

Dear Hon Cyd Ho and members of the Panel on Environmental Affairs,

23rd July 2013



Dealing with our wet food waste



The big problem with Hong Kong's ultra-wet food waste (WFW) is.....

- It's very wet and difficult to handle (90% water content in wet market food waste, 70-75% water content in malls and restaurant WFW)
- It requires more energy to burn than it inherently contains.

<http://www.massbalance.org/downloads/projectfiles/1826-00237.pdf>

(p.8) *European food waste 4.2 MJ/kg calorific value (CV)* but European food waste has on average only 30% moisture content, so HK WFW will be even lower (CV). Hong Kong has the wettest worldwide putrescible waste w/ 90% moisture levels from wet markets & avg 70+% domestic WFW versus 56% Korea, 50% Japan, 30% Europe.

Anaerobic digestion is an appropriate treatment for putrescible wet food waste(WFW), not incineration. The Government's "Bury 'N Burn" waste 'plan' is for 3 incinerators & extended landfills – however you cannot combust low CV /high moisture WFW without co-combusting additional higher CV feedstocks, (thus defeating recycling efforts) since at least 6 MJ/kg CV in the feedstock is needed for combustion.

<http://www.waste-management-world.com/articles/2013/07/is-waste-to-energy-to-answer-for-india.html>

But Hong Kong can consider another method..... methane generating food waste is the smelly and obnoxious component of MSW ; *48% of HKG daily MSW is putrescible waste (42.3% wet food waste / 1.6 % yard waste / 4.3% used nappies + cotton wool)*

- WFW is a health hazard as it generates methane – methane is 21 times more damaging to the environment than CO₂ so it is flared off at the landfills 24/7.



- It is the prime reason why we need to employ so many Refuse Collection Vehicles (RCV's) to clear the problem daily from HKG's WSW generators
- It is the reason why odorous RCV's get a bad name
- It accounts for many of the RCV trips per day, 48% of HKG's daily MSW is putrescible waste
- RCV's spill stinky leachate on the road
- Were food waste not present in MSW we could reduce waste collection frequency and its weight and significant costs to handle, transport and landfill.

So why not remove food waste at source and before it gets into the MSW ?

This would:

- Avoid the smell at collection points and landfills
- Avoid the smell from RCV's on the roads
- Improve public health
- Reduce the need to clean the roads
- Enable MSW to remain dry and more easily recycled and/or plasma gasified / syngas converted to bio diesel or aircraft / ship fuels
- Reduce the frequency of RCV trips
- Make people more aware of the packaging and food waste they generate

So how do we progress?

(instead of stepping backwards with HKG ENB's Bury 'N Burn Blueprint)

At present we are planning to introduce two anaerobic digestion organic waste treatment facilities (OWTF) for 200 tpd & 300 tpd (Total 500 tpd WFW) These will generate about 7.5 MW of power using anaerobic digestion that converts the waste to sugars and then gas to drive turbines but these will generate about 50 tpd of low quality compost as a result.

Where is all the low grade compost going to go? No-one will buy it. **Do we need to spend this money ?**

Altogether the OWTF's will cost about \$HK 3 billion to build and well over \$HK 250 million per year to operate and **will treat only a miserable 12.5% of the almost 4,000 tonnes food waste generated each day**, mainly from hotels, wet markets, food stalls and the catering industry as well as residential units.

The remainder of the food waste problem could be avoided and many of the issues

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identified above could be eliminated if we were to make hotels, restaurants, caterers, markets, businesses etc and individuals responsible for processing their own food waste.

The best choice of course would be not to waste food in the first place. However, we are an affluent society in Hong Kong and can afford to bin half the food we buy and we no longer have pigs to feed...

So..

Why not make every restaurant, wet market, business, caterer, hotel and household responsible for sorting food waste at source and disposing of their own food waste as it is generated **using waste disposal shredding (garburator) units with outfalls linked to the existing sewerage system ?**

It would foster a sense of responsibility and everybody could get involved and feel good about doing the right thing. Even easier than taking the lift down to the ground floor and walking to the garbage area. A garburator system needs to be inexpensive to install and operate when compared with housing costs and it should not require fancy new technology.

So, consider making sink outlet WFW shredding disposal units mandatory in households and industrial garburator units in restaurants, hotels, hospitals, schools and the catering industry, businesses etc, & connected to the sewage system. The DSD waste water sewage handling system is already there and capable of accepting it.

Phase 1- every hotel, restaurant, food business, hospital and wet market management etc would have industrial sized food waste shredding units - extending to Phase II Govt housing estates next, then Phase III to the rest of HKG households that have a legal sewage connection, so there would be no discrimination.

For those premises not connected to the existing sewage system such as village houses there would be a **GREEN BIN** collection scheme, charged for at sewage rates, which would be delivered to neighborhood industrial WFW shredding disposal units connected to the existing sewage network.

GREEN BIN



Shrieks of horror ! we cannot do that, Government will rant (because they never thought about it whilst blindly idolising their regurgitated 'Bury ' N Burn Blueprint')

OK let's check the feasibility then.....

http://www.biwater.com/Articles/325198/Biwater/BW_Home/waste_water/waste_water_projects/Stonecutters_Island_STW.aspx

Stonecutters treatment plant is designed to handle up to 2,764,800 cubic meters of waste water sewage per day by 2016.

Stonecutters currently handles approx 1.6 million cubic meters of waste water (1.6m tonnes per day) of which the remaining sludge is approx 800 (eight hundred) tonnes per day.

Disposing of a few extra thousand tonnes of shredded WFW (70-90% water content) would add a very small additional load to Stonecutters capability to process additional sewage above the current 1.6 million tonnes per day, since between 70%-90% of the 3,500 tonnes WFW is already water anyway!

