

## A Northern Inland Biohub Network for Waste Management & Energy

### What is a Biohub Network?

A system where councils and private businesses cooperate to recover the highest value from regional waste streams (Figure 1). The BioHub provides the enabling systems and infrastructure for the establishment of a biomass processing sector in the region. The BioHub would act as a “first point of receipt” for unwanted material (biomass). It has all the essential equipment to pretreat or process received materials into products for local use, or sufficiently processed and value added to afford the transport to other specialist sites or biorefineries or process plants. Approximately 50% of municipal waste will be biomass suitable for energy production (electricity, gas, heat, CO<sub>2</sub>, chars, cooling energy and liquid fuels).

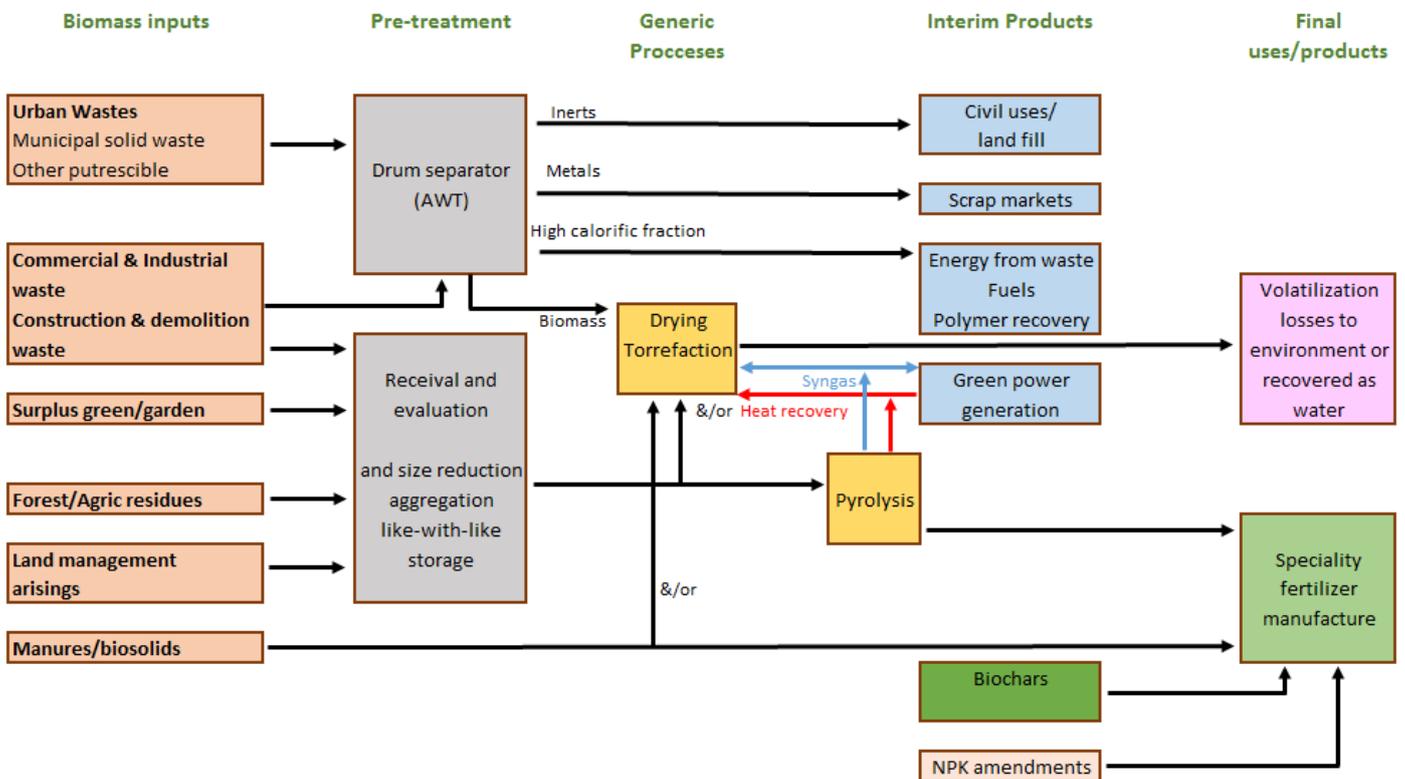


Figure 1. Biohub Flow Diagram

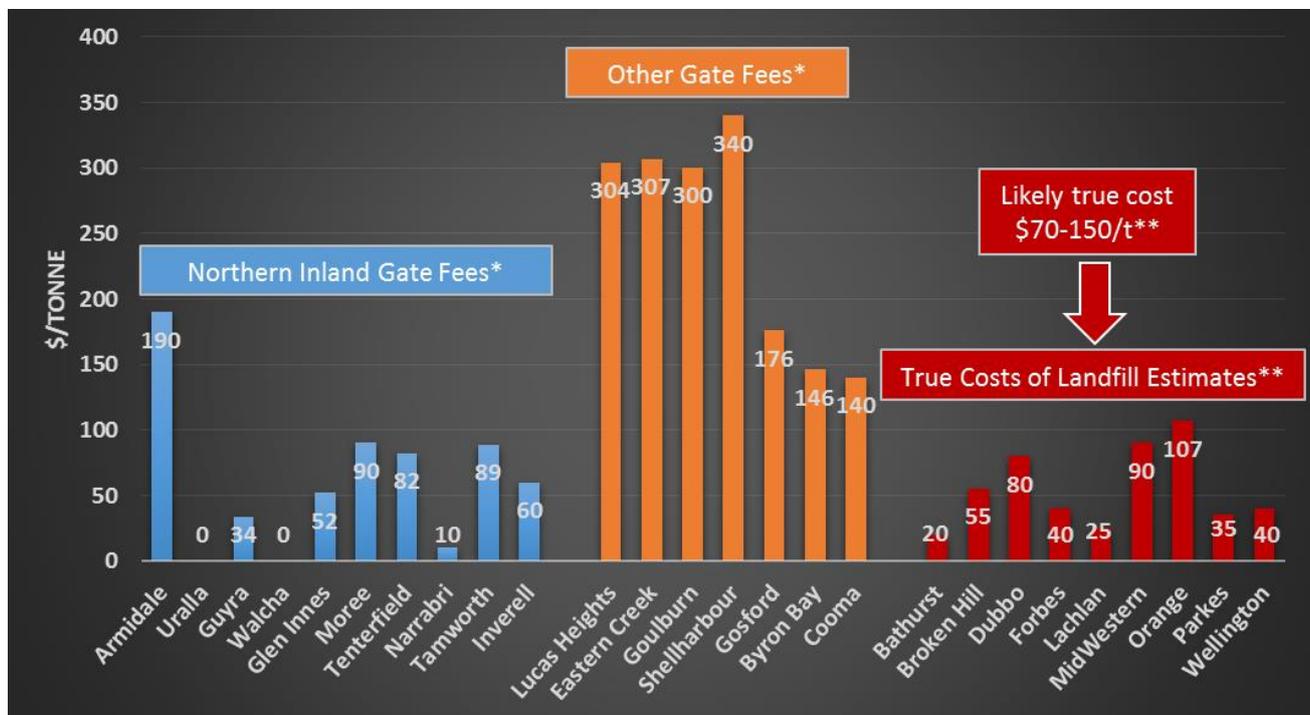
### Why Consider a Biohub?

- To address the potentially rising costs of landfill (see Figure 2) – the State Government is considering imposing a levy on rural landfills to discourage their use. In Sydney that levy is \$107/t and \$58/t on the North Coast;

- Minimise landfill requirements;
- Better economic use of regional waste;
- Energy production to replace fossil fuels;
- Generation of new business activity = regional economic development;
- Deal with the woody weed problem in some locations;
- Add value to agricultural and forestry residues;

## Show Me the Money

Figure 2 shows landfill gate fees for some councils in our region (blue) and in other areas (orange). There is massive variation in the fees charged, and the fact that some councils charge low or zero fees indicates that it could be difficult for a biohub (which may need to charge gate fees of \$60-80/tonne?) to compete.



**Figure 2. Landfill Gate Fees and True Landfill Cost Estimates (Sources: MRA consulting\*, NetWaste\*\*).**

However, current gate fees may not represent the true cost of landfill (Figure 2 – red bars, MRA consulting view some of these as under-estimates and the more likely cost is \$70-150/t). For many councils, the true costs of landfill are well above the gate fee and so they have an incentive to either reduce waste management costs, or increase the gate fee. Reduced cost to councils could be achieved through a biohub where private operators take over much/all of the waste management task, segregating and processing the waste to produce saleable products.

