COLLECTION, AGGREGATION AND REPORTING OF WASTE DATA TO IMPROVE RECYCLING RATES

CONTEXT

CapitaLand Group (CapitaLand) is one of Asia's largest diversified real estate groups. Headquartered in Singapore, CapitaLand's portfolio focuses on real estate investment management and real estate development, and spans across more than 260 cities in over 40 countries. CapitaLand owns and operates eight real estate assets in the Jurong Lake District (JLD) including six business park assets in International Business Park (IBP) and retail malls IMM and Westgate. CapitaLand aims to contribute to the environmental and social well-being of the communities where it operates, as it delivers long-term economic value to its stakeholders.

In CapitaLand's 2030 Sustainability Master Plan, it aims to achieve a 25% recycling rate in its day-to-day operations. CapitaLand has been experimenting with multiple ways of encouraging better recycling habits and behaviours within its assets and properties to meet this target. These include (1) launching awareness campaigns, (2) testing out transparent recycling bins, (3) deploying reverse vending machines and SGRecycle stations, and (4) waste digitalisation initiatives. Despite these initiatives, CapitaLand continues to face challenges in increasing recycling rates and contamination rates of the recycled materials remain high. Another challenge is in getting tenants to participate in waste digitalisation initiatives as the need to consolidate and bring the recyclables to a designated area for weighing may deter participation.

CapitaLand is keen to create a solution to facilitate collection, aggregate, and report the state of waste generated and recycling collected within its assets. Collecting recycling data in large commercial properties remains challenging mainly due to decentralised recycling collection networks. If tenants do not send their recyclables to the designated receptacles for data collection, the data will not be collected. The same applies to retail malls, where visitors are transient and dispose of their recyclables and waste at their convenience.

This sector-wide challenge is supported by the Urban Redevelopment Authority (URA) and Smart Nation & Digital Government Office (SNDGO) for the development of sustainability and smart nation initiatives within Jurong Lake District.

PROBLEM STATEMENT

How might we design a digital solution that can collect, sort, aggregate, and report waste data within the commercial properties. This data enables waste monitoring so that area of waste management improvement can be identified and strategize to improve recycling or waste reduction.

WHAT ARE WE LOOKING FOR?

CapitaLand is looking for a solution that can assist the sustainability and operations teams to collect and aggregate recycling data from various sources in their properties in JLD, starting with a retail mall (e.g. Westgate) and potentially the properties in the IBP. The solution should adequately measure recycling efforts to provide insights to help CapitaLand shape consumer and tenant recycling behaviour and incentivise effective waste segregation.

The solution should include the following features:
- Data collection. The solution should be able to collect tenant information including the types of waste (eg. food, paper, plastic, metal etc.) that they generate, the volume of waste, the frequency, and the actual location of where the disposal/recycling takes place.

- <u>Data separation</u>. The solution should assist CapitaLand in categorising the eventual recycling data. CapitaLand has currently identified the following aspects that they want information around: (1) presence of contamination and (2) potential for waste to be converted or repurposed for other use?
- <u>Data integrator</u>. The solution should be able to integrate other waste data from multiple sources, such as general waste collectors (GWC) and other waste initiative or recycling vendors. Data collected should also be integrated back to our Environment Tracking System and other platform like tenant portal for ease access of data by our tenants. This will provide CapitaLand with a fused and reconciled understanding of their commercial property's current waste and recycling situation.
- <u>Fused information</u>. The solution should be able to provide a single source of information that CapitaLand can use to understand recycling rates, types of waste and recyclables, and proportions of recyclables.
- <u>Consolidate improvements</u>. The solution should provide reports and valuable metrics to CapitaLand and its stakeholders that can be used to guide strategies and initiatives to improve recycling rates and minimise waste.

OVERALL PERFORMANCE REQUIREMENTS

The solution should meet the following performance criteria:
- <u>Scalable</u>. The solution's assets need to be plug-and-play and work with the current facilities operating management and metering systems. Tests will be run in CapitaLand properties including retail mall (Westgate) and within IBP, as a proof-of-concept and could be scaled throughout JLD.
- <u>Return-on-investment</u>. The solution should be cost-effective so that the savings from reducing waste from the property makes commercial sense.
- <u>Robust and rugged</u>. The solution should be robust and capable of handling day-to-day waste and recyclable collection by multiple parties, to minimise possibility of damages and need for frequent maintenance.
- <u>Future-proof</u>. The solution should be modifiable, taking into consideration possible emerging technologies such as dust drum systems, smart compactor and alignment with new waste streams. The solution should also be able to work or adapt in a future where CapitaLand properties may have solar capture capabilities.
- <u>Automated and easy to use</u>. The solution should involve as few manual inputs as possible.
- <u>Ease of data collection</u>. As much as possible, the data collection should be easy for both the tenants and the visitors of the commercial building. It should not require additional manpower or processes to derive the information.
- <u>Auditable data</u>. The data collected will be used for sustainability reporting by CapitaLand and should be verifiable by a third party.

