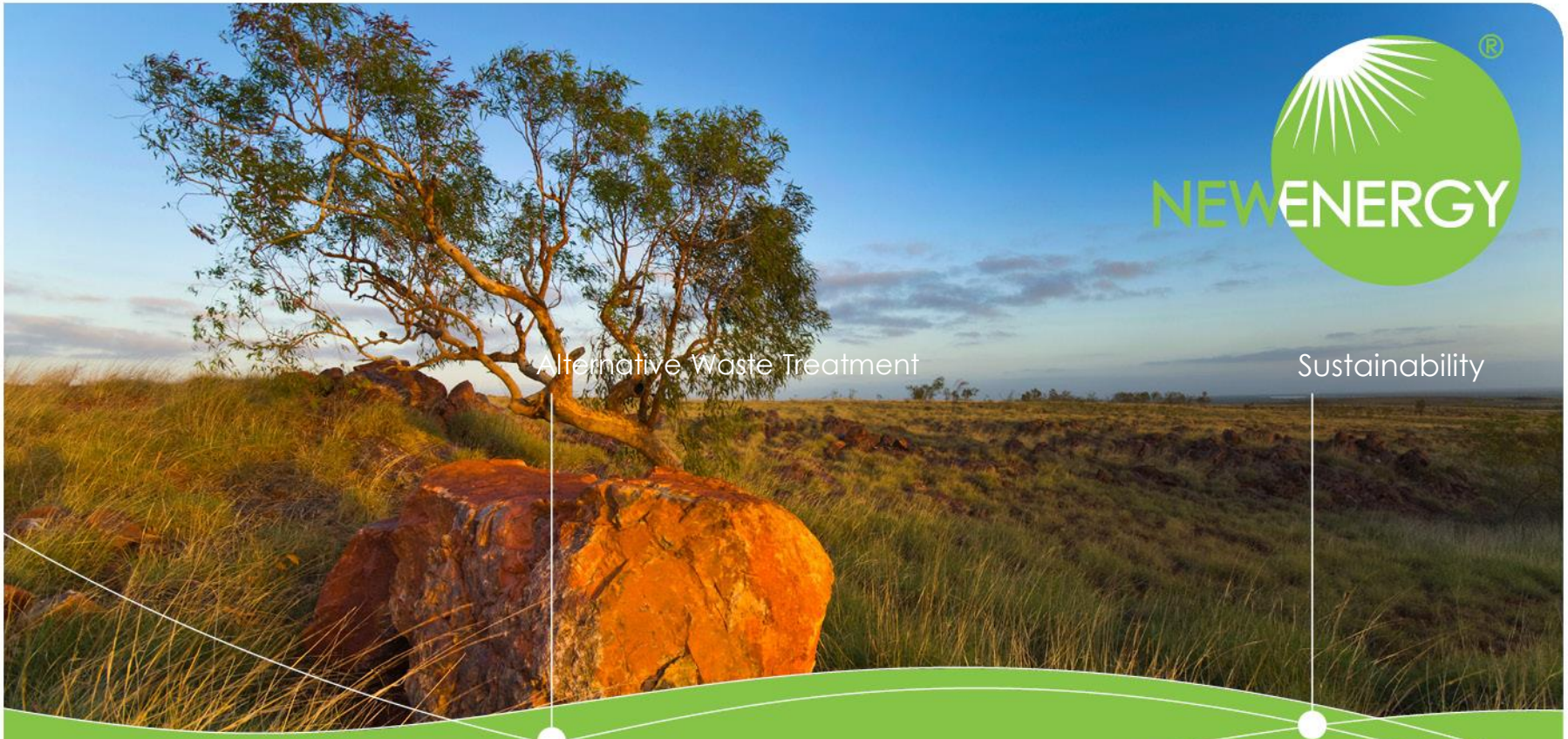


Alternative Waste Treatment

Sustainability

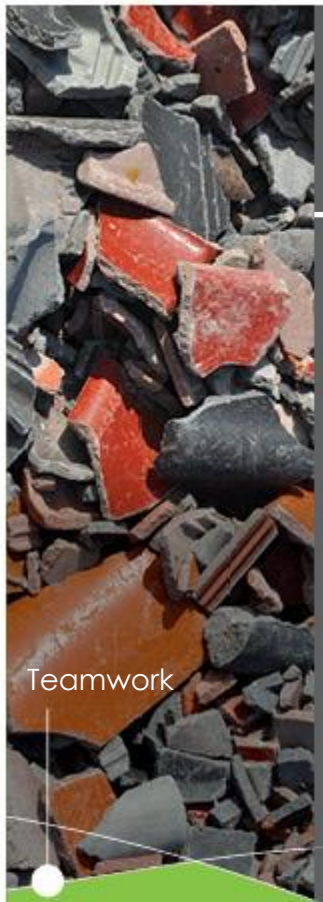
Waste to Energy in the Pilbara

Brian Lloyd – Project Manager

Renewable Energy

New Energy Corporation

- WA Company formed in 2009
- Worldwide Licensee (ex-Americas) for the Entech Waste to Gas technology
- Australian technology already exported successfully on projects worldwide.
- Company developing 2 WA projects:
  - ✓ Port Hedland
  - ✓ East Rockingham
- Established as the leading company in the waste to energy market in Australia.



