Federal Ministry of Education and Research (BMBF)

Announcement of

Regulations governing the funding of international collaborative projects under the National Bioeconomy Strategy

"Bioeconomy International 2025"

1 Funding aim, purpose and legal basis

1.1 Aim of funding

The Federal Ministry of Education and Research (BMBF) intends to strengthen the implementation of the National Bioeconomy Strategy[1] with regard to its international outlook and context by funding collaborative research, development and innovation (R&D&I) projects that involve foreign partners. The aim of the Federal Government's National Bioeconomy Strategy published in January 2020 is to support the transformation of the largely fossil-resources-based economy into a sustainable bio-based economy that focuses on natural material cycles. In this context, research for innovation is regarded as the necessary key to identifying and exploiting the potential of the bioeconomy. As described in the National Bioeconomy Strategy, the BMBF's corresponding research funding focuses on six building blocks of which the first, "Biological knowledge as the key to the bioeconomy", has particular relevance for these funding regulations (see 2 below).

The National Bioeconomy Strategy provides substantial support for the use of various biotechnological processes in industry, as well as other aspects. Companies are already increasingly introducing sustainable processes and products in order to remain competitive. Implementing the bioeconomy should not, however, interfere with efforts to ensure global food security. Today, many countries are already having to deal with conflicting aims such as increasing competition for natural resources (land and water) and the use of agricultural products for different purposes (nutrition, industrial material, energy). In addition, there is increasing global demand for food and animal feed, timber and various types of agricultural products, including side and residual streams, which has direct and indirect effects on global land use, the climate, biodiversity and major ecosystem services.

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[1] https://www.bmbf.de/SharedDocs/Publikationen/de/bmbf/7/31576_Nationale_Biooekonomiestrategie_Langfassung.pdf?__blob=publicationFile&v=6

The Bioeconomy International funding regulations make a contribution to Mission I "Enable resource-efficient and circular-economy-based competitive industry and sustainable mobility", and Mission II "Advance climate protection, climate adaptation, food security and the conservation of biodiversity", as well as to the third goal "Intensify European and international cooperation" of the Federal Government's Future Research and Innovation Strategy.

1.2 Funding purpose

Implementing the bioeconomy as a sustainable bio-based economy requires not only national and European initiatives, but also – in particular – international initiatives involving many ambitious activities and projects. Since the sustainable bioeconomy has to be considered at a global level, worldwide cooperation is needed to achieve the objectives set out for establishing the bioeconomy. This is where the Bioeconomy International funding measure comes in. Funding will be provided for research and development projects in close cooperation with relevant foreign partners on core issues of the bioeconomy in order to strengthen international collaborations and to establish active, reliable partnerships in the area of research, development and innovation. This may include projects of variable geometry.

The international project proposals submitted for selected projects accompany the BMBF's national activities in support of the bioeconomy and constitute an additional contribution towards achieving the funding objectives of the National Bioeconomy Strategy.

The results from the funded project may only be used in the Federal Republic of Germany or the European Economic Area (EEA), Switzerland, Australia, Brazil, Thailand and Vietnam.

2 Object of funding

Funding will be provided for research, development and innovation projects (R&D&I projects) that are carried out by collaborations involving partners from Vietnam, Thailand, Queensland/Australia and/or São Paulo/Brazil that have been selected in a competitive procedure.

Funding will be provided for the German partners in these international collaborations (see 3 Funding recipients). The international partners will receive matching funding from the funding agencies of the partner countries involved that are cooperating with the BMBF (see modules 1-4).

Funding is provided within the context of the National Bioeconomy Strategy of 15 January 2020 and its guidelines and strategic objectives. The strategy's implementation objectives define clear building blocks for research funding in order to achieve its strategic objectives.

The funded collaborative projects are expected to address research building block 6 "Global research collaborations" and to relate to at least one of the five other building blocks for research funding mentioned in the strategy:

1) Biological knowledge as the key to the bioeconomy (microorganisms; algae, fungi, bacteria, plants; insects, etc.);

2) Converging technologies and cross-disciplinary collaboration (digitalization, artificial intelligence, nanotechnology, automation, miniaturization, etc.);

3) Limits and potential of the bioeconomy;

4) Transfer into application (value creation networks, etc.);

5) Bioeconomy and society (interactions, conflicting aims, etc.);

6) Global research collaborations.

The precise topics that are eligible for funding have been specified/defined individually for each module in coordination with the relevant collaborating funding agencies.

Further information on topics eligible for funding can be obtained from the responsible project management organization (see 7.1).

