Position Paper on the future of European Union programmes for research and innovation | February 2023

Cohesion, integration, and the creation of opportunities in EU research and innovation

Aurora's eleven recommendations

In view of the public consultation set out by the European Commission on Horizon 2020, Horizon Europe and beyond, the Aurora Universities Network presents eleven improvements for the Horizon Europe Strategic Plan 2025-2027, while at the same time looking towards the next research framework programme. Although this position paper has a variety of propositions, key recommendations centre around the need for more cohesion and integration between EU policies, programmes, and funding; the structural integration of stakeholder and citizen engagement; and the possibilities for global collaboration on cross-border issues.

1. To start with a crucial issue that has already taken too long to resolve. Aurora strongly believes that the **finalisation of United Kingdom's association to Horizon Europe - and its successor - should remain a top priority for both the EU and the UK government, and needs to be resolved swiftly**. Successive EU research framework programmes have demonstrated to be highly effective at facilitating and stimulating high quality pan-European collaboration. The UK Department for Business, Energy and Industrial Strategy (BEIS) shared that, under Horizon 2020, the UK was a top five collaboration partner for each of the other (then) 27 EU Member States. EU research activity proved to be one of the areas where the UK's interests align closely with those of the EU [1]. It is perhaps no surprise then that the UK performed so well in EU research framework programmes prior to Brexit. UK universities played an important role in this success, due to their interdisciplinary ethos and by helping support many of the UK's vital international partnerships and relationships, not only with other academic and research institutions, but also with businesses/SMEs, governments, NGOs and charities. Those aligned R&I interests between the UK and the EU continue today.

2. Aurora stresses the importance of **more cohesion and integration between EU programmes**. More and better integration between research and innovation (R&I) and education at higher education institutions is required to ensure the state-of-the-art education for students, and equip staff, teachers and researchers with the most recent knowledge, methodologies, and techniques to perform the best and most effective research and innovation [2]. The need for improved cohesion and synergies, also applies to the developments of the European Research Area (ERA), the European Education Area (EEA), and the European Higher Education Area (EHEA). Higher education institutions need continuation, alignment, and cohesion between the activities and EU policies on education, research, and innovation. For example, a clearer vision for alignment between these policies and their programmes, would address disparities that have led to the discontinuity of the Horizon 2020 SwafS funding for the support of

[1] UK Government Review of the Balance of Competences. Report on Research and Development. 2014
[2] European Education Area – European Research Area. Aurora position paper, 2020. https://aurora-universities.eu/new/wp-content/uploads/2023/02/AURORA-position-paper_EEA-ERA_June2020.pdf

European University Alliances whereas the Erasmus+ European Universities Initiative topic supporting European Universities alliances is being continued.

3. Aurora also advocates for **less fragmentation in the support schemes for research and innovations**, and therefore recommends more cohesion between EIT/KIC, EIC and ERC Proof of Concept (PoC) instruments. One way to achieve this would be to merge EIT, EIC, and ERC PoC activities into a single programme or organisation addressing both R&I and educational aspects. A merger would provide an opportunity to address the discrepancies that now exist, such as the criticism on the financial sustainability of the EIT and KICs [3], and the management of the EIC and its issues with operational procedures and non-alignment to the needs of applicants, and the need for "*a one-stop shop for European innovators looking for support*" [4]. Also, the existence of the ERC PoC and EIC Pathfinder leading both to a proof of concept may cause some inefficiency. The ERC PoC can remain as a separate scheme and/or serve as a support mechanism preceding a Pathfinder (or alike) grant application, separate from PoC schemes based on monobeneficiary or multibeneficiary research.

4. Continuing on the topic of funding, Aurora recommends enabling **longer funding periods in the research and innovation funding schemes**. Research into long-term effects require funding for longer periods than is now possible in the existing research and innovation funding schemes. Regular projects funded via Horizon Europe have a duration of up to four years, with a few exceptions such as funding for Mission-driven projects. Aurora suggests to create the possibility of 72 – 96 months funding periods for projects that need it. Such projects will then also need a mid-term evaluation to steer or adapt these projects or programmes where applicable.

5. Aurora highlights the importance of **structurally integrating and implementing citizen engagement and co-creation in policy development throughout the full R&I programme**. Aurora recognises that steps have been made when comparing to previous framework programmes. However, to ensure the societal input in EU research and innovation policies and programmes - and subsequently increase the relevance and impact of R&I activities on society - Aurora believes it would be beneficial if the practices of citizen engagement are implemented and applied across all the Commission's DGs, with the aim of achieving this for the next policy period, in line with the outcomes of the Conference on the Future of Europe [5].