Teamwork

Positive Outcomes

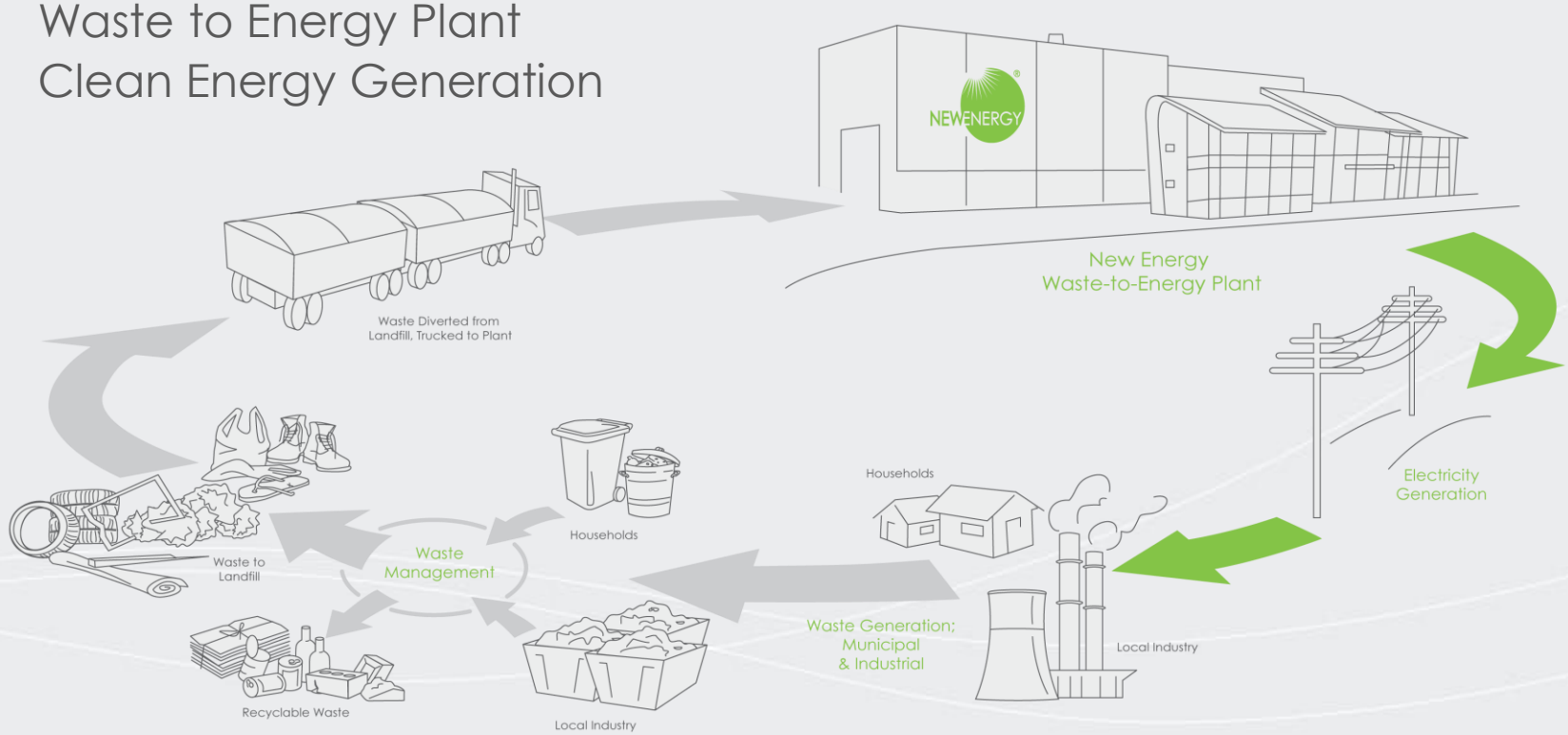
Entech

- Perth based company - delivered 46 waste to gas projects internationally since 1990
- Global design headquarters in Perth
- More than10 million hours of operating experience
- Modular gasification plants to de-risk scale up
- Plant design meets EU/WID/76 emissions standards
- Technology proven for variety of waste streams
  - MSW
  - Industrial
  - Clinical and biohazardous

The Process

New Energy supports sustainable waste management practices by providing a viable alternative to landfill.