International cooperation within the collaborative projects and the benefit it generates for each of the two countries in the implementation of the National Bioeconomy Strategy are the focus of the Bioeconomy International funding measure. With regard to the envisaged sharing of responsibilities, expertise and know-how of the partners and the utilization of the project results, cooperation must take place on an equal footing in terms of content and workload, thus allowing all countries involved to benefit in an equal and fair manner. Furthermore, the funding measure provides the opportunity to implement project ideas that were initiated as part of previous preparatory measures. More information on the National Bioeconomy Strategy is available online at https://www.bmbf.de/bmbf/en/research/energy-and-economy/bioeconomy/bioeconomy.html#searchFacets.

The "Bioeconomy International 2025" funding measure is composed of four modules:

Module 1 "Bioeconomy Germany – Queensland, Australia"

Cooperation with partners from Queensland

In Australia, a parallel funding call is being published by the Queensland Government under its AUD 150 million Trade and Investment Strategy 2022-2032, administrated by the Department of Environment and Science (DES).

Projects with partners from Queensland on the following topics are eligible for funding:

1. *Agriculture and food*: Development or advancement in using biological resources, technologies, and innovations to help transform agrifood systems so they are more efficient, inclusive, resilient, and sustainable. Projects may include, but are not limited to the development of biotechnology, digitalisation, data science and AI in biological systems, in areas such as crop and soil improvement, land rehabilitation, sustainable fertilisers, and pest management.
2. *Bio-based products and processes*: Development or advancement in converting renewable biological resources, technologies, co-products or wastes into value

added products, including but not limited to bio-inspired materials, chemicals, products, and services. Projects may include development of bioproducts with novel qualities, enhanced functionalities, and improved sustainability, capable of replacing current production of unsustainable products and/or advancing innovative market applications.

3. *Advancing knowledge and tools*: Projects are sought that develop and advance the biotechnological knowledge and tools that underpin a growing bioeconomy. Projects involving innovative and transformational science could include, but are not limited to:

    a. the generation of very large and high quality or novel datasets using, for example, advanced multi-omics, robotics and laboratory automation, sensors, or quantum techniques;
    b. integration of big data and computing (AI, bioinformatics etc.) for deepened biological knowledge and function prediction;
    c. high throughput and high efficiency building and testing of new biological systems using, for example, synthetic and engineering biology, protein and metabolic engineering, systems biology, microbial consortia and multicellular systems;
    d. advancing cell-free biomanufacturing from lab via pilot to industrial scale

This module requires the involvement of partners from industry. Projects must involve at least one industrial partner from Germany or Queensland. This could, however, also be an associated partner with an advisory function.

The selection procedure for the project proposals submitted under Module 1 will be carried out jointly with the Queensland Government.

It is absolutely necessary to submit in parallel a project proposal in the required format to the Queensland Government.

Module 2 "Bioeconomy Germany – São Paulo/Brazil"

Cooperation with partners from São Paulo

The São Paulo Research Foundation (FAPESP) is announcing a parallel funding call in Brazil in order to provide funding to cooperation partners from the state of São Paulo.

Under this module, proposals for projects on the following subjects can be submitted:

1. Industrial use of sustainably produced biomass for products with an added-value (also with support of e.g. biotechnological approaches, metabolic engineering, IoT, synthetic biology and systems biology).
2. Sustainable agriculture for tomorrow's nutrition: Increasing productivity (also with support of e.g. precision, smart and digital agriculture) under consideration of a careful use of the environment and resources.
3. Innovations to support sustainable and resilient food systems (e.g. innovations that enable resource efficiency and valorization of side streams, circular systems, waste

reduction, resilience against shocks (like pandemics, climate shocks, political shocks etc.))

4. Enhancement of predictive breeding technologies and development of new genotypes leading to new phenotypes and crop varieties for improvement of plant health, protection, production and resilience (with support of e.g. AI).**This module does not require the involvement of partners from industry, but it is recommended.**

The selection procedure for the project proposals submitted under Module 2 will be carried out jointly with FAPESP.

It is absolutely necessary to submit in parallel a project proposal in the required format to FAPESP.

Module 3 "Bioeconomy Germany – Thailand"

Cooperation with partners from Thailand

The Program Management Unit for Human Resources & Institutional Development, Research, and Innovation (PMU-B) is announcing a parallel funding call in Thailand in order to provide funding to cooperation partners from Thailand.

