****

**CITIES OF TOMORROW R&D PROGRAMME**

**FULL PROPOSAL TEMPLATE**

**All information is treated in confidence. The information is furnished to the National Research Foundation, Ministry of National Development, and National Parks Board with the understanding that it shall be used or disclosed for evaluation, reference and reporting purposes. Please complete ALL sections, following instructions and prompts carefully. Incomplete submissions may not be accepted.**

1. **PROJECT DETAILS & DESCRIPTION:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Call Topic**: | | | | | |
| **Proposal Title: *The proposal title should be descriptive and accessible to the general reader, and should not exceed 30 words.*** | | | | | |
| **Total Budget Requested (Including indirect cost):** | | **Period of Support:** | | **Host Institution[[1]](#footnote-2):** | |
| **List of Project Team Members** | | | | | |
| **Role** | **Name** | **Designation** | **Department & Institution** | **Contact details (Email address)** | **% of time committed on the project** |
| ***Lead PI[[2]](#footnote-3)*** |  |  |  |  |  |
| ***Co-I[[3]](#footnote-4) (1)*** |  |  |  |  |  |
| ***Collaborator[[4]](#footnote-5) (1)*** |  |  |  |  |  |
| ***Collaborator (2)*** |  |  |  |  |  |

**Technology Readiness Level**

|  |  |  |
| --- | --- | --- |
| **Level** | **Stage** | **Description** |
| 9 | Production | Actual system, proven through successful mission operations |
| 8 | Full-scale development | Actual system completed and operationally qualified through test and demonstration |
| 7 | Exploratory development | System prototype demonstration in an operational environment |
| 6 | System/ sub-system model or prototype demonstration in a relevant environment |
| 5 | Component and/ or basic sub-system validation in relevant environment |
| 4 | Technology development | Component and/ or basic sub-system technology validation in laboratory environment |
| 3 | Analytical and laboratory studies to validate analytical predictions |
| 2 | Technology concept and/ or application formulated |
| 1 | Basic principles of technology observed and reported |

Please indicate the start and end TRLs of the research project based on the table above.

**Start TRL:**

**End TRL:**

1. **IMPORTANT INSTRUCTIONS AND NOTES**
   1. All essential project information for the required write-ups in Sections 3 (Details of Research Proposal) and Section 4 (Outcomes & Deliverables) should be kept **strictly within a total of 20 printed pages** using a size 12, Times New Roman (or equivalent) font. Additional sheets can be attached to include the applicant(s)’ CVs (see Annex A for requirements) and selected publications, and the list of cited literature. Please note that proposals would be evaluated based on these 20 printed pages and that additional sheets attached may or may not be taken into consideration.
   2. All proposals will be evaluated against the following criteria and hence, the applicant(s) is encouraged to highlight the information below clearly in the proposal:
      1. Potential Contribution to CoT Objectives

* Relevance of proposed research in contributing to objectives/targets stated for the CoT Call Topic.
  + 1. Potential for Breakthrough and Innovation
* Quality and significance of proposed research, including value for money, and the potential for breakthrough/innovation to advance knowledge and understanding within its own field or across different fields.
  + 1. Potential for Application and Deployment in Singapore and Commercialisation/Export
* Potential for application of research outcomes in Singapore by a public agency and potential for solutions to be replicated in Singapore beyond a single site/project.
* Feasibility for commercialisation/ export in areas where Singapore has a competitive advantage.

* + 1. Execution Strength and Technical Competency of Research Team
* Quality of plans for execution and delivery of the research programme and goals, including the appropriateness of the proposed milestones and deliverables (specific to evaluation of full proposal applications)
* Quality, significance, and relevance of the recent research record of the Lead PI and Co-Is and the strength of the applicant group, including likely synergy in delivering research and potential for international leadership.

1. **DETAILS OF RESEARCH PROPOSAL**
   1. **Research Objectives**

* *What are the objectives of this research? Clearly state the research question(s) and the objectives of the proposed project, and elaborate how this project will contribute to the specified targets and requirements set out in the grant call document.*
* *Articulate how the research will address costs (such as resource impacts etc), as set out in the grant call document*
* *Articulate trade-offs, if any (ie. This solution will improve productivity by 50%, at the expense of energy consumption increase of x%)*

|  |
| --- |
|  |

* 1. **Research Methodology and Approach**
     1. **State of Current Research and Impetus for R&D**
* *Describe prior work that is related and/or relevant to this proposal and any preliminary results that would help support this proposal.*
* *Describe the state of current research for the proposed project within Singapore and globally, i.e. list researchers who are working in similar areas and highlight their current work.*
* *Highlight whether there are similar commercially available solutions, and how this research is different.*
* *Highlight the novelty of the proposed R&D work, and how this work will address the limitations in existing R&D efforts/market solutions.*

