

— Framework for the Environmental Sustainability of Research Organisations

Priorities and objectives for research funding and research performing organisations towards making their activities environmentally sustainable

November 2024

Colophon

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Science Europe, 'Framework for the Environmental Sustainability of Research Organisations: Priorities and objectives for research funding and research performing organisations towards making their activities environmentally sustainable.'

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1. Introduction and Background

The world is facing the triple planetary crisis – climate change, pollution, and biodiversity loss.¹ According to the Intergovernmental Panel on Climate Change (IPCC), “In the near term, every region in the world is projected to face further increases in climate hazards (*medium to high confidence*, depending on region and hazard), increasing multiple risks to ecosystems and humans (*very high confidence*).”² We live in the “critical decade,” in which our ability to pursue “deep, rapid, and sustained reductions in greenhouse gas emissions”³ will define whether global warming will be contained to below 1.5°C.⁴ Air pollution “is the world’s leading environmental health risk factor,”⁵ with 99% of the world’s population living in places where air pollution exceeds the World Health Organization’s guideline limits,⁶ and anthropogenically-driven biodiversity loss is happening at a rate “within the range of a mass extinction.”⁷

Tackling the triple planetary crisis requires the collective effort of all parts of society to effectively address its causes and mitigate its impacts. In addition to ongoing national initiatives, work is also organised in international frameworks. Within the European Union, the European Green Deal, adopted in 2019, is one of the EU’s foremost initiatives to address these challenges, and includes the commitment for the EU to become climate neutral by 2050, which is now enshrined in the European Climate Law.⁸ At global level, a complex system of international environmental governance includes, among others, institutions, environmental agreements such as the United Nations Framework Convention on Climate Change (UNFCCC), and scientific advisory bodies such as the International Panel on Climate Change.⁹

As the basis for developing new solutions for global sustainability, the knowledge generated through research has its role to play in facing these crises. It is also imperative that research organisations care for the environmental sustainability of their own operations. While better appraisal of their environmental impact is needed, research and development activities are in themselves considerable resource consumers and sources of pollution and greenhouse gas emissions.¹⁰ According to the European Federation of Academies of Sciences and Humanities (ALLEA), “the academic system is currently not climate-sustainable.”¹¹ Reducing the environmental impacts of research and research-related activities is therefore a matter of following scientific

¹ United Nations Climate Change, “What is the Triple Planetary Crisis?”, 13 April 2022, <https://unfccc.int/news/what-is-the-triple-planetary-crisis>

² https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

³ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

⁴ <https://unfccc.int/maintaining-a-clear-intention-to-keep-15degc-within-reach>

⁵ <https://www.nature.com/articles/s41467-023-41086-z>

⁶ <https://www.who.int/data/gho/data/themes/air-pollution>

⁷ <https://www.embopress.org/doi/full/10.15252/embr.202154193>

⁸ European Commission, “European Climate Law”, https://climate.ec.europa.eu/eu-action/european-climate-law_en

⁹ <https://oxfordre.com/internationalstudies/display/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-96?d=%2F10.1093%2Facrefores%2F9780190846626.001.0001%2Facrefores-9780190846626-e-96&p=emailAuVkJ5XE%2FwCtuE>

¹⁰ See for example, <https://www.sciencedirect.com/science/article/abs/pii/S0959652611003787>; https://elib.dlr.de/195764/1/Master%20Thesis_453992_Pratiwi.pdf;

¹¹ <https://allea.org/wp-content/uploads/2022/05/ALLEA-Report-Towards-Climate-Sustainability-of-the-Academic-System.pdf>

advice, ethics and credibility.¹² It is also a matter of unlocking new benefits from environmental action, such as saving resources and expanding collaborations.

Science Europe and its members have embarked on the mission to promote sustainability as a fundamental value for research organisations, and to provide support for reducing the environmental impacts of their activities. Care and collegiality, including the need “to care for and nurture the ecosystem that research exists within, including responsible resource use,” is one of the six core values in Science Europe’s [Values Framework for the Organisation of Research](#).¹³ Sustainability is also a key element of one of Science Europe’s strategic priorities, “Strengthening the role and the contribution of science for tackling societal challenges.” For the purposes of this Framework, we call ‘Greening Research’ the processes leading to sustainability or research activities, involving the planning, management and conduct of research. The present Framework is Science Europe’s first strategy document specifically dedicated to making research environmentally sustainable.

