

# CALL FOR DATA-DRIVEN ENVIRONMENTAL SERVICES OPERATIONS

## 1. INTRODUCTION

- 1.1 The National Environment Agency (NEA) and Enterprise Singapore (ESG) have jointly launched the Call for Data-driven Environmental Services (ES) Operations as part of the National Innovation Challenges (NIC), to develop a digital platform for a seamless interpretation and analysis of data across formats to assist users to monitor conditions of their properties, improve service responses and optimise resource allocation in near real-time condition. The solution should translate to cost savings, improvement in productivity, service quality and performance for users.
- 1.2 This Innovation Challenge is launched together with four problem owners (i.e. CapitaLand Limited, Keppel Land Limited, Mapletree Investments Pte Ltd and NTUC Club) who are partners under NEA’s ES Industry Transformation Map (ITM) INCUBATE<sup>1</sup> partnership programme. To demonstrate **scalability** of the proposed solution, interested solvers shall:
- Commit capacity to undertake at least 2 problem owners and justify their preferred choice (*if any*); as well as
  - Demonstrate capability to develop a solution based on the requirements for all problem owners. If the solver is unable to meet any requirements, the solver is to indicate why with supporting information.
- 1.3 This call provides selected solvers with the opportunity to develop solutions to address validated market needs identified through working with the problem owners, with first deployment lined up following successful prototyping. Building on their first demonstration, solvers can potentially scale through industry-wide adoption and internationalise.

## 2. PROBLEM STATEMENT

Project Title	Description of the problem statement
<b><u>Data-driven Environmental Services operations</u></b>	<ul style="list-style-type: none"> <li>• ES industry currently relies heavily on low-skilled and manual labour, employs an aging workforce, and is labour-intensive and unproductive</li> <li>• Growing trend amongst building owners implementing task-specific technologies with the use of robots, sensors, mobile applications and wearables in their operations</li> <li>• Challenge amongst facilities managers (FM) to manage multiple systems/dashboards provided by different solution providers to track:               <ul style="list-style-type: none"> <li>○ <i>Performance and delivery of services rendered by their contractors</i></li> <li>○ <i>Correlation of data across devices to manage services rendered and remote monitoring of property conditions</i></li> </ul> </li> <li>• Lack of knowhow in using and making sense of data from individual dashboards</li> </ul>

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<sup>1</sup> **IN**novating and **CU**rating **B**etter **A**utomation and **T**echnologies for **E**nvironmental Services (INCUBATE) embodies the partnership between the technology providers and services providers, premises owners, and the government, to collectively innovate and curate better technologies, solutions and innovations for the Environmental Services industry.

- Existing solutions are typically built using proprietary protocols which might not be compatible for integration to provide seamless analytics of data

Please refer to the attached problem statements on the website for the full details on the overall problem statement and technical needs as well as for the four problem owners.

### 3. FUNDING SUPPORT

- 3.1 Up to \$2 million is allocated to this Innovation Challenge. Of the \$2 million, up to \$1 million is allocated to support one or more selected enterprise(s) in solution development projects from Proof-Of-Concept (POC) / prototyping to pilot deployment. The remainder of up to \$1 million is allocated to support adoption of solutions.

#### **FUNDING SUPPORT FOR DEVELOPMENT PROJECTS (up to \$1 million)**

- 3.2 Project lead(s) and members of the solver project teams must be identified and clearly indicated for each proposal. Public researcher(s) from Institutes of Higher Learning (IHLs) and Research Institutes (RIs) may collaborate with enterprise(s) on these projects. Project teams should be enterprise-led.
- 3.3 Singapore-based enterprises can qualify for up to 70% funding support if development activities are performed in Singapore. This includes local SMEs/start-up<sup>2</sup>, and foreign SMEs/startups based in Singapore.
- 3.4 Separate funding will be provided by National Research Foundation (NRF) Singapore to public researchers to collaborate with Singapore-based enterprises for POC/prototyping and pilot deployment. Public researchers can be supported up to 100% by NRF. For details, please refer to Innovation and Enterprise Office (IEO) office.
- 3.5 Solutions should also not be readily or commercially available in the market.
- 3.6 Qualifying cost components for enterprises include:

Components	Description
<b>Manpower costs</b>	This only applies to employees directly involved in the project. This does not include employees employed for other job functions and/or job scopes outside of the proposal.
<b>Equipment/ Software</b>	Core equipment/tools required for developing front-end/back-end application ( <i>e.g. software/mobile application</i> ) and/or prototyping. This includes purchase price, and costs related to R&D and test-bed phases ( <i>e.g. delivery, installation, handling, etc.</i> ). Only project-related technical software and equipment that is non-existing within the