|  |
| --- |
|  |

* + 1. **Proposed Approach and Methodology**
* *What is your research approach?*
* *Highlight the novelty of the research and how it differs from existing efforts.*
* *Highlight the technical challenges and the corresponding mitigation measures.*

|  |
| --- |
|  |

* + 1. **Declaration of Other Substantially Similar Projects**

Please indicate (Yes/No) if the Lead PI, Co-I(s), or Collaborator(s) have submitted other project proposals, with substantially similar scope to this project, for grant application under other funding initiatives/grants.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Yes: |  |  | No: |  |

If yes, please provide the details in the table below. Please note that this project proposal will not be considered until the results from the other funding initiatives/grants are finalised. Please also complete a more detailed declaration of other funding support in the “Budget Template (Form B)”.

|  |  |  |  |
| --- | --- | --- | --- |
| **Funding Initiative/Grant** | **Funding Agency** | **Total Amount**  **(S$ ‘000)** | **Years of Support** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

* + 1. **Data Requirements**
* *Highlight all the datasets necessary to be obtained from other sources (e.g. government agencies, collaborating companies etc.) for this project. Include details on data parameters needed, resolution, and whether each type of data, if unavailable, would impact the success of the project. Pls also highlight mitigation measures.*
* *Highlight all the datasets to be measured/collected within this project. Include details on data parameters to be measured, data collection plans, potential challenges, and mitigation measures.*
* *Please note that data to be collected in the project could be shared, unless they are commercial data or bounded by NDAs.* *This applies to all publicly funded projects and is meant to maximise synergies across projects requiring similar data and minimise duplicative work.*

|  |
| --- |
|  |

* + 1. **Approval(s) for Work (If Applicable)**
* *Summarise any regulatory, institutional, or professional approvals required to execute this project, such as site access permits, safety requirements, or ethics reviews.*

|  |
| --- |
|  |

* 1. **Value Capture/Value Created**
     1. **Deployment/Application of R&D Outcomes**

Describe which areas (e.g., physical locations, policies, operational processes, etc.) in Singapore this project could positively impact, and the proposed plans to facilitate the deployment or application of research outcomes.

For projects expected to end at TRL 6 and above:

* *Where will the project be test-bedded/deployed?*
* *Why are these site(s) chosen, and how will the research be applied?*
* *Who are the key translation partners (both public agency or industry) that you would work with to bring this work to deployment (either during the project or as a next step)?*
* *Is any additional funding required (beyond this funding proposal) for the test-bedding / deployment activities?*

For projects expected to end at TRL 5 and below:

* *What are your plans to bring this technology to the next stage of deployment / application? Highlight any issues or obstacles you anticipate.*

|  |
| --- |
|  |

* + 1. **Industry Collaboration Plan to Translate Upstream Research to Downstream Implementation**
* *State the industry collaborators involved in the project, their roles, and the plan to translate upstream research to downstream implementation.*

|  |
| --- |
|  |

* + 1. **Commercialisation/Export Plan**
* *Describe the commercialisation plan (e.g. licensing of IP generated, export of product overseas) for the proposed R&D products / solutions and the prospects for successful exploitation (i.e. large international market demand, etc.).*
* *What is the time to market?*
* *What is the addressable market for this technology, both locally and overseas?*
* *List the expected intellectual property (in the form of patents and technology disclosures) likely to be generated from this project, if any.*

|  |
| --- |
|  |

* 1. **Capabilities Needed for the Project**

*CVs of the PI, Co-I(s) and Collaborator(s) should be attached in a separate document (see format in Annex A).*

* + 1. **Expertise & Effort Level of Lead PI**
* *Please indicate the role and contribution of the Lead PI.*
* *Briefly describe the plans for interaction among the team member(s) and collaborators in achieving the research objectives.*
* *Does the Lead PI have any prior experience in IP commercialisation, such as via licensing or creating spin-offs?*

|  |
| --- |
|  |

* + 1. **Expertise & Effort Level of Co-I(s) and Collaborator(s)**
* *Please indicate the role and contribution of each Co-I and Collaborator.*
* *Do the Co-I(s) and/or Collaborator(s) have any prior experience in IP commercialisation, such as via licensing or creating spin-offs?*

