

**4<sup>th</sup> Singapore-Germany International Collaboration on  
“Circular Economy”  
CALL FOR PROPOSALS 2024**

(Guidelines for Singapore-based Public Sector Research Performers)

Call Opens: 13 May 2024

Submission deadline: 18 July 2024

Revised guidelines as of 28 May 2024

<b>Updated Section No.</b>	<b>Page No.</b>
2.9 ii - provide insights and usable research results that lead to new or advanced technologies, products and/or services, (these can be both process and product innovations; in order to achieve these innovations within the project duration, project proposals are requested that have already reached a corresponding level of technological maturity (so-called Technology Readiness Level (TRL) - at least TRL <b>3</b> ).	6
9.1 Eligible activities  Eligible expenditure must be focused on undertaking eligible activities, which are defined as being directly related to the project and may include – but are not limited to: <ul style="list-style-type: none"><li>• employment of personnel</li><li>• proof of concept activities (including field trials)</li><li>• other direct research costs</li><li>• exchanges and secondments of personnel between Australia and Germany for project activities</li><li>• <b>Apparatus and small equipment</b></li><li>• research project–related communication initiatives</li></ul>	9

## 1. SUMMARY OF INITIATIVES

- 1.1. The Agency for Science, Technology and Research (A\*STAR) and the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF), jointly announce the **4<sup>th</sup> Singapore-Germany International Collaboration** call for proposals.
- 1.2. The goal of the Call for Proposals is to promote research and development bilateral collaboration between Singapore- and Germany-based public and private institutes and organizations through joint scientific projects. This collaboration calls for the union of at least **one Singapore-based and one Germany-based public sector research performer, with possible partnerships with one Singapore-based and/or one German-based industry collaborator**. Against the backdrop of globalization and Singapore government's recent step-up to help companies stay competitive through innovation and technology adoption, this cooperation framework could incentivize Singapore-based companies to undertake open innovation partnership and provide an additional avenue for them to internationalise. For the 4<sup>th</sup> Singapore-Germany International Collaboration joint grant call, A\*STAR and BMBF would like to invite researchers based in Singapore and Germany to submit proposals for joint research projects in the area of **Circular Economy**.
- 1.3. All joint proposals will be assessed and evaluated by scientific panels appointed by the respective implementing agencies from Singapore and Germany. Shortlisted proposals enter a second stage evaluation and will be cross-ranked with nominated proposals from BMBF.
- 1.4. All projects can be up to **36 months** in duration starting from the project start date. For each project, a funding sum of up to **SGD\$ 800,000 (inclusive of overheads)** shall be granted for Singapore-based researchers, and up to **€ 560,000** for Germany-based researchers.

## 2. INITIATIVE DESCRIPTION

- 2.1. The aim of this funding guideline is to develop new knowledge and expertise for innovative solutions in the field of the circular economy within the framework of bilateral projects that contribute to a more sustainable economy.
- 2.2. Against the backdrop of a further increase in the demand for raw materials in Germany and Singapore and at the same time dwindling natural resources, new strategies for action are becoming necessary. Urban mining has the potential to make a significant contribution to a resource-conserving circular economy by extracting valuable materials from buildings, infrastructure, consumer and capital goods, etc. in the urban environment. By tapping into secondary raw materials in this way, dependence on imports and thus both raw material shortages and waste volumes can be reduced.
- 2.3. Furthermore, in Germany and Singapore, the increasing use of plastics in all areas of life and the associated rise in packaging waste is increasing the amount of macro- and microplastics entering ecosystems. In addition to waste avoidance and intelligent waste

separation, there is therefore a need for recycling-friendly design of new plastic developments as well as effective and cost-efficient sorting/processing and recycling processes in order to increase the recycling of plastics, make plastics usable as a secondary raw material and thus improve the ecological balance.

2.4. Ideally, the research results should lead to new products, processes, procedures or services - or at least point the way to them.