Since 2021, in close consultation with its members – in particular the Working Group on the ‘Green and Digital Transition’, recently refocused towards ‘Greening Research,’ Science Europe has been working along four axis:

- 1. Developing, coordinating and leveraging scientific knowledge for tackling climate change** – see reports “[Science for the Green Transition](#)” (2021) and “[Interdisciplinary Research for the Green and Digital Transition](#)” (2022),
- 2. Promoting science-policy interactions in tackling societal challenges** – see the report “[Science–Policy in Action: Insights for the Green and Digital Transition](#)” (2023) followed by the [Guidance on Science for Policy Activities](#) (2024),
- 3. Contributing to EU policy development for the green transition** – Science Europe has contributed, alongside EU Member States, to the development of a new European Research Area (ERA) action on greening research for the ERA Policy Agenda 2025-2027.
- 4. Promoting coordinated principles and activities on the global level** – Science Europe co-authored the [Call to Action to Research Organisations for the Net-Zero Transition](#) (2021) which was launched in the framework of COP26 and co-organised the [Symposium “Interdisciplinarity for the Net-Zero transition”](#) in the lead-up to COP27 in 2022. It has provided input to global statements by national research funding and performing organisations in the framework of the Global Research Council (GRC), namely the [Statement of Principles and Practices on Climate Change Research Funding](#), 2023 GRC Annual Meeting (The Hague, The Netherlands) and the [Statement of Principles on Sustainable Research](#), 2024 GRC Annual Meeting (Interlaken, Switzerland).

The present Framework introduces strategic directions for Science Europe Member Organisations to share practices and coordinate efforts. In addition to leading by example, the objective is to achieve systemic change – pursuing environmental sustainability of research organisations’ activities – including mitigating climate impacts. Other important questions, such as funding for

¹² <https://www.sciencedirect.com/science/article/abs/pii/S0959378020307676>

¹³ <https://scienceeurope.org/our-priorities/research-culture/research-values-framework/>

research on sustainability, as well as the economic and social dimensions of sustainability, fall outside of the scope of this Framework and may be the subject of future actions.

The target audiences of this Framework are research funding and research performing organisations, recognising their individual characteristics while accounting for the many interlinkages between their missions and operations. Section 2 presents the goals and structure of the Framework; Section 3 discusses the objectives linked to eight action areas and specific actions that can be undertaken in the short and medium term; and Section 4 outlines next steps for Science Europe and its Member Organisations.

2. Goal and Structure of the Framework

The ultimate goal of Science Europe and its Member Organisations is to promote environmental sustainability on the systemic level in Europe. It should be a fundamental value in the organisation, management and conduct of research and research-related activities, alongside research excellence and as a contributing factor to research excellence. In line with scientific recommendations, Science Europe's members need to commit their best efforts to achieve Net-Zero for themselves and to continuously pursue minimisation of their own environmental footprint. Environmental sustainability is a dynamic, and multi-layered challenge, affecting single research projects to programmes and organisations, to whole research systems. It requires considering the various types of interactions across research organisations, funding bodies, and with policymakers. It also requires both the re-evaluation of the principles on which we assess and plan research, and support for operational change on the ground. For this reason, we aim not only to lead by example but also to mobilise other research organisations and other stakeholders, in order to identify common interests and priorities; promote a cooperative approach to improving the sustainability of research systems; and play our part in addressing the causes and mitigating the impacts of the triple planetary crisis.¹⁴

Science Europe and its Member Organisations have identified **eight objectives** corresponding to eight (partly overlapping) thematic action areas that can inform research organisations' work towards environmental sustainability of research and research-related activities. These include:

- Environmental footprint of research organisations;
- Environmental criteria in the evaluation and management of research;
- Sustainable travel policy;
- Promoting digital solutions for environmental sustainability;
- Addressing the environmental impacts of digitalisation;
- Science for policy activities;
- Inter- and trans-disciplinary approaches;
- Knowledge management.

