



Research on Hydropower and Fish in the WP of Climate action, environment, resource efficiency and raw materials

Hydropower and Fish, Joint Workshop IEA Hydropower TCP–
European Commission DG RTD, Brussels, 29 May 2017

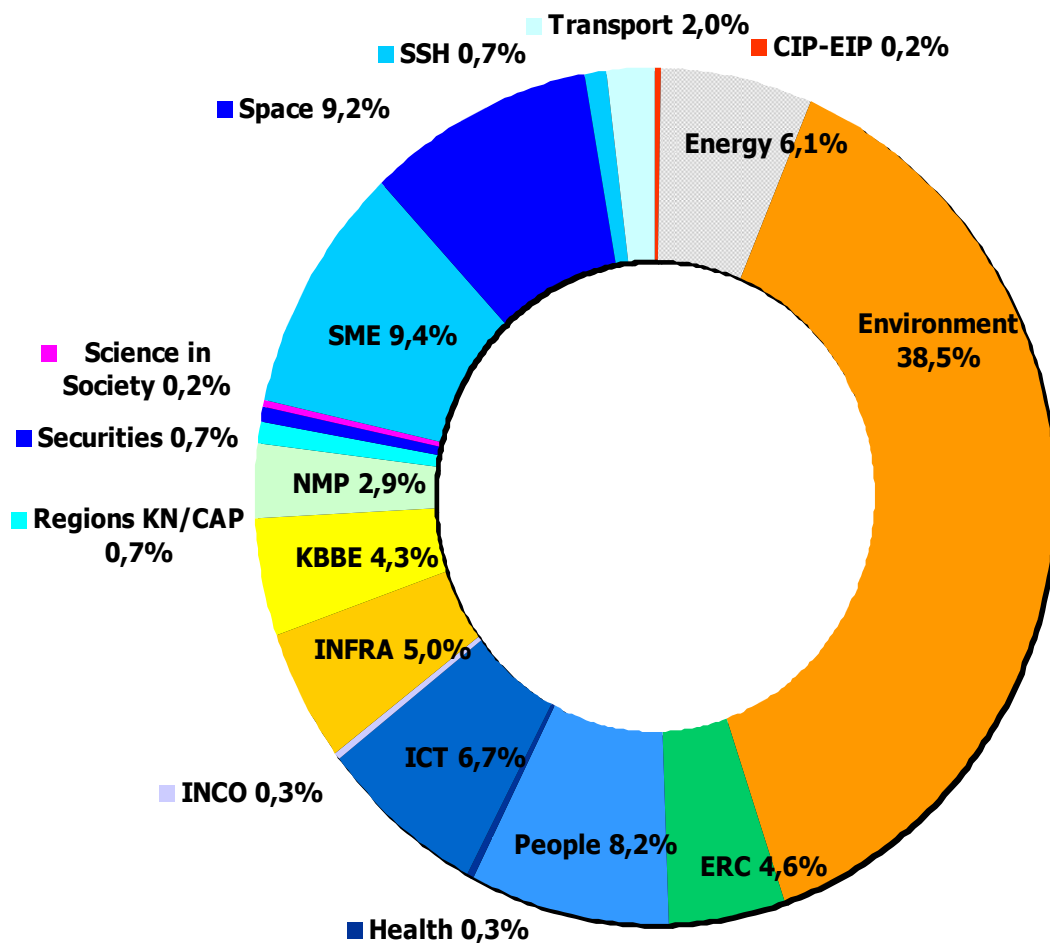


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EU research for the Environment

- ✓ Climate Change
- ✓ Natural Hazards
- ✓ Environment and Health
- ✓ Natural Resources Management (land, water, urban)
- ✓ Biodiversity
- ✓ Marine Environment
- ✓ Environmental Technologies
- ✓ Cultural Heritage
- ✓ Earth Observation
- ✓ Assessment tools for sustainable development

WATER - A major component of successive EU RTD programmes



HORIZON 2020

**€130million per year in FP7
900 projects on Water**

from

*a multidisciplinary
sectorial approach in FP7*

to

*a transdisciplinary and
cross-sectorial approach in
HORIZON 2020*



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Water Research and Innovation in Horizon 2020

