



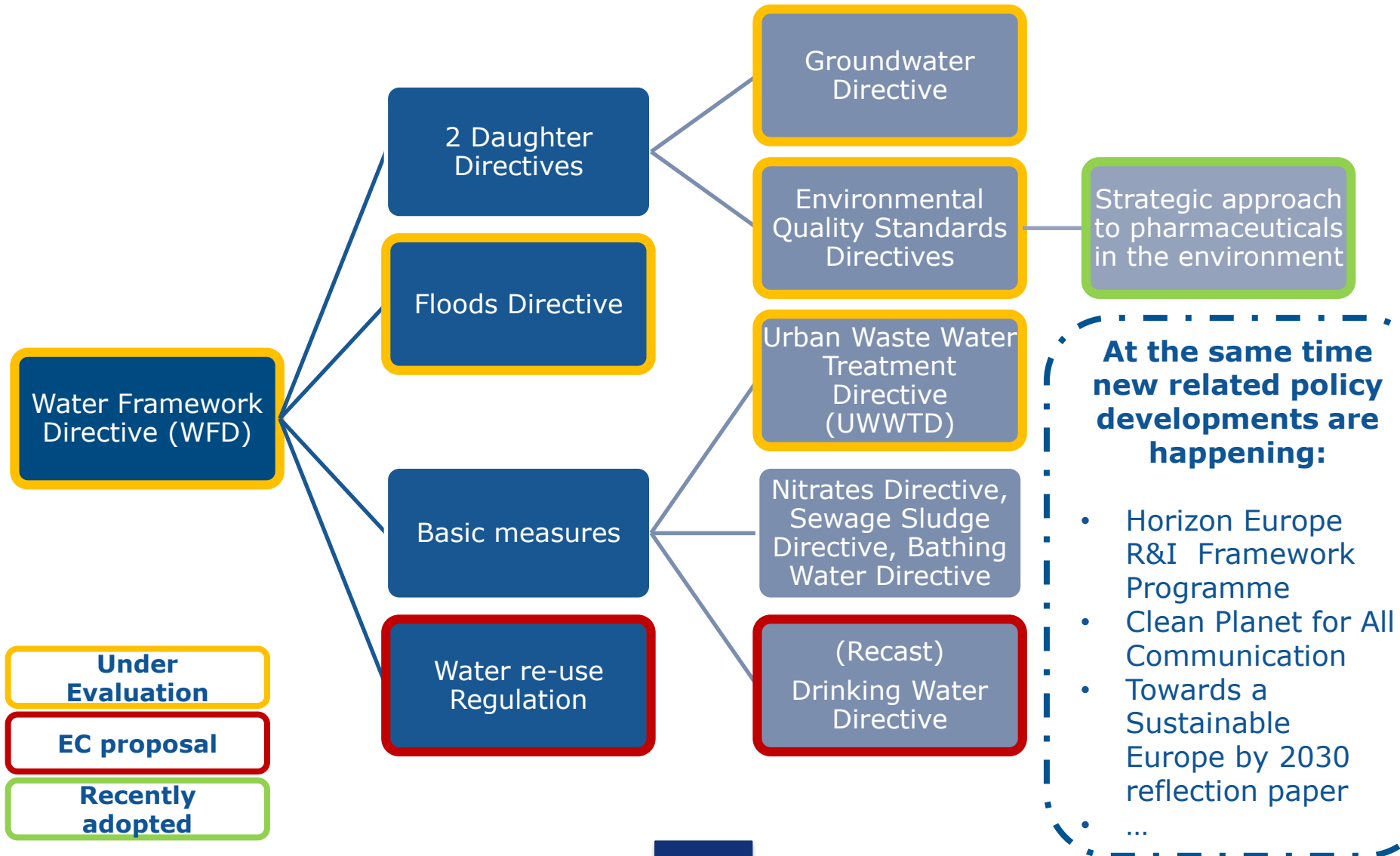
EC policies to support the potential of the waste and wastewater sector The role of research and innovation

**The energy potential of the wastewater sector:
the REEF 2W approach, Brussels, 6 June 2019**



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EU water law currently under evaluation