2.5. This grant call serves to further strengthen efforts in research and innovation between Singapore and Germany in the area of **Circular Economy** based on the agreement on scientific and technological cooperation, to build a basis for mutual market access and sustainable economic alliance. The grant call is both competitive and multi-disciplinary in nature and is aimed at encouraging engagements between the Singapore and German research community and industry collaborators. Projects should also aim to achieve a Technology Readiness Level (TRL) between 5 and 7 upon completion. Key topics include:

1. Polymer design and recycling
2. Valorisation of biogenic waste
3. Waste as resource

2.6. Examples of issues in the three focus areas are detailed below:

### 2.2.1 Polymer design and recycling

- Sustainable alternative feedstock and monomer innovation;
  - Development of novel and environmentally friendly raw materials for polymers from alternative renewable raw materials (e.g. biogenic wastes and residues, carbon dioxide) in order to reduce dependence on fossil fuels.
- Recycling technologies of polymers;
  - Development of new or advanced mechanical and/or chemical recycling for mixed streams and mixed material layers or packaging to obtain new materials with desired properties taking into account the recycled material qualities, and quality assurance. Development of new or advanced chemical or biochemical recycling technologies that can convert hard-to-recycle contaminated or mixed plastic waste into feedstock for the production of plastics or other high-value products such as fuel.
- Polymer technology for easy recycling;
  - Design-for-Recycling (DfR) concepts for polymers (e.g. towards circular economy, recycling, usage optimization, easy disassembly), reduction of complexity of polymer waste by standardisation of components or polymers that are easy to separate, avoidance of multilayer materials and reduction of (toxic) additives
- Waste segregation;

- Development of collection systems and sorting technologies for homogeneous recycled material and increasing the quality of the recycled material.

### **2.2.2 Valorisation of biogenic waste**

- Collection and separation of biogenic waste
  - Development of innovative solutions to promote collection and separation of biogenic waste (e.g. food waste, agricultural side streams, plant cuttings ) collection and segregation, which can be valorised into high quality products.
- Green extractions and conversion technologies;
  - Development of cost-efficient, sustainable and scalable extraction and conversion technologies (e.g. green solvents, solvent-free methods, enzyme-assisted processes, fermentation, etc.) for the extraction and production of high-value, bioactive compounds that can be integrated into food and non-food products.

### **2.2.3 Waste as resource**

- Development of ecologically sustainable treatment concepts for incinerated fly ash (IFA) and incinerated bottom ash (IBA) with the aim of facilitating their reuse;
- Development of safe applications for the treated IBA/IFA, such as applications in structural concrete and coastal protection.

2.7. For each new assessment, technology or concept to be developed under the 3 themes stated above, a holistic perspective of the intended sustainability effects is required as a mandatory part of each project by Lifecycle Assessment (LCA), Life Cycle Cost (LCC) or Techno-Economic Assessment (TEA). Assessments of energy and carbon/greenhouse gas (GHG) emissions assessments are particularly important to be integrated for new or advanced technologies of polymer recycling. The aim is to develop, strategies with the highest impact on resource and energy efficiency, economic viability and social acceptance, as well as lowest environmental impact (e.g. reduction of environmentally harmful additives and residues).

2.8. The consideration of the following cross-cutting sub-topics in the proposal is of added value:

- New business models (implementation of circular economy aspects)
- Improvement of methods or data for environmental impact assessment
- Social acceptance and trust as well as public perception of circular economy aspects
- Health and safety issues
- Industrial symbiosis

2.9 Overall, the projects should

- i. have a high practical relevance

- ii. provide insights and usable research results that lead to new or advanced technologies, products and/or services, (these can be both process and product innovations; in order to achieve these innovations within the project duration, project proposals are requested that have already reached a corresponding level of technological maturity (so-called Technology Readiness Level (TRL) - at least TRL 3
- iii. Identify strategies for implementing the research results in politics, society and industry
- iv. develop solutions that can be implemented in major cities and metropolitan regions in Germany and Singapore,
- v. include parameters for transferability to other cities and regions. In this context, test fields, real laboratories and pilot regions or cities for testing the developed circular economy concepts and technologies and for networking need to be involved, as far as possible.
- vi. promote young scientists (where appropriate)

