SURVEY REPORT

INTERDISCIPLINARY RESEARCH FOR THE GREEN AND DIGITAL TRANSITION

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INTERDISCIPLINARY RESEARCH FOR THE GREEN AND DIGITAL TRANSITION

Table of Contents

Foreword

The climate crisis calls us to act promptly. Science Europe has a specific strategic priority to "strengthen the role and contribution of science in tackling societal challenges," in particular the Green and Digital Transitions. In the framework of COP26 (Glasgow, UK, November 2021), Science Europe and several partners in higher education together launched a Call to Action to Research Organisations for the Net-Zero Transition. This Call outlines a vision in which scientific research works together in an interdisciplinary way, and in interaction with the whole society to address the climate crisis. Six areas for action were defined with a systems-thinking perspective to mobilise all stakeholders for urgent, immediate climate actions, in line with the United Nations' Sustainable Development Goal 13.

Interdisciplinary research is an elusive concept as science and scientific disciplines constantly evolve. In full awareness of this, Science Europe initiated a reflection in 2018 with its members on the state of the art of conceptualisations and existing trends, both theoretically and methodologically, at its 2018 Symposium on Interdisciplinarity. The Member Organisations of Science Europe are engaged in both funding and performing interdisciplinary research across Europe.

More recently, in our 'Values Framework for the Organisation of Research' (June 2022) inter- and trans-disciplinarity were recognised as main elements of the value of collaboration, which – balanced against competition – is necessary to support research quality and relevance.

This new survey report builds on initiatives implemented by Science Europe members, national research performing and funding organisations, and how they have integrated interdisciplinary approaches to tackle the compelling challenges related to climate change and digitalisation. It sheds new light on how interdisciplinarity contributes to and points at what is most needed to further interdisciplinary research. In the report, the reader will find extensive evidence of the approaches, instruments, and interventions that Science Europe members have put in place to address current challenges. From this perspective, interdisciplinary research constitutes an experimental approach to developing new forms of high-quality scientific research.

It is time to foster more collaboration and interdisciplinary approaches in science. The climate crisis and digitalisation challenges are urgent and require science to tackle them. Research organisations are called to scale up these activities to address societal challenges more effectively and rapidly.

Dr. Angelika Kalt
Director of the Swiss National Science Foundation
Vice President of Science Europe

Key Messages and Lessons Learnt

Based on the survey on 'Interdisciplinarity for the Green and Digital Transition' carried out among Science Europe Member Organisations in 2022, this report highlights five key messages and recommendations:

1. Science Europe Member Organisations have funding instruments and perform interdisciplinary research activities. These experiences are part of a broader shift towards challenge-oriented research activities, including those addressing the Green and Digital Transition.

   These experimental approaches show the efforts of research funders and performers to tackle the challenges of the Green and Digital Transition, while the urgency of the climate crisis calls for scaling up these activities beyond the existing ones.

2. Definitions of interdisciplinarity are rarely formalised because the aim is to bridge scientific disciplines. Strict, formalised definitions may hamper the orientating of interdisciplinary research activities toward addressing the Green and Digital Transition.

   Since scientific disciplines evolve and have no fixed boundaries, the recommendation is to keep definitions of disciplines open, aiming to orient them towards addressing societal challenges by working together.

3. The Green and Digital Transition are multidimensional societal challenges requiring the mobilisation of multiple disciplines and stakeholders. Acting together for the Green and Digital Transition requires overcoming co-ordination obstacles, enhancing the capacity to tackle the climate crisis and challenges coming from digitalisation. This approach requires systems-thinking and collaborative approaches, as presented in the Call to Action to Research and Higher Education system for the Net-Zero Transition.

   Research funders and performers are engaged facing the challenges of mobilising different scientific disciplines and co-ordinating societal stakeholders. The critical dimensions of these societal challenges still require more ambitions and efforts to mobilise research, engage stakeholders and orient research toward addressing societal challenges.

4. The funding of interdisciplinary research activities tends to follow the same management organisations of mono-disciplinary instruments adding the challenge-oriented perspective. The main question is ensuring a fair and just assessment of the quality of interdisciplinary research proposals that go beyond consolidated, mono-disciplinary approaches. The Agreement on Reforming Research Assessment points to the importance of recognising these multiple aspects.

   The recommendation is to focus on supporting the most promising proposals regarding the potential impacts on the climate crisis and digitalisation challenges.

5. Performing interdisciplinary research requires co-operation across discipline-based research units. Although several examples already exist, the challenge is to overcome the traditional researchers' career paths that are predominantly mono-disciplinary.

   In this respect, the Agreement on Reforming Research Assessment shows the direction: recognising inter-/multi-disciplinary career paths for researchers should be encouraged.

1. Introduction

The climate crisis and digitalisation are complex societal challenges requiring science-based knowledge to address. At the same time, interdisciplinarity is a long-standing challenge, together with related notions such as trans- and cross-disciplinarity, which Science Europe addressed in 2018 at its Symposium on Interdisciplinarity.

Interdisciplinary research is commonly considered better suited to tackle the so-called 'Green and Digital Transition', as it can mobilise different disciplines working together for a common goal. **While science and scientific disciplines constantly evolve and have no fixed borders, this report proposes to conceive interdisciplinarity as a space for experimenting research practices.** This experimental approach is strategic and needed for both research funding and performing organisations, as well as for other actors of the research ecosystem who want to address the climate crisis and digitalisation.

From this perspective, this report aims to address two main objectives:

1. **Mapping the existing experiences** of interdisciplinary research addressing the Green and Digital Transition funded and performed by Science Europe Member Organisations; and,

2. **Proposing recommendations** to reinforce, develop and improve interdisciplinary research activities for the Green and Digital Transition.

'Interdisciplinary research' (IDR) is proposed as an umbrella term covering notions like trans-, cross- and multi-disciplinarity, as explained more in detail in Section 3. It involves a wide range of challenges for research funders and performers as well as policy makers and researchers. Defining IDR and its practices is not straightforward and varies across countries and contexts due to different understandings of what constitutes a discipline. An extensive debate exists around theoretical conceptualisation and empirical applications (König, Diehl & Helming, 2013), and Science Europe provided an overview of challenges at its 2018 Symposium.

Interdisciplinarity is a recurring issue because science and scientific disciplines constantly evolve. In this perspective, interdisciplinarity is an elusive concept, and researchers and research funding and performing organisations have difficulties in formalising it. On the other hand, interdisciplinarity, together with related notions such as trans-, multi-, and cross-disciplinarity, is the recognition that research activities can be carried out in different ways, with multiple approaches and operationalisations (Bammer, 2017). Interdisciplinarity and related notions pose the challenges of mobilising and combining multiple disciplinary approaches, theories and methods, as well as questioning the standard quality criteria for projects and scholars (for a review, see the report of Science Europe's 2018 Symposium).

The outcomes of this survey contribute to developing Science Europe's strategic priority to "strengthen the role and contribution of science in tackling societal challenges" (see its Strategy Plan for 2021–2026), and precisely the actions to "support transdisciplinary research (and Open Science) as key enablers for sustainable development" and to "promote the role of science in shaping input for sustainable development beyond 2030" (see its Multi-Annual Action Plan for 2021–2026).

This report provides a common framework for IDR initiatives carried out by Science Europe members that address the Green and Digital Transition. Defining IDR is challenging as different understandings of 'disciplines' exist across countries and scientific fields (Klein, 1996; Bennett, 1997), while disciplines constantly evolve with no fixed boundaries (see Section 3). The debate on IDR has several open challenges, such as the use of different terminologies (inter-, multi-, trans-, cross-disciplinarity) related to different forms of IDR, the granularity of disciplines, and to what extent scientific disciplines stemming from different research cultures and epistemic traditions should be bridged (Mobjörk, 2010; Jacobs, 2014; Robinson, 2008; Huutoniemi, Klein, Bruun, & Hukkinena, 2010; Bennett, 1997). While standard scientific approaches (methods and empirical analyses) are discipline-based, IDR leads to scientific novelty, innovative approaches, and new research fields. Given the challenges brought by IDR, an open debate exists on how to achieve 'excellent' interdisciplinary research, thus recognising and valuing it. On the other hand, IDR is seen as better addressing societal challenges and providing innovative approaches beyond disciplinary boundaries.

From a broader perspective, the willingness to experiment with novel research approaches indicates a risk-prone attitude, as needed to tackle emerging societal challenges. This desire to experiment with new IDR approaches emerges from the complexity of challenges imposed by the climate crisis and digitalisation, and it affects the other research actors, from individual scholars to policy makers and stakeholders. For research funding organisations (RFOs), IDR is a way to orient research towards addressing societal challenges, and to experiment with new funding instruments that can mobilise multiple disciplines at once to address these. For research performing organisations (RPOs), it is a space to promote new forms of doing research for discipline-based research units by co-operating with researchers from different scientific backgrounds. Experimenting with these new approaches implies the recognition of new, diverse forms of contribution to scientific research, in line with the proposed Reform of Research Assessment launched in July 2022.

As mentioned above, the Green and Digital Transition involves complex and multidimensional challenges, requiring the mobilisation of several disciplines to address the needed systemic changes. **These challenges include different aspects, such as mitigating and adapting to climate change and achieving biodiversity-sustainable development, as well as implementing digital technologies and artificial intelligence. Furthermore, these themes are interconnected:** for example, the environmental benefits of switching to online communication instead of air travel, or the environmental implications of mining raw materials for chips. The report maps the areas considered and addressed by Science Europe Member Organisations using IDR approaches (see Section 4). Challenges like energy transition, circular economy, smart mobility, human-centred digitalisation, and new computing technologies are among those requiring the mobilisation of multiple, different scientific backgrounds. As discussed in the Call to Action for the Net-Zero Transition of Research Organisations, this multidimensional perspective is needed to adopt a systems-thinking approach.