6. The need for extensive engagement also comes to light when looking at the definitions of Deep Tech in the new European Innovation Agenda. At the moment these do not include social sciences and humanities (SSH), nor non-technological aspects of medical sciences, as remarked by the Council of the EU [6]. As such, comprehensive universities are partly excluded from this agenda, as are innovations deriving from

[3] 7-Year Review of 2nd Wave KICs: EIT Health. Final report. Deloitte, 2022. https://eit.europa.eu/sites/default/files/eit_health_seven-year_comprehensive_assessment_report.pdf
7-Year Review of 2nd Wave KICs: EIT RawMaterials. Final Report. Deloitte, 2022. https://eit.europa.eu/sites/default/files/eit_rawmaterials_seven-year_comprehensive_assessment_report.pdf

[4] REPORT on the implementation of the European Innovation Council. European Parliament, ITRE Committee, 2022. https://www.europarl.europa.eu/doceo/document/A-9-2022-0268_EN.html

[5] Conference on the Future of Europe. Putting Vision into Concrete Action. COM(2022) 404 final. European Commission, 2022. https://commission.europa.eu/system/files/2022-06/communication_1.pdf

[6] Conclusions on the New European Innovation Agenda. 14705/22. Council of the European Union, 2022. https://data.consilium.europa.eu/doc/document/ST-14705-2022-INIT/en/pdf

these scientific domains. This is a missed opportunity, according to Aurora, and represents a disconnection between the Innovation Agenda and Horizon Europe's policy agenda and Regulation. In addition, innovations cannot take place without the inclusion or connection with and supply from basic and translational sciences in this innovation strategy. Continued innovation is based on continuous new knowledge and results from scientific research [7,8], which should also include the active engagement of end-users and societal actors throughout the innovation agenda. This is why Aurora recommends **extensive engagement of the academic and research community, and citizens**, in the development, writing and implementation of these strategies to ensure acceptance, and maximise impact, of the human-centred innovation strategies.

7. Since cross border challenges such as climate change require an international approach, that includes actors and partners outside of the EU, Aurora recommends providing **more possibilities in future framework programmes for researchers, innovators, societal actors and governments to collaborate with non-HEU-associated countries** on cross-border topics to find mutual solutions to SDG-related issues [9]. In addition, the European Commission and Council of the European Union emphasised that international cooperation is part of the EU strategy in R&I. The international setting of these intercontinental collaborations, should follow the narrative of the SDGs in addition to, or instead of, relevant EU priorities.

8. Staying on the topic of SDGs, and in line with Aurora's position on climate change and societal transformation (2020) [10], Aurora emphasises that **climate change research should also address climate-related diseases and disorders**. Although few R&I projects on this theme have been funded [11], and upcoming calls may address the relation between pollution and climate risks for health, there is an opportunity for more synergies and integration between Horizon Europe, EU4Health, LIFE, Digital Europe and their successors. Such an approach could address more the relation between and policy development for health and diseases induced by climate change, and the related societal changes based on preventive measures, epidemiological and social predictions, lifestyle changes, disease mechanisms, monitoring, medical and social care, and cure. Specific examples include a) the spread of infectious diseases to new geographical areas, b) the aggravation of medical conditions and health and care needs due to heat, and c) the impact on health and nutrition of vulnerable populations of climate-induced weather shocks.

9. A recent evaluation study by the European Court of Auditors (2022) [12] on the effects of Widening support in the Horizon 2020 programme, pointed out that many Widening

[7] G. Conway, J. Waage, and S. Delaney. Why Science Is Important for Innovation. Development Outreach 2010, pp 13-15. World Bank https://www.academia.edu/72453318/Why_Science_Is_Important_for_Innovation

[8] Furthering America's Research Enterprise. Eds. R.F. Celeste, A. Griswold, and M.L. Straf. Chapter 3. Understanding the Pathways from Research to Innovation. National Academies Press (US), 2014.

