

Regional Resource Recovery - A Road map to Hydrogen

This company is a special purpose vehicle that brings together the preeminent knowledge of David Cork, who has built and had tested prototype gasifiers, Nick Hogan who has recycled agricultural waste in the Riverina for over 20 years and John Wayland who is a Lloyds Business Brokers consultant.

We are seeking partners that have a waste issue and who need energy to locate a “small” plant adjacent to those issues—Waste recovery to energy. A small plant typically takes 80 tpd of waste to produce 3.2 tpd of hydrogen, generate 1.9 MW_e of electricity and 2.0 MW_t of steam.

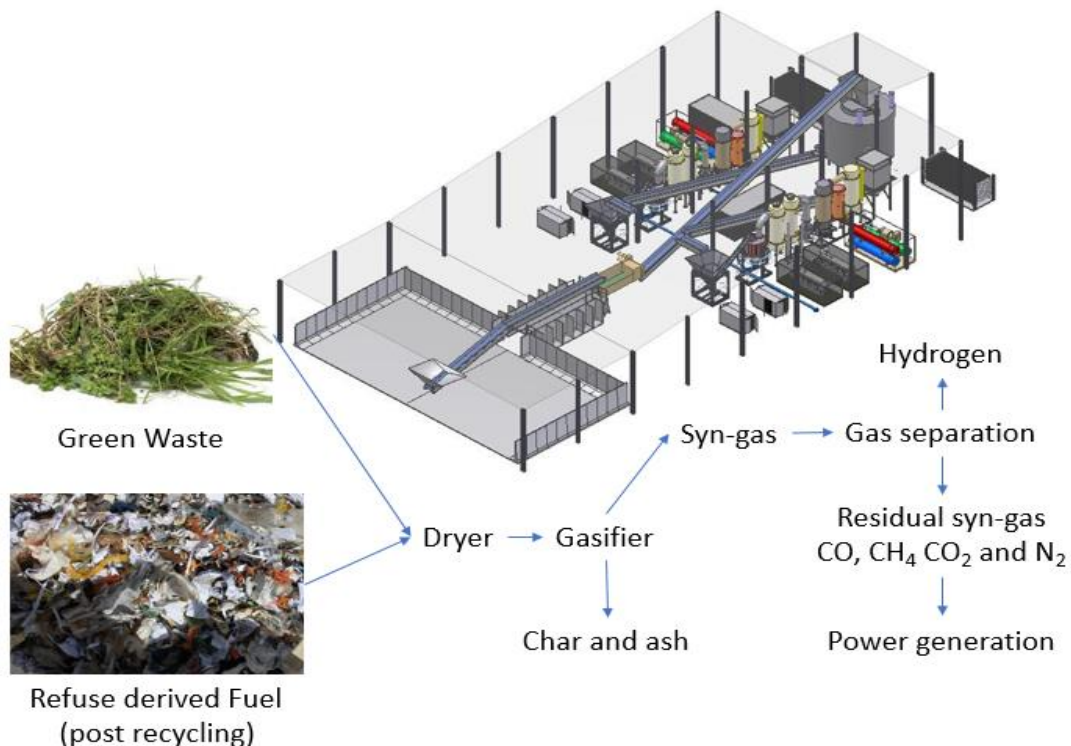
How is this Solution different to Others?

The “small gasifier” solution is different to electrolysis technology or other solutions?

1. This is Tested, best practice emission technology based on a prototype.
2. It has a very high energy utilisation (about twice that of a conventional coal powered station and about three times a conventional waste to energy plant)
3. It can recovery hydrogen cheaper at about half the current cost of electrolysis using solar.
4. It is stacks up at small scale and suitable for distributed energy and hydrogen production in rural communities

Whilst each site is slightly different, the internal rates of return for investors is approximately 20% plus but that depends on gate fees and take off agreements.

THE PROCESS: THIS IS NOT incineration producing ‘doubtful’ emissions.



We offer a process designed by David Cork. This is a mix agricultural or green waste with post recycling waste. It dries that waste using heat from the process. This is called integrated drying in chemical engineering. Then we gasifier the waste which is like cooking the waste to break it into small molecules. The result is a gas called synthesis gas or syn-gas for short. The syn-gas is about 36% to 42% hydrogen. Hydrogen is refined from syn-gas by separating the small hydrogen molecules from the comparatively large CO, CO₂, CH₄ and N₂-- Integrated Dryer Gasification Combined Heat and Power Plant (IDGCHPP). The really clever bit is in the gas cleaning which is called **scrubbing** by chemical engineers. **This scrubbing appears to be world's best practice with respect to dioxins, poly aromatic hydrocarbons (PAH) and Poly Chlorinated Biphenyls (PCB).**

The hydrogen can replace diesel energy in a fuel cell truck, tractor or generator at a cost cheaper than diesel BUT it is better if it is near the demand as transporting as hydrogen compression can use up to 13 % of the energy in the hydrogen. Using hydrogen will have less maintenance compared to a diesel-powered truck or generator. The residual gas is used for power generation and heating.



Each project is bespoke to the client's energy needs and the waste being processed but is based around an efficient IDGCHPP. This concept pursues a long-term goal of industry decarbonisation. It turns today's waste into tomorrow's resource. It used and manage water responsibly, being half the water consumption compared to a hydrogen electrolysis plant.

The feedstock is sourced sustainably, renewable green waste or agricultural and post recycling waste. Notably, IDGCHPP helps its neighbour industries reduce their greenhouse gas emissions.

The low selling price for the hydrogen is achieved via:

- Recovering the gate fees in the plant economics.
- Selling excess electricity "over the fence", "behind the meter" to neighbouring industry
- Using the waste heat to raise steam and hot water for heat and cooling via an absorption chiller sale to neighbouring industry

Such a project needs the support by power and steam purchase agreements with client neighbour and gate fee agreements with waste operators. The hydrogen sales are achieved by buying hydrogen fuel cell trucks and tractors and leasing them out to neighbouring industry. RRR is in touch with such over the fence energy users.

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