The report presents findings from a survey devoted to these themes, lessons learnt, and recommendations for Science Europe Member Organisations, as follows:

- **Section 2** describes the methodology adopted.
- **Section 3** addresses the different definitions of IDR used by Science Europe members.
- **Sections 4 and 5** present the IDR funding instruments and performing organisations addressing the Green and Digital Transition.
- The involvement of stakeholders is discussed in **Section 6**, while the reasons for choosing IDR and the main challenges ahead are in **Section 7**.
- **Section 8** concludes and presents some future areas to be addressed.

2. Methodology

A thematic survey was held among Science Europe's Member Organisations (see respondents in Annex 1). It consisted of a questionnaire (April–May 2022) and a focus group (June 2022).

The questionnaire (see Annex 2) was prepared with the support of a thematic task force within the Science Europe Working Group on the Green and Digital Transition. It was sent to Science Europe Member Organisations on 6 April with responses due by 31 May 2022. A focus group, comprising a selection of respondents to the questionnaire and Working Group members, met on 30 June 2022. They discussed the results, and key elements of their findings are integrated into the following sections. The final report was completed between July and October 2022 with the support of a dedicated task force composed of selected Working Group members.

Table A **Profile of respondents**

Does your organisation fund or perform interdisciplinary research activities?			
	No	**Yes**	**Total**
Organisations with a research funding mission (RFO)	1	17	18
Organisations with a research funding and performing mission (RFPO)		4	4
Total	**1**	**21**	**22**

The questionnaire was answered by 22 out of 38 Science Europe Member Organisations,[1] mainly research funding organisations. One organisation declared not to have any IDR activities; thus, it was excluded from the analysis. Hence, the total number of organisations represented is 21. The distribution of respondents between RFOs and RPOs is in line with the general representation of these two types of organisations in the membership of Science Europe.

3. Definitions

The proposed definition of interdisciplinary research is an umbrella term to designate collaboration between scientific disciplines or between scientific disciplines and non-academic stakeholders (such as the business sector, policy makers, NGOs, civil society, and citizens).

This definition, inspired by the Encyclopaedia of Sustainability in Higher Education (Crabbé, 2019), is in line with those of UNESCO and the OECD, as well as the Cambridge Dictionary. This umbrella term covers other terms such as trans-, multi-, and cross-disciplinary research. It aims to deal with and eventually overcome context-specific issues such as national definitions of disciplines, disciplinary traditions, or institutional settings.

Table B **Science Europe Member Organisations having IDR-related definitions**

Does your organisation have a definition of:			
	RFO	**RFPO**	**Total**
Inter-disciplinarity	9	1	**10**
Multi-disciplinarity	4	2	**6**
Trans-disciplinarity	2	0	**2**
Cross-disciplinarity	1	0	**1**
Total	**16**	**3**	**19**

1. Two organisations, the Science Fund of the Republic of Serbia (SFRS) and the National Research Foundation of Ukraine (NRFU), joined Science Europe after the launch of the survey. These organisations were not involved in the process.

The term 'inter-disciplinary research' is the most used among Science Europe Member Organisations.[2] Each organisation's definition of IDR is often related to its national disciplinary traditions and understanding. Among those proposed by Member Organisations, the one by the Dutch Research Council (NWO) seems the most complete, able to summarise key elements present in the other definitions and provide relevant examples:

Definition of interdisciplinary research by NWO (The Netherlands)

Interdisciplinary collaboration [...] refers to research in which knowledge and expertise from different scientific areas are integrated to jointly solve problems and explain phenomena for which the knowledge from a single discipline is inadequate. [...]

[Integrated] The research integrates at least two [...] scientific fields [...] always including [...] the technical sciences, the exact and natural sciences, as well as the medical and health sciences [and social sciences and humanities]. Researchers from each of the domains can take the initiative to collaborate. [...]

[From the beginning] The research question in the integrated approach is always interdisciplinary. That is why interdisciplinary collaboration takes place from the start. Only then can interdisciplinary research questions arise. [...]

[Innovative] The collaboration must have added value for all researchers and be innovative. [...] There is no single ideal approach or method for interdisciplinary collaboration. The content of the research is leading in this. Researchers choose the approach that best suits their research.

[Examples] Below are some examples of integrated (interdisciplinary) research questions for inspiration:

- What does the technological development of self-driving cars mean for the city, the inhabitants and mobility in the Netherlands?
- How can innovations for remote care (telecare) be made in such a way that patients have good reasons to trust this form of care? What do patients find important for this?
- How can the flood risk management objectives coming under increasing pressure due to climate change be (sustainably) combined with economic and ecological development?
- How can blockchain applications be designed and implemented so that they are (transparent) from a legal and socialviewpoint and that citizens can have confidence in them?
- How can societal challenges, like the increasing role of data and data analysis, new forms of energy, urbanisation, and circularity, be harmonised so that infrastructures and their management become future-proof?
- How can technological innovation in the construction sector be accelerated by intervening in the design phase of circular construction projects in collaboration and thus contributing to behavioural change?
- From a technical, market, legal and spatial perspective, what is the feasibility of new methods for transporting electricity and hydrogen to land in the Dutch North Sea?

Source: NWO, the Netherlands, translated and adapted in English by the authors. [Dutch version]

This definition has several merits. It highlights the importance of going beyond disciplinary boundaries to address complex (societal) questions. Furthermore, multiple disciplines must be involved from the beginning, and innovative approaches are expected. The importance of bridging disciplines with 'far' epistemological roots, such as engineering and social sciences (the so-called 'radical' IDR), is emphasised, making clear that IDR should not be limited to the integration of 'close' disciplines. Given the challenges addressed, the proposed definitions do not

2. It should be noted that the survey was entitled 'inter-disciplinary research'. Thus, this term was likely to be considered more than others. Nonetheless, respondents were invited to present their understanding of the different terms.

enter 'epistemological' discussions, which might be specific to disciplines. On the contrary, this definition allows for common ground across disciplinary backgrounds.

Definitions of IDR also have a practical focus. Several RFOs reported that IDR is used in an open way to incentivise research co-operation. They do not formalise IDR definition in research funding calls, as this might cause unwanted legal constraints. Furthermore, some research proposals might not fit into existing disciplinary panels for evaluation. However, RFOs want to keep the door open and welcome applications that might be evaluated by more than a single expert panel. For RPOs, IDR provides the opportunity to co-operate across discipline-based research units, especially around thematic challenges.

The following definition, extracted from the Swiss National Science Foundation (SNSF), can be considered a sound synthesis of the previous discussions:

Synthetic definition of interdisciplinarity by the Swiss National Science Foundation (SNSF)

Interdisciplinary research [...] refers to research across disciplinary boundaries. In order to achieve the relevant research objectives, it is necessary to combine elements (theories, methods, concepts, etc.) from two or more disciplines. A similar degree of importance is attached to all the disciplines involved.

Source: SNSF, Switzerland

The survey collected other similar terms used in the IDR debate:

- **Multi-disciplinarity** is often used as a synonym of 'inter-disciplinarity', but more openly. The scope is to involve several disciplines, with less emphasis on the interconnections among them.
- **Trans-disciplinarity** is rarely used among Science Europe members, only in the frame of their co-operation with the Belmont Forum and Global Research Council (GRC). A transdisciplinary approach aims to place interactions with stakeholders in an integrated system with a social purpose, resulting in a continuously evolving and adapting system. This approach includes strong partnerships between academic and non-academic partners in co-designing and implementing the project. This approach aims to promote impact and ownership of outcomes amongst all stakeholders.
- **Cross-disciplinarity** is the least used among Science Europe members. Only one RFO mentions it as a way to involve more disciplines.

UKRI adopts a solution able to overcome the possible ambiguity caused by the various terms: Multi- and Inter-Disciplinary Research and Innovation (MIDRI) is a short-hand approach to include any research that draws together perspectives from different disciplines, including trans-disciplinary and cross-disciplinary research. This approach is then commonly used by UKRI across disciplinary contexts, to mobilise researchers from different disciplines. Without a formalised definition, MIDRI is seen as an effective, flexible way to be used in the various research fields.

4. Funding Interdisciplinary Research for the Green and Digital Transition

Among the responding Member Organisations, 17 out of 21 reported having funding instruments for interdisciplinary research dedicated to the Green and Digital Transition. This finding refers to both RFOs (14) and RPOs (3). Four organisations declared not having IDR activities devoted explicitly to the Green and Digital Transition, because they adopt bottom-up approaches; it is up to the researchers to develop their approaches.

The most common funding instruments are internal public calls for single applicants (15 out of 21 respondents) or co-operative research projects (14). National IDR consortia are also standard funding instruments; while international examples exist (10 out 21), participants in the focus group reported that cross-border IDR co-operation is challenging.

Table C **Types of IDR funding instrument addressing the Green and Digital Transition**

Which type(s) of instruments does your organisation have to fund interdisciplinary research activities that tackle the Green and Digital Transition?			
	RFO	**RFPO**	**TOTAL**
Public or internal calls for individual research projects/ programmes *(single applicant)*	14	1	**15**
Public or internal calls for collaborative research projects/programmes *(2+ national applicants)*	12	2	**14**
International calls for research projects/programmes *(2+ international applicants)*	8	2	**10**
IDR platforms *(funded or within your organisation)*	3	2	**5**
National IDR consortia *(funded or joined by your organisation)*	8	2	**10**
International IDR consortia *(funded or joined by your organisation)*	7	2	**9**

4.1. Thematic areas

The climate crisis and digitalisation are complex societal challenges and addressing them requires mobilising several disciplines. Such an IDR approach is needed because the Green and Digital Transition involves several thematic areas that are, in some cases, interconnected. Science Europe Member Organisations have developed and implemented several tools for addressing the various thematic areas of the Green and Digital Transition with specific funding mechanisms. These funding instruments can be open calls for research projects, special projects with direct funding or bottom-up calls where researchers are invited to contribute based on their scientific curiosity. Annex 3 presents a non-exhaustive list of these funding instruments. In this subsection, we present the main areas addressed by these funding instruments.