<sup>2</sup> For SMEs, the companies must fulfil the following criteria:

- Registered and operating in Singapore, and
- Have minimum 30% local shareholding, and
- Have group annual sales turnover of not more than S\$100 million, or group employment of not more than 200 employees

	<p>organisation may be supported. Operational costs such as cost of capital works, general infrastructure, general purpose IT communication equipment, office software and equipment, and furniture and fittings, etc. will not be supported.</p> <p><i>Note: Equipment purchased prior the notification date of award cannot be claimed.</i></p>
<b>Testing and Certification</b>	Third-party testing and certification services to ensure that proposed solutions comply with required standards and regulations.
<b>Consultancy (Professors/ Experts)</b>	Consultancy or advisory cost for professors/experts may be supported if relevant to meeting the milestones and deliverables of the project.
<b>Intellectual Property (IP)</b>	Licensing/Technology/Acquisition/Patent-related costs in direct relation to the technology must be stated in proposal. Supporting documents such as a copy of the original source must be provided.

### 3.7 Development and test-bedding of the solutions

The development and test-bedding of the solutions could be carried out in the following phases, up to a period of 15 months.

- a) Development Phase: Involves the development of the solution and prototyping. Proposal shall proceed to the Test-bedding Phase only upon successful completion of prototyping.
  - Demonstration of Proof-of-Concept (POC) within 2 months from notification of award:
    - Proposal should include a plan on what could be demonstrated during POC to prove the companies' ability to perform integration work and ability to develop analytics that can serve users on day-to-day needs (*need not be limited to ES solutions*). Some information, but not limited to, include:
      - i. Ability to perform integration
      - ii. How/Where will the POC be conducted?
      - iii. POC should demonstrate communication and connectivity to multiple types of equipment/sensors, and processing different types of information (*e.g. location, alerts, etc*)
      - iv. Capability to handle bandwidth of > \_\_\_\_\_ no. of sensors
      - v. Examples to demonstrate analytics capabilities
- b) Test-bedding Phase: Involves test-bedding and user acceptance test of the proposed solution at relevant premises/sites in Singapore.
- c) Pilot Deployment Phase: Involves deployment of solution in "live" operation at designated premises/sites, ensuring that the expected outcomes are always met, fulfilling the scope of works and meeting the deliverables specified in the Project Agreement.

### 3.8 The total funds requested shall not exceed the approved quantum.

3.9 There should be no request for additional funds unless there are strong and valid justifications. Any additional funding will be subject to NEA's and ESG's approval. Companies are advised to provide thorough and accurate breakdown costs of their proposal during the submission.

#### 4. EVALUATION CRITERIA

4.1 The proposed development solutions must address the requirements of the problem statements in this Call. The proposed solution should demonstrate all of the attributes to achieve the purpose of this project and value offering of such a solution, whereby the solution should demonstrate to:

- Reduce reliance of manpower;
- Improve quality, consistency and performance of service delivery;
- Achieve cost-savings;
- Improve efficiency/productivity;
- Improve visibility/situational awareness of ES operations; and
- Enhance safety of operations

4.2 Proposals will be evaluated based on the four parameters indicated in the table below, with the corresponding information to be included in the proposal:

<b>Parameters</b>	<b>Objective / Details</b>	<b>Required Information</b>
<b>1. Technical feasibility of solution (35%)</b>		
Effectiveness in addressing the challenge	Whether and how the proposed solution can address the requirements stated in the challenge statements	<ol style="list-style-type: none"> <li>1. Preliminary system design and architecture</li> <li>2. Preliminary interface requirement specification</li> <li>3. Shows how each of the requirements can be met, with relevant examples</li> <li>4. Scalability of the solution (<i>ability to be scaled up for use at FM level</i>)</li> </ol>
Operational Feasibility	To demonstrate the user friendliness of the system and strategies to ease the users in transiting to the proposed solution	<ol style="list-style-type: none"> <li>1. Stakeholder onboarding plan</li> <li>2. Clear identification of potential users of this solution</li> <li>3. Training plans across different user groups</li> <li>4. Demonstrate ease of use</li> </ol>
<b>2. Business feasibility of solution (30%)</b>		
Commercialisation strategy	To demonstrate clear business strategies in the scale up use of this solution	Comprehensiveness on the business plan to scale up the developed solution ( <i>e.g. target audience, potential prospects, sales &amp; marketing channels, etc</i> )
Estimated Commercial cost and return of investment (ROI) upon implementation	To demonstrate ROI of the solution	Proposed business model with the following information: <ol style="list-style-type: none"> <li>1. Estimated Commercial Price: CAPEX or Subscription-based (<i>to indicate minimum committed time period</i>)</li> <li>2. Estimated Operational and Maintenance cost</li> <li>3. ROI calculations and assumptions made</li> </ol>
<b>3. Capacity and Expertise to execute projects (20%)</b>		

