Competitive Research Programme

Overview

Waste is not waste. Much of our disposed "waste" should not in fact be considered waste; they are simply misplaced resources. Based on current waste management concepts, these resources are normally buried in landfills or incinerated. Such waste treatment/disposal approaches need to be revised as natural resources are being depleted. Waste becomes potential sources for resource recovery. This would be especially relevant to resource-limited and land scarce Singapore and many other cities in the Asia Pacific region.

Objective

The main objective of this proposal is to develop a research program that would pave the way for developing sustainable urban waste management solutions for 2020. Research outcomes are expected to bring long term environmental, economical and social benefits to Singapore and eventually the rest of the world. To achieve the main objective, the following three research subprograms are proposed:

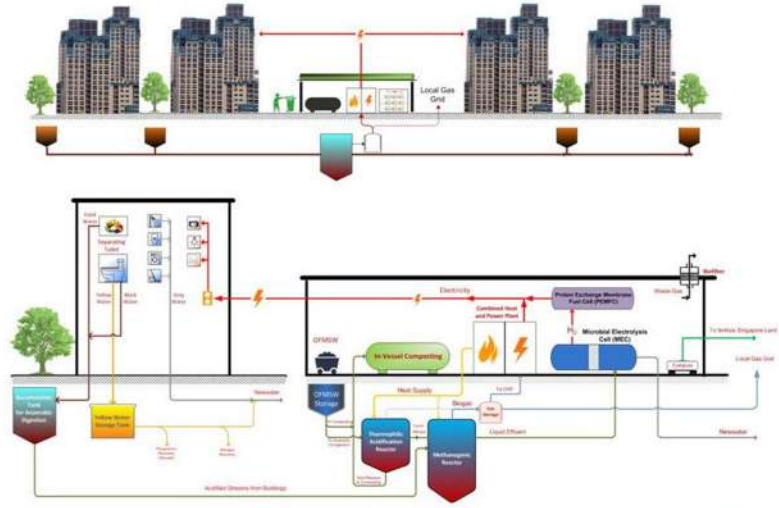
- Subprogram A: Communities as renewable resource recovery centres
- Subprogram B: Wastewater treatment plants as urban eco power stations
- Subprogram C: Rapid land reclamation of closed dumping grounds

The benefits of the proposed program are multi-faceted; they include the following:

- Reduction of water consumption (A)
- Reduction of wastewater treatment cost (A)
- Recovery of energy from black water and food waste (A)
- Recovery of nutrients from yellow water and digested
- residues (A)
- Reclamation of grey water on site, if needed (B)
- Recovery of energy from co-digestion of sludge and other wastes (B)
- Reclamation of land of closed urban dumping grounds (C)
- Recovery of energy and materials from landfill mining (C)
- Recovery of quality soil from remediated landfill site (C)

The benefits listed above are substantial and applicable not only to the public sector, but also private sector. Most importantly, they could help make future urban waste management more sustainable with a decentralised "waste to resources" solution as opposed to the current centralised treatment/disposal method that has been implemented for more than 5 to 6 decades. This is important especially now that resources are diminishing rapidly.

Communities as Renewable Resource Recovery Centres



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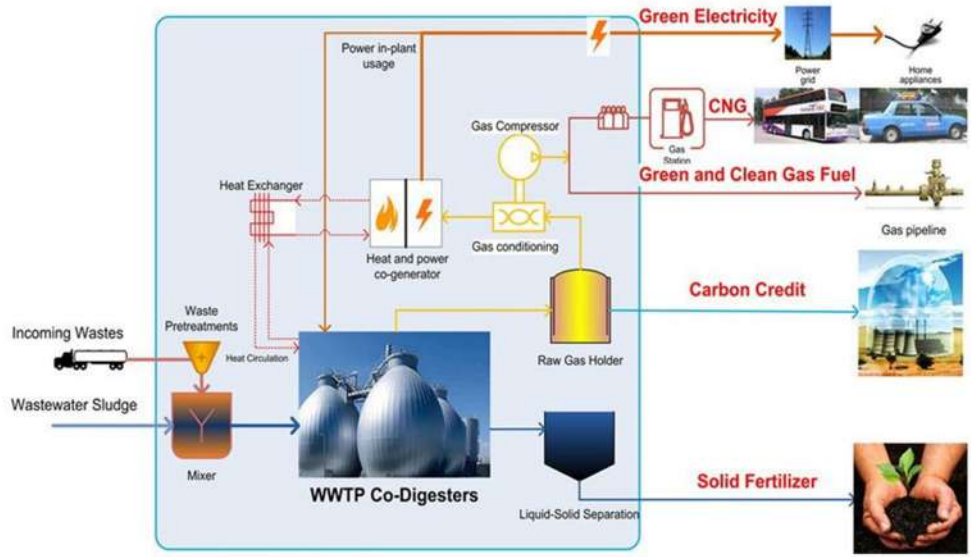
WWTPs as Urban Eco Power Stations



Rapid Land Reclamation of Closed Urban Dumping Grounds