- ✓ *A priority across the 3 priorities of Horizon 2020 and a key component of Societal Challenge 5: "Climate action, environment, resource efficiency and raw materials"*
- ✓ *Reinforcing water innovation capacity and market uptake of successful research results, boost competitiveness and growth and create leadership in water resources management*
- ✓ *Support the needs of relevant EU water, innovation and resource efficient policies, international commitments and related initiatives*
- ✓ *Within SC5, water is put in the center of a systemic approach for eco-innovation and circular economy, nature based solutions and climate services*
- ✓ *Up to now, approximately 245 M€ were devoted to specific water calls, mainly under SC5 of Horizon 2020*



EU major water related initiatives and partnerships

- ✓ *Joint Programming Initiative "Water challenges in a Changing World"*
 - ✓ *An EU Member States partnership on a voluntary basis, implementing joint calls of proposals, opening also to third countries participation*
- ✓ *European Innovation Partnership on Water*
 - ✓ *A voluntary partnership bringing together public and private actors at EU, national and regional level, to facilitate the development of innovative water solutions (e.g. water reuse and recycling, desalination, flood and drought risk management)*
- ✓ *Water Supply and Sanitation Technology Platform (WssTP)*
 - ✓ *A technology platform bringing together the European water sector and its supply chain to foster collaborative, innovative and integrated research and technologies development*

The importance of water-energy nexus

- ✓ Energy needs water
 - ✓ *hydropower*
 - ✓ *thermoelectric cooling*
 - ✓ *power plant operations*
 - ✓ *fuel extraction and refining*
 - ✓ *fuel production*

- ✓ Water needs energy
 - ✓ *extraction*
 - ✓ *treatment*
 - ✓ *transportation*



Examples of current Horizon 2020 SC5 projects on water and energy

- ✓ **POWERSTEP:** Full-scale demonstration of energy positive sewage treatment plant concepts towards market penetration
- ✓ **MASLOWATEN:** Market uptake of an innovative irrigation solution based on low water-energy consumption
- ✓ **BlueSCities:** Blueprints for Smart Cities: Developing the methodology for a coordinated approach to the integration of the water and waste sectors within the EIP Smart Cities and Communities
- ✓ **DAFNE:** Use of a Decision-Analytic Framework to explore the water-energy-food NExus in complex and trans-boundary water resources systems of fast growing developing countries
- ✓ **AMBER:** Adaptive Management of Barriers in European Rivers
- ✓ **MAGIC:** Moving Towards Adaptive Governance in Complexity: Informing Nexus Security
- ✓ **SIM4NEXUS:** Sustainable Integrated Management FOR the NEXUS of water-land-food-energy-climate for a resource-efficient Europe



AMBER: Adaptive Management of Barriers in European Rivers

AMBER aims to create an online interactive European atlas of stream barriers and deliver efficient methods for restoring stream connectivity through transdisciplinary adaptive barrier management processes (12 case studies).

20 partners including large hydropower business, river authorities, NGOs, universities and the JRC, spread out through Europe (Coordinator: University of Swansea)

Topic(s):

SC5-07-2015 - More effective ecosystem restoration in the EU

Call for proposal:

H2020-SC5-2015-two-stage

Funding scheme:

RIA - Research and Innovation action

EU Contribution:

EUR 6 020 172,75

From 2016-06-01 **to** 2020-05-31





SIM4NEXUS:

A novel approach towards improving decision-making for resource efficiency, based on the water-land-food-energy-climate Nexus

4 year project (2016-2020)

Started June 2016 for 4 years (EU contribution: € 7.9M)

