CALL FOR APPLICATIONS

as of August 31, 2021

Helmholtz Sustainability Challenge: First Call – Core Projects

Funded by the Initiative and Networking Fund of the President of the Helmholtz Association

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The campaign at a glance

The preservation of our livelihoods and the continuous improvement of our living conditions are at the center of our scientific work. For years, the scientists of the Helmholtz Association have made important contributions to the transformation towards a sustainable society through their research. These include major international projects such as the <u>MOSAiC expedition</u>, participation in the World Climate Report or the World Biodiversity Council, joint initiatives such as <u>Energy Systems 2050</u> or the <u>Helmholtz Climate</u> <u>Initiative</u>, as well as countless research projects for sustainable materials, low-emission mobility and much more. This call for applications adds to the important endeavor of a sustainability transformation.

To promote new research topics, cross-sectional activities and community-wide initiatives, the Helmholtz Association maintains the Initiative and Networking Fund (INF). As part of a research campaign, the fund provides up to **21 million Euro from 2022 to 2027 for joint research projects** of the Helmholtz centers and their partners dedicated to design novel research activities in the field of sustainable value chains and to bring them to the widest possible application.

In the spirit of the Helmholtz creed "Research for Grand Challenges", the Helmholtz Sustainability Challenge "**Sustainable Value Chains**" will focus on research questions that integrate contributions towards a sustainable society in a problem-oriented manner:

What major challenges exist en route to sustainable value chains and a circular economy and what competencies do we need to combine at Helmholtz to overcome them?

Once the problem has been defined and analyzed, it should be approached creatively, drawing from a diverse group of disciplines to find alternative viewpoints and solutions with a clear goal in mind: bringing solutions to the real world. Unfortunately, today's economic concepts are often not sustainable because they build on linear production processes from a raw material to a single product. This mechanism causes resource demands depleting natural resources, high energy consumption with the connected climate impact as well as increasing waste problems. In contrast, sustainable solutions result from integrated processes and resource flows optimized systemically along value chains while efficiently delivering the required products. Ideally, circularity (circular economy) reduces waste and resource input into systems and contributes to the dynamic equilibrium of the affected ecosystem or overall well-being of the society. Natural ecosystems provide a blueprint for these principles, prompting the use of naturebased solutions and bio-inspired mechanisms. Since many underlying economic processes border on everybody's personal surrounding, the required solutions have to be designed in a transformative manner to unfold an impact on our economy.

The Helmholtz Sustainability Challenge aims at **developing and demonstrating practical examples of sustainable value chains/circularity** to obtain improved resource and energy use by a combination of technical progress, economic, ecological, and societal innovations. In this context, projects should define a specific challenge or problem that will:

 Address a challenge and underlying systemic issue in line with the UN Sustainable Development Goals (SDGs) and the EU green deal

and

- Demonstrate transfer-oriented solutions in the form of services, processes, and products within 5 years incl. a sustainability assessment and prospective use cases;
- Be tackled in a **transdisciplinary fashion**: across domains, across research fields and scientific communities, exploiting existing skills and competencies from the Helmholtz Programs.

The core projects (see definition below) can be rooted in a variety of fields along the concept of value chains. They could potentially:

- Address systematic optimization of integrated process and material flows with the objective to reduce or avoid waste, energy and resource inputs, or greenhouse gas emissions to target circularity;
- Strive for innovative technological developments, e.g. living materials, nature-based solutions, novel energy carriers;

- Utilize and stimulate ecosystem services and biodiversity, e.g. turnover of contaminants, waste remediation
- Establish business cases supporting circularity and promotion of this transformation through social innovation.



Structure of the campaign

The campaign consists of two separate calls concerning research questions addressing **sustainable value chains**; open to all members of the Helmholtz Association:

The first call for applications (details below) includes funding opportunities for up to three joint research projects, so-called CORE PROJECTS. These form the critical mass of the campaign and address cross-cutting research questions concerning sustainability challenges in the context of sustainable value chains and their contribution towards a sustainable society.

The second call for applications (two rounds of applications in 2022 ff.) provides funding for short-term SATELLITE PROJECTS that diversify the campaign portfolio and focus on high risk/high gain research ideas to exploit synergies during the funding period of the campaign. These agile satellites allow single projects with a strategic fit to boost the impact of the campaign as they may align with one core project, act as a bridge between two or more core projects, or stand individually to address an emerging issue in the field.

This first call for applications details the funding opportunities for CORE PROJECTS.

First Call for Applications – Core Projects

A. Prerequisites for the funding of core projects

Each core project should address all of the following five areas aligned with the strategic objectives of the Initiative and Networking fund (INF). The prerequisites also represent the major selection criteria for the evaluation of the proposals for core projects.