¹⁴ <https://unfccc.int/news/what-is-the-triple-planetary-crisis>

For the overarching goal and each of the eight objectives, we identify a set of actions that can be undertaken in the short and medium term, which are discussed in the next section (Section 3). These actions must be underpinned by an **integrated research policy**, as mentioned in Section 4. Figure 1 illustrates the structure of the Framework.

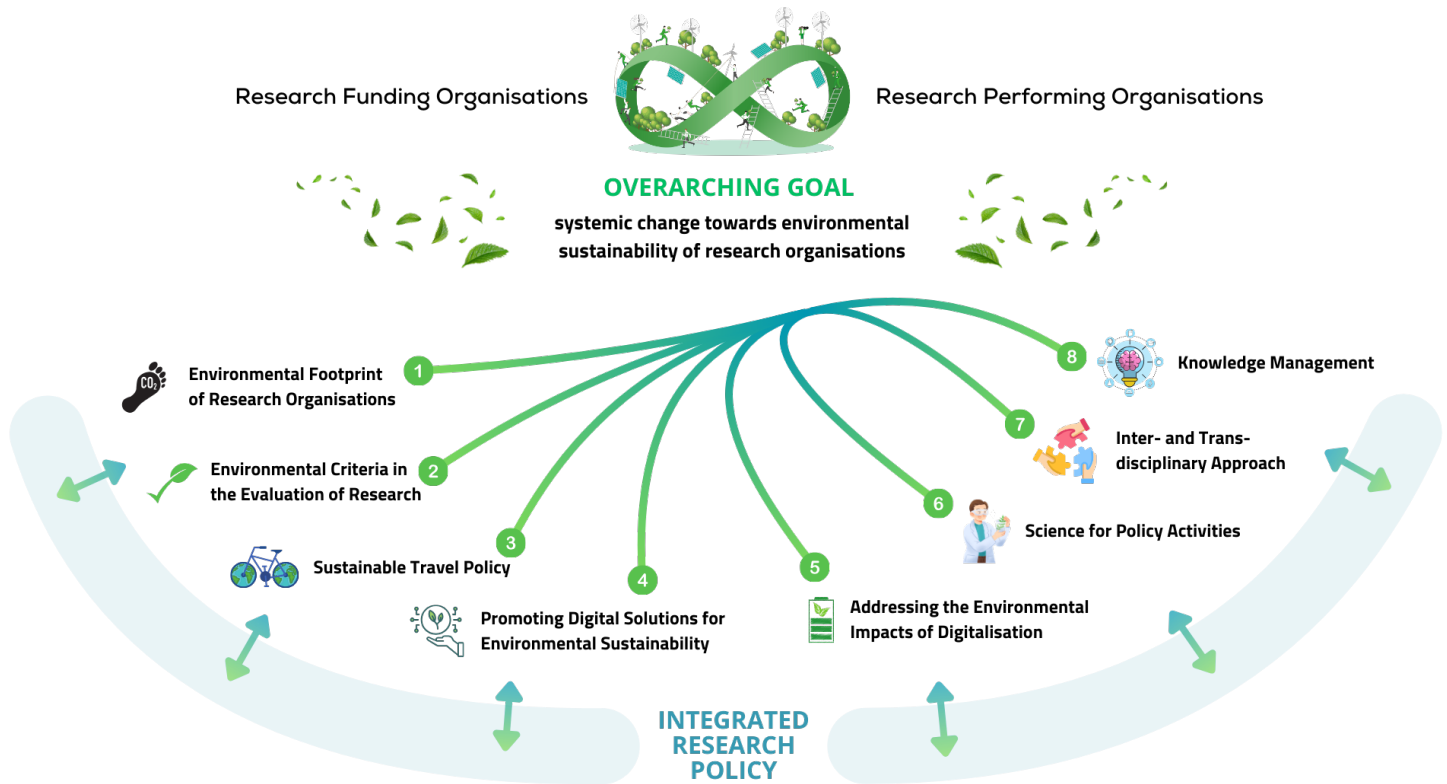


Figure 1. Structure of the Framework

A few caveats must be mentioned here. The objectives and possible actions are not intended to be fixed or exhaustive, and are likely to be subject to evolution. Pursuit of environmental sustainability in the organisation and conduct of scientific research will need to be flexible, responding to new challenges and constantly evolving contexts, and taking into account lessons learned while implementing the current Framework. We intend to regularly revise and adapt the suggested actions. This document also does not intend to define numerical targets. What we do intend to provide is an overarching framework and building blocks that can be transposed in Science Europe Member Organisations’ and similar research funding and performing organisations’ institutional strategies, supported by Science Europe and other relevant stakeholders, guiding future efforts to make their work environmentally sustainable.

3. Actions and Objectives

Overarching ambition: Systemic Change towards Environmental Sustainability of Research Organisations

Overarching goal: to promote environmental sustainability on the systemic level as a fundamental value in the organisation, management and conduct of research and research-related activities, alongside research excellence and also as a contributing factor to research excellence

Actions to be undertaken in the short term

Review and develop organisational policies for greening organisation, management and conduct of research; explore opportunities to develop new ones.

Identify the principles for greening research activities (services, opportunities, and trade-offs) and tools to evaluate the progress towards the environmental sustainability of research.

Carry out an awareness campaign for researchers and research organisations, highlighting the importance of environmental sustainability.

Explore opportunities and challenges across various scientific domains.

Build contacts and align efforts with other stakeholders in the research universe.

Mobilise leadership at all levels and promote grassroots initiatives, combining top-down and bottom-up approaches.

Promote dialogue and collaboration between research funding and research performing organisations.

Actions to be undertaken in the medium term

Align best practices and produce cross-institutional guidelines, recommendations and toolboxes for greening the organisation, management and conduct of research.

Increase and maintain the awareness of the importance of environmental sustainability in the organisation, management and conduct of research by showcasing outcomes and reporting on the progress.

