

Problem Statement Title: To reduce food waste disposal in Lendlease malls

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A. Desired outcomes:

Lendlease Retail is seeking solution(s) to:

- A. Encourage, facilitate and/or track source segregation of food waste by various stakeholders (tenants, cleaning staff and/or patrons), to reduce the reliance on downstream manpower to segregate and transfer food waste into food waste recycling machine
- B. Have an on-site food waste treatment solution that can recycle food waste with high tolerance of contamination within a small bin centre in existing malls, as well as have output that can be of use to the mall

B. Background of the Problem:

Lendlease has set an annual food recycling target of 30% for all premises. All of Lendlease's assets have food waste digesters except for 313@Somerset. In 2013, Lendlease installed its first two-ton food waste digester in one of its malls, JEM. Food waste digesters at the other malls were installed over the past two to three years.

Despite the good intent of investing in food waste digesters as part of Lendlease' recycling effort, these systems are unable to handle non-food waste. Due to improper/poor segregation of food waste, the food waste digesters broke down frequently, leading to operational inconvenience. At times, it would take up to a week to be repaired, which caused operational challenges (i.e. diversion of food waste to waste compactor, resulting in increased frequency of compactor removal which affects the delivery schedule of goods) as well as affected the food waste recycling target.

The food waste from our tenants mainly consist of leftover food waste, kitchen food waste, and expired and non-fresh food waste from supermarkets. However, as the food waste is often contaminated with items such as tins, utensils, tissue papers, plastic containers or wrappers, it requires tremendous effort to sort out these "impurities" manually. If the manual sorting process missed a metal or hard object, it would cause the food waste digesters to break down.

This is despite Lendlease's continuous effort to raise awareness among its tenants. The following initiatives were implemented across the 3 malls with the food waste digesters:

- a. Educate our tenants to properly segregate their food waste at source. However, as there is a high turnover rate of tenants, frequent retraining of personnel is required to ensure continuity.
- b. One full-time manpower is required to be stationed in front of the system to manually separate the food waste and non-food waste. However, as such job is performed in a "smelly" environment and is deemed to be labour intensive, we experienced difficulties in hiring manpower to perform this job. It is also costly to hire manpower for such a laborious job.

In addition, as the current food waste digester system occupies a large space, it is difficult for other existing premises to accommodate the existing or one with larger capacity, as well as a sorting area

for manual separation of food waste. As such, this limits the amount of food waste that can be recycled. For example, in JEM, the total available space for the manual sorting area and the food waste digester is 11 m (L) x 7 m (W). Due to the limited space available, it can only accommodate a two-tonne food waste digester which occupies 9 m (L) x 6 m (W), although JEM generates more than two-tonne of food waste. Thus, if a higher capacity food waste recycling machine can be installed in JEM using the same available space, more tenants can participate in the food waste recycling programme, which would improve our food waste recycling rate.

The system that Lendlease had installed currently does not produce output such as composter/soil conditioner. Lendlease would be interested if the output generated by the proposed solution is of high value which can be used in the malls.

C. Technical Requirements / Performance Criteria:

The proposed solution (A) shall address the following:

1. Engagement of stakeholders (tenants, cleaning staff and/or patrons) must be self-sustainable in the long term
2. Measure stakeholders' efforts in proper source segregation of food waste, with proposed targeted efforts to engage specific stakeholders who do not properly source segregate
3. Eliminate downstream manpower reliance in the segregation and transfer of food waste to the food waste recycling machine
4. The equipment (if any) should be able to fit within the available space in the bin centre

The proposed solution (B) shall address the following:

1. Handle high tolerance of food waste contaminants to minimise breaking down of the system due to contamination
2. Solution should be able to handle more than two tonnes of food waste per day, within a dimension of 11 m (L) x 7 m (W) and able to fit within the available space in the bin centre
3. Output of the system should be of use to the malls

D. Solutions that are not preferred:

As this problem statement aims to tackle the food waste problem in existing premises, we are not looking for solutions that are only relevant for new buildings. Proposed solutions should not cause major disruptions in operations (e.g. closure of floor).

E. Cost target of the product/solution:

Return on Investment will probably be a better indicator. If the system can payback (by reducing the cost for incineration) at approximately two years, it will be considered a good investment for the developers.

This can be achieved by either reducing the cost of the system or increasing the capacity of the system.

Nonetheless, it will be ideal if the cost does not exceed S\$300,000.

F. Timeframe for development of the product/solution:

Within 12 months after the award of project

G. Potential market / business opportunity for the product/solution:

There is possibility of scaling up to other Lendlease properties upon successful trial. The solution is also applicable for other existing properties with similar challenges in food waste segregation efforts and limited bin centre space. Results from the deployment of the solution will also be shared with our overseas premises, for their consideration to adopt.

H. Resources to be provided:

JEM will be the allocated test-bedding site of the solution for the pilot deployment.

I. Other considerations:

NIL