### 3. ELIGIBILITY AND SUBMISSION INSTRUCTIONS

- 3.1. This Call for Proposal is a joint submission that involves at least **one Singapore-based and one Germany-based public sector research performer, with possible partnerships with one Singapore-based and/or one Germany-based industry collaborator**. Eligible Singapore- based public sector research performers include the Institutes of Higher Learning (including universities and polytechnics), A\*STAR Research Institutes, and non-defense-related public sector agencies (e.g., Ministries, Statutory Boards). Proposals must be submitted with the appropriate endorsement by the respective Host Institution (by the Chief Executive Director, Executive Director, the Director of Research or equivalent) to ensure that organizational support is clearly associated with the proposed research plan. Singapore-based applicants are required to submit their applications electronically via the Integrated Grants Management System (iGrants) by 18 July 2024, 23:59hrs SGT. The Germany-based public sector research performer must also concurrently submit the joint proposal to BMBF.
- 3.2. Each selected research projects under this 4th grant call will be funded up to SGD\$800,000 by A\*STAR (for Singapore-based public sector research performers) and € 560,000 by BMBF (for the Germany component) for up to 36 months, and this includes funding for general overheads (30% indirect costs applicable for Singapore-based public sector research performers only).
- 3.3. Companies will be assessed on the quantitative and qualitative merits of the proposed project. These include the employment of research scientists and engineers, total business expenditure in R&D which generates spin-off to the economy, investments in fixed assets, and the company's commitment to growing R&D capabilities in Singapore. The grant will be subject to incentive terms and conditions requiring the company to implement its plans to grow and sustain R&D activities in Singapore. The two companies participating in the proposal must be separate entities. One of the companies should not be the Singapore/German office of the other participating company (i.e. Singapore company is the branch company or subsidiary of the Germany's company and vice versa).

#### **4. PROPOSAL REQUIREMENTS**

- 4.1. Only COMPLETE proposals will be accepted for review, evaluation and assessment for awards. Proposals must attempt to fully disclose the research ideas and approaches. It is important that proposals are well crafted and provide substantial description of the research plan for a fair review of the scientific and/or technical plans and approaches. Proprietary or confidential information must be clearly indicated in the proposal. Proposals must not be duplicative or substantially similar to any previous project or proposal submission, and public sector research performers should not be represented in more than one proposal.
- 4.2. The proposal shall contain the following, more details can be found in the application form
- The overall detailed joint project description,
  - Details on the involvement and contribution of the Singaporean public sector research performers,
  - Details on the interaction among public sector research performers of both countries,
  - Details on the funding required for the Singaporean effort.

#### **5. CRITERIA FOR EVALUATION OF GRANT PROPOSAL**

- 5.1. Each project shall *inter alia*:
- Implement research findings to the industry or society (The project should have a minimum TRL level of 3 at the beginning and the team should indicate the target TRL level at the end of the project in the application form.
  - Apply state-of-the-art methods and advance technologies.
  - Be tackled in an inter-disciplinary approach involving scientists with different backgrounds in basic research and/or applied/closed research.
  - Involve a mix of experienced and young scientists.
- 5.2. Projects should preferably provide leverage in one or more of the following means:
- Provide access to unique and/or specialized characteristics of overseas partner country (i.e. specific scientific knowledge or technique), availability of key manpower, common interest in seeking a breakthrough in a specific field, etc;
  - Tap on specialized capabilities of overseas partner agencies, and through this, create strategic linkages to tap on specialized capabilities in the future; and
  - Provide opportunities to learn/share/benchmark research with your international public sector research performer.
- 5.3. Other factors will include the following:
- level of synergy of the proposed research to the collective set of activities,
  - the abilities of the researchers, their past performances in prior awards, comments of the referees (if required),
  - effectiveness of project management, and
  - appropriateness of the requested budget.

## **6. PROPOSAL SELECTION AND AWARD PROCESS**

- 6.1. All joint proposals will be assessed and evaluated by scientific panels appointed by the respective implementing agencies from Singapore and Germany. These panels will consist of scientific experts who will review and recommend complete proposals for the award. Project proposals with clear strategies for implementing research findings to industry or society and show greater prospects of attaining a TRL level of 3 at the beginning and a higher target TRL level at the end of the project.
- 6.2. The Implementing Agency may seek referee reports, written submissions or presentations from some public sector research performers to justify, elaborate or clarify aspects of the research approach described in the proposal during the review process.
- 6.3. Notification of awarded projects will be sent to the respective employing organizations and copied to the respective public sector research performers.

## **7. INFORMATION OWNERSHIP**

- 7.1. The following should be satisfied prior to commencement of the project:
  - Cooperating parties should enter into formal contract agreement, which should specify the roles and tasks to be undertaken by each party to the cooperation; and
  - Share the ownership of Intellectual Property (IP) rights brought to and resulting from the cooperation, as well as the commercialization rights agreed amongst cooperating parties, and will be subjected to the contract assigned by both parties in the joint collaboration within reasonable limitations before the commencement date of the project.
- 7.2. A formal Research Collaboration Agreement (RCA) between the collaborating parties from Singapore and Germany would need to be signed and forwarded to A\*STAR and BMBF not later than three (3) months after the Letter of Award of the project has been issued to the team. Permission from A\*STAR and BMBF must be sought at least one month in advance if further time extension is required for the completion of the RCA. A\*STAR reserves the right to terminate the project should the team fail to submit the signed RCA within the stipulated deadline.