The **Green and Digital Transition** is a multifaceted societal challenge. Only one funding instrument uses this specific label: the special RRF funding for research on key areas of Green and Digital Transition 2022 by the Academy of Finland (AKA). Other specific initiatives for the **Green Transition** are the Independent Research

Fund Denmark (DFF) programmes and the Green Platforms Initiative by the Research Council of Norway (RCN). The **Green Finance/Economy** is one of the priorities for the Swiss National Science Foundation (SNSF) and the Luxembourg National Research Fund (FNR); while the Swiss National Science Foundation (SNSF) addresses the 'sustainable economy'. The so-called **Green Technologies (or GreenTech)** are the focus of specific funding instruments by Hungary's Eötvös Loránd Research Network (ELKH)[3] and the Research Council of Norway (RCN).

A large spectrum of funding instruments addresses **climate-sustainable development**, such as the joint call by Formas and Vinnova in Sweden. Along the same line, the French National Research Agency (ANR) has a general call for research projects on 'Sustainability Sciences'; Belgium's F.R.S.-FNRS has similar panels dedicated to **sustainability**. International initiatives, such as the Belmont Forum, NORFACE's 'Transformations to sustainability', and the European Joint Programming Initiative (JPI) 'Climate Solstice', are good examples of international co-operation on climate research adopting IDR approaches. Two specific funding instruments address the challenge of **emissions**: 'CO2 Capture, Utilisation and Storage' of the Research Council of Norway and the 'National Call for Research Project to fight Chlordecone' of France's ANR. A cross-country initiative is the ERA-GAS for 'Monitoring & Mitigation of Greenhouse gases from Agri- and Silvi-culture', which proposes a more holistic approach requiring the combination of disciplines.

Biodiversity, ecology, and ecosystems are other central topics for which Science Europe members dedicated several funding instruments: Belgium's FWO has a specific programme for the 'Bio-economy' and France's ANR for 'Dynamics of socio-ecosystems and of their components'. These examples require bridging the gap between natural sciences and biodiversity with social sciences. Along the same line, 'BiodivERsA-3' involves several national funding organisations for research on the Global 2050 Vision of "living in harmony with nature."

A multi-disciplinary thematic area with high priority is **energy**. The Latvian Science Council (LZP) has a State Programme for Energy. The Research Council of Norway (RCN) has one for hydrogen and one for wind power. Switzerland's SNSF had two national research programmes entitled 'Energy Turnaround' (NRP 70) and 'Managing Energy Consumption' (NRP 71). In Luxembourg's National Research Priorities (NRP), researchers are invited to address the nexus between 'Climate change: energy efficiency and smart energy management'. The ERA-NET Smart Grids Plus aims to gather several actors in this field "from local trials towards a European knowledge community."

Water-focused research is a significant theme which includes several subthemes, such as oceans and seas, inland water, and marine and maritime research. Science Europe Member Organisations reported being involved in two Joint Programming Initiatives (JPIs) devoted explicitly to water and oceans' pollutants and the ERA-NETs on 'Marine biotechnology', 'Marine and Maritime Technologies', and 'Blue Bioeconomy'. The OCEANERA Cofund focuses on the nexus between **Oceans and Energy**, and is another ERA-NET initiative involving multiple partners. These examples show the cross-national, multi-actor efforts to address water-related societal challenges with IDR approaches.

Food is a major societal challenge at the global level, and it requires the mobilisation of several disciplines. Science Europe members reported several cross-national co-operations, such as the ERA-NETs Cofund on Sustainable Food Production and Consumption (FACCE SURPLUS) and Sustainable and Resilient agriculture for food and non-food systems (SUSFOOD 2). A unique initiative worthy of mentioning is the Formas programme 'Digital transformation of the food system', combining **food & digitalisation**.

The challenge of **land use and preservation, including soils**, is addressed by specific instruments such as Latvia's State Programme for 'Sustainable territorial development and rational use of land resources' and the (concluded) Swiss National Research Programmes on 'Sustainable use of soil as a resource' (NRP 68). A related thematic area is **cities**, for which the JPI 'Urban Europe' proposes regular calls for funding involving several Science Europe Member Organisations. Other areas are systems for **Earth observation and space** (see Luxembourg National Research Priorities on 'Space telecommunications, Earth observation and space resources'), **raw materials** (see Swiss National Research Programmes on 'Smart Materials', NRP62; and the multi-actor initiatives on 'Non-energy and non-agricultural raw materials'), and the interfaces across **digital sciences, Earth system and environmental sciences** (see the call of France's ANR).

Digitalisation is an emerging thematic area receiving growing attention for its rapid evolution and huge impacts on societies. The following calls address digitalisation directly by adopting an IDR approach: the Science, Technology and

3. The ELKH 'Proof-of-Concept' Funding Grants Call (ELKH-PoC-2022) was completed.

Society Network (RCTS) by Portugal's Foundation for Science and Technology (FCT), and Switzerland's National Research Programmes for 'Digital Transformation' (NRP 77). **Artificial intelligence** is a particularly relevant topic in this thematic area, with specific calls from Sweden's Formas in partnership with Vinnova. Another related area refers to **high-performance computing**, a specific priority for both Luxembourg's FNR and Portugal's FCT, and the **digital economy** (see Luxembourg National Research Priorities on 'Trusted data-driven economy and critical systems' and 'Responsible development: regulations and ethics for a data-driven society').

The challenge of digitalisation is cross-cutting, calling for research on the boundaries between thematic areas. This is the case of the link between **health and digitalisation**: the special initiative 'AI 4 COVID-19' by Portugal's FCT and the Luxembourg National Research Priority on 'Data-driven healthcare'. Furthermore, Ireland's Health Research Board provides several IDR initiatives to train researchers at various stages of their careers (see Applied Partnership Awards, Definitive Intervention and Feasibility Awards (DIFA) 2023, and Knowledge Translation Awards (KTA)). Another cross-cutting area is **humanities and digitalisation**, for which the Latvian Science Council (LZP) runs three State programmes on Digital Humanities, Digital resources in the humanities, and Latvia for the development of Latvian and European society. Finally, France's ANR has a general Call for Research Projects on Digital & humanities and social sciences.

The previous thematic areas are also addressed in open, **bottom-up calls** for research projects. This approach is adopted, among others, by ELKH's Priority Research Topics,[4] FWO's Strategic Basic Research (SBO) and ordinary calls, the Dutch Research Agenda and NWO's Knowledge and Innovation Covenant, the Czech GAČR's thematic calls, and UKRI's calls for funding opportunities. A bottom-up funding instrument specifically requiring IDR proposals is Sinergia by the Swiss National Science Foundation (SNSF), which is open to all research topics and not just the Green and Digital Transition. All these funding instruments welcome IDR proposals covering the previous thematic areas.

4.2. Selected examples

This section presents some selected examples of funding instruments for IDR activities dedicated to the various thematic areas of the Green and Digital Transition. These examples were proposed by Science Europe Member Organisations and selected to provide more concrete elements of how funding instruments are structured.

AI in the service of climate, by Formas and Vinnova, Sweden

One of the goals of this joint call by Formas and Vinnova was to connect climate research with research on AI within a societal context, that is focusing on research activities with a close connection to societal actors' needs. The key aim was expressed as "advancing tools for decision support". Formas and Vinnova required that proposals include actors' constellations of at least three parties, of which at least one must be a research organisation, and at least one must be a company or public organisation. Among the requirements, projects must link to the needs of the business or public sectors, and thus these actors should have an essential and active role.

AI 4 COVID-19, by Foundation for Science and Technology (FCT), Portugal

The main objective of this call was to promote the presentation of R&D projects in the area of Data Science that could contribute to improving the response of public administration bodies to the impact of COVID-19 and future pandemics, in line with the National Plan for Preparedness and Response to COVID-19 of the Directorate General for Health (DGS). Applicants were invited to adopt IDR and innovative approaches to address this major, urgent challenge.

Bio-economy Impulse Programme, by the Research Foundation of Flanders (FWO), Belgium

The aim of research projects within the Bio-economy Impulse Programme is to initiate technological developments with high potential

4. In 2022, this programme was temporarily postponed. It should be restored in 2023 or 2024.

for economic or societal valorisation. Proposals should be at a low 'Technology Readiness Level' (maximum TRL at the start of the research project is three) and need to determine the optimal direction in which the innovation trajectory has the best chance to succeed. The main reason to opt for IDR is that research is expected to be "interdisciplinary and holistic" to serve as a basis for direct dialogue with citizens and social representatives. This dialogue aims to gain insights into societal concerns and expectations.

Digital transformation of the food system, by Formas, Sweden

This programme aimed to fund research projects with a clear IDR approach that combines food science research with digital competencies to increase competitiveness and sustainability in the food system. A new collaboration was called for, and societal actors outside academia were eligible partners in the call.

Researcher Project for Technological Convergence Related to Enabling Technologies, by the Research Council of Norway

The objective of this call is to achieve radical new technological development across the enabling technologies through projects that endeavour to help to achieve the UN Sustainable Development Goals and resolve major societal challenges. The projects have to focus on collaboration between research organisations and stakeholders from outside the research sector that represent societal and industry needs for knowledge, research competence and technology.

Structured Population & Health Services Research Education, by the Health Research Board (HRB), Ireland

The HRB is committed to building an interdisciplinary approach to health research in Ireland. The 'Structured Population & Health Services Research Education' aims to build a network of PhD across disciplines who understand how excellent research, data and evidence can influence decision-making and inform health and social care policy. This programme is run jointly by the Royal College of Surgeons of Ireland and eight additional partner Irish universities. This programme funds six PhD scholars annually to develop the knowledge and skills to conduct high-quality IDR and maximise translation from academia to policy and practice. This programme has been running since 2007.