[9] European Global Approach revisited - position paper by Aurora. 2021. https://aurora-universities.eu/new/wp-content/uploads/2023/02/AURORA-position-paper-on-EC-Global-Approach_210323_final.pdf

[10] Aurora's position paper on the future mission "climate mitigation and adaptation including societal transformation". 2019. https://aurora-universities.eu/new/wp-content/uploads/2023/02/AURORA-position-paper-on-adaptation-to-climate-change-and-societal-transformation-Oct2019.pdf

[11] Horizon Europe health addresses climate change concerns. European Commission HaDEA, 2022. https://hadea.ec.europa.eu/news/horizon-europe-health-addresses-climate-change-concerns-2022-09-29_en

[12] Special Report 15-2022. European Court of Auditors, Luxembourg. https://www.eca.europa.eu/Lists/ECADocuments/SR22_15/SR_Horizon_2020_Widening_EN.pdf

countries make effective and beneficial use of the Widening budget for research and innovation. This was confirmed by an European Research Executive Agency evaluation in 2021 [13]. However, the Widening budget was not used equally by the Widening countries, resulting in scientists not profiting equally in all Widening countries. The study concluded that without sufficient national support and national reforms for R&I (infra)structures the observed progress and improve in R&I excellence will not be sustainable. This may lead to another development gap. Aurora supports the Widening endeavours, while also stressing that the overarching principles of the framework programmes should be focussed on excellence and impact. **Aurora stresses that a continued enlarged national political willingness to structurally invest in R&I is needed and that sustainable funding and excellent R&I infrastructures are key**. Allocation of dedicated budget from other EU programmes like Cohesion Fund, European Regional Development Fund (ERDF) and NextGeneration EU may help in this as these funds currently do. As a second recent report by the European Court of Auditors pointed out [14], those countries receiving a high ERDF budget are less successful in HEU. The Court recommends to improve the connection between ERDF and HEU by liberating financial resources within ERDF budget - instead of within the HEU budget – to help participation of Widening countries in HEU. In turn, this could allow for an alleviation in the Widening budget of the R&I framework programmes. Moreover, while specific support for R&I in Widening countries can be very useful to increase their excellence, it should be reminded that scientists in Widening countries are equally excellent to their non-Widening scientific peers. In addition to the need for structural national investment, some instruments or funding schemes in the current HEU WIDERA programme are useful in contributing to the achievement of excellence, promotion of the international perspective of scientists, staff and institutions, and exchange of knowledge and expertise, like Twinning, ERA Fellowships, Teaming, and COST.

10. The rapid developments and uptake of **digital technologies require sufficient training and skilling of people** for an efficient and effective use of these technologies in many aspects of life. However, digital technologies - including artificial intelligence - are a means to an end, not the ultimate solution or goal. Therefore, the focus of digitalisation in R&I and application in society should be on the development, implementation, and use to help achieving overarching human-centred goals. Aurora also emphasises that non-digital techniques, technologies and sources, should not be forgotten and need to be preserved and taught as well.

11. Finally, there are gaps in the applicability of the Technology Readiness Levels (TRLs). TRLs do not apply to all research domains, including SSH or non-technological medical research. This has also been observed by the European Commission itself [15]. As a result, Aurora recommends an **examination of the way in which innovation and impact are measured and addressed, to include non-technological aspects of scientific result**. Some alternatives have already been developed, such as KTH

[13] Spreading Excellence and Widening Participation. Impact Report. H2020 Results and Outlook to Horizon Europe. European Research Executive Agency, 2021. https://op.europa.eu/en/publication-detail/-/publication/d3eed905-7356-11ec-9136-01aa75ed71a1/language-en/format-PDF/source-248298288

[14] Special report 23-2022. European Court of Auditors, Luxembourg. https://www.eca.europa.eu/Lists/ECADocuments/SR22_23/SR_H2020_and_ESI_Funds_EN.pdf

[15] I. Bruno et al. Technology Readiness revisited: A proposal for extending the scope of impact assessment of European public services. ICEGOV2020 Proceedings, Athens, 2020, pp369-380. https://ec.europa.eu/isa2/sites/default/files/technology_readiness_revisited_-_icegov2020.pdf

Innovation Readiness Levels TM, the Societal Readiness Thinking Tool [16] and the Impact Readiness Level [17]. This oversight of SSH is also reflected in the lack of embeddedness of SSH in STEM research, although SSH are very important for social transformation issues, economic challenges and health-related topics.

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[16] The Societal Readiness Thinking Tool: A Practical Resource for Maturing the Societal Readiness of Research Projects. Michael J. Bernstein, Mathias Wullum Nielsen, Emil Alnor, André Brasil, Astrid Lykke Birkving, Tung Tung Chan, Erich Griessler, Stefan de Jong, Wouter van de Klippe, Ingeborg Meijer, Emad Yaghmaei, Peter Busch Nicolaisen, Mika Nieminen, Peter Novitzky & Niels Mejlgaard. Science and Engineering Ethics volume 28, Article number: 6 (2022)

[17] DANDELION – Promoting EU – funded projects of inclusive, innovative and reflective societies (IIRS) – Grant Agreement Nº: 693796