

## Greenhouse Gas Reduction via on-site IVC:

We are often asked about the economics of in-vessel composting (IVC) relative to other forms of disposal. IVC does have a higher initial capital cost but can offset this with lower operational and maintenance costs, and a better-quality product. Additionally, and of increasing importance, on-site IVC offers opportunities for significant greenhouse gas emission reduction.

Composting on site can minimise transport costs and GHG emissions and IVC has lower GHG emission than traditional windrow composting.

Disposal of food waste to a class 1 landfill without gas capture is estimated to generate 2.11 kg CO<sub>2</sub>-e per kg of dry matter (0.64 kg CO<sub>2</sub>-e per kg of dry matter with gas capture). Windrow composting can reduce emissions to 0.176 kg CO<sub>2</sub>-e per kg but due to poor aeration releases methane and other GHG.

Measurements for the HotRot system indicate that composting food waste releases approximately 0.08-0.10 kg CO<sub>2</sub>-e per kg of waste (dry); methane emissions are avoided due to the higher efficiency of aeration, etc.

One thousand tonnes of food waste at 15% dry matter can release 316.5 tonnes of CO<sub>2</sub>-e when landfilled. Windrow composting the material can reduce this to 26.4 tonnes of CO<sub>2</sub>-e, and composting in-vessel in the HotRot system will release 12.0 – 15.0 tonnes of CO<sub>2</sub>-e (a 95% reduction).



*HotRot composting system in urban setting.*

Direct reduction in GHG emissions from processing or disposal is only part of the story. Using an in-vessel system like HotRot in an urban environment or close to where the waste is generated is possible due to improved odour control and this can reduce emissions from transport. It is estimated that the “average” truck (dependent on size and load) produces 100g of kg CO<sub>2</sub>-e per km. Trucking one thousand tonnes of food waste 50km will release 1000 tonnes of CO<sub>2</sub>-e. Even if the compost after on-site processing needs to be transported the same distance the mass reduction (average 35% during composting) results in additional GHG reductions, and the potential to use fewer larger trucks.

Assuming an average carbon price of \$40.00 per tonne, on-site in-vessel composting of one thousand tonne of food waste could be valued at >\$12,000, without transport.