UWWTD evaluation - Key issues



Combined
sewer overflows
+ urban runoff

Individual and
other
appropriate
systems

Small
Agglomerations

Substances of
emerging
concern

Monitoring
requirements

Sensitive areas

Late
implementation

Incorrect
dimensioning of
plants

Resource
efficiency
(water & sludge re-
use, energy)

Cost and
benefits
(affordability)

Coherence +
clarity

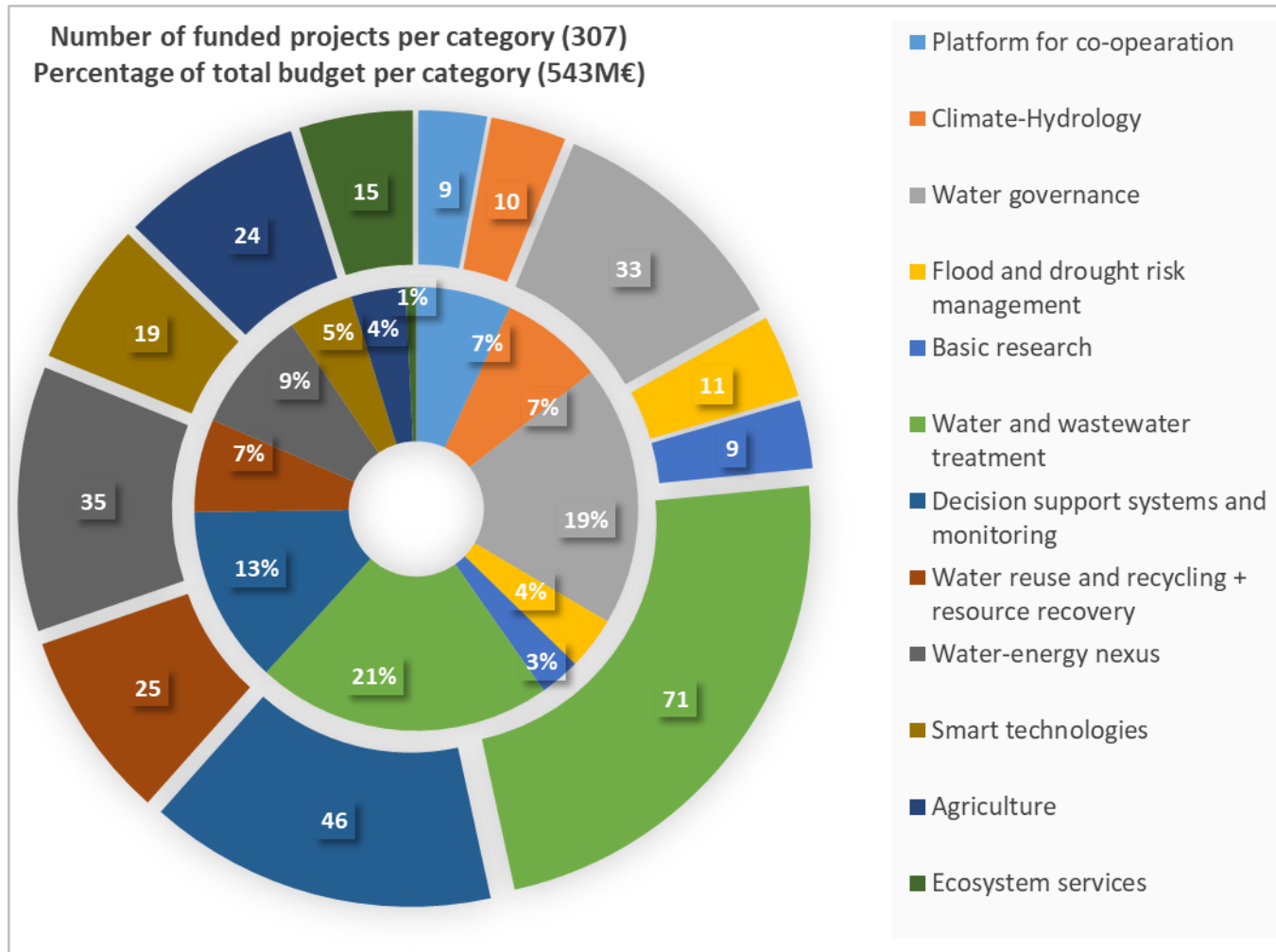
Governance

Validated through stakeholder activities

The role of research and innovation

- Investing in research and innovation - Horizon 2014-2020 (until 2017 approximately 635 M€ were invested in collaborative projects)
- Supporting the needs of relevant EU water, climate and resource efficient policies
- Reinforcing water innovation capacity and market uptake of successful research results
- Strengthening international R&I cooperation in the field of water to support the implementation of Sustainable Development Goals
- Promoting and strengthening public-public and public-private partnerships in the water sector (eg. Water Supply and Sanitation Technology Platform, Joint Programming on Water, European Innovation Partnership on Water)
- Supporting evidence based policy-making (e.g. P4P initiative)
- Addressing regulatory and financial innovation (e.g. Innovation Deals, Innovation Principle)

Water in Horizon 2020



NextGen aims to boost sustainability and bring new market dynamics throughout the water cycle at the 10 demo cases and beyond. Three key areas of action are foreseen:

The project will assess, design and demonstrate a wide range of water-embedded resources, including:



Water

Itself with reuse at multiple scales supported by nature-based storage, optimal management strategies, advanced treatment technologies, engineered ecosystems and compact/mobile/scalable systems



Energy

Combined water-energy management, treatment plants as energy factories, water-enabled heat transfer, storage and recovery for allied industries and commercial sectors;



Materials

Such as nutrient mining and reuse, manufacturing new products from waste streams, regenerating and repurposing membranes to reduce water reuse costs, and producing activated carbon from sludge to minimise costs of micro-pollutant removal

An integral part of deploying NextGen solutions will be to **define and cultivate the framework conditions for success:**

Involving and engaging citizens and other stakeholders