4.3. Challenging aspects

The survey included several other aspects of the organisation of IDR funding instruments. In general, IDR funding instruments are managed similarly to other instruments. The eligible applicants are the same as ordinary calls, mainly universities, higher education institutions, and research centres, while some instruments also involve NGOs, firms, and private consultancies. The number of funded IDR projects and their timespan are similar to disciplinary research grants. Given that IDR funding instruments are managed similarly to mono-disciplinary ones, it is impossible to make a clear distinction on the budget allocated. Finally, the time needed to evaluate IDR research proposals is in line with the ordinary ones.

Two main differences between the IDR funding instruments and mono-disciplinary ones are reported regarding the internal organisation and evaluation criteria. First, eight Science Europe organisations reported that two or more units manage IDR calls, whereas ordinary, disciplinary calls tend to be managed by individual units within their organisations. The involvement of multiple units of research funding organisations requires internal co-ordination and allows to leverage of multiple internal expertise. Second, IDR calls tend to differ from ordinary calls regarding the evaluation criteria and balance among them: the weight of criteria about societal relevance and impacts tends to be higher. This difference in the evaluation criteria is part of the broader shift toward challenge-oriented research.

5. Performing Interdisciplinary Research for the Green and Digital Transition

The research performing organisations participating in the survey reported having IDR platforms connecting discipline-based departments within their organisations. Commonly, research activities are carried out by disciplinary homogeneous units, that is researchers sharing similar theoretical, methodological, and conceptual approaches interested in close thematic areas. While discipline-based research units have a clear focus, addressing the climate crisis and digitalisation challenges require multiple research units, mobilising different theoretical angles and methodological approaches. This aspect is even more challenging in large research organisations. For this reason, research performing organisations have developed IDR platforms (see Section 5.1). Each IDR consortium is reported to have different forms of organisation, but several common elements exist. First, IDR platforms (or hubs) aim to connect discipline-based units to perform research activities around complex themes, as those of the Green and Digital Transition. Second, these platforms gather internal units and external partners, such as other research organisations as well as the business sectors, government's bodies, or NGOs. In this perspective, IDR is linked to a multi-actor approach to research activities.

5.1. List of IDR Platforms of Science Europe's Research Performing Organisations

This section presents the IDR platforms active in the research performing organisations that answered the questionnaire. The names of these platforms (or hubs) present the theme they address, like those of RFOs presented in Section 4.1. All these platforms link different research units within each RPO around thematic societal challenges. Most of the themes covered by these platforms were identified as related to the Green and Digital Transition, while Section 5.2 provides some selected examples of those platforms.

Spanish National Research Council (CSIC)

Energy & Industry

- TranEnerg (Energy)
- SusPlast (Sustainable Plastics towards a Circular Economy)
- QTEP+ (Quantum Technologies)
- FAB3d (Industry 4.0)
- SosEcoCir (Sustainability and Circular Economy)

Digitalisation & Future Society

- DigitalScience+
- ES Science (interdisciplinary platform for the Spanish Language in a digital society)
- PAIS (Science & Society)
- MEDhis (interdisciplinary platform for social and cultural research of the Mediterranean)
- Alcinder (rural depopulation)

Health & Environment

- Global Health+ (health systems)
- NeuroAging+ (neuroscience)
- EcoBioDiv+ (ecosystems & biodiversity)
- Green Horizon+ (Green Transition)
- Agrofor (agriculture & biodiversity)
- Food Allergy (food)
- Climate (Climate science)
- ES Science (interdisciplinary platform for the Spanish Language in a digital society)

Earth Systems & Oceans

- GeoRisks+ (geology and natural disasters)
- Oceans+ (oceans)

- Polar CSIC (polar research)
- Teledetect (Earth observation)
- SolXyl (interdisciplinary platform to study Xylella fastidiosa and its impact on cultivations)
- SoilBio (Plant-soil relationships)

For more information: https://bit.ly/3Dynoxn

Eötvös Loránd Research Network (ELKH), Hungary

- Centre for Agricultural Research (ATK)
- Veterinary Medical Research Institute (ÁTKI)
- Institute for Nuclear Research (ATOMKI)
- Balaton Limnological Research Institute (BLKI)
- Biological Research Centre (BRC)
- Research Centre for the Humanities (BTK)
- Centre for Ecological Research (CER)
- Research Centre for Astronomy and Earth Sciences (CSFK)
- Centre for Energy Research (EK-CER)
- Institute of Earth Physics and Space Science (FI)
- Centre for Economic and Regional Studies (KRTK)
- Hungarian Research Centre for Linguistics (NYTK)
- Institute of Experimental Medicine (IEM)
- Alfréd Rényi Institute of Mathematics (Rényi Institute)
- Institute for Computer Science and Control (SZTAKI)
- Centre for Social Sciences (TK)
- Research Centre for Natural Sciences (TTK)
- Wigner Research Centre for Physics (Wigner RCP)

For more information: https://bit.ly/3WlERln

UK Research and Innovation (UKRI)

- UKRI GCRF Achievement for Africa's Adolescents Hub
- UKRI GCRF Accountability for Informal Urban Equity Hub
- UKRI GCRF Action Against Stunting Hub
- UKRI GCRF Gender, Justice and Security Hub
- UKRI GCRF Living Deltas Hub
- UKRI GCRF One Health Poultry Hub
- UKRI GCRF One Ocean Hub
- UKRI GCRF South Asian Nitrogen Hub
- UKRI GCRF South-South Migration, Inequality and Development Hub
- UKRI GCRF Trade, Development and the Environment Hub
- UKRI GCRF Urban Disaster Risk Hub
- UKRI GCRF Water Security and Sustainable Development Hub

For more information: https://bit.ly/3DWy4XW

5.2. Selected Examples

Among the IDR platforms created by Science Europe's research performing organisations, the following cases have been chosen as examples. These cases show the thematic areas and type of co-ordination platforms set up to tackle the Green and Digital Transition. The objective is to provide concrete experiences of the type of platforms or hubs existing across Europe.

CSIC Platform DigitalScience+

This platform brings together 67 research units and 38 institutes with 19 companies and institutions involved as well as three research infrastructures, all working together on digital sciences. The mission is to innovate in all areas of digital science and data life-cycle management, from planning, acquisition and processing to publication and preservation. This platform aims to produce innovation with economic and societal impacts, particularly in the areas of health and well-being, agriculture, climate, and safe society.

CSIC Platform SosEcoCir

The Platform on Sustainability and Circular Economy aims to gather industrial actors and societal stakeholders around the topic of circular economy with a specific focus on preserving natural resources in urban areas to develop innovative solutions in the realm of materials which help to improve both the environment and human health through systems based on circular economy criteria. The mission is to advance knowledge and promote actions for sustainability in urban communities in the following areas: mitigating the effects of global warming, guiding sectoral policies (agricultural, forestry, environmental), implementing innovative solutions in the management of resources and waste, reducing the energy needs of buildings, establish govern-

ance systems and establish balances between human needs, innovation and socio-economic development.

ELKH Institute for Computer Science and Control (SZTAKI)

This research institute is the largest and most successful one in the field of information science in Hungary, performing basic and application-oriented research in an interdisciplinary setting. SZTAKI is the national research base for IT, computer science, engineering, intelligent systems, process control, wide-area networking, and multimedia. Its R&D activities include system design and integration, consulting, and software development. The institute has a broad international network as Hungary's member of the World Wide Web Consortium and as EU centre of excellence. The institute is financed by research grant and revenues from commercial research contracts.

ELKH Research Centre for Natural Sciences (TTK)

TTK unites four institutes and two central laboratories conducting multi-disciplinary research in the field of natural sciences with a focus on organic chemistry, materials and environmental chemistry, enzymology, cognitive neuroscience and psychology. TTK aims to develop solutions to reduce environmental damage by producing 'green diesel' and promote sustainable economic processes.

UKRI GCRF One Ocean Hub

The One Ocean Hub is an international research programme for sustainable development, promoting fair and inclusive decision-making for a healthy ocean where people and the planet can flourish. It involves 19 partners, 21 organisations and 120+ researchers in five countries around five themes: 1) Blue Economy and Society; 2) Capacity Strengthening; 3) Marine Spatial Planning; 4) Environmental and Human Rights Law; 5) Ocean Culture.

UKRI GCRF Water Security and Sustainable Development Hub

This hub is focused on research for the United Nations' Sustainable Development Goal 6: Clean Water and Sanitation. The transdisciplinary approach aims "to break down traditional siloed ways of thinking to address systemic barriers to water security: 1) Insufficient data; 2) Unfit service delivery models; 3) Fragmented governance; 4) Unsuitable solutions to localised problems; and, 5) Limited community involvement." This programme is organised around six work streams and 55 partners in the UK and abroad.

5.3. Challenging aspects

Research performers have confirmed a strong interest in IDR activities because it helps to bring together different research groups. By working together in challenge-oriented IDR activities, researchers with different scientific backgrounds can learn from each other, exchanging theories, methods and approaches. RPOs tend to be organised in discipline-based units or departments, but this often creates silos, and IDR is seen as a way to overcome them. An open challenge is the definition of scientific disciplines, thus their granularity, around which research units are built. This granularity differs across disciplinary contexts and traditions and affects how discipline-based research units are organised. A participant in the focus group reported a provocative, though relevant, definition of IDR for RPOs: "interdisciplinarity means making discipline-based research units work together." While this definition might be simplistic, it summarises the main challenge for RPOs, and how IDR can help bridge discipline-based research units.