|  |
| --- |
|  |

* 1. **Program Plan**
     1. **Internet-facing Sites Relevant to the Delivery of the Project**
* *Please specify all registered corporate websites and any e-services URLs (including public facing APIs and IP addresses of cloud assets) to be used in the delivery of the project.*
  + *Examples of corporate websites* 
    - *xyz.edu.sg for IHLs*
    - *abc.com.sg for companies*
  + *Examples of e-services URLs*
    - *dropbox.com*
    - *web.autocad.com*
    - *mathworks.com/products/matlab-online*
    - *api.github.com*
    - *api.openweathermap.org*
    - *https://www.nasa.gov*
* *These are used for cybersecurity posture evaluation and for awarded proposals, monitoring over the course of the project.*

|  |
| --- |
|  |

* + 1. **Research Component to Be Done Overseas (If Applicable)**
* *Please specify and justify any research work to be done overseas, listing the key deliverables and funding required.*
* *The funding required for overseas work should be clearly indicated in budget.*
* *Please note that any research work to be done overseas using the awarded funding must be expressly approved by the Grantor.*

|  |
| --- |
|  |

1. **OUTCOMES & DELIVERABLES** 
   1. **R&D Key Performance Indicators (KPIs)**

* *List quantifiable targets for technical key performance indicators (KPIs), with clear baselines for this research. An example would be ‘to improve the time needed to perform xxx task by x%, from a baseline of y hours’. The overall technical deliverables/ KPI of the project should align with the targets set out in the grant call document.*
* *Specify how these KPI targets will be measured.*
* *Quantify the impact of the KPIs in terms of the return on investment for the R&D monies to be spent.*
* *Specify potential trade-offs (e.g. increase in x% of energy consumption from current operations) and how these trade-offs could be minimised (i.e. through future research)*

|  |
| --- |
|  |

* 1. **Outcome Key Performance Indicators (KPIs)**
* *Please fill in the targeted indicative outcome KPIs in the table below.*

|  |  |  |  |
| --- | --- | --- | --- |
| **RIE2025 outcome KPI** | **Definition** | **Projected target** | **Remarks** |
| Proportion of publications in the top 10% most highly cited worldwide[[5]](#footnote-6) | % of Singapore's publications in top 10% citation percentiles (worldwide, field weighted), excluding self-citations.[[6]](#footnote-7) | <Indicate number/value> |  |
| No. of publications in top 10% journals | No. of publications in the top 10% of S&T journals in the field as tracked in the Thomson Reuters Joint Citation Report. | <Indicate number/value> |  |
| No. of industry projects | No. of R&D projects (in the form of research collaboration agreements or contract research agreements) undertaken with industry. | <Indicate yes/no> |  |
| No. of technologies deployed, including licenses[[7]](#footnote-8) | This measures the no. of research findings or technologies developed that are deployed (e.g. through a license or at least at pilot scale) that will contribute to at least one of the following outcomes:   * Introduction of new product in the market; * Introduction of new service in the market; * Product or process improvement. | <Indicate number/value> |  |
| No. of instances of policy influence | A policy influence refers to an instance whereby:   * Outputs of a funded project (e.g. research findings or published technology roadmap) informed policy, regardless of the outcomes of the eventual policy e.g. changes in guidelines, informing of target setting, informing of strategy/ops planning etc.; or * Expertise developed through funded activities (e.g. technical experts hosted by a core funded entity) participated in policymaking or were consulted by policymakers in their expert capacity. | <Do not fill; To be completed by Lead/Member Agencies> |  |
| No. of instances of standard industry practice influences[[8]](#footnote-9) | A standard industry practice influence refers to an instance whereby:   * Outputs of a funded project (e.g. research findings or published technology roadmap) informed industry decision making or practice beyond the level of single companies, e.g. contributing to setting of industry managed standards, presentation of technology roadmaps to industry bodies (e.g. associations or consortia); or * Expertise developed through funded activities (e.g. technical experts hosted by a core funded entity) participated in decision making by industry bodies or were consulted by industry bodies in their expert capacity. | <Indicate number/value> |  |

* 1. **Project Deliverables and Implementation Schedule (Technical Milestones in IGMS)**
* *Please list proposed milestones/deliverables and their delivery timelines (see example below).*
* *Milestones/deliverables stated here should represent technical milestones and should be as specific as possible.*
* *These milestones/deliverables will be tracked throughout the project.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Research**  **Milestones/**  **Deliverables** | **Year 1** | | | | **Year 2** | | | |
| ***e.g. Milestone 1*** |  |  |  |  |  |  |  |  |
| ***e.g. Milestone 2*** |  |  |  |  |  |  |  |  |
| ***e.g. Deliverable 1*** |  |  |  |  |  |  |  |  |
| ***e.g. Milestone 3*** |  |  |  |  |  |  |  |  |
| ***e.g. Milestone 4*** |  |  |  |  |  |  |  |  |
| ***e.g. Deliverable 2*** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

1. **SUGGESTED NAMES OF TECHNICAL PEER REVIEWERS**

The applicant(s) is invited to submit the names and contact details (organisation and email address) of at least (3) three experts, including at least (1) one international expert, in the field as possible reviewers for the proposal. The proposed reviewer list should not include anyone who may have a conflict of interest in reviewing the proposal, such as former advisers, students, or recent collaborators. It will be the CoT Directorate’s decision whether to use the reviewers suggested. Please indicate NIL for sections that are not applicable.