Addressing social and governance challenges

Scale-up of low-carbon footprint **MA**terial **R**ecovery **T**echniques in existing wastewater treatment **PLANT**s

The project will prove the feasibility of circular management of urban wastewater and environmental sustainability of the systems and co-benefits of scaling-up water solutions through Life Cycle Assessment and Life Cycle Costing approaches.

About SMART-Plant

SMART-Plant will scale-up in real environment eco-innovative and energy-efficient solutions to renovate existing wastewater treatment plants and close the circular value chain by applying low-carbon techniques to recover materials that are otherwise lost. 7+2 pilot systems will be optimized for more than 2 years in real environment in 5 municipal water treatment plants, including also 2 post-processing facilities. The systems will be automated with the aim of optimizing wastewater treatment, resource recovery, energy-efficiency and reduction of greenhouse emissions. A comprehensive SMART portfolio comprising biopolymers, cellulose, fertilizers and intermediates will be recovered and processed up to the final end-products.

The integration of resource recovery assets to system-wide asset management programs will be evaluated in each site following the resource recovery paradigm for the wastewater treatment plant of the future, enabled through SMART-Plant solutions. The project will prove the feasibility of circular management of urban wastewater and environmental sustainability of the systems, to be demonstrated through Life Cycle Assessment and Life Cycle Costing approaches to prove the global benefit of the scaled-up water solutions. Dynamic modeling and superstructure framework for decision support will be developed and validated to identify the optimum SMART-Plant system integration options for recovered resources and technologies. Global market deployment will be achieved as right fit solution for water utilities and relevant industrial stakeholders, considering the strategic implications of the resource recovery paradigm in case of both public and private water management. New public-private partnership models will be explored connecting the water sector to the chemical industry and its downstream segments such as the construction and agricultural sector, thus generating new opportunities for funding, as well as potential public-private competition.

