

# “Stored Solar” Energy for the Carbon Constrained Economy



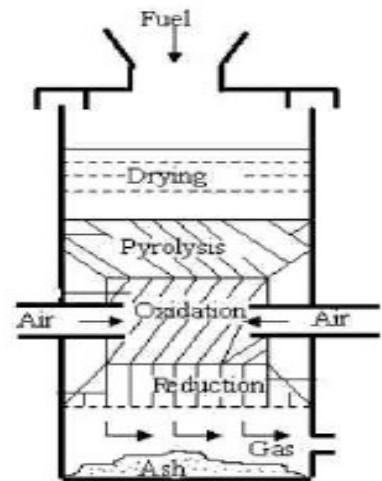
**PowerHearth™**

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# What is Gasification?

- Gasification is a thermal process that turns woody materials into energy rich gas by heating the solid fuel under controlled conditions.
- Unlike combustion, which fully converts the wood into heat and ash, gasification processes deliberately limit the conversion so that most of the combustion does not take place directly. Instead, the material is converted into a readily used gas fuel i.e. producer gas, that can power a reciprocating engine, boiler or gas turbine.



Down draft



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# PowerHearth Gasification

## The solution to converting biomass to energy.

- Powerhearth is a fixed bed, **LINEAR HEARTH**, downdraft biomass gasification system.
- Powerhearth is **fully automatic**, including ash removal, from start up to shut down, and can be monitored or controlled remotely by landline, cellular or internet connection. With the flip of a switch, any part or the entire system may be operated manually
- The engineering of the Powerhearth enable it to make gas in less than a minute and **engine fuel in less than six minutes from a COLD start**.
- Powerhearth "lives" in a state of pyrolysis, over 1000 C in the main reduction zone ensuring **tar free gas**. It employs a multi stage **dry** gas cooler, cleaner and gas polisher, (no large volumes of contaminated water to dispose of).
- Independent tests have repeatedly demonstrated 0% tar.
- Powerhearth leaves **< 0.5% ash residue** by volume using clean wood fuels.
- Powerhearth is a modern, mature technology gasifier made from superior materials for reliability and consistency in clean quality gas output, coupled to ancillary systems optimized for the operation of modern industrial engines and associated power plant.



# Carbon Offset Calculations

## 250kWe plant

- This option considers the installation of a 250kWe biomass power plant using plantation sourced wood as fuel.
- The power plant will generate 2100 MWe/year of renewable power and saving 2242 tonnes of CO<sub>2</sub> (NSW/ACT factor, other states will vary).
- It will load share with the nearby transformer (if available) providing redundancy during maintenance and grid sales of premium Green Power at other times.
- The plant will consume approximately 8 tonnes of wood wastes and/or equivalent plantation sourced woody fuels per day operating on a 24/7 basis. Waste cardboard, paper and green waste can be included with the addition of an integrated briquette plant.
- The concept is easily replicated as required, if 50 sites each had an installation the cumulative power plant would be equivalent to over 18MWe saving 111,000 tonnes/yr of CO<sub>2</sub>.
- The scale is arbitrary and as a modular system any size plant can be installed to match available resources.

# How can this fit with a Municipal situation?

- *Ever wanted a "black box" sitting out of the way at your depots that you could send all those problem green waste residues to? Well now you can and get heat, power and income back in return!*
- Low impact stand alone biomass power plants for integrating with grid electricity supply and enhancing regional energy redundancy.
- Provide renewable energy for on-site heating, cooling and power for public facilities and buildings such as swimming pools and hospitals whilst also solving disposal of hazardous hospital wastes in a more efficient and safe manner.
- Streamline street scape and parkland management and integrate with other waste reduction and recycling options to reduce landfill.
- Multi function co-generation plants including wastewater reclamation using vapour distillation technology for increased water supply and security.
- Increase future options for regional business development of alternate carbon energy products from biomass such as crop residues and purpose grown woody fuels.

# The 3i Team!

## *The power of energy independence!*

- **Peter & Kerry Davies** are exclusive Australian agents for 3i and the Powerhearth gasifier range, they are highly regarded in industry and government as “not the usual suspects” with a background in agriculture, public service, forestry, saw milling and bio-energy. They are considered professionals in their chosen fields and have participated as guest speakers at various industry and research forums as well as influencing government policy. Their collective lateral thinking ability, innovative approaches and solution oriented pragmatism is appreciated by all those they work with.
- **3i** are a private International company, heavily engaged in the research and development, design and engineering, manufacturing, testing and marketing of their own alternative power systems and associated technologies.
- 3i and Powerhearth Gasifiers are recognised as a “Preferred Vendor” and certified Manufacturer” by United Nations Agency for International Development.
- The strength of the commitment to high quality alternative power technology and dedication to their customer's satisfaction is reflected in the system's design and engineering excellence. Each of the systems demonstrates high efficiency, leading edge technologies and is fabricated from the highest quality materials available by a dedicated and skilled team of craftsman. A recent UN Auditor Generals report noted a gasifier supplied in 1978 for an African project is still operational and performing its design function.
- The extraordinary quality of each of the systems makes it easy to provide a "No Risk" Performance Guarantee and a fully supported warranty on every system 3i design and fabricate.
- After thirty five years of commercial gasifier experience and the many years of experience building engines to operate, exclusively, on gas, they are eminently qualified to help you realize ***the power of energy independence!***