* 1. **Proposed Reviewer List**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **Salutation/ First Name/ Last Name** | **Institution/ Designation** | **Tel/ Fax/ Address/ Email** | **Relationship** | **Expertise** |
| **1** |  |  |  |  |  |
| **2** |  |  |  |  |  |
| **3** |  |  |  |  |  |
| **4** |  |  |  |  |  |
| **5** |  |  |  |  |  |

1. **DECLARATIONS**

We affirm that all information provided in this proposal is complete and accurate to the best of our knowledge and ability at the time of preparation.

We affirm that we have reviewed and understand the application requirements for the Grant Call. We acknowledge that the submission of this proposal signifies unconditional acceptance of the terms and conditions applicable to the grant.

We, the applicant(s), of the proposal agree that (i) the CoT Directorate is under no obligation to accept the proposal, and (ii) the applicant(s) shall abide by the decisions of the CoT Directorate.

**PROPOSAL TITLE:**

|  |  |
| --- | --- |
| Signature of Lead Principal Investigator (PI): | Organisation: |
| Name (in BLOCK LETTERS): | Contact Number: |
| Lead PI’s Designation: | E-mail Address: |

**(1) Supported by Head of Department or equivalent position holder in the organisation**

|  |  |
| --- | --- |
| Signature: | Designation: |
| Name (in BLOCK LETTERS): | Date (DD/MM/YY) |

**(2) Endorsement by organisation (Research Director, CEO, MD or equivalent)**

|  |  |
| --- | --- |
| Signature: | Stamp of Organisation |
| Name (in BLOCK LETTERS)/ Designation: | Date (DD/MM/YY) |

**NOTE:**

**Only application forms that are duly signed and endorsed and submitted to the IGMS website within the stipulated period will be accepted for review and evaluation.**

**ANNEX A: CURRICULUM VITAE**

CVs should be provided for PI, Co-Is, and collaborators.

Please use the format below to provide the required information on the research team. Please indicate “**NA”** beside the label field if the required information is not applicable. Please limit the CVs to **2 pages** for each team member.

* Name
* Title
* Office Mailing Address
* Email
* Contact No.
* Current Position (Please provide full details, e.g. primary appointment, joint appointments; other academic appointments including those outside of Singapore; percentage of time spent in Singapore every year, if applicable)
* Employment History
* Academic qualifications (Indicate institution’s name and year degree awarded)
* Professional Awards
* Research interests
* Top 5 publications in the last 5 years that pertains to the proposed project/programme
* Patents filed (related or unrelated to the study)
* Summary of the most relevant research outcomes from all previous grants (e.g. patents, awards, etc) [please limit to half a page]

1. Host institution refers to the organisation (Singapore-based public research institutes (RIs) (e.g., Institutions of Higher Learning (IHLs) and A\*STAR RIs), companies, company-affiliated research laboratories or institutions and not-for-profit entities) to which the Lead PI belongs, which will provide the primary support for the proposed programme if it is funded by CoT. This organisation will be named in the Letter of Award as the Host Institution. [↑](#footnote-ref-2)
2. Lead PI refers to Lead Principal Investigator who is the person to be named in the Letter of Award as the Lead Principal Investigator for the project. [↑](#footnote-ref-3)
3. Co-I refers to Co-Investigator who is the person to be named in the Letter of Award as a Co-Investigator for the project. [↑](#footnote-ref-4)
4. Collaborator refers to any company, institution, incorporated body or other industry or academic collaborator, which is not an Institution or an Investigator but is to be engaged in the Research in collaboration with the Institutions or any of them. A Collaborator is not eligible to receive any part of the funding for the project. [↑](#footnote-ref-5)
5. Please indicate the i) projected total number of publications, and ii) projected number of publications in the top 10% most highly cited worldwide under the Remarks column. [↑](#footnote-ref-6)
6. As citations are a lag indicator, please indicate the target intended for the time frame of 5 years from publication. [↑](#footnote-ref-7)
7. Please provide details of the research findings or technologies developed that are expected to be deployed under the Remarks column. [↑](#footnote-ref-8)
8. Please provide details of the expected instances of standard industry practice influences under the Remarks column. [↑](#footnote-ref-9)