## **8. PROJECT REVIEW, MONITORING AND EVALUATION**

- 8.1. Each awarded project will be evaluated and assessed for progress to ensure that proposed milestones and deliverables can be achieved. Successful grant applicants will be required to submit an annual progress report and a final report upon project completion to A\*STAR via iGrants and BMBF.
- 8.2. Presentations and public seminars may also form part of the progress review of a project.
- 8.3. More details can be found in A\*STAR Grant Terms & Conditions and Guidelines

## **9. WHAT THE GRANT MONEY CAN BE USED FOR**

You can only spend grant funds on eligible activities incurred on the agreed project as defined in your grant arrangement.



## 9.1 Eligible activities

Eligible expenditure must be focused on undertaking eligible activities, which are defined as being directly related to the project and may include – but are not limited to:

- employment of personnel
- proof of concept activities (including field trials)
- other direct research costs
- exchanges and secondments of personnel between Australia and Germany for project activities
- Apparatus and small equipment
- research project–related communication initiatives
- conferences, workshops, symposia related to the research.

This list is not exhaustive. We may update the guidance on eligible expenditure and activities from time to time.

## 9.2 Ineligible expenditure

You can only spend grant funds on eligible expenditure you have incurred on an agreed project as defined in your grant agreement or arrangement.

For guidance on ineligible expenditure, please refer to Appendix A. We may update the guidance on eligible and ineligible expenditure from time to time.

## 10. TIMELINE OF GRANT OPPORTUNITY

10.1 This Call for Proposal opens 13 May 2024 Singapore applicants are required to apply electronically via iGrants [<https://igrants-app.a-star.edu.sg/>] by 18 July 2024, 23:59 (SGT)

10.1. Germany-based applicants are required to submit their applications to BMBF's online system.

10.2. Grant recipients will be notified of the selection outcome by late October **2024 to early November 2024**.

10.3. Indicative timeline of grant call activities are as follows:

Activity	Timeline (SGT)
Application opening period	13 May 2024 to 18 July 2024 (10 weeks)
Assessment of applications and Cross evaluation	22 July 2024 to 27 Sep 2024(10 weeks)
Joint Steering Committee review	30 Sep 2024 to 18 Oct 2024 (3 weeks)
Announcement of Outcomes	21 Oct 2024 to 08 Nov 2024 (3 weeks)
Letter of Award and Project Start Date	Apr 2025

## **11. ENQUIRIES**

11.1. For enquiries pertaining to this grant call, the respective contact persons are:

### **A\*STAR (Singapore)**

E-Mail: oga\_bilats@hq.a-star.edu.sg

### **DLR-PT on behalf of BMBF (Germany)**

Dr. Ludwig Kammesheidt

E-Mail: Ludwig.Kammesheidt@dlr.de

Birgit Ehrenberg

E-Mail: Birgit.Ehrenberg@dlr.de

## Appendix A – Ineligible Expenditure for Singapore applicants

This section provides guidance on what we consider ineligible expenditure.

The Program Delegate may impose limitations or exclude expenditure, or further include some ineligible expenditure listed in these guidelines in a grant agreement or otherwise by notice to you.

Examples of ineligible expenditure include:

Type of Expenses	Description
Salaries of Lead PI / Investigators / Visiting Professors & researchers/ Collaborators/ general administrative support staff	Not allowable.
Teaching buy outs	Not allowable for the hiring of substitutes to perform the Investigators' teaching duties.
Stipend top-up for existing post-graduate scholarship holders	Not allowable.
Undergraduate stipend and tuition support	Not allowable.
Costs related to general administration and management.	Not allowable.
Costs of office or laboratory space	Not allowable.
Personal productivity tools & communication expenses	Not allowable, unless the use of mobile phones and other forms of smart devices were included in the methodology for the Research.
Audit fees (Internal and external audit) and Legal fees	Not allowable.
Entertainment	Not allowable.
Refreshment	Not allowable.
Fines and Penalties	Not allowable.
Patent Application	Not allowable. This includes patent application filing, maintenance and other related costs.
Professional Membership Fees	Not allowable.
Staff retreat and team building activities.	Not allowable.

This list is not exhaustive and applies only to the expenditure of the grant funds. Other costs may be ineligible where we decide that they do not directly support the achievement of the planned outcomes for the project or that they are contrary to the objective of the program.

You must ensure you have adequate funds to meet the costs of any ineligible expenditure associated with the project.