Originality of the research

The research question at the center of the core projects should clearly **contribute to the Helmholtz mission** and prove its relevance for our society. The following aspects are of particular importance:

- Definition of the problem and approach in the context of sustainability (SDGs) and value networks (transfer orientation), i.e. the sustainability assessment along economic, social and ecological criteria should be fulfilled in a holistic manner (reduced resource and/or energy use need to be quantified showing the impact of the newly designed versus a state-of-the-art reference process, product or service).
- Novel ideas and innovative topics beyond and complementary to existing research and sustainability initiatives at Helmholtz with a clear differentiation from existing research activities in the programs, centers, or current initiatives. Consortia need to prove the added value and cross-domain approach of the core project.

Transfer by design

As stated above, the campaign and its projects should identify sustainability challenges in the field of sustainable value chains. With a concise challenge or problem as starting point, the projects inherently address research subjects with high societal relevance and transfer potential. Accordingly, the consortia should involve future users and consider market requirements at an early stage. Overall, transfer aspects have to be taken into account **at all project stages** by involving **relevant societal or economic stakeholders** in the consideration of urgent needs or solutions (co-creation). To ensure the fitness for purpose, usability and potential market-fit for the intended goal, user and application orientation as well as impact reflection must be included during the research life cycle.

The consortium should define the **potential target group(s)** as well as **possible use cases** in the early stage of the project development. Stakeholders in this context can be:

- Suppliers, users and/or customers;
- Trade and startup associations;
- GOs and NGOs.

The consortia should further:

- Define clear work packages dedicated towards transfer within the sub-projects. These should be flanked by ambitious but realistic milestones and goals (e.g. projected Technology Readiness Level (TRL) increase or similar). In the assessment of goal achievement, actual and target values for these performance indicators (current values for 2022 and target values for the conclusion of the core project) will be used in conjunction with qualitative indicators. Transfer options can be adjusted during the consortium term, but must be explained in the course of reporting.
- Allocate a funding sum of at least 40% of the INF funding budget of the core project for transfer-related purposes distributed equally over the funding period, i.e. dedicated work packages and their respective budgets have to equal 40% of the INF funding budget. This can be achieved using the suggested instruments (see below) or suitable alternative measures.
- Chose appropriate transfer indicators from the respective centers' assortment of indicators (as defined in their respective transfer strategies) at the level of the core project

The core projects have to involve the participating centers' transfer offices throughout this process. The transfer offices of the involved Helmholtz centers have to submit a letter of support containing a brief assessment of the transfer potential of the sub-projects, as part of the application.

The consortia are encouraged to utilize the following measures for achieving the requirements of the transfer budget (transfer funds serve to cover direct and indirect personnel or material costs and costs for third-party orders):

- Preparing spin-off projects or measures to support start-ups (profit & non-profit);
- Support for technical validation projects and the development of prototypes to test a transfer project under real conditions, proof-of-concept initiatives;
- Support to develop partnerships with companies or other users outside academia (profit & nonprofit);
- Innovation Labs, in which research and application are merged and developed further (profit & non-profit);
- Field studies to test customer and user needs (profit & non-profit);
- Developing consulting services, simulation tools, or databases for users outside academia (profit & non-profit);
- Knowledge transfer initiatives (formerly funded directly through the INF);
- Transfer Tandem Groups: Two research groups form a transfer tandem with a translational perspective e.g. by combining basic and application-oriented research or two complementary aspects of an application, both relevant to solving the underlying problem.
- Lab-to-Market partnerships: Strategic development partnerships between the participating Helmholtz Centers and companies working in complementary fields.

The above-mentioned activities represent only a small fraction of measures that research institutions can use to interact with society. The consortia are encouraged to plan further measures such as supportive science communication and societal outreach projects. The funds for these measures must rely on basic financing but can be included in co-financing. Furthermore, consortia can account for measures of entrepreneurship education in the transfer budget.

All transfer activities should align with the Helmholtz self-commitment towards the goals of the <u>Pakt für</u> <u>Forschung und Innovation IV</u> as well as with the participating centers' transfer strategies.

Cooperation and strategic partnerships

The core projects unite several partners in a research consortium. These consortia from all areas of the Helmholtz Association are to develop joint projects **across centers and research field boundaries**, following a joint transdisciplinary approach reflected in the sub-projects and in the selection of external partners. Consortia have to involve researchers from at least two Helmholtz centers and two Helmholtz research fields. Furthermore, the consortia may involve:

- Partner institutions (university or non-university);
- Industrial partners at different corporate levels (start-ups, SMEs, large corporations);
- NGOs or government branches.

