Problem Statement [D]: To develop a cost-effective and efficient on-site non-domestic mixed waste treatment system

Desired Outcomes:

NEA is exploring the possibility for existing premises to install an on-site waste treatment system within their waste management facility to effectively treat their own general wastes. This should be a versatile system to effectively and efficiently treat the general waste (made up of different types of waste streams) to higher value by-products such as electricity, hot water, etc.

Background of Problem:

Non-domestic waste is collected by licensed general waste collectors (GWCs) and treated at licensed waste disposal facilities. While premises segregates recyclables from their wastes to be recycled by the main waste management contractor, there are still significant amount of general waste collected by GWCs and sent to incineration plant and then to landfill. Examples of such general waste could be food wastes mixed with paper, plastic, packaging and potential metals which reduces the "recyclability" of the individual waste streams.

Currently, the only type of waste treatment installed at facility level is on-site food waste treatment machines. However, as they are used to treat source segregated food waste, general waste are currently being collected by GWCs for incineration.

As general wastes is made up of different types of wastes, the challenge is to look for a versatile system to effectively and efficiently (such as a self-sustaining system where power output is higher than input. Efficiency for hot water could be measured in terms of cost savings from conventional hot water generation) treat the general waste to higher value by-products such as electricity, hot water, etc.

Another key challenge is to propose a system which can function within the waste management facility in existing premises, such as bin centres.

Technical Requirements:

1. There should be minimal noise from the proposed system operation.

2. (a) The proposed system will need to fit into the existing premises' waste facilities or in spaces of proximity.
   Note:
   As different premises generates varying amount of general waste, proposals to include the recommended treatment capacity up to 35 tonnes of general wastes/day. Depending on the recommended treatment capacity, shortlisted companies will be invited for a site survey and are expected to refine their proposals according to the site-specific environment.

   (b) Total power consumption of equipment(s) used must be within total allowable power supply in the premises to prevent power trips. QP/LEW is to certify the installation of the system is safe for the purpose of the trial.

(c) The general waste profile comprises food waste, paper, plastic and packaging waste. Thus, the system should be a versatile system to effectively and efficiently treat the general waste.

3. The proposed system must not cause any public health issues and comply with the EPHA and its relevant Subsidiary legislation.

4. The proposed system must comply with the necessary building regulation requirements.

5. Operation of the system should be efficient (e.g. cost efficient, energy efficient) and manpower should also be efficient.

What solutions you are not interested in (if any)?

Not interested in further solutions related to Composting, Anaerobic/aerobic Digestion, or Incineration.

Timeframe for development of proposed solution/product

1. Completion of site evaluation, equipment concept design & detailed drawings 3 months after the start of project
2. Necessary regulatory approval 6 months after the start of project
3. Completion of working prototype ready for evaluation 8 months after the start of project.
4. Trial of working prototype with solution adopter for 3 months
5. Provide reports and findings on data collated during trial of prototype
6. Completion of full functional end product ready for pilot deployment 15 months after the start of project
7. Provide regular updates on progress of prototype and end product

Requirements of prototype

Prototype should minimally comply with the points listed under Technical Requirements.

Costing and Procurement

Interested proposals are to propose a cost effective solution which minimally meets the needs as stated in the problem statement. Considerations will be on the costing of the proposed solution. Proposals are also to detail the overall cost of the device as well as its costing breakdown into the following:

a. Materials and Consumables cost
b. Development cost (i.e manpower cost, equipment cost, software cost)
c. Consultancy cost
d. IP, licensing and any other cost

Market Potential for proposed solution/product

Proposed solution could be adopted by waste generators (such as building owners), and would find it useful to use the by-product in their operations.