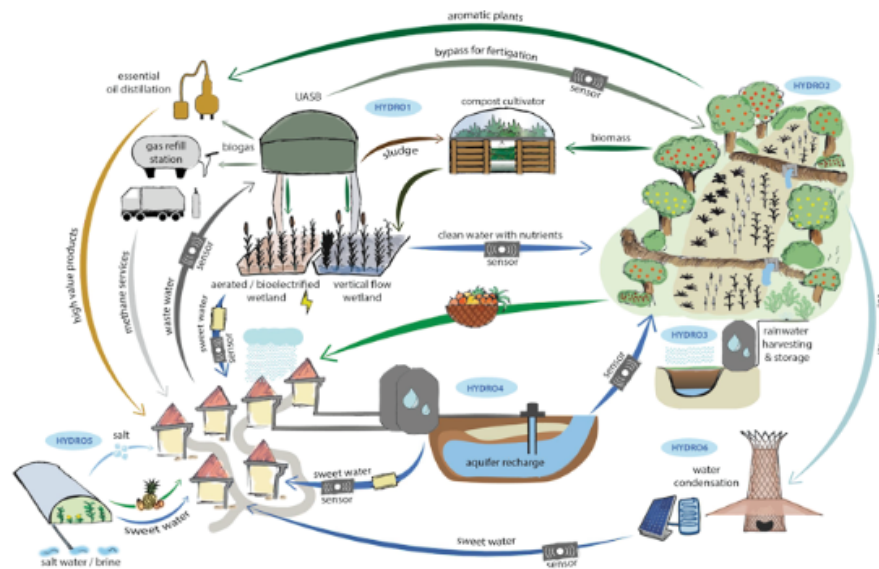


The Project

DEMONSTRATION OF WATER LOOPS WITH INNOVATIVE REGENERATIVE BUSINESS MODELS FOR THE MEDITERRANEAN REGION

HYDROUSA is a EU Horizon2020 Innovation Action project approved under the call topic CIRC-[02-2016-2017](#) (Water in the context of the circular economy) (Grant Agreement No. 776643). HYDROUSA aims to revolutionize the water supply chain in Mediterranean regions by demonstrating innovative solutions for water/wastewater treatment and management, which will **close the water loops** and will also **boost their agricultural and energy profile**.

[Read more](#)





POWERSTEP **Full-scale demonstration of energy positive
sewage treatment plant concepts
towards market penetration**
YOUR FLUSH, OUR ENERGY

Policy recommendations:

- ✓ Recognise biogas from sewage as a renewable energy with a lower environmental footprint than other forms of biogas and biofuels
- ✓ Prioritise renewable energy from sewage for public support
- ✓ Extend green public procurement (GPP) criteria for wastewater treatment plants so that they promote energy neutral or energy positive plants as well as energy efficiency
- ✓ Grant access to cohesion/structural funds contingent on energy efficiency investments, including in wastewater treatment plants
- ✓ Make public subsidies for energy production at wastewater treatment plants contingent on the application of energy management systems that render these plants state-of-the-art
- ✓ Define power-to-gas (P2G) as a form of energy storage.

Innovation Deals (IDs)

Sustainable wastewater treatment combining anaerobic membrane technology and water reuse (07 April 2017)



From E-Mobility to recycling: The virtuous loop of electric vehicle (12 March 2018)



P4P Urban Water Management

Definition of
policy
questions

Harvesting
policy
information
from EU-
funded R&I
projects

Validation
of the
findings by
a broader
scientific
community

Comple-
menting
the
knowledge
from other
sources

Producing the
outcome:
1. Policy
recommenda-
tions
2. SRIA for HE

✓ External experts

**Christian KAZNER, Uwe FORTKAMP, Alfieri POLLICE,
Despo FATTA-KASSINOS, Andreas ANDREADAKIS,
Christos KARAVITIS, Gonzalo DELACAMARA**

✓ Report sections: Water quality, Water quantity, Water in Circular Economy, Water-Energy nexus, Economic and financial sustainability, Governance

✓ Next steps: finalisation Q2 2019

P4P Urban water Management

- ***Draft recommendations on Water-Energy Nexus***
 - ✓ Set **energy performance targets for urban water systems** and; define KPIs and set up reporting system to monitoring the performance
 - ✓ Target for **energy efficiency in water distribution** (pressure management, leaks management)
 - ✓ Targets for **energy efficiency and energy production of waste water treatment systems** (e.g. production of methane as biogas of 2nd generation fuel)
 - ✓ Require **urban energy systems to be water efficient**

