



SINTEF Community
Postal address:
Postboks 4760 Torgarden
7465 Trondheim, Norway
Switchboard: +47 40005100
community@sintef.no

Enterprise /VAT No:
NO 919303808 MVA

Norwegian Ministry of Education and Research
PO Box 8119 Dep
0032 Oslo

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Our Ref:
99130108

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Thematic submissions to the EU's upcoming framework program for research and innovation - 24/5497

Which thematic areas are particularly important for us to collaborate on at European level in the upcoming framework programme?

- **Water and climate resilience:** The increasing frequency and severity of extreme weather events concomitant with slow-onset changes to the Earth's climate highlight the significance of the global water cycle and need to adapt to observed and predicted changes in the water cycle. Water management is a universal challenge, with increasing spatial and temporal misalignment between water supply and demand globally. Given Norway's focus on sustainable water management and environmental resilience, collaboration in the thematic area of **climate change adaptation** and **water systems management** is essential. EU-wide cooperation on **digital twins** for infrastructure, **predictive maintenance**, and **resilient water infrastructure management** could benefit Norwegian systems. This includes enhancing the **operational efficiency** and **sustainability** of water assets through digital technologies.
- **Critical Infrastructure Protection:** Given the increasing vulnerability of critical infrastructure to cyber threats, natural disasters, climate change impacts, hybrid threats, etc., **critical infrastructure protection** (CIP) is an urgent area for collaboration. Norway, with its emphasis on **resilient infrastructure** and **secure systems**, should lead initiatives on **cybersecurity** for water and energy systems, and **disaster preparedness** for critical infrastructure.
- **Digitalization and innovation:** The integration of **AI**, **IoT**, and **data-driven solutions** in water, energy, and infrastructure systems presents vast opportunities for collaboration. Research into **smart cities**, **AI for decision support systems**, and **digital twins** in water systems aligns with Norway's national ambitions. Special emphasis should be placed on **water infrastructure asset management**, using digital technologies to improve life-cycle management, maintenance, and efficiency of assets.
- **Circular economy:** Norway should emphasise **circular economy solutions in the water sector** to promote resource recovery and provide the knowledge required for arguing water management in an economic context.
- **Biodiversity:** Biodiversity loss poses an existential threat to humanity. Feedback loops between climate change and biodiversity loss highlight the need to prioritise research initiatives aimed at addressing **ecosystem degradation and biodiversity loss** concomitant with climate action.
- **Nature restoration:** **Nature-based solutions** to conserve, protect, restore and sustainably use and manage ecosystems and their services should be further promoted, not as alternative to but as complementary to technological solutions, in order to increase water and food security and climate resilience, and combat biodiversity loss. Additional effort is needed to illustrate the benefits of **integrating nature-based and technological solutions**. We need to recognise the value of both nature-based and technological or engineered solutions and invest in research and innovation initiatives to identify novel hybrid solutions that exemplify working with nature whilst at the same



time utilising innovative digital technologies, novel sustainable materials, and advanced engineering concepts to address major societal challenges.

- **Green transition and sustainability:** Norway is a leader in **clean energy** and **sustainable technologies**. Collaboration in **energy systems**, **carbon capture and storage**, and **sustainable agriculture** would align with both Norwegian national priorities and EU sustainability goals. Key to this collaboration is integrating **sustainable water (infrastructure) management** into the broader context of the green transition, ensuring water assets are part of Europe's climate-smart future.
- **Regenerative rural economies:** Norway has the potential to be a leader among European countries with respect to **nature-positive and regenerative rural development**. Additional research and innovation centred on local co-definition with stakeholders and operationalisation of regenerative rural development pathways should be emphasised as a means to bridge the urban-rural divide, conserve natural capital and build social capital in rural areas.

In which areas is it particularly important for Norway to utilise the European Partnerships and Missions instruments?

