

Hearing on MFF – NORCE input to the Norwegian position paper

Question 1 - Thematic areas especially important/fitting for European collaboration.

Polar

To achieve the EU Arctic Policy goals and European Green Deal targets, Europe needs to lead the development for building climate change resilience and sustainable development in the polar regions, especially the Arctic. Europe must take a leading role in the support and coordination of polar research in the forthcoming decade to ensure a **strong European leadership role** in upcoming internationally coordinated initiatives, such as, International Polar Year (IPY, 2032-2033) and UN Decade of Action for Cryospheric Sciences (2025-2034). Achieving this leadership and these goals necessitates strong support for **increasing confidence in climate change information** through **improved understanding, modelling, and observations of poorly understood polar processes** (land ice, sea ice, snow, permafrost, atmospheric patterns, extreme events) **and their impacts** on, **and response of**, society and the environment in the polar regions and beyond. It is essential to **bridge observation gaps** in polar regions by using Copernicus expansion missions and digital twins to **enhance understanding, monitoring, and forecasting of polar climate**, including extremes.

Earth system science for society

To reach the EU Adaptation Strategy goals and for humanity to implement feasible and knowledge-based climate adaptation strategies, Europe needs to take a leading role in **strong and diverse climate modelling tools, data and novel techniques**. Understanding Earth system science is key to **reducing large uncertainties in crucial parts of the Earth system**. Focus should be on:

- 1) Improving climate sensitivity to temperature changes,
- 2) Impact and proximity of abrupt climate changes, e.g. ocean circulation, ice sheet instability.

Aquaculture

To meet the EU Green Deal goals and the Farm-to Fork Strategy, to aim at implementing the EC's Strategic guidelines for a more sustainable and competitive EU aquaculture (2021-2030), and to ensure future food security, food demand, ecosystem resilience and EU competitiveness; it is essential for Europe to prioritize a **sustainable, responsible and digital aquaculture sector**. This should include efforts towards:

- 1) **Bio and circular economy principles** (including efficient, resilient, low-impact production systems, low-trophic and multi-trophic production, sustainable feeds as provided through microbial production such as fermentation and microalgae cultivation, increased resource utilization);
- 2) **Animal welfare and health** (including farmed animals' physiological needs and limitations underpinning the development of any new products/processes, and production standards);
- 3) **Accelerating the uptake of digitalization** throughout the entire value chain (through data integration, data-sharing, advanced monitoring, and autonomous and AI-powered solutions);
- 4) **Resilient aquaculture value chains and businesses** in Europe;
- 5) **Societal engagement** in co-creating/co-designing solutions, consumer trust and societal acceptance;
- 6) International cooperation in aquaculture such as with African, South American or Asian countries.

Biotechnology

EC has ambitious goals to reach the EU's climate targets in the EU Green Deal, and has set up the European Biotechnology and Biomanufacturing Initiative, making biotechnology one of the most promising areas in the coming years. One concrete area is marine biotechnology. Marine habitats are largely unexplored and underexploited for biotechnological purposes. To de-risk investment, stimulate demand, and boost market uptake of sustainable and reliable **bio-based/bio-manufactured products & processes**, it is essential to:

- 1) Prioritize **optimization & scale-up** of new/existing biotechnological production processes (microalgae cultivation, microbial production, fermentation (gas) and downstream processing into ingredients/products);
- 2) Emphasize **sustainability and circular approaches** (also ensuring regulatory alignment);
- 3) Ensure **co-creation/co-design** with all relevant stakeholder communities, including responsible research and innovation (RRI) approaches. In addition, **transformative technologies** such as AI, gene editing or personalized/consumer biotechnology, and their combined use, can be critical for Europe to facilitate process efficiency, lab-to-market, quicker uptake, as well as new discoveries.

AI, data, and robotics

In alignment with the EU Green Deal, the Digital Strategy, and frameworks like AI Act and Data Act, Europe must prioritise a **sustainable, responsible, and sovereign AI, data, and robotics sector** to secure Europe's **technological leadership, strategic autonomy, and global competitiveness**. Key areas should include:

- 1) **sovereign data ecosystems** with secure, interoperable, and decentralised data infrastructures to promote cross-border sharing;
- 2) **next-generation AI and robotics**, emphasising scalable, explainable AI-driven systems for manufacturing, energy, materials, among others;
- 3) **human-centric AI** aligned with the AI Act, promoting explainability, fairness, privacy, and transparency;
- 4) **supply chain autonomy** through leadership in critical raw materials, HPC, and resilient, trusted AI systems;
- 5) **skilled talent and innovation hubs** to enrich expertise in AI, data sciences, and robotics;
- 6) **digital transformation** via AI and robotics integration for predictive maintenance & intelligent automation;
- 7) **international cooperation** to co-create, to uphold ethical standards and to build consumer confidence.

Technology & social sciences

Horizon Europe places emphasis on social sciences and humanities (SSH), and on interdisciplinarity; however, more effort is needed to **fully and truly integrate** social sciences in the next framework programme to tackle global challenges and to address the green & digital transitions. Also, following the *European data strategy* and *A Europe fit for the digital age*, Europe is supporting the development of AI and other frontier technologies aiming at **empowering people** with a new generation of technologies in a **data-driven society**.

However, transformative technologies like **artificial intelligence (AI)**, come with profound social challenges which also impact fundamental rights/systems like **democracy**. It is crucial for Europe to fully understand the social impact of AI. As AI technologies, particularly generative AI, become integrated into everyday life, they reshape societal functions, creating both opportunities and challenges for democratic governance. A European collaborative approach is essential to ensure that **AI development aligns with European values of fairness, transparency, and accountability**. Research on **public attitudes toward AI** can offer vital insights, helping policymakers anticipate and respond to concerns about social equity or individual rights, —thereby fostering a **trusted ecosystem for AI** that supports democratic resilience and citizen empowerment.