The programme is aimed at supporting high-quality R&D projects involving Thai-German cooperation that make a substantial contribution in one of the below fields. Project proposals should, as a rule, have a link to the production of high-quality chemical compounds. This includes, but is not limited to biohydrogen:

1. Synthetic biology for the design and construction of new biological parts, devices, and systems, or re-design of existing, natural biological systems for useful purposes (e.g., orthogonal bio-systems, regulatory circuits, minimal genome approaches, and protocells).
2. Systems biology to expand the knowledge of biological processes and regulatory mechanisms in intra- and intercellular processes. This includes the use of bioinformatics tools (e.g., data standardization, modeling, open repositories) and the development of new computational methods.
3. Metabolic engineering for targeted optimization of microbial production strains and biological processes, including the optimization of metabolic pathways and their regulation.
4. Development or advancement of technologies for production of value-added products from sustainably-sourced biomass.
5. Biotechnological approaches (possibly in combination with chemical ones) to transform bio-based building blocks into high-value products in a sustainable way.
6. Innovations to support sustainable and resilient food systems focused on reducing or reusing wastes, enhancing efficiency, and improving circularity.
7. Use of bioinformatics tools (e.g., data standardization, modeling, open repositories) for the identification and utilization of metabolic pathways, such as those useful for bio-production and strain/variety improvement.

This module does not require the involvement of partners from industry, but it is recommended.

The procedure for selecting the project proposals submitted for Module 3 will be carried out in cooperation with PMU-B.

It is absolutely necessary to submit in parallel a project proposal in the required format in Thailand.

Module 4 "Bioeconomy Germany – Vietnam"

Cooperation with partners from Vietnam

The Ministry of Science and Technology (MOST) of Vietnam is announcing a parallel funding call in Vietnam in order to provide funding to cooperation partners from Vietnam.

Under this module, proposals for projects on the following subjects can be submitted:

1. Development / optimization of production processes or of new / optimized strains and enzymes for the industrial usage of renewable resources;
2. Cascade use of agricultural residues/side-products for sustainable agricultural production / towards circular economy
3. Application of New Breeding Technology for crop improvement;
4. Application of Nano Technology for agriculture;
5. Application of ICT Technologies, such as (Big) Data storage, compression, annotation, analysis and presentation as well as KI-approaches, to make such data available for application in precision farming, smart intensification of agriculture and bio-industry

This module does not require the involvement of partners from industry, but it is recommended.

The selection procedure for the project proposals submitted under Module 4 will be carried out jointly with MOST.

It is absolutely necessary to submit in parallel a project proposal in the required format in Vietnam.

All four modules provide funding for transnational collaborative projects involving at least one partner from Germany and the country involved in the call respectively.

The proposed projects must be structured in such a way that the project objectives can be reached within a period of max. 36 months.

Furthermore, the projects must be balanced between the international partners involved with regard to their workload.

Other research partners from other countries can participate in a collaborative project provided that these partners document their financial commitment in a binding, signed letter. These financial commitments must be uploaded, alongside the project proposal, to the web portal at http://www.bioeconomy-international.de.

Further general rules for how to submit and structure project proposals are contained in the call documents at http://www.bioeconomy-international.de, or can be obtained from the project management agency (see 7.1).

3 Funding recipients

Applications may be submitted by universities, non-university research institutions, federal and *Länder* institutions with R&D responsibilities, as well as commercial companies, particularly small and medium-sized enterprises (SMEs).

Applicants are required to have a plant or branch (company) or another entity serving the non-commercial activities of the funding recipient (university, non-university research institution, federal and *Länder* institutions with R&D responsibilities) in Germany at the time of payment of the grant.

Research institutions which receive basic institutional funding from the Federal Government and/or the *Länder* can be granted project funding supplementary to their institutional funding to cover additional project-related expenditure or costs if, in their funding application, they provide explicit detail of the relationship between the proposed project and those activities provided for by their basic funding, and clearly differentiate between the two.

Small and medium-sized enterprises (SMEs) within the meaning of these funding regulations are companies that meet the requirements of the EU definition of SMEs.[2] Applicants must declare their classification according to the Commission Recommendation concerning SMEs to the granting authority in their application for funding.

Concerning the conditions for when state aid is or is not deemed to be involved and the extent to which funding can be provided without constituting state aid, please consult the Community Framework for State Aid for R&D&I.[3]

[2] cf. Annex I of the GBER or the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises notified under document number C (2003) 1422 (2003/361/EC) (OJ L 124 of 20 May 2003, p. 36): [http://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32003H0361&from=DE].

[3] Commission Communication (2022/C 414/01) of 28 October 2022 (OJ C 414 of 28 October 2022, p. 1).