Promote the environmental sustainability of research activities in policy development by mobilising decision-makers at all levels, in the EU's Framework Programme for Research and Innovation and the ERA Forum, as well as internationally.

Foster a long-term approach to investing in sustainable operations and practices, as well as visibility and recognition of these investments.

Provide a forum for research organisations to discuss systemic challenges such as the push for continual innovation and growth versus the concept of 'slow science' as a more environmentally sustainable form of conducting science.

Action area 1: Environmental Footprint of Research Organisations (all types)

Objective: Assess and mitigate the environmental footprint of research organisations

Actions to be undertaken in the short term

Fund, perform, collect, and share methods on how to estimate and reduce the environmental footprint, considering relevant categories such as the disciplinary needs of research organisations, seniority of researchers (from

Actions to be undertaken in the medium term

Based on the studies indicated in the left column, identify optimal strategies to mitigate the environmental footprint of research organisations.

junior to senior), levels (from single projects to whole institutions), or geographical localisation of research organisations.

Include environmental criteria in the management practices of research organisations. In particular, promote sustainable procurement practices, circular and sharing economy of equipment and services linked to research and research-related activities, energy savings and use of renewable energy sources.

Sub-area 1.1: Environmental Footprint of Research Funding Organisations (RFOs)

Objective: Assess and mitigate the environmental footprint of research organisations – *specific to research funding organisations (RFOs)*

Actions to be undertaken in the short term

Join forces by collecting and discussing methods and sharing best practices that are used, or can be used, by RFOs in mitigating the environmental impacts.

Raise awareness among research funding applicants by encouraging them to reflect on the environmental footprint of their research, such as travel, material use, energy use or purchasing equipment.

Actions to be undertaken in the medium term

Develop tools to support applicants in estimating their carbon footprint and broader environmental footprint.

Develop guidelines for grant recipients to reduce their carbon footprint and broader environmental footprint.

Sub-area 1.2: Environmental Footprint of Research Performing Organisations (RPOs)

Objective: Assess and mitigate the environmental footprint of research organisations – *specific to research performing organisations (RPOs)*

Actions to be undertaken in the short term

Analyse RPOs' challenges in reducing GHG emissions, and more broadly environmental footprint linked to research activities.