At the level of individual researchers, IDR is seen as problematic because academic careers tend to be structured along mono-disciplinary paths. For this reason, IDR is commonly seen as a risky option, especially for early-career researchers who still need to secure a permanent position. IDR research findings are seen as more difficult to publish in disciplinary scientific journals, and less funding is available; thus, engaging in IDR activities is considered riskier. Even though it is difficult to provide strong evidence for these risks, all participants in the focus group, both RPOs and RFOs, agreed that IDR is risky for the progression of researchers' careers.

6. Stakeholders' Involvement

Stakeholders' involvement plays a specific role in the debate on interdisciplinary research. The fundamental idea is that their involvement helps research activities to tackle the Green and Digital Transition and, in general, societal challenges. Table D reports when Science Europe Member Organisations involve stakeholders during the various stages of research funding and performing cycles.

Table D **Non-academic stakeholders' involvement in interdisciplinary research activities**

Does your organisation involve non-academic stakeholders, besides scientific experts, in the following stages of IDR for the Green and Digital Transition?						
	National policy makers	Regional and local gov./ authorities	International bodies	Business sector	NGOs/civil society	Citizens
Defining the calls						
RFO	8	4	2	5	4	1
RFPO	1	2	2	2	2	1
Selecting projects/programmes						
RFO	4	2	2	3	3	0
RFPO	1	1	1	1	1	1
Monitoring projects/programmes						
RFO	4	2	1	0	0	0
RFPO	1	0	1	0	0	0
Performing projects/programmes						
RFO	4	5	3	6	5	3
RFPO	0	1	2	2	2	1
Disseminating findings						
RFO	8	8	4	8	8	4
RFPO	2	2	2	2	2	1

RFOs tend to involve policy makers (mainly national ones) to define research calls (first two rows in Table D) and disseminate findings (bottom part of Table D). The business sectors are also involved, especially in defining calls, while other actors are reported to be less involved. Nonetheless, RFOs can mobilise different types of stakeholders across the research call cycle. The case of RPOs presents lower values, making it difficult to draw conclusions. Nonetheless, findings tend to be in line with RFOs when it comes to the phase of stakeholders' engagement.

7. Reasons and Challenges for Choosing Interdisciplinarity for the Green and Digital Transition

Several reasons exist to adopt IDR approaches to tackle the Green and Digital Transition. The following response from a Science Europe member summarises the key elements:

> Interdisciplinary research is increasingly vital for meeting societal needs and addressing complex real-world issues that demand collaborative, creative, novel insights and integrative approaches. An interdisciplinary research approach provides the best context for delivering the critical mass and quality of research capacity required in Ireland. Such an approach integrates the researcher's backgrounds and perspectives from multiple disciplines and combines them for a more comprehensive, critical understanding of a problem. Consideration is needed on such issues as maintaining researchers' sense of identity while working interdisciplinary, rethinking typical funding processes and systems and determining what makes an excellent inter-disciplinary approach.
>
> *Source: Health Research Board, Ireland*

The growing interest reported for IDR approaches is motivated by the possibility of **orienting research towards addressing societal challenges**, such as the Green and Digital Transition. IDR stimulates innovative approaches 'across knowledge boundaries', including societal relevance in the assessment criteria and, generally speaking, promoting innovative, flexible, and more comprehensive approaches to research questions.

The main pitfall for IDR is the limited funding opportunities that might prevent researchers from applying. The evaluation criteria, publication possibilities and time required to establish IDR co-operation are seen as 'trickier' than mono-disciplinary research (MDR) approaches. On the other hand, IDR funding instruments are more likely to receive researchers more motivated in innovative approaches and willing to engage tackling societal challenges.

Table E reports the judgements given by respondents on the importance of adopting IDR approaches for the Green and Digital Transition. Even though these judgements are individual, results report an overwhelming majority favouring IDR for the Green and Digital Transition among both RFOs and RPOs. It is relevant to highlight that the support is almost unanimous in the case of the climate crisis, whereas some nuances exist for digitalisation. From the focus group, experts reported that digitalisation is a less mature field as topics like the internet and its socio-psychological implications, artificial intelligence, and supercomputing are new and rapidly evolving fields. Thus opinions tend to be more complex, whereas climate-sustainable development has been a well-structured field for decades.

Table E **Synthesis of results on organisation's agreement that interdisciplinarity better tackles the Green and Digital Transition**

In how far does your organisation agree or disagree with the following statements?									
	RFO			RPO			Total		
	A	N	D	A	N	D	A	N	D
IDR better contributes to supporting climate-sustainable development than MDR	94%	6%	0%	100%	0%	0%	95%	5%	0%
IDR better contributes to supporting human-centred digitalisation than MDR	71%	29%	0%	100%	0%	0%	76%	24%	0%
IDR better contributes to supporting human-centred digitalisation than MDR	76%	24%	0%	100%	0%	0%	33%	24%	0%
IDR should always be preferred to MDR for tackling any societal challenge	29%	24%	47%	50%	25%	25%	33%	24%	43%
MDR is better suited for tackling the Green and Digital societal challenges	0%	18%	82%	20%	0%	80%	5%	14%	81%

A = (Strongly) Agree *N = Neutral* *D = (Strongly) Disagree*

A relevant result comes from the fourth row of Table E, because respondents do not agree entirely with the statement that "IDR should always be preferred to mono-disciplinary research for tackling any societal challenge." This statement confirms that disciplines are still relevant and should be considered so. During the focus group, participants reported an existing tension on the commonly believed assumption that scientific excellence equates to mono-disciplinarity and interdisciplinarity is considered lower quality. This equation is questioned and probably biased on perceptions rather than a proven fact. The findings report an open challenge in defining quality criteria for IDR activities.

The questionnaire asked Science Europe Member Organisations to rank the main (perceived) challenges of implementing IDR. Table F reports the results giving a score of 5 points to the priorities ranked first, 3 for those ranked second, and 1 for the third ones. A preliminary finding is that challenges for RFOs and RPOs tend to be aligned.

Table F **Perceived challenges for IDR to address the Green and Digital Transition**

What are the main challenges for interdisciplinary research to address the Green and Digital Transition?										
	RFO			RFPO			TOTAL			Score
	#1	#2	#3	#1	#2	#3	#1	#2	#3	
Defining topics	2	4	1	2	1	0	4	5	1	36
Mobilising different disciplines	3	5	2	0	0	1	3	5	3	33
Mobilising stakeholders	5	0	2	0	0	0	5	0	2	27
Mobilising researchers	1	2	3	2	0	0	3	2	3	24
Organising IDR units	2	3	0	0	1	0	2	4	0	22
Finding IDR-orientend researchers/organisations	2	0	3	0	2	1	2	2	4	20
Selecting projects	2	1	2	0	0	1	2	1	3	16

Score: Priority 1 = 5 points, Priority 2 = 3pts, Priority 3 = 1pt.

The main challenge for implementing IDR is the definition of research topics (score = 36) and then mobilising different disciplines (score = 33). The involvement of stakeholders is ranked third as a challenge for the implementation. At the bottom of this ranking, the selection of IDR projects and identification of research organisations able to perform IDR research are seen as easier to overcome.

8. Conclusions and Next Steps

Science Europe Member Organisations carry out various activities to fund and perform interdisciplinary research addressing the climate crisis and digitalisation. These IDR activities are growing as part of a broader shift towards challenge-oriented research, of which the Green and Digital Transition is a prominent example.

IDR was proposed as an umbrella term with different terminologies (including trans-, cross-, and multi-disciplinarity) to bridge existing scientific disciplines. The survey mapping Science Europe members' definitions showed that **respondents perceive IDR as supporting the evolution of scientific disciplines beyond their borders**. This shift is a common challenge for RFOs and RPOs and involves other actors in the research ecosystems.

The Green and Digital Transition is a societal challenge involving several thematic areas (see subsections 4.1 and 5.1), for which Science Europe members have put in place an extensive array of funding instruments and research platforms. The main challenge identified by RFOs is **the fair and just selection of high-quality IDR proposals**. At the same time, RPOs reported that **mobilising different research units** is the main issue. For both cases, the report mapped extensive experiences where Science Europe members are experimenting with IDR activities, moving beyond scientific disciplinary boundaries. IDR activities are also seen as **an opportunity to involve societal stakeholders** in the various phases of the research cycle, from designing research funding calls to disseminating findings. Experimenting with IDR activities is an excellent opportunity to make researchers learn from each other.

Science Europe members positively judge the contribution of IDR to tackling the Green and Digital Transition as a way to experiment with new approaches. In the case of climate-related and biodiversity research, IDR is already delivering essential benefits. These benefits also exist on the 'digital' side, but to a more limited extent. The reason is the most recent emergence and extremely rapid digital sphere development. Nonetheless, the report provides extensive evidence of IDR activities in all the Green and Digital Transition thematic areas.

Three main challenges were identified for future venues. First, **the quality challenge** to ensure that IDR activities can deliver the expected benefits for the Green and Digital Transition is still open. The design of IDR research calls, the criteria for proposal assessment, and the composition of IDR panels to select calls are open challenges for RFOs. Second, **researcher careers** are still discipline-based, which limits RPOs pursuing IDR activities. Science Europe played a leading role in drafting the Agreement on Reforming Research Assessment, which acknowledges the importance of IDR for researchers' careers. How this should be implemented is still open, especially from the perspective of individual researchers. The third challenge relates to **the need for urgent climate action**, as stated in the Call to Action for the Net-Zero Transition.

Urgent actions are needed to address the climate crisis, and research can play a role with new understanding and novel solutions. While several IDR initiatives addressing the Green and Digital Transition were reported, there is a call for upgrading these initiatives and scaling up IDR activities for more effective and urgent actions.