But can the biohub charge a gate fee low enough to divert waste from landfill and still operate at a profit? That is the fundamental question which needs to be answered, and will require a full feasibility study to do so.

Other options:

- Close regional landfills such that waste must go through the biohub;
- Send the waste to landfills outside the region (which will happen if the cost of doing so is lower than sending waste to the biohub or existing landfills within the region);
- Retain existing landfills, but councils raise gate fees to reflect the true cost of running a landfill;
- Do nothing.

## Costs and Benefits of a Biohub

### Costs

- Capital cost - \$300-400 per tonne of waste processed (may be a private, not a council cost);
- Operating costs - \$110-160 per tonne of waste processed (may be a private, not a council cost);
- Transport costs to the Biohub - \$13-25 per tonne depending on moisture content (may be a private, not a council cost);
- Costs to councils associated with moving to a new waste management model involving partnerships with private operators.

### Revenues/Benefits

- Lower waste handling/disposal costs for councils;
- Reduce landfill, no need for putrescible waste treatment;
- Revenue from energy sales, or savings from using self-generated energy at council facilities or in council vehicles;
- Leasing revenues from private operators or equity returns if council is a co-investor;
- Internal rate of return around 20%;
- Gate fees for waste around \$60-80/tonne ;
- Revenue from treated product sales;
- Net revenue of around \$200/tonne if the full suite of products are generated;
- New local industries and employment (1 FTE per 2,000-2,500t of waste processed);
- Test bed for new waste handling/processing technologies;
- Reduced greenhouse gas emissions;
- Waste processing and market risk transferred to entities other than councils.

## Will councils be better off financially?

It's too early to tell without a more detailed analysis.

However, anecdotal evidence from some councils suggests their costs of the waste management task are increasing, and they would be keen to significantly reduce those costs while also reducing reliance on landfill.