- Sustainable Waste Treatment
- Waste to Energy Plant
- Clean Energy Generation



Materials Recovery Facility

Low Temperature

Environment

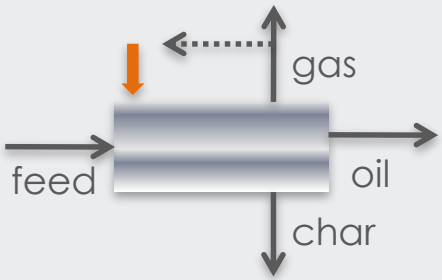
Gasification Stage

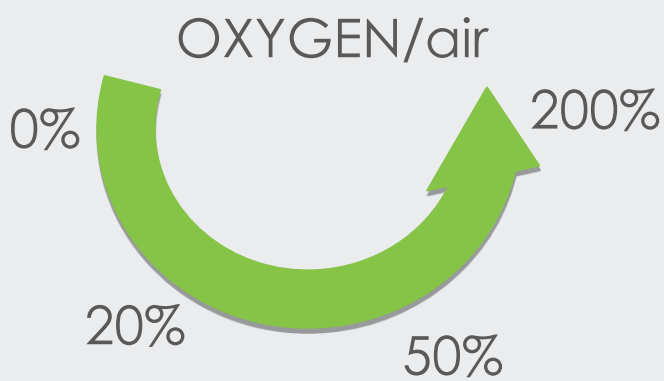
Low Temperature

Environment

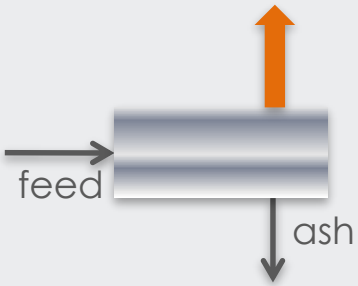
Waste to Energy Technologies

Pyrolysis
products