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List of Tables

Annex 1: Member Organisations Participating in the Survey and Focus Group

Organisation Name	In Focus Group
Belgium: Fund for Scientific Research (F.R.S.-FNRS)	✓
Belgium: Research Foundation Flanders (FWO)	✓
Croatia: Croatian Science Foundation (HRZZ)	
Czech Republic: Czech Science Foundation (GAČR)	
Denmark: Independent Research Fund (DFF)	
Finland: Academy of Finland (AKA)	
France: French National Research Agency (ANR)	✓
Hungary: Eötvös Loránd Research Network (ELKH)	✓
Ireland: Health Research Board (HRB)	✓
Ireland: Science Foundation Ireland (SFI)	
Latvia: Latvian Science Council (LZP)	
Lithuania: Research Council of Lithuania (LMT)	
Luxembourg: Luxembourg National Research Fund (FNR)	✓
Netherlands: Dutch Research Council (NWO)	
Norway: Research Council of Norway (RCN)	✓
Poland: National Science Centre (NCN)	
Portugal: Foundation for Science and Technology (FCT)	✓
Romania: Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	
Sweden: Swedish Research Council for Sustainable Development (FORMAS)	✓
Switzerland: Swiss National Science Foundation (SNSF)	
United Kingdom: UK Research and Innovation (UKRI)	✓

Annex 2: Survey on Interdisciplinary Research for the Green and Digital Transition

Interdisciplinary research is an umbrella term used to designate collaboration between different scientific disciplines, as well as between scientific disciplines and non-academic stakeholders (such as the business sector, policy makers, NGOs, civil society, and citizens).

This umbrella term covers various notions of interdisciplinary research, such as trans-, multi-, or cross-disciplinary research. Member Organisations are invited to provide their conceptualisations and operationalisations, as interdisciplinarity is frequently considered to be better placed to address the Green and Digital Transition, which includes the following areas:

- Climate-sustainable development
- Ecological sustainable development
- Digitalisation for the Green Transition
- Greening digital technologies
- Human-centred digitalisation

The objectives of this survey are to:

- Map the existing experiences of inter-disciplinary research activities funded or performed by Science Europe Member Organisations.
- Identify main characteristics of these activities, such as definition, call design, project selection, stakeholders' involvement, organisational adjustments, and evaluation needs.
- Propose recommendations to Science Europe Member Organisations to reinforce, develop, or improve their interdisciplinary research activities for the Green and Digital Transition.

General Information

* **Your name**

* **Your email address**

* **Which Science Europe Member Organisation do you represent?**

* **What is the title of your position in this organisation?**

* **Which of the following missions does your organisation have?**

- ○ A research funding mission
- ○ A research performing mission
- ○ Both a research funding and a research performing mission

Understanding and Definitions

Interdisciplinary research is an umbrella term used to designate collaboration between different scientific disciplines, as well as between scientific disciplines and non-academic stakeholders (such as the business sector, policy makers, NGOs, civil society, and citizens).

This umbrella term covers various notions of interdisciplinary research, such as trans-, multi-, or cross-disciplinary research. Member Organisations are invited to provide their conceptualisations and operationalisations, as interdisciplinarity is frequently considered to be better placed to address the Green and Digital Transition, which includes the following areas:

- Climate-sustainable development
- Ecological sustainable development
- Digitalisation for the Green Transition
- Greening digital technologies
- Human-centred digitalisation

*** Does your organisation fund or perform interdisciplinary research activities?**

○ Yes
○ No

Does your organisation have a definition of:

☐ Inter-disciplinarity: _____
☐ Trans-disciplinarity: _____
☐ Cross-disciplinarity: _____
☐ Multi-disciplinarity: _____

*** Does your organisation have interdisciplinary research activities conceived to (among others) tackle the Green and Digital Transition?**

○ Yes
○ No

Interdisciplinary research activities can include, for example, calls, projects, programmes, platforms, and consortia.

Please provide more information about these activities

Please write your answer here: _____

*** In how far does your organisation agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	N/A
Interdisciplinary research better contributes to supporting climate-sustainable development than monodisciplinary research						
Interdisciplinary research better contributes to support digitalisation for the green transition than monodisciplinary research						
Interdisciplinary research better contributes to supporting human-centred digitalisation than monodisciplinary research						
Interdisciplinary research should always be preferred to monodisciplinary research for tackling any societal challenge						
Monodisciplinary research is better suited for tackling the Green and Digital societal challenges						

* **Which type(s) of instruments does your organisation have to fund interdisciplinary research activities that tackle the Green and Digital transition?**

Please choose all that apply:

☐ Public or internal calls for individual research projects/programmes (single applicant)
☐ Public or internal calls for collaborative research projects/programmes (two or more national applicants)
☐ International calls for research projects/programmes (two or more international applicants)
☐ Interdisciplinary research platforms (funded or within your organisation)
☐ National interdisciplinary research consortia (funded or joined by your organisation)
☐ International interdisciplinary research consortia (funded or joined by your organisation)
☐ None/I do not know
☐ Other: _____

Design of calls

* **Does your organisation have public or internal calls for funding interdisciplinary research projects or programmes that explicitly aim to tackle the Green and Digital Transition?**

Please choose only one of the following:

○ Yes, public calls
○ Yes, internal calls
○ Yes, both public and internal calls
○ No, our organisation does not have any calls for this

Please provide the name of the call, a short description of its objectives, and – if available – a link to the call(s)

* **What is the objective of public or internal calls for interdisciplinary research projects or programmes that tackle the Green and Digital Transition?**

Please describe why your organisation opted for interdisciplinary research over monodisciplinary research.

* **How does your organisation select interdisciplinary research topics?**

Please write your answer here: _____

Is the topic selection process different from monodisciplinary calls? Are topics defined by funding organisations only, together with stakeholders, or are they proposed by researchers?

* **Who are involved in drafting the interdisciplinary research calls for the Green and Digital Transition?**

○ A single unit/department within our organisation
○ Two or more units/departments in our organisation
○ Our organisation, together with other policy makers (ministries, regional or local governments)
○ Our organisation, together with societal stakeholders (business sector, NGOs, civil society)
○ Our organisation, together with international bodies (eg. IPCC)
○ None/I do not know
○ Other: _____

* **Who are the eligible applicants for interdisciplinary research calls that aim to tackle the Green and Digital Transition?**

☐ Universities/Higher Education Institutions
☐ Public research centres/research performing organisations

- ☐ Firms
- ☐ Private research centres/consultancies
- ☐ Public administrations/ministries/governments
- ☐ NGOs
- ☐ Other: _____

* **What is the average duration, in months, of interdisciplinary research projects for the Green and Digital Transition?**

___ month(s)

* **How many interdisciplinary research projects for the Green and Digital Transition does your organisation select per year, on average?**

___ project(s)

* **Does your organisation have an allocated budget for interdisciplinary research calls for the Green and Digital Transition?**

- ○ Yes
- ○ No

Can you provide an estimate of the allocated budget (in Euro) per year?

€ _____

* **What percentage of your organisation's total budget is allocated to interdisciplinary research calls for the Green and Digital Transition?**

____ %

* **Does your organisation provide training for policy officers dealing with interdisciplinary research for the Green and Digital Transition?**

- ○ Yes
- ○ No

If Yes, please describe the training provided: _____

* **Does your organisation provide training for researchers performing interdisciplinary research activities for the Green and Digital Transition?**

- ○ Yes
- ○ No

If Yes, please describe the training provided: _____

Selection of projects

* **Are the criteria your organisation uses to select interdisciplinary research proposals for the Green and Digital Transition different from those for monodisciplinary proposals?**

- ○ Yes
- ○ No

If Yes, please describe how they differ: _____

* **Are your organisation's expert panels for the selection of interdisciplinary research proposals for the Green and Digital Transition different from other panels?**

If Yes, please describe how they differ: _____

* **Does your organisation involve experts specialised in selecting interdisciplinary research proposals?**

☐ Yes, for climate-sustainable development
☐ Yes, for ecologically sustainable transition
☐ Yes, for digitalisation for the Green Transition
☐ Yes, for greening digital technologies
☐ Yes, for human-centred digitalisation
☐ No, we rely on monodisciplinary experts
☐ Other: _____

* **How long does the selection of interdisciplinary research projects take for your organisation, when compared to monodisciplinary projects?**

○ Interdisciplinary programmes take less time
○ Interdisciplinary programmes take the same amount of time
○ Interdisciplinary programmes take more time
○ We do not know

Stakeholder involvement and participative science

* **Does your organisation involve non-academic stakeholders, besides scientific experts, in the following stages of interdisciplinary research for the Green and Digital Transition?**

	National policy makers	Regional and local governm./ authorities	Inter-national bodies	Business sector	NGOs/ civil society	Citizens	Others	None of these
Defining the calls								
Selecting projects/programmes								
Monitoring projects/programmes								
Performing projects/programmes								
Disseminating findings								

Which 'Other' non-academic stakeholder(s) does your organisation involve in the indicated category/categories?

