BUILDING INTEGRATED ORGANIC WASTE MANAGEMENT AND CONVERSION INTO ENERGY (BIO-WASTE)

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WE DO NOT REALISE THE AMOUNT OF ENERGY THAT WE ARE THROWING AWAY IN OUR WASTE EVERYDAY. THERE IS FAR MORE ENERGY EMBODIED IN OUR ORGANIC WASTE THAN MOST OF US DARE TO THINK. THE UTILISATION OF ENERGY YIELDED BY OUR PRE- AND POST-KITCHEN WASTE, GARDEN SCRAPS AND OTHER WASTE WE PRODUCE, MAY WELL PROVIDE A SUBSTANTIAL, RELIABLE SOURCE OF ENERGY IN OUR COMMERCIAL AND DOMESTIC BUILDINGS.

BIO-GASIFICATION EQUIPMENT

There is far more energy embodied in our organic waste than most of us dare to think

To fully utilise the energy of our waste, it is crucial to identify the types of waste produced within the building, from its operations and residents. Several streams of waste are usually available from residential buildings, they are:

1. **Pre-Kitchen Waste** - produced during the preparation of food for cooking
2. **Post-Kitchen Waste** - food waste that has been cooked but not consumed
3. **Used Cooking Oil** - from frying activities in the kitchen
4. **Garden Mulch and Horticultural Waste** - from surrounding landscaped areas
5. **Any Other Organic Waste** produced from the building

To ensure the production of maximum energy, the volume produced by each waste stream will have to be accurately determined and strictly monitored.

The next step is to determine the building's energy content, depending on the distribution of waste streams and also the respective amounts produced by each source. While the conversion mechanism itself will consume some energy, the bulk of it can still be channeled back into the building's grid to ease energy needs by lighting corridors and other shared spaces.

An exhaustive energy mix and balance analysis will then need to be conducted, to strike a vital balance between the building's organic waste profile and the energy drawn for its common areas. It may be a daunting task at present, but with clear planning and precise engineering, the energy demands of a building's common areas can certainly be met. Nevertheless, in the event of inadvertent failure – or indeed, even planned maintenance and servicing – grid power can still serve as an essential backup energy source.

After cementing the feasibility of the implementation, space will have to be identified for all required equipment and a cost analysis must determine if the building's management is able to afford it. When the Bio-Waste component is taken into consideration and incorporated into early design and development stages, the equipment can be placed in spaces of low value, which are non-essential to the building's functionality.

However, when retrofitting the equipment into a building with a single conventional power source – grid power – it displays a remarkable versatility in being assembled to accommodate pre-existing building design limitations. For example, by employing a modular arrangement where the conversion mechanism's components are placed in a series of rooms – and connected via piping – rather than a centralised arrangement with all components in one room.

The infrastructure for organic waste collection will then have to be developed, and can operate based on collection from either individual tenants or from centralised locations in the building. Extensive design and development has to go into this area to ensure the maximisation of collected waste, by engendering a culture where tenants willingly contribute towards the shared goal of energy savings.

To achieve this, the collection system will have to regard its users' habits, likes and dislikes, responding to them in positive ways, so that residents become invested

WASTE SEPARATION EQUIPMENT