Norway and Europe has key expertise in fields such as **social simulation** (e.g. agent-based modeling) – developing software that portrays the unfolding of challenges Europe faces and **aids in finding context-tailored solutions to strategically managing upcoming crises** (e.g. extreme climate, pandemics, Etc.). These simulation models allow for the creation of “**data-based societies**” **where various situations and processes can be tested, making it easier to make informed decisions**. Combining social simulation with, for example, access to High Performance Computing (HPC) can contribute to increase competitiveness of European science, building bridges between existing “technology” and “social sciences” silos.

Energy

To meet EU Green Deal, Fit for 55, and in line with REPowerEU and REFuelEU, priority should be put on:

- 1) **Renewable energies**: Renewables, such as offshore wind, hydropower and geothermal, remain critical to decarbonizing Europe's energy supply. To enhance the **geothermal energy development**, it is crucial to focus on Underground Thermal Energy Storage (UTES), monitoring techniques, the drilling and completion process, as well as optimization, automation, and **chemical and microbial aspects** to reduce costs and risks;
- 2) **Carbon capture and storage (CCS)**: Permanently storing CO₂ underground remains critical in reducing the overall carbon footprint of hard-to-abate sectors. To develop a robust storage infrastructure, **better understanding of energy production and storage activities on the subsurface environments** is crucial to avoid costly competition for subsurface space and to secure the subsurface as a valuable future resource;
- 3) **Sustainable fuels**: green hydrogen and advanced biofuels offer critical alternatives for hard-to-abate transport sectors. In line with the Renewable Energy Directive which extended the scope of carbon sources from biogenic and atmospheric carbon to **recycled carbon fuels, the EU needs to increase funding** for usage of waste as a valuable source of carbon and energy to produce fuels, incl. Sustainable Aviation Fuels;

- 4) **Hydrogen**: H2 is key for energy storage, grid stabilization and decarbonizing, with research needed to **scale biohydrogen production**, create a cohesive H2 regional/EU infrastructure and improve H2 storage;
- 5) **Integrated energy systems**: Integrating different vectors and sectors, advances in **flexibility, energy management system, and storage**, will optimize energy flow across borders, balancing variable renewable energy sources and **enhancing resilience**. R&I efforts should however focus not only on technology development but also on **environmental impacts, worker health and safety, and social acceptance** and fully **involve the relevant stakeholders** (including energy communities), to **reflect societal needs and readiness**.

Question 2 - European partnerships and Missions.

The **partnerships' landscape is too broad and complex**. The need for closer cooperation between RTOs and industry is essential and can be achieved with simpler and more transparent rules/criteria for participation. It is important to work towards **simplification for beneficiaries**; such as harmonizing rules and procedures, and using the Funding and Tenders portal for all types of partnerships. In terms of **partnerships**, some areas are of **strategic importance for Norway**, such as **marine/oceans, energy, or raw materials**; however, in some specific contexts such as co-funded partnerships there is **limited funding** for Norwegian participation (e.g. Blue Economy SBEP partnership, or the CET partnership where Norway should participate in all call modules). It is positive to see new partnerships with strong social components (Societal transformations and resilience).

EU Missions should be properly evaluated for their effectiveness in achieving their desired impacts. Adjustments should be considered, including **the assessment of the need to improve or stop specific Missions** when deemed as “underperforming”. If Missions remain under the “R&I” budget, their scope needs to be within R&I activities. The same focus is to be put on the need to either improve or stop other instruments such as the **EIT - European Institute of Technology**.

Question 3 - Are there other aspects that are important to include in a national position paper?

Higher investments at EU-level must be accompanied by **stronger national commitment and larger national investments**, as highlighted in the *Letta, Draghi* and *Heitor* reports. Member states and associated countries need to step up their efforts so that strategic targets and goals can be met.

Europe is heading towards strategic autonomy, EU leadership in strategic sectors and better protecting European interests; highlighting concepts such as “EU Strategic value chains”, reducing “EU import dependencies” or “access to critical raw materials”. In this respect, it is **urgent and of strategic importance that Norwegian actors work together to clarify and to position the role of Norway as an associated country** in the future EU Framework Programme, understanding the risk that may be at stake of being “left out” since some strategic areas may be limited to EU Member States only. It is also important to monitor the introduction of **dual use**, since this could also bring access limitations for Norway as an associated country.

The Heitor report states ‘An increased budget should be guaranteed to fund multidisciplinary collaborations in FP10 for European added value’ and ‘focus on industry-led activities and public-private partnerships’. The role of RTOs and the role that RTOs play in fostering links to industry participation in R&I programmes is key¹. We urge to **preserve & strengthen Pillar II in FP10 and increase its budget**. It is key to ensure that the proposed *Industrial Competitiveness & Technology Council & Societal Challenges Council* have a focus on collaborative research and that they are fully open to Norway.

There are strong claims (e.g. EARTO, Heitor report) calling for a specific instrument for **technology infrastructures** (TIs) under the next MFF. In this respect, Norway needs to have a clear and inclusive understanding of which are the **strategic Technology Infrastructures** for Norway to be promoted at European level; aiming to have a comprehensive picture and a clear strategy at national level. **EDIHs** should also be understood as an enabler to access TIs and boost SMEs towards technology uptake.

¹ EARTO members participation in Horizon Europe [EARTO-Members-Participation-in-Horizon-Europe-Final.pdf](#)