Please write your answer(s) here _____

Organisation

* **Does your organisation have interdisciplinary research platforms that connect discipline-based departments within your organisation?**

○ Yes
○ No

If Yes, please describe it: _____

* **Is your organisation a member of a national consortium for interdisciplinary research thematically devoted to tackling the Green and Digital Transition?**

  ○ Yes
  ○ No

  If Yes, please describe it: _____

* **Is your organisation a member of an international consortium for interdisciplinary research thematically devoted to tackling the Green and Digital Transition?**

  ○ Yes
  ○ No

  If Yes, please describe it: _____

* **Are researchers in your organisation evaluated based on a single disciplinary framework?**

  ○ Yes
  ○ No

  If yes, how are interdisciplinary research activities included in the evaluation of researchers' careers?
  _____

* **Are any incentives provided to researchers for performing interdisciplinary research activities that tackle the Green and Digital Transition?**

  ○ Yes
  ○ No

  If Yes, please describe these incentives : _____

* **What advantages or disadvantages does your organisation perceive for researchers who engage in interdisciplinary research activities?**

  Please write your answer here: _____

Evaluation of Interdisciplinary Research Activities

* **Does your organisation carry out ex-post evaluations of interdisciplinary research activities?**

  ○ Yes
  ○ No

* **For which of the following activities does your organisation carry out ex-post evaluations?**

  ☐ Public or internal calls for individual interdisciplinary research projects/programmes (single applicant)
  ☐ Public or internal calls for collaborative interdisciplinary research projects/programmes (two or more national applicants)
  ☐ International calls for interdisciplinary research projects/programmes (two or more international applicants)
  ☐ Interdisciplinary research platforms (funded by or within your organisation)
  ☐ Interdisciplinary research consortia (funded or joined by your organisation)
  ☐ International interdisciplinary research consortia (funded or joined by your organisation)

Please describe which criteria are used for public or internal calls for individual projects or programmes, and how they differ from those for monodisciplinary ones

Please write your answer here: _____

Please describe which criteria are used for public or internal calls for collaborative projects or programmes, and how they differ from those for monodisciplinary ones

Please write your answer here: _____

Please describe which criteria are used for international projects or programmes, and how they differ from those for monodisciplinary ones

Please write your answer here: _____

Please describe which criteria are used for interdisciplinary research platforms, and how they differ from those for monodisciplinary ones

Please write your answer here: _____

Please describe which criteria are used for interdisciplinary research consortia, and how they differ from those for monodisciplinary ones

Please write your answer here: _____

Please describe which criteria are used for international interdisciplinary research consortia, and how they differ from those for monodisciplinary ones

Please write your answer here: _____

* **What are the main challenges for interdisciplinary research to address the Green and Digital Transition?**

Please rank each item in order of preference from 1 to 7

↕ Mobilising researchers
↕ Defining topics
↕ Selecting projects
↕ Finding interdisciplinary research-oriented researchers/organisations
↕ Organising interdisciplinary research units
↕ Mobilising stakeholders
↕ Mobilising different disciplines

Final comments

Is there any other aspect related to interdisciplinary research for the Green and Digital Transition that you would like to comment on or suggest to us?

Please write your answer here: _____

Annex 3: List of Interdisciplinary Research Activities

Member Organisation	Country	Instrument & Link
Artificial Intelligence		
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Autonomous and intelligent systems and robotics for earth and space https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/
Swedish Research Council for Sustainable Development (FORMAS)	SWE	Artificial Intelligence [together with Vinnova] https://www.vinnova.se/en/calls-for-proposals/ai-from-research-to-innovation/ai-in-climate-service/
Biodiversity & Ecosystems		
Multiple members, including: • Academy of Finland (AKA) • French National Research Agency (ANR) • Foundation for Science and Technology (FCT) • Swedish Research Council for Sustainable Development (FORMAS) • Fund for Scientific Research (F.R.S.-FNRS) • Research Foundation Flanders (FWO) • Research Council of Lithuania (LMT) • Latvian Science Council (LZP) • Poland's National Science Centre (NCN) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Swiss National Science Foundation (SNSF) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	Biodiversa+ http://www.biodiversa.org/
French National Research Agency (ANR)	FRA	General Call for Research Project: Dynamics of socio-ecosystems and of their components https://anr.fr/fileadmin/aap/2022/aapg-2022-v1.1a.pdf
Research Foundation Flanders (FWO)	BEL	Bioeconomy https://www.fwo.be/en/fellowships-funding/research-projects/research-projects-bioeconomy/
Research Council of Lithuania	LIT	Sustainability of agro, forest and water ecosystems https://www.lmt.lt/en/national-programmes/national-research-programmes-nrp/sustainability-of-agro-forest-and-water-ecosystems/791

Member Organisation	Country	Instrument & Link
Cities		
Multiple members, including: • French National Research Agency (ANR) • Swedish Research Council for Sustainable Development (FORMAS) • Research Foundation Flanders (FWO) • Research Council of Lithuania (LMT) • Poland's National Science Centre (NCN) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	ERA-NET Urban Transformation Capacities (ENUTC) https://jpi-urbaneurope.eu/calls/enutc/
Multiple members, including: • French National Research Agency (ANR) • Foundation for Science and Technology (FCT) • Swedish Research Council for Sustainable Development (FORMAS) • Fund for Scientific Research (F.R.S.-FNRS) • Research Foundation Flanders (FWO) • Research Council of Lithuania (LMT) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Swiss National Science Foundation (SNSF) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) • UK Research and Innovation (UKRI)	Eur.	Driving Urban Transitions Partnership (DUT) https://jpi-urbaneurope.eu/driving-urban-transitions-to-a-sustainable-future-dut/
Multiple members, including: • French National Research Agency (ANR) • Swedish Research Council for Sustainable Development (FORMAS) • Research Foundation Flanders (FWO) • Poland's National Science Centre (NCN) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	Sustainable Urbanisation Global Initiative (SUGI)/Food-Water-Energy Nexus: 'Sustainable urbanisation' http://jpi-urbaneurope.eu/calls/sugi/
Climate		
Multiple members, including: • Swedish Research Council for Sustainable Development (FORMAS) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • UK Research and Innovation (UKRI)	Int.	Belmont Forum https://www.belmontforum.org/
Multiple members, including: • Academy of Finland (AKA) • French National Research Agency (ANR) • Swedish Research Council for Sustainable Development (FORMAS) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • UK Research and Innovation (UKRI)	Eur.	JPI Climate Solstice https://jpi-climate.eu/programme/solstice/

Member Organisation	Country	Instrument & Link
Dutch Research Council (NWO)	NLD	Dutch Climate Research Initiative https://www.nwo.nl/en/kin
Swedish Research Council for Sustainable Development (FORMAS)	SWE	Climate Transformation and Adaptation (with Vinnova) https://formas.se/en/start-page/about-formas/what-we-do/national-research-programmes/climate.html
Climate & Energy		
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Climate change: energy efficiency and smart energy management; resilient eco- and agrosystems https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/
Digital & Biodiversity		
French National Research Agency (ANR)	FRA	National Call: "Artificial Intelligence in the field of Biodiversity" https://anr.fr/en/call-for-proposals-details/call/challenge-ia-biodiv-research-in-artificial-intelligence-in-the-field-of-biodiversity/
Digital & Environment		
French National Research Agency (ANR)	FRA	General Call for Research Project: Interfaces: mathematics, digital sciences – Earth system and environmental sciences https://anr.fr/fileadmin/aap/2022/aapg-2022-v1.1a.pdf
Digital & Food		
Swedish Research Council for Sustainable Development (FORMAS)	SWE	Digital transformation of the food system https://formas.se/en/start-page/archive/calls/2019-04-25-digital-transformation-of-the-food-system.html
Digital & Health		
Foundation for Science and Technology (FCT)	POR	AI 4 COVID-19 https://www.fct.pt/apoios/projectos/concursos/datascience/index.phtml.pt
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Data-driven healthcare https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/
Digital & SSH		
French National Research Agency (ANR)	FRA	General Call for Research Project: Interfaces: mathematics, digital sciences – Humanites and social sciences https://anr.fr/fileadmin/aap/2022/aapg-2022-v1.1a.pdf

Member Organisation	Country	Instrument & Link
Digital & Sustainability		
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Responsible development: regulations and ethics for a data-driven society https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/
Digital Economies		
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Trusted data-driven economy and critical systems https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/
Digitalisation		
Foundation for Science and Technology (FCT)	POR	Colibri https://www.fccn.pt/colaboracao/colibri/
Foundation for Science and Technology (FCT)	POR	National Network for Advanced Computing (FCCN) https://www.fccn.pt/
Foundation for Science and Technology (FCT)	POR	Science ID https://www.ciencia-id.pt/CienciaID/HomePage.aspx
Foundation for Science and Technology (FCT)	POR	The Science, Technology and Society Network (RCTS) https://fccn.pt/quem-somos/rede-rcts-rede-ciencia-tecnologia-e-sociedade/
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Future computer and communication systems https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/
Swiss National Science Foundation (SNSF)	CHE	National Research Programmes: NRP 77 “Digital Transformation” https://www.snf.ch/en/ELxP53n5RBBa08a2/funding/programmes/national-research-programmes-nrp
Earth Observation		
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Space telecommunications, earth observation and space resources https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/

Member Organisation	Country	Instrument & Link
Emissions		
Multiple members, including: • French National Research Agency (ANR) • Swedish Research Council for Sustainable Development (FORMAS) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	ERA-GAS - Monitoring & Mitigation of Greenhouse gases from Agri- and Silvi-culture https://www.eragas.eu/en/eragas.htm
French National Research Agency (ANR)	FRA	National Call for Research Project to fight Chlordecone https://anr.fr/en/call-for-proposals-details/call/1st-joint-call-chlordecone/
Research Council of Norway (RCN)	NOR	CO2 Capture, Utilisation and Storage https://www.forskningsradet.no/en/call-for-proposals/2022/act4-co2-capture/
Energy		
Multiple members, including: • Foundation for Science and Technology (FCT) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	ERA-Net Smart Grids Plus: from local trials towards a European knowledge community https://www.eranet-smartenergysystems.eu/Community/Knowledge_Community_Overview
Latvian Science Council (LZP)	LVA	State Programme for Energy https://lzp.gov.lv/programmas/valsts-petijumu-programmas/energetika/
Research Council of Norway (RCN)	NOR	Centre for Environment-friendly Energy Research (FME) in Hydrogen https://www.forskningsradet.no/en/call-for-proposals/2021/fme-hydrogen/
Research Council of Norway (RCN)	NOR	Centre for Environment-friendly Energy Research on Wind Power (FME) https://www.forskningsradet.no/en/call-for-proposals/2021/midler-til-etablering-av-forskningsenter-for-miljovennlig-energi-fme-innenfor-vindenergi/
Swiss National Science Foundation (SNSF)	CHE	National Research Programmes: NRP 70 "Energy Turnaround" https://www.snf.ch/en/ELxP53n5RBBa08a2/funding/programmes/national-research-programmes-nrp
Swiss National Science Foundation (SNSF)	CHE	National Research Programmes: NRP 71 'Managing Energy Consumption' https://www.snf.ch/en/ELxP53n5RBBa08a2/funding/programmes/national-research-programmes-nrp

