- Unlocking private and public investment in future solutions
- Large-scale demonstration projects with replication potential



Societal Challenge 5: key objectives for 2016-2017

Climate action

- Climate services
- Low-carbon
 Europe
- Arctic dimension

Raw materials

Mainstreaming water R&I

Nature-based solutions:

- for territorial resilience
- for sustainable cities

Systemic eco-innovation for a circular economy

Sustainable growth by harnessing:

- Earth observation data
- Cultural heritage



European Commission

Climate services



- ✓ building Europe's capacity to respond to and improve resilience to climate change
- ✓ strengthening significantly the nascent global market for demand-driven climate services
- ✓ addressing both climate change mitigation and adaptation needs



Background & context

<u>Why:</u>

Climate has a central role in global economic & social sectors and policy domain

▶ Public and private entities need reliable, trusted and timely information and tools to minimize risks and be best positioned for continued growth in all sectors.

The challenge:

Science has created a strong knowledge base on climate change....however.... much of this knowledge needs to be custom-made for decision making

Strong need to move from "diagnosis" to "solutions".

Climate services: translate climate intelligence and relevant knowledge on global change (demography, resources, economics) into **customized products** that **meet the needs of individual end-users** (*public authorities, policy makers, businesses, cities...*) and enable them to take climate-smart decisions

Focus moves from <u>supply</u> (climate research) to <u>demand</u> (innovative solutions)



Our objective: Decision Making under a Changing Climate: Matching Users' Needs with Solutions

bridge the <u>gap</u> between scientific knowledge and real world decision making and support end-users (governments, city authorities, business associations, investors, planners) in order to better manage the risks of climate change.

(→ extract societal & economic value out of R&I investments)

The way forward: "A European R&I Roadmap for Climate Services"

- ✓ framework for engaging the relevant actors and stakeholders to fill gaps
- ✓ basis for finding solutions and pathways that will deliver benefits to society
- ✓Principle: <u>Demand-driven</u> & <u>Science-informed</u>







Actions proposed in the Roadmap:

- > Understand the demand and supply sides of climate services
- > Identify the **potential for growing the service market**
- Support the sustainability of a viable European climate service community engaging users, providers, innovators and researchers
- Demonstrate and promote the added value of climate services for decision-making (large scale demonstration actions based on "co-design" approach)
- > Improve the **framework conditions**, by addressing barriers, standards, etc.

> Create a broad and consistent layer of **public**, **free and open access** data, data products, model results, indices and climate information

> Integrate the physical, land-use, socio-economic and other non-physical **data and information** and framing them to support decision-making processes; Improve **modelling and predictive capabilities**

> Engage in international cooperation (e.g. WMO – Global Framework for Climate Services)



Implementation: what is currently being done in the EU

- Horizon 2020: EU 's Framework for Research and Innovation (2014-2020) (~ 45 M Euros to be invested on climate services over the coming 2 years)
- Joint Programming Initiative : JPI Climate (EU Member States)
 Pool national research efforts and align research agendas in order to tackle more efficiently societal challenges (75 M Euros currently invested on climate services)
- **COPERNICUS:** The European Earth Observation Programme (Climate Services Component)
- European Institute of Technology (Climate Knowledge & Innovation Community)
- European Environmental Agency (Climate-ADAPT Platform)
- Activities at national and international level



Towards Roadmap Implementation

Potential actors that could be involved with H2020 - investing in achieving this shared agenda include:





4TH INTERNATIONAL CLIMATE CHANGE ADAPTATION CONFERENCE

ROTTERDAM THE NETHERLANDS 10-13 MAY 2016





Government of the Netherlands

Conference themes

CROSS

ISSUES



Registration open!

www.adaptationfutures2016.org

Towards a low-carbon Europe

Aim: design deep decarbonisation scenarios and pathways to be used as *mapping tools*, deep-rooted in scientific methods and principles, allowing for systematic feedback loops between objectives and means, in order to enable policy makers to better analyse risks and opportunities and design policies that are coherent, consistent, science-informed and visionary



- ✓ deepening the analysis of possible, cost-effective & socially accepted trajectories for Europe to achieve its medium and long-term climate objectives
- Address challenges of planning technological transition ahead of time taking into account non technological factors and drivers (e.g. financial, institutional, regulatory, behavioural aspects).
- Address the socio-economic and environmental implications of the of deep decarbonisation pathways and identify necessary changes in investment patterns and regulatory incentives.



What we are up to is a fast, non-linear socio-technical transition - from this situation.....



GHG emission intensity vs. per capita, major economies, <u>2010-2030 Baseline</u>



.....To this, if we want to stay on the 2°C trajectory:



GHG emission intensity vs. per capita, major economies, 2030-2050 Global mitigation scenario



The Arctic Dimension of climate change



- ✓ the region of the globe with most rapid climate change
- changes in the Arctic have global consequences with socio-economic impact on the EU
- ✓ deepening knowledge and identifying sustainable, innovative approaches to tackle the challenges climate change is posing in the Arctic region
- ✓ improving our predictive capability of the evolution of climate-related changes



Earth observation



- ✓ maximising the benefits for European citizens of the Earth observation infrastructure
- ✓ developing innovative services to support more sustainable production and consumption patterns and resilient societies
- ✓ completing the in-situ component of GEOSS and Copernicus
- enabling the sharing and full, open and unrestricted access to validated Earth observation datasets
- engaging with the private sector to leverage emerging technologies and develop services



PRIMAVERA & CRESCENDO supporting policy and decision making

- Provide updated information, new insights and state-of-the art knowledge to policy makes
- Support the implementation of the EU R&I Roadmap on Climate Services
- Support the process of the new -6th- assessment cycle of the IPCC (scoping, expert meetings, lead authors, publications to feed AR6): Demonstrate the added-value of European climate change research in this process.
- Contribute to events, conferences, policy workshops, dissemination activities supporting the science-policy interface.





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Thank you for your attention!

Find out more: www.ec.europa/research/horizon2020