They should form a genuine **synergetic research consortium** so that the individual parts make valuable contributions to the overall research question. New collaborations within and outside should follow the objectives to engage in high-quality complementary research and to increase the visibility of Helmholtz research in the field of sustainable value chains / circular economy. The consortia and their research networks ideally provide possibilities to reach out to greater research initiatives and funding, e.g. on a European level to enable future collaboration opportunities.

Therefore, the consortia should provide:

- A **collaboration strategy** deciphering the expected contributions of the involved groups and stakeholders and underlining the added value of network compared to the sum of individual elements.
- A **backbone project** as structural element that will manage the consortium, support joint initiatives and manage overarching offers.

Promotion of early career researchers and diversity

Supporting early career researchers is a top priority in the Helmholtz Association. The consortia are expected to provide an excellent framework for conducting doctoral and postdoctoral research, such as outstanding infrastructure, stable working conditions, and a training program tailored to the individual needs of early career researchers, independent of their funding and affiliation. In order to promote graduate level researchers, all core projects are required to incorporate **Helmholtz Research Schools** – with a **budget of one million Euros** - to enable at least one generation of graduates to become an integral part of the consortium. The Helmholtz Research Schools:

- Represent joint facilities of the centers (on site or virtual) involved in the consortium and at least one partner university, operating for at least four years. Doctoral students are the primary target group of a Research School.
- Offer a curriculum of events and educational opportunities that provide an excellent scientific
 program with high relevance, innovative potential and incorporate multidisciplinary perspectives
 on the research subject.
- Take the transfer of results to business and society into consideration from an early stage.
- May include a foreign partner to support internationalization.

The concept for a Helmholtz Research School must include:

- A concept on how early career researchers involved in the project will be supported, funded and supervised in line with the Helmholtz Doctoral Guidelines and the Helmholtz Guidelines for the Postdoctoral Phase.
 - This should include the development of a work and qualification plan for doctoral students, the establishment of a doctoral committee for optimal supervision, and innovative further career development opportunities. The centers ensure that the doctoral students are familiar with essential support structures such as the technology transfer offices or ombuds-persons in the event of conflict within a structured process.
 - In the area of Information and Data Science, the consortia should strive for cooperation with the Helmholtz Information and Data Science Academy (HIDA).
 - In case of an International Research School and the integration of a foreign partner, a mobility concept for doctoral candidate exchange and a strategy for partner facility interaction is required. Doctoral students are expected to spend a significant period (at least six months) at the foreign partner facility.
- 2) A recruitment concept on how the project accounts for diversity, equality and inclusion, as specified in the Helmholtz Association's Guideline on Diversity and Inclusion.
 - Explain how you intend to set up and foster a diverse research team, which benefits from the different perspectives and backgrounds of its members, e.g. via recruiting, attracting, including and developing diverse researchers.
 - The centers should further explain which concepts and measures at the facilities they intend to draw on when implementing diversity aspects.

The funds from the Initiative and Networking Fund primarily serve to finance the additional costs of the Research School's organizational structure and the special technical and additional qualifications of-fered. Some of the funds can also be used to finance doctoral positions.

Open Science

The project should be carried out in the **spirit of Open Science**. Open Science means

- Open access to scientific textual publications (Open Access according to the Helmholtz Association's policies);
- Open and FAIR research data (Open Research Data);
- Open access to research software (Open Research Software) wherever possible and appropriate.

If required, further advice is provided by the Helmholtz Open Science Office (os.helmholtz.de). Open Science can also be addressed by conducting individual sub-projects using appropriate Citizen Science methodology.



Exemplary structure of a core project

B. Recipients, type and scope of the funding

The Initiative and Networking Fund provides funds for up to three core research projects with:

- A maximum funding of up to €5 million per core project;
- A funding period of 4 to 5 years.

Helmholtz Centers and German universities (as partners of centers) are eligible for funding. The participating Helmholtz Centers and, if applicable, other partners involved are expected to provide co-financing, the total of which should at least correspond to the amount of funding provided by the Initiative and Networking Fund over the entire term. The proposal must specify the co-financing as allocated to subprojects and involved partners as well as regarding the respective term of years (see template for application).

Project funding is provided as fixed-amount financing. Personnel costs (expenditures), material costs (expenditures), and investments according to the NKBF 2017 (for the funded Helmholtz Centers) and the ANBestP (for partners external to the Helmholtz Association) are eligible for funding.