Horizon Europe

is the Commission proposal for a **€ 100 billion** research and innovation funding programme for seven years (2021-2027)



to strengthen the EU's scientific and technological bases



to boost Europe's innovation capacity, competitiveness and jobs

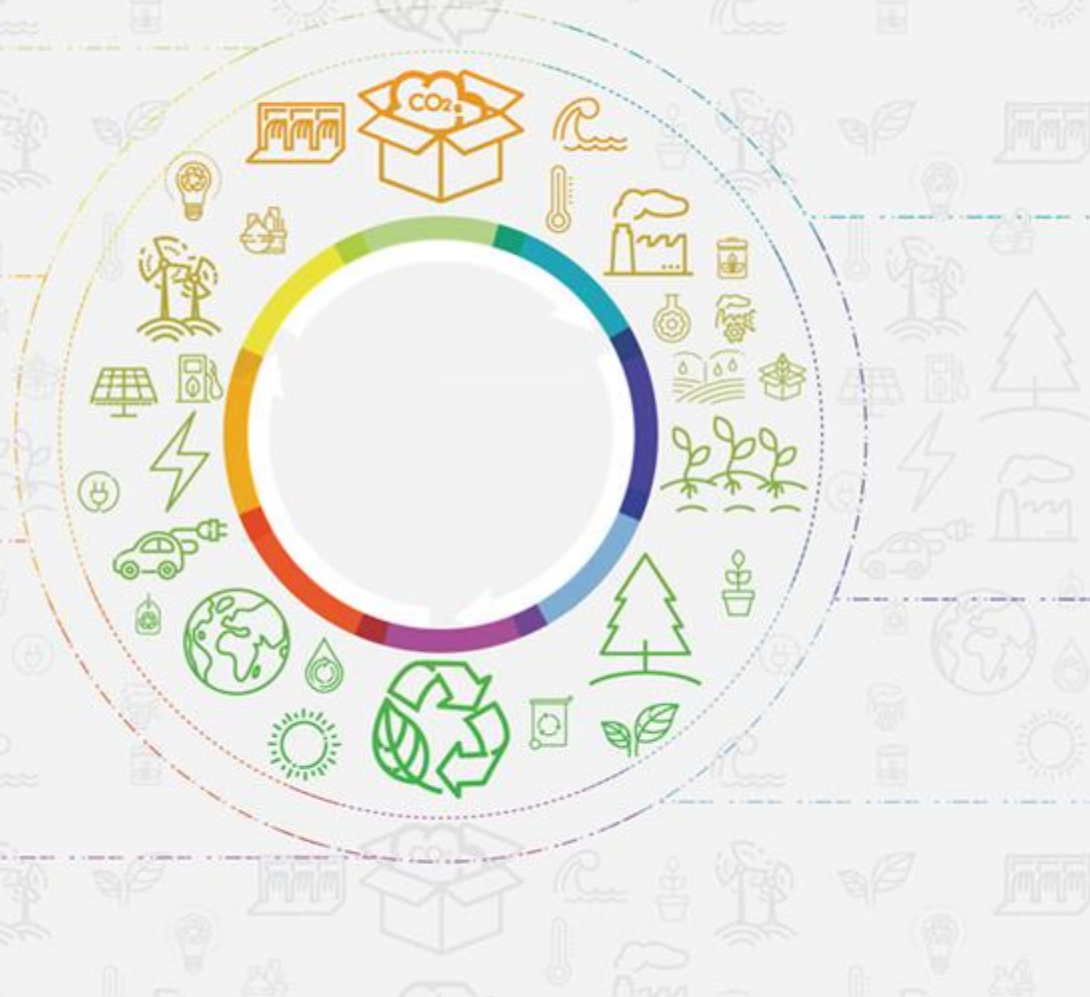


to deliver on citizens' priorities and sustain our socio-economic model and values

€ 4.1 billion are proposed to be allocated for defence research, in a separate proposal for a European Defence Fund

“A Clean Planet for all”

A European strategic
long term vision for a
prosperous, modern,
competitive and
climate neutral
economy





Challenges and opportunities ahead

- ✓ From linear to circular economy
- ✓ From farm to fork
- ✓ Future-proof energy, building and mobility
- ✓ Ensuring a socially fair transition

Thank you!

#InvestEUresearch

More information:

www.ec.europa.eu/research

Participant Portal:

www.ec.europa.eu/research/participants/portal/desktop/en/home.html

SC5 social media network on 'Yammer':

<http://www.tinyurl.com/greenRTD>