Member Organisation	Country	Instrument & Link
Food		
Multiple members, including: • French National Research Agency (ANR) • Swedish Research Council for Sustainable Development (FORMAS) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	ERA-net Cofund on Sustainable Food Production and Consumption (SUSFOOD) https://susfood-db-era.net/
Multiple members, including: • French National Research Agency (ANR) • Fund for Scientific Research (F.R.S.-FNRS) • Research Foundation Flanders (FWO) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	SUstainable and Resilient Agriculture for Food and Non-Food Systems. (FACCE SURPLUS) https://projects.au.dk/faccesurplus
Multiple members, including: • Academy of Finland (AKA) • French National Research Agency (ANR) • Foundation for Science and Technology (FCT) • Fund for Scientific Research (F.R.S.-FNRS) • Research Foundation Flanders (FWO) • Dutch Research Council (NWO) • Research Council of Norway (RCN)	Eur.	LEAP-AGRI: 'EU-Africa research and innovation partnership on food and nutrition security and sustainable agriculture' http://www.leap-agri.com/
Green and Digital Transition		
Academy of Finland (AKA)	FIN	Special RRF funding for research on key areas of Green and Digital Transition 2022 https://www.aka.fi/en/research-funding/apply-for-funding/calls-for-applications/apply-now2/special-rrf-funding-for-research-on-key-areas-of-green-and-digital-transition-2022/
Green Economy		
Eötvös Loránd Research Network (ELKH)	HUN	'Proof-of-Concept' Funding Grants Call (ELKH-PoC-2022) https://elkh.org/hirek/13-projekt-kozel-300-millio-forint-tamogatasban-reszesul-az-elkh-titkarsag-masodik-alkalommal-meghirdetett-2022-evi-proof-of-concept-programja-kereteben/ *(programme completed)*
Luxembourg National Research Fund (FNR)	LUX	Luxembourg National Research Priorities (NRP): Economic: green sustainable finance / circular and shared economy https://www.fnr.lu/national-research-priorities-for-luxembourg-approved/

Member Organisation	Country	Instrument & Link
Green Transition		
Independent Research Fund Denmark (DFF)	DNK	Green Transition https://dff.dk/en/application/call_green_transition_2021_eng.pdf
Research Council of Norway (RCN)	NOR	Green Platforms Initiative https://www.forskningsradet.no/en/apply-for-funding/the-green-platform-initiative/
Green-Tech		
Research Council of Norway (RCN)	NOR	Collaborative Project for Technological Convergence Related to Enabling Technologies https://www.forskningsradet.no/en/call-for-proposals/2021/collaborative-project-technological-convergence/
Research Council of Norway (RCN)	NOR	Researcher Project for Technological Convergence Related to Enabling Technologies https://www.forskningsradet.no/en/call-for-proposals/2021/researcher-project-technological-convergence/
Health		
Health Research Board (HRB)	IRL	Applied Partnership Awards https://www.hrb.ie/funding/funding-schemes/all-funding-schemes/grant/applied-partnership-awards-apa-2022/
Health Research Board (HRB)	IRL	Definitive Intervention and Feasibility Awards (DIFA) 2023 https://www.hrb.ie/funding/funding-schemes/all-funding-schemes/grant/definitive-intervention-and-feasibility-awards-difa-2023-full-application/
Health Research Board (HRB)	IRL	Knowledge Translation Awards (KTA) https://www.hrb.ie/fileadmin/2._Plugin_related_files/Funding_schemes/KTA_2022_Guidance_Notes_Final.pdf
Humanities & Digitalisation		
Latvian Science Council (LZP)	LVA	State Programme for Digital Humanities https://lzp.gov.lv/programmas/valsts-petijumu-programmas/digitalas-humanitaras-zinatnes/
Latvian Science Council (LZP)	LVA	State Programme for Digital resources in the humanities https://lzp.gov.lv/programmas/valsts-petijumu-programmas/humanitaro-zinatnu-digitalie-resursi/
Latvian Science Council (LZP)	LVA	State Programme for Latvia for the development of Latvian and European society https://lzp.gov.lv/programmas/valsts-petijumu-programmas/letonika-latviskas-un-eiropeiskas-sabiedribas-attistibai/

Member Organisation	Country	Instrument & Link
Materials		
Swiss National Science Foundation (SNSF)	CHE	National Research Programmes: NRP 62 "Smart Materials" https://www.snf.ch/en/ELxP53n5RBBa08a2/funding/programmes/national-research-programmes-nrp
Raw Materials		
Multiple members, including: • French National Research Agency (ANR) • Foundation for Science and Technology (FCT) • Research Foundation Flanders (FWO) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	ERA-MIN-1/-2/-3: 'Non-energy and non-agricultural raw materials' https://www.era-min.eu/
Soil & Land Use		
Latvian Science Council (LZP)	LVA	State Programme for Sustainable territorial development and rational use of land resources https://lzp.gov.lv/programmas/valsts-petijumu-programmas/ilgtspejiga-teritorijas-attistiba-un-racionala-zemes-resursu-izmantosana/
Soils		
Swiss National Science Foundation (SNSF)	CHE	National Research Programmes: NRP 68 "Sustainable use of soil as a resource" https://www.snf.ch/en/ELxP53n5RBBa08a2/funding/programmes/national-research-programmes-nrp
Sustainability		
French National Research Agency (ANR)	FRA	General Call for Research Project: Dynamics of socio-ecosystems and of their components https://anr.fr/fileadmin/aap/2022/aapg-2022-v1.1a.pdf
French National Research Agency (ANR)	FRA	General Call for Research Project: Sustainability Sciences https://anr.fr/fileadmin/aap/2022/aapg-2022-v1.1a.pdf
Fund for Scientific Research (F.R.S.-FNRS)	BEL	IDR Panels dedicated to Sustainability in all calls https://www.frs-fnrs.be/en/

Member Organisation	Country	Instrument & Link
Multiple members, including: • Academy of Finland (AKA) • French National Research Agency (ANR) • Foundation for Science and Technology (FCT) • Fund for Scientific Research (F.R.S.-FNRS) • Research Foundation Flanders (FWO) • Swedish Research Council for Sustainable Development (FORMAS) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	Aquatic Pollutants: 'Risks posed to human health and the environment by pollutants and pathogens present in water resources' http://www.waterjpi.eu/
Swiss National Science Foundation (SNSF)	CHE	National Research Programmes: NRP 73 'Sustainable Economy' https://www.snf.ch/en/ELxP53n5RBBa08a2/funding/programmes/national-research-programmes-nrp
Water, Oceans, and Rivers		
Multiple members, including: • Foundation for Science and Technology (FCT) • Swedish Research Council for Sustainable Development (FORMAS) • Research Council of Norway (RCN) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	Marine Biotechnology ERA-NET https://www.marinebiotech.eu/ https://uefiscdi.gov.ro/articole/3790/Marine-biotechnology-ERA-NET.html
Multiple members, including: • Foundation for Science and Technology (FCT) • Swedish Research Council for Sustainable Development (FORMAS) • Research Foundation Flanders (FWO) • Croatian Science Foundation (HRZZ) • Research Council of Norway (RCN) • Science Foundation Ireland (SFI) • Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	Eur.	Blue Bio-Economy: 'Unlocking the potential of aquatic bioresources' https://bluebioeconomy.eu/
Multiple members, including: • Academy of Finland (AKA) • French National Research Agency (ANR) • Independent Research Fund DK (DFF) • Foundation for Science and Technology (FCT) • Luxembourg's National Research Fund (FNR) • Research Foundation Flanders (FWO) • Poland's National Science Centre (NCN) • Dutch Research Council (NWO) • Research Council of Norway (RCN) • Swiss National Science Foundation (SNSF) • UK Research and Innovation (UKRI)	Eur.	Transformations to sustainability (T2S; NORFACE network): 'Global sustainability challenges' http://www.norface.net/
Multiple members, including: • Foundation for Science and Technology (FCT)	Eur.	Ocean Energy ERA-NET Cofund https://cordis.europa.eu/project/id/731200

Member Organisation	Country	Instrument & Link
Bottom-Up Approach		
Czech Science Foundation (GAČR)	CZE	Open Calls https://gacr.cz/en/panels
Eötvös Loránd Research Network (ELKH)	HUN	'Priority Research Topics' Call (ELKH-KKT-2022) https://elkh.org/kiemelt-kutatasi-temak-program/ *(Temporarily postponed)*
Research Foundation Flanders (FWO)	BEL	Strategic Basic Research (SBO) https://www.fwo.be/en/fellowships-funding/research-projects/sbo-projects/
Multiple Topics		
Dutch Research Council (NWO)	NLD	Dutch Research Agenda https://www.nwo.nl/en/researchprogrammes/dutch-research-agenda-nwa
Dutch Research Council (NWO)	NLD	Knowledge and Innovation Covenant https://www.nwo.nl/en/researchprogrammes/knowledge-and-innovation-covenant
Research Foundation Flanders (FWO)	BEL	[Ordinary calls] https://www.fwo.be/en/fellowships-funding/research-projects/junior-and-senior-research-projects/
Swiss National Science Foundation (SNSF)	CHE	Sinergia https://www.snf.ch/en/HzVMPWm96mz69ZJ8/funding/programmes/sinergia
Poland: National Science Centre (NCN)	POL	[Multiple calls] https://www.ncn.gov.pl/en/finansowanie-nauki/konkursy/typy
UK Research and Innovation (UKRI)	UK	[Multiple calls] https://www.ukri.org/opportunity/

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