Identify which measures can mitigate these challenges.

Actions to be undertaken in the medium term

Develop tools to support researchers and RPOs in estimating their environmental footprint.

Publish guidelines for researchers and research teams to reduce their environmental footprint, tailored to the different types of research infrastructures and facilities.

Promote openness and shared use of research infrastructures, including the promotion of secondary data use and innovative access models, to optimise their use and operation models thereby reducing the environmental

impact of these often energy- and resource-intensive facilities and services.¹⁵

Action area 2: Environmental Criteria in the Evaluation of Research

Objective: Ensure that environmental criteria are progressively integrated in the evaluation of research alongside other criteria, reflecting sustainability (and careful resource use¹⁶) as a fundamental value

Actions to be undertaken in the short term

Discuss relevant environmental sustainability criteria and recognition mechanisms, considering their short- and long-term implications.

Actions to be undertaken in the medium term

Progressively integrate environmental sustainability as a criterion in the evaluation of research - alongside research excellence and other criteria - including in the assessment of funding applications, monitoring grantees, and the eligible costs for research funding organisations (RFOs).

Action area 3: Sustainable Travel Policy

Objective: Promote an awareness-based transformative travel policy for research organisations

Actions to be undertaken in the short term

Identify relevant criteria for sustainable travel policies for researchers and staff, starting at the executive level. Due consideration needs to be given to aspects such as purpose of travel (e.g. conferences, collaborative projects or research evaluations) and to developing alternative arrangements.

Actions to be undertaken in the medium term

Develop guidance and a toolbox to enable research organisations to make informed decisions on travel in view of environmental sustainability considerations.

Action area 4: Promoting Digital Solutions for Environmental Sustainability

Objective: Use the potential of digital solutions for achieving the environmental sustainability of research

Actions to be undertaken in the short term

Discuss the current and potential contribution of digitalisation, including artificial intelligence (AI),

Actions to be undertaken in the medium term

Produce foresight studies and recommendations on how digital technologies

¹⁵ <https://scienceeurope.org/media/cbchuqpi/se-oecd-policy-paper-optimising-the-operation-and-use-of-national-research-infrastructures-aug-2020.pdf>

¹⁶ <https://scienceeurope.org/our-priorities/research-culture/research-values-framework/>

to ensuring the environmental sustainability of the organisation, management and conduct of research. This can concern, for example, the role of digital solutions in the development of sustainable travel policies, or in achieving other objectives under this framework.

(for instance, AI or quantum technology) can support RFO/RPO activities in promoting the environmental sustainability linked to the organisation, management and conduct of research.

Action area 5: Addressing the Environmental Impacts of Digitalisation

Objective: Assess and minimise the environmental impacts associated with the use of digital solutions in the organisation, management and conduct of research

Actions to be undertaken in the short term

Identify ways to assess the environmental footprint linked to the use of digital solutions in the organisation, management and conduct of research, such as the air and water pollution generated by the production of IT equipment and the energy required to use it.

Discuss best practices and organisational approaches to promoting a sustainable use of digitalisation for RFOs/RPOs.

Actions to be undertaken in the medium term

Develop guidance for RFOs and RPOs on an environmentally sustainable use of digitalisation, in particular AI, for scientific research.

Raise awareness and promote a more sustainable procurement and use of IT equipment and digital products, including, for example, edge computing¹⁷ as well as circular and sharing economy approaches.

Develop guidelines on the environmental implications of the use of data by RFOs/RPOs, specifically dealing with confidentiality, integrity, openness, privacy, and security.

Action area 6: Science for Policy Activities

Objective: Strengthen the role and contribution of science in tackling societal challenges through liaison with decisionmakers

Actions to be undertaken in the short term

Promote science-informed decision-making, especially in knowledge-demanding fields such as climate change, biodiversity, and the green energy transition.

Identify organisational settings and incentive mechanisms to support decision-makers, as well as criteria for selecting relevant policy questions.