The Stonecutters sewage treatment plant is ideally suited to handle such a relatively small additional quantity (3,500 tpd WFW) and is already operational.

Such a small increment of the incoming sludge would be negligible and it would all have calorific value (CV) so it would benefit the new Tsang Tsui sludge incineration process we have already implemented (at least once it's commissioned) and it will generate power which is already being negotiated to be fed into the grid.

The Big Advantage with this proposal will however be.....

It uses existing facilities and technology but more importantly the pre-processing will be done by hotels, restaurants, caterers, fast food outlets, businesses, hospitals, wet markets, Government and private estates and at least 2 million households, - everybody doing their bit and thereby using existing end of line reception resources and diverting the vast majority of daily MSW from landfills!

Excellent...! we will mobilize the entire population and they will feel "good" about doing the right thing (they even do not have to walk to the garbage area with it any more)

provided the idea is marketed correctly.



So where do we go from here.....

Government Departments are highly adept at passing the responsibility buck. CEDD at Area 137 Wan Po Road handles Hong Kong's 18,000+ tpd (reusable fill) construction waste for export.

So let's suggest ENB pass on their WFW problem to DSD.... ENB has a great incentive to do this and for DSD, this would be minimal fuss, just slightly more dehumidified sludge to be shipped to Tsang Tsui sludge incinerator each day- The garburator scheme could even win brownie points for the beleaguered Government of CY Leung.

Make it Free

The funds will be easily recovered by the reduced handling costs and landfill benefits
Provide vouchers not cash subsidies for every household from the Budget surplus to install a



sink waste disposal unit from appointed installers (paid by voucher) and make them mandatory to install and to use. (1 x Govt provided free garburator voucher per household ... HKG people love freebies even if they are mandatory)

Non households, hotels and catering business outlets etc must buy their own commercial units and be inspected by FEHD under licensing conditions.

Next: Charge heavily for WFW disposal from the general public dumped at garbage collection points... and instead propose the use of private sector WFW collectors for **GREEN BIN** contents to dedicated reception points for disposal in each neighborhood for shredding and feeding into the sewage system. Government could actually pay for this collection service since the reduced number of current RCV trips and transfer stations would cover the costs of WFW **GREEN BIN** collections

We would need to deal with glass recycling. Glass has a very low calorific value (0.7 MJ/kg) Govt should encourage a new local recycling business to keep people at the bottom end of the chain employed. Glass can be ground to produce a substitute for aggregate in concrete products., Alternatively glass could be plasma gasified to produce an inert vitrified molten slag that can be used as a construction aggregate substitute given that all our building aggregate here is imported. Likewise plasma gasification could treat the construction waste that cannot be recycled and convert it to usable vitrified inert aggregate.

So with a new direction and using existing operating end-of-line reception facilities at Stonecutters we can handle our existing and future WFW, which is almost half of our daily MSW.

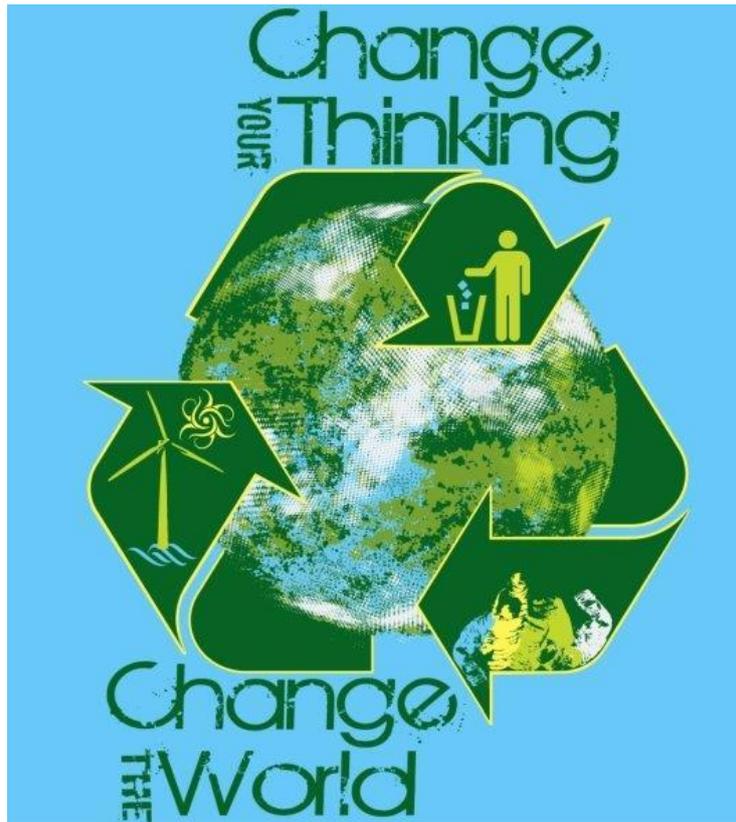
The other half of the daily MSW can be locally recycled as RDF (Refuse Derived Fuel) thus providing more local jobs and then sold to Europe as high CV feedstock in the interim; Europe considers MSW as a commodity feedstock for its overcapacity incinerator networks and which relies on same for its electricity and heat generation.

This will give Hong Kong breathing space to commission enhanced landfill mining at its landfills using plasma gasification technology that can produce bio diesel and bio fuels for airlines and Ocean Going Vessels (OGV's our biggest source of pollution).

MAJOR BENEFITS

The resultant resumed former landfill land (270 hectares) can be used for local public housing units instead of waiting 50 years (with maintenance costs of the closed sites) after the closure of the landfill, as at present due to subsidence and methane problems.

Message for Hong Kong Government



Yours sincerely,

James Middleton

Chairman

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