Expertise to executive projects	Credibility of project consortium	<ol style="list-style-type: none"> <li>1. Relevant project references</li> <li>2. Credentials (CV) of project team members especially project manager/technical leads</li> </ol>
Capacity to execute projects	Demonstration of capacity to undertake this project	<ol style="list-style-type: none"> <li>1. Current and upcoming projects (6 months) that consortium is/will be involved in</li> <li>2. Current and upcoming projects (6 months) projects that the project team manager/technical leads are/will be involved in</li> </ol>
<b>4. Clarity &amp; Comprehensiveness of proposal and test plans (15%)</b>		
Overall clarity and comprehensiveness of proposal	Demonstrate clarity and comprehensive in the proposal	<ol style="list-style-type: none"> <li>1. Project management plan (<i>timeline, personnel involved at each phase, etc</i>)</li> <li>2. Risk identification and mitigation (<i>Covering design risk, operational risk</i>)</li> <li>3. To state the standards used, which the software is tested against</li> </ol>
Detailed plans for development, POC, Test-bedding and Pilot deployment	Detailed plans for development, POC, Test-bedding & Pilot deployment tests stating the purpose, objectives, scope, deliverables and outcomes	<ol style="list-style-type: none"> <li>1. Development plan</li> <li>2. POC Plan</li> <li>3. Test-bedding plan (<i>including UAT: User Acceptance Trial plan</i>)</li> <li>4. Pilot Deployment plan</li> </ol>

## 5. RIGHTS OF AWARDING

NEA and ESG reserve the right to select proposals to be awarded. For the avoidance of doubt, NEA and ESG also reserves the right not to award funding to any proposal.

## 6. DATES OF THE CALL AND TECHNICAL BRIEFING

6.1 The Call will be opened between 2 Oct 2020 and 18 December 2020 (*both dates inclusive*). The deadline for submission is on **18 December 2020 at 12 noon** (*Singapore time, GMT+8*).

6.2 A technical briefing will be held to provide potential solvers with more information. The details for the briefing are as follows:

<b>Date :</b>	22 October 2020 ( <i>Thursday</i> )
<b>Time:</b>	9.30am to 11am
<b>Location:</b>	<p>The technical briefing will be held online via <b>CISCO Webex</b>.</p> <p>Please register your interest on the Gov-PACT portal, <b>by 16 October (Fri)</b>:</p> <ul style="list-style-type: none"> <li>• Step 1: Create an <b>account</b> in the Gov-PACT portal and you will receive an email reply for the confirmation of the account creation;</li> <li>• Step 2: <b>Log in</b> to the Gov-PACT portal;</li> <li>• Step 3: Select “<b>CALL FOR DATA-DRIVEN ENVIRONMENTAL SERVICES OPERATIONS</b>”</li> <li>• Step 4: Scroll down and click ‘<b>REGISTER</b>’ for the technical briefing.</li> </ul> <p>Thereafter, the meeting details and links will be sent to the registrants’ email addresses.</p>

## 7. SUBMISSION PROCEDURE

- 7.1 Submit your proposal using the **Application Form (Proposal)**, together with all supporting documents in the **Gov-PACT portal**
- Step 1: Create an **account** in the Gov-PACT portal (*if yet to do so*), and you will receive an email reply for the confirmation of the account creation;
  - Step 2: **Log in** to the Gov-PACT portal;
  - Step 3: Click '**APPLY**'.
- **Note:** *Pl refer to the user guide for more information*
- 7.2 The deadline for submission is ~~18 December 2020 (Friday) at 12 noon~~ **6 January 2021 (Wednesday) 12 noon** (Singapore time, GMT+8).

## 8. CONTACT PERSON

For further enquiries on this Call, please email:

- [IOT-for-ES@nea.gov.sg](mailto:IOT-for-ES@nea.gov.sg) – National Environment Agency for matters pertaining to the problem statements
- [Gov-pact@ipi-singapore.org](mailto:Gov-pact@ipi-singapore.org) – for assistance on:
  - *Using the Gov-PACT portal for registration, submission of proposal, etc.*
  - *Matching technology partners to collaborate for this call*
  - *Funding enquiry*