Actions to be undertaken in the medium term

Contribute to policy development, for example in the framework of the Conferences of the Parties of the Rio Conventions (United Nations Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD) and Convention to Combat Desertification (UNCCD)); United Nations Convention on the Law of the Sea (UNCLOS); Sendai Framework for Disaster Risk Reduction; Intergovernmental

¹⁷ <https://www.rtinsights.com/edge-computings-undeniable-role-in-sustainability/>

Discuss incentives for researchers engaged in science for policy activities, as well as ‘evaluation’ of science-policy interactions and the interfaces promoting them.

Strengthen collaborative and transdisciplinary approaches to science (co-design and co-implementation of research projects between academic and non-academic partners).

Platform on Biodiversity and Ecosystem Services (IPBES).

Action area 7: Inter- and Trans-disciplinary Approach

Objective: Promote an inter- and trans-disciplinary approach to solve research questions on the environmental sustainability of science

Actions to be undertaken in the short term

Discuss organisational incentives and resources needed to promote inter- and trans-disciplinary approaches for increasing environmental sustainability of research activities.

Involve researchers in dialogue with RFOs and RPOs to promote inter- and trans-disciplinarity for greening research activities.

Collect and exchange best practices.

Actions to be undertaken in the medium term

Adopt guidelines and promote favourable environment (including funding) for an inter- and trans-disciplinary approach to solve research questions on the environmental sustainability of research activities.

Action area 8: Knowledge Management

Objective: Accumulate and openly exchange knowledge on environmental sustainability of science

Actions to be undertaken in the short term

Map ongoing activities by the scientific community, including RPOs and RFOs, focusing on opportunities for ensuring environmental sustainability of research.

Conduct a survey to monitor the implementation of environmental sustainability practices across Science Europe Member Organisations.

Develop a Science Europe white paper with best practices for greening the organisation and conduct of research.

Actions to be undertaken in the medium term

Promote funding for mission-driven studies on greening the organisation and conduct of research, or relevant topics such as greener buildings and circularity.

Promote funding for reconciling scientific, indigenous, and business knowledge for the benefit of greening research activities.

Promote networking and knowledge exchange among science stakeholders.

4. Next Steps for Science Europe and its Member Organisations

As discussed above, systemic change is needed in order to ensure that scientific research is organised, managed and conducted in an environmentally sustainable manner. In line with Science Europe's Strategy Plan, we will lead by example, provide support and promote collaboration among our Member Organisations in implementing the current Framework, and mobilise broader actions towards environmentally sustainable research.

Currently, we have identified the following six **working priorities** for Science Europe and for its Member Organisations to guide the attainment of the environmental sustainability goal:

1. Identify and share opportunities, challenges, relevant policies and best practices for ensuring environmental sustainability of research activities and research organisations, namely the reduction of the environmental footprint (including, but not limited to, carbon footprint) and promoting environmentally sustainable practices.
2. Develop a set of coordinated actions to support Science Europe's Member Organisations (and other similar organisations) in transitioning towards environmentally sustainable practices. Develop synergies across relevant Science Europe strategic priorities and promote dialogue and collaboration between research funding and research performing organisations.
3. Mobilise research organisations to tackle environmental sustainability challenges pertaining to the organisation and conduct of research (e.g., climate change and the links between digitalisation and the environment).
4. Create a broader network to include additional stakeholders in the science universe, for example grassroots initiatives and umbrella organisations.
5. Liaise with decision-makers and key stakeholders to garner (political) support for ensuring environmental sustainability of research systems, in line with Science Europe's [Guidance on Science for Policy Activities](#). Engage with the relevant international fora such as the Global Research Council and the Conferences of the Parties of the Rio Conventions (following Science Europe obtaining provisional observer status at the Conference of the Parties of the United Nations Framework Convention on Climate Change).
6. Monitor the implementation of the present Framework and introduce adjustments as necessary, based on the results of the monitoring and on the feedback from the Science Europe's Working Group on Greening Research.

To include environmental sustainability among the fundamental values of research cultures, Science Europe and its Member Organisations will need to support the development of an **integrated research policy**, covering inter alia the EU's Framework Programmes. Such a policy must not only adopt a holistic approach to 'greening' research organisations, but also identify and develop synergies between environmental sustainability and other challenges that research systems are currently facing.