25 partners from 15 European countries

Co-ordination: Wageningen University & Research

Core team: University of Exeter, University of Thessaly

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689150 SIM4NEXUS



Thematic models in SIM4NEXUS

Model feature	E3ME-FTT	MAGNET	CAPRI	IMAGE-GLOBIO	OSeMOSYS	SWIM	MAgPIE-LPJmL
Model type	Global macro-econometric energy, environment and economy model	CGE model with a focus on bio-economy and food security	Global agro-economic model with regionalized EU detail	Global integrated assessment model	Global energy modelling system	Eco-hydrological model	Global land use allocation model
Main topics	Energy and climate policies	Trade, agricultural and bioenergy policies, climate impacts	Agricultural, trade, bioenergy and water policies, climate impacts	Sustainability, climate change, land use, hydrology, biodiversity, ecosystem services	Energy efficiency, climate change, mitigation strategies; technology transition	Sustainable water and land use management, climate change impacts	Land-use change
Nexus components	Energy, land, economy, climate	Food, land, economy, energy, climate	Food, water, bioenergy, environment, climate	Environment, biodiversity, land, water quantity and quality, energy	Energy, land, climate, water, materials	Water, land, climate	Food, land, water, bioenergy, environment climate
Geographic coverage	Global	Global	Global	Global	Global	Several river basins in Europe	Global
Spatial resolution within EU	National	National	National and regional (NUTS2)	Detailed grids	River basin, national, international	Regional and river basin	Detailed grids
Application to case studies	Global, European and national	Global, European and national	Global, European, national and regional	Global and European	Global and European	Regional and transboundary	Global and European

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



Objective: *"to achieve a resource – and water – 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: Key priority areas

- ✓ Fighting and adapting to climate change
- ✓ Protecting the environment, sustainably managing natural resources, water, biodiversity and ecosystems
- ✓ Improving the knowledge base on the availability of raw materials
- ✓ Enabling the transition towards a green economy and society through eco-innovation
- ✓ Developing comprehensive and sustained global environmental observation and information systems
- ✓ Cultural heritage

SC5 strategic priorities for 2018-20

Scoping paper set out:

- ✓ **Climate Action in support of the Paris Agreement**
- ✓ **Circular Economy**
- ✓ **Water for our environment, economy and society**
- ✓ **Innovating Cities for sustainability and resilience**
- ✓ **Raw Materials**
- ✓ **Protecting and valorising our natural and cultural assets**
 - Earth observation
 - Nature-based solutions, disaster risk reduction & natural capital accounting
 - Heritage alive

Structure of SC5 draft WP 2018-20: two calls

Call: "Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement"

Indicative call budget: 2018 EUR 128 million; 2019 EUR 108 million [2020 EUR 192 million] (all contributing to Climate Focus Area)

Call: "Greening the economy in line with the Sustainable Development Goals (SDGs)"

Indicative call budget: 2018 EUR 211 million; 2019 EUR 264 million [2020 EUR 165 million]

(of which contributing to Circular Economy Focus Area: 2018 EUR 130 million; 2019 EUR 115 million; [2020 EUR 81 million])

SC5 draft WP 2018-20: content of calls (1)

Call: "Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement"

✓ **Climate action in support of the Paris Agreement**

All topics focused on climate action from the priority areas:

✓ **Water for our environment, economy and society**

✓ **Innovating Cities for sustainability and resilience**

✓ **Protecting and leveraging the value of our natural and cultural assets:**

○ **Earth observation**

○ **Nature-based solutions, disaster risk reduction & natural capital accounting**

○ **Heritage alive**

SC5 draft WP 2018-20: content of calls (2)

Call: "Greening the economy in line with the SDGs"

- ✓ **Circular Economy**
- ✓ **Raw Materials**

Topics not focused on climate action from the priority areas:

- ✓ **Water for our environment, economy and society**
- ✓ **Innovating Cities for sustainability and resilience**
- ✓ **Protecting and leveraging the value of our natural and cultural assets:**
 - **Earth observation**
 - **Nature-based solutions, disaster risk reduction & natural capital accounting**
 - **Heritage alive**

Water for our environment, economy & society

How?

- ✓ R&I actions to boost both EU water market and secure long-term sustainability of environment, public health and human well-being
 - ✓ *Innovative water technologies, services and monitoring tools, digital solutions, living labs and large scale demonstration projects, for various water users and scales*
 - ✓ *Integrated approaches to address the water/energy/food nexus and explore the linkages between the digital and physical world*
- ✓ R&I actions to improve risk and impact assessments and support relevant EU policies and initiatives
- ✓ Activities to strengthen international cooperation and support the implementation of SDGs and PRIMA initiative






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PRIMA Art.185

Partnership for Research and Innovation in the Mediterranean

The PRIMA initiative identified 8 operational objectives clustered in **three main thematic pillars.**

Pillar 1	Pillar 2	Pillar 3
		
Sustainable management of water for arid and semi-arid Med areas	Sustainable farming systems under Med environmental constraints	Mediterranean food value chain for regional and local development



Thank you for your attention!

Find out more:

www.ec.europa.eu/research/horizon2020