C. Procedure

a) Overview on timeline and deadlines

Overall procedure for the INF Campaign "Helmholtz Sustainability Challenge":



First Call for Applications (Core Projects):

Second Call for Applications (Satellite Projects):		QIII 2022
1.1	Submission of detailed financial planning:	April 2022
1.1	Project presentations and selection:	March 2022
1.1	Written assessments/feedback by panel:	February 2022
1.1	Proposal submission:	December 17, 2021
1.1	Expression of interest submission:	October 15, 2021

b) Details on the procedure

For this first call, the procedure for applying for a consortium involves three stages:

Stage 1: Open project development and expression of interest

The research campaigns are holistic efforts of the entire Helmholtz Association to focus their scientific expertise on a single topic. Hence, core projects should be developed in a participative manner. To facilitate the formation of research consortia, interested parties are encouraged to participate in the open project development. To this end, the Helmholtz Association Head Office provides various support platforms (in addition to the general website www.helmholtz.de/sustainability-challenge:)

HelmholtzCloud as an information/exchange platform

The following information and interaction opportunities are provided on the Helmholtz Cloud documentsharing server:

- Information on the call for applications with templates and FAQs on the call for applications;
- Poster pitches with research ideas from the networking events/project development
- Topic proposals: A document folder will be set up for each project idea submitted to the Helmholtz Head Office in the form of an expression of interest (see below), where the expression of interest and any other outlines or contribution pitches by any interested Association scientists can be submitted, so that the consortium can develop openly and is mutually enriching.

The Helmholtz Cloud is accessible via this <u>LINK</u>. Please contact <u>kampagne@helmholtz.de</u> to receive the password.

Networking events

To facilitate the exchange of ideas and the formation of trans-disciplinary consortia, the Helmholtz Head Office will host three events via the platform MeetAnyway:

- Networking Event #1 Monday, 09/27/21 | 1 3 p.m.
- Networking Event #2 Wednesday, 09/29/21 | 10 11 a.m.
- Networking Event #3 Tuesday, 10/05/21 | 9 11 a.m.

Each event will consist of

- A "speed dating" round for all participants
- Poster sessions: participants with a project idea can prepare a brief project or challenge pitch in form of a poster (template annexed) to find potential partners
- Open discussions: create a private room to discuss ideas

Participants are asked to enroll for the respective event (or to all of them) one week in advance via <u>kampagne@helmholtz.de</u>. The Head Office will then send all relevant information and dial-in for the event(s).

All project ideas have to be submitted as an **expression of interest** to be eligible for proposal submission. The expression of interest must at least contain the following information (template annexed):

- Working title (preliminary but informative), including a short title (and, as appropriate, an acronym/key word with no more than 20 characters)
- Preliminary short description of the challenge and project idea (abstract, no more than five lines/450 characters)
- One or more exemplary use cases to highlight the underlying problem to be solved (need not be the final use cases for the proposal)
- Coordinator including contact data (Center and e-mail address at least)

The Helmholtz Association will publish expressions of interest via the Helmholtz Cloud (information below) to support the consortium-building process. Expressions of interest will not be assessed and it is recommended that further information about the project idea be included along with the required, basic information. Examples include information on preparatory work, resources (devices, data, etc.), approaches to consortium formation, and acquisition of new consortium partners.

Expressions of interest are to be submitted in electronic form to the Helmholtz Association Head Office at <u>kampagne@helmholtz.de</u> by October 15, 2021.

Stage 2: Project planning and submission of proposal

The proposals present the selected challenge/research question, the consortium, and the structure of the joint project. The proposals should explain the objectives and the basic approach. They should show how the individual sub-projects interact and complement one another to create synergies in addressing the research question. The selected profile elements and their functions and integration into the overall consortium should be stated as well as how they are to be used with potential instruments. Moreover, the draft proposal should include a schedule and a financial plan.

The documents for submission of the proposal for core projects include:

- The proposal including a draft for project schedule and financial planning (template below),
- Résumés for the principal investigators with a list of their ten most important publications (template below),
- Written agreements by the management of each co-financing partner institution to provide the matching funds indicated in the proposal,
- Letter of intent by the participating centers' transfer offices containing a brief assessment of the transfer potential of the (sub-)project,
- Proposals for ten reviewers.

The proposals have to be submitted electronically to the Helmholtz Head Office (<u>kam-pagne@helmholtz.de</u>) by December 17, 2021.

Stage 3: Assessment, feedback & selection

After the submission of the proposal and an initial checking of formal requirements, the proposals will undergo a written peer review. The consortia that fulfill the formal requirements and a first internal feasibility proof by an expert panel (based on the written reviews) will be invited to give a presentation. During the selection meeting, the consortia should introduce the core projects and their sub projects.

Based on the presentations, discussions and written reviews, the panel will select up to three promising proposals and recommend them for funding.

D. Annex

- Template for expression of interest
- Template for the proposal of the core project
- Compulsory information according to Art. 13 GDPR