- Norway should **continue to engage fully in European Missions**. The European Missions (Adaptation to Climate Change, Restore our Oceans and Waters by 2030, 100 Climate-Neutral and Smart Cities by 2030, A Soil Deal for Europe, and Cancer) are central to the achievement of objectives outlined within the European Green Deal and related policy initiatives.
- **Water and climate resilience Missions:** Norway should advocate for the use of Missions to enhance collaboration on large-scale **climate resilience** and **water management** solutions. Norway's strong position in **climate adaptation**, **flood management**, and **sustainable water technologies** should leverage Mission-driven projects to advance these areas rapidly. Missions focusing on **water infrastructure resilience** and **sustainable management** would be a key area to support.
- **Critical Infrastructure Protection Missions:** Given the increasing risks posed to critical infrastructure, Norway should prioritize missions focused on their **protection against dynamically changing threats landscape, also considering cascading effects**. Mission-driven projects could develop novel **resilience strategies**, enhance **asset management** in critical sectors, and create scalable models for **disaster-proofing** infrastructure across Europe, as well as support / guide the implementation of directives (e.g., CER and NIS-2).
- **Digital and green infrastructure Missions:** Mission-driven initiatives for **digital twins**, **AI-based infrastructure management**, and **smart water systems** could accelerate the development of innovative, scalable solutions. Norway's experience in **smart infrastructure** and **water asset management** could position it as a leader in the digital transformation of European infrastructure systems, ensuring water systems are more adaptive and resilient.
- We should seek to **expand Norwegian involvement in European Partnerships**. European Partnerships provide a critical opportunity to bridge gaps between high level policy initiatives, research outcomes and innovation adoption by end users. These topical Partnerships are key to industry modernisation and as such are essential to maintain a vibrant Norwegian economy and society. Engagement in a broad range of European Partnerships allows Norwegian industry to define and fulfil development needs and strengthen the global competitiveness of Norwegian businesses.
- **European Partnerships in food, bioeconomy, natural resources, agriculture and environment** address critical challenges that are fundamental to future food and water security, and address threats to ecosystems and biodiversity. Within this portfolio, **Biodiversa+**, **Water4All**, and **SBEP (sustainable and productive Blue Economy)** are particularly relevant to Norwegian business and industry.
- **European Partnerships in climate, energy and mobility** support the transformative change needed to enhance the long-term sustainability of the built environment and critical infrastructure. Within this portfolio, **Driving Urban Transitions (DUT)** strongly supports people-centred, multi-sector



innovation towards sustainable urban futures, including sustainable urban water systems and services.

Are there other factors that are important to emphasise in a national thematic input?

- **Cross-sector collaboration:** Emphasize the importance of **multi-disciplinary collaboration** across research fields such as water, energy, climate, and digitalization. Norway's integrated approach to sustainability, **water infrastructure asset management**, and climate action should be recognized as a best practice for fostering collaborative projects.
- **Strengthening EU-Norway cooperation:** Highlight the value of **Norway's participation in EU research programs** and the need for frameworks that facilitate **collaboration with Norway's national research entities** and **industry** on European projects through increased engagement in European Partnerships.
- Continued support for the widespread participation of Norwegian entities in EU research is critical to ensure continued alignment of Norwegian policies and practices with the best available knowledge and information (i.e., data-driven decision-making). The translation of cutting-edge research and innovation into practice is particularly supported by **Research and Innovation Actions**, which **bridge the gap between fundamental and applied research**. Additional emphasis on Research and Innovation Actions is needed to mobilise private investment in climate and sustainability actions, thereby accelerating transformational change.
- **Innovation and commercialization:** It's important to focus on the **commercialization of R&I outputs** in the EU framework program, particularly in areas where Norway has a strong innovation base, such as **green technologies** and **digital solutions** for infrastructure. Calls for innovation-focused initiatives and funding should be designed with mechanisms to support scaling up and **market entry**, especially for solutions that enhance the **sustainability** and **resilience** of water systems and critical infrastructure.
- Future research initiatives should more explicitly recognise **connections among water, energy, food, climate and ecosystems**, seeking to better understand interdependencies and cascading impacts of developments in one or more areas. Scientific/technological assessments of food-water-energy-climate-ecosystem dependencies and cascading impacts are needed to inform innovative governance models and sustainable green business and finance models.
- In order to achieve the desired green transformation of Europe, additional research and innovation is needed to **move beyond conventional concepts of sustainability towards nature-positive and regenerative paradigms**. The standardisation of nature-positive and regenerative development concepts and their mainstreaming within industries and sectors should be encouraged through transdisciplinary research initiatives aimed at building regenerative socio-ecological systems.
- **National priorities on asset management and infrastructure resilience:** Stress the importance of prioritizing **water infrastructure asset management** in the EU framework, especially in the context of **long-term sustainability** and **climate resilience**. This includes promoting research on **predictive maintenance**, **asset life-cycle management**, and **resilient infrastructure** in line with evolving risks and societal needs.

Sincerely,

On behalf of SINTEF Community

Rita Maria Ugarelli
Chief Scientist

Herman Helness
Senior Scientist

Laura Alison Wendling
Senior Scientist