There are no restrictions on the geographical location of the problem solvers who may choose to apply to this challenge. However, the prototype must be demonstrated in Singapore.

Proposals that are non-digital or combine digital and non-digital components which address the challenge statement are welcome too and will be assessed accordingly.

POSSIBLE USE CASEs

1. <u>Tenants are incentivised to recycle better.</u> A CapitaLand property tenant receives a report highlighting the latest waste disposal information. It shows the various possibilities around waste management – what was disposed, what was recycled and shares possible areas of improvement,

including ways to reduce and reuse. As a result, the tenant realises that the large amount of cardboard from the deliveries could be collected and recycled.

2. <u>CapitaLand employee easily accesses recycling data.</u> While preparing the sustainability report, a CapitaLand employee finds it easy to draw out information from the recycling collection system. While planning a new recycling programme with other stakeholders, the staff member shares insights about recycling data collected over the past six months and proposes a new programme with stakeholders. The stakeholders agree on the programme approach, noting the targets that CapitaLand is trying to achieve and the collective benefit each stakeholder will get from this programme.

WHAT'S IN IT FOR YOU

- S$50,000 of prize money for each winner of this challenge (see Award Model)
- Access to IMDA's innovation consultancies (e.g. Design Thinking, Digital Storytelling, UI/UX) and PIXEL corporate innovation hub (e.g. hot-desking, project studios, ARVR, usability, 5G test labs) for prototyping and commercialisation
- Co-innovate with CapitaLand with access to their expertise, facilities, and human resources in developing the solution
- Contribute to JLD's sustainability efforts and towards the collective green ambitions of the district, with profiling opportunities and potential to scale successful solutions within the district

EVALUATION CRITERIA

The evaluation process shall take place over 2 stages. Proposals shall be evaluated based on the evaluation criteria below for the first stage. Thereafter, shortlisted proposals shall be subjected to a second stage evaluation in the form of an interview / pitch, and the scoring shall be based on a re-defined assessment criteria for the selection of the challenge finalist(s).

Solution Fit (30%)	<u>Relevance</u>: To what extent does the proposed solution address the problem statement effectively?
Solution Readiness (30%)	<u>Maturity</u>: How ready is the proposed solution to go to the market? <u>Scalability</u>: Is there any evidence to suggest capacity to scale?
Solution Advantage (20%)	<u>Quality of Innovation</u>: Is the solution cost effective and truly innovative? Does it make use of new technologies in the market, and can it potentially generate new IP?
Company Profile (20%)	<u>Business Traction</u>: Does the product have user and revenue traction? <u>Team Experience</u>: Do the team members possess strong scientific/technical background?

AWARD MODEL

30% of the prize money will be awarded to each selected finalist at the start of the POC/prototype development process. The remaining 70% will be awarded after completion of the POC/prototype solution, based on milestones agreed between Problem Owner(s) and the solver. Prize money will be inclusive of any applicable taxes and duties that any of the parties may incur.

Note that a finalist who is selected to undertake the prototype development process will be required to:

- Enter into an agreement with Problem Owner(s) that will include more detailed conditions pertaining to the prototype development;
- Complete an application form with IMDA that will require more financial and other related documents for potential co-funding support.

Teams with public research performers are required to seek an endorsement from their respective Innovation and Enterprise Office (IEO) and submit the IEO form together with the proposal.

The proposal should include the following:

- 1 deck of slides in ppt format explaining the proposed solution, how it addresses the problem statement and meets the desired performance requirements. To include information such as the proposed cost model, data inputs, system that the proposed solution will run on, potential benefits, and the team's implementation plan.
- Video or pictures (300dpi) of any prototype or simulation, if applicable.
- Track record of the company/ CV of the team.

All submissions must be made by **21 April 2023, 1600 hours (SGT/GMT +8)**. Problem Owner(s) and IMDA may extend the deadline of the submission at their discretion. Late submissions on the OIP, or submissions via GeBIZ, will not be considered.

Please visit https://www.openinnovation.sg/challenges to sign up for this challenge.