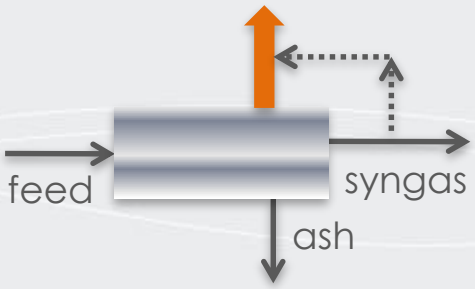




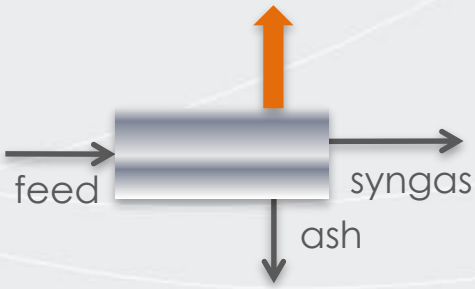
Incineration
waste treatment



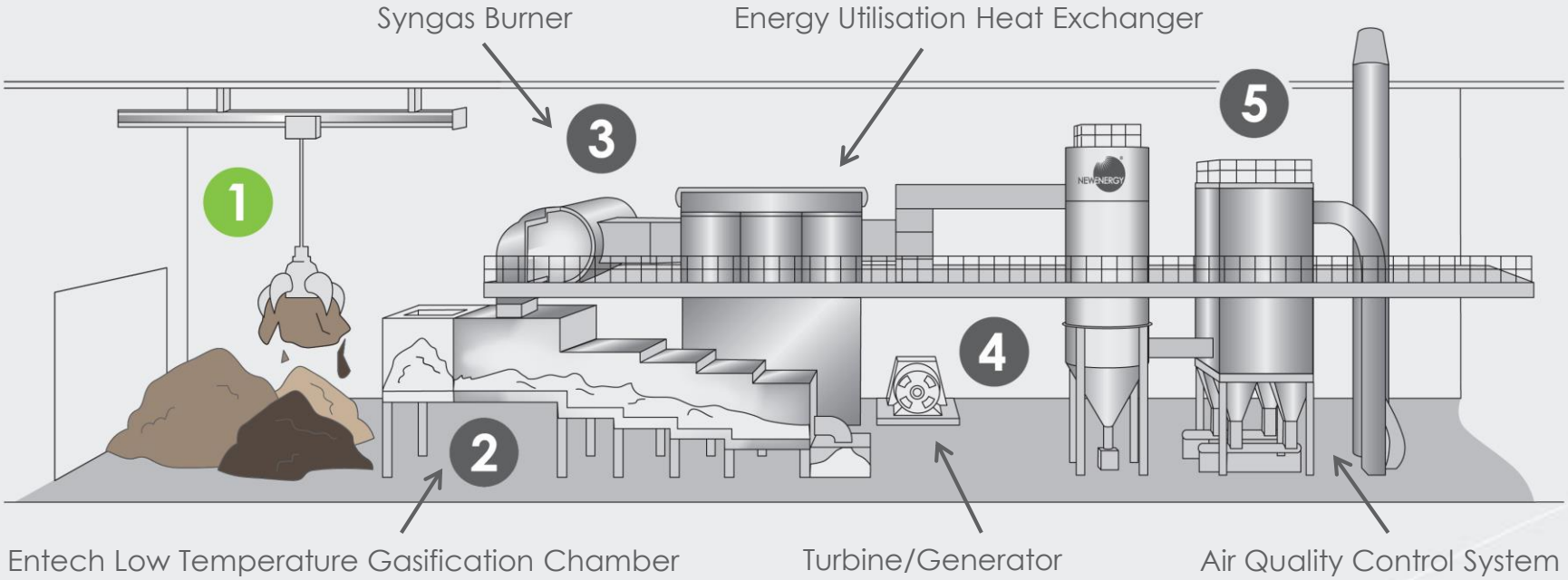
Low temperature gasification
waste treatment



High temperature gasification
industrial, syngas production (eg coal)



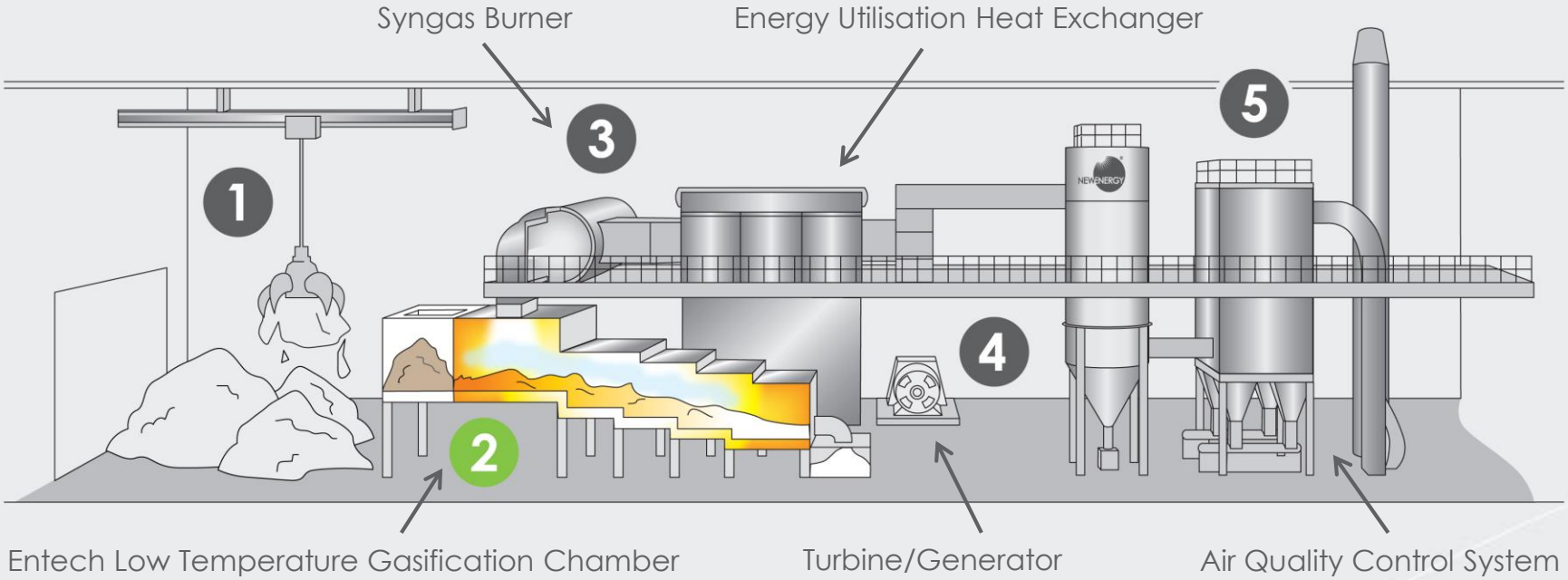
New Energy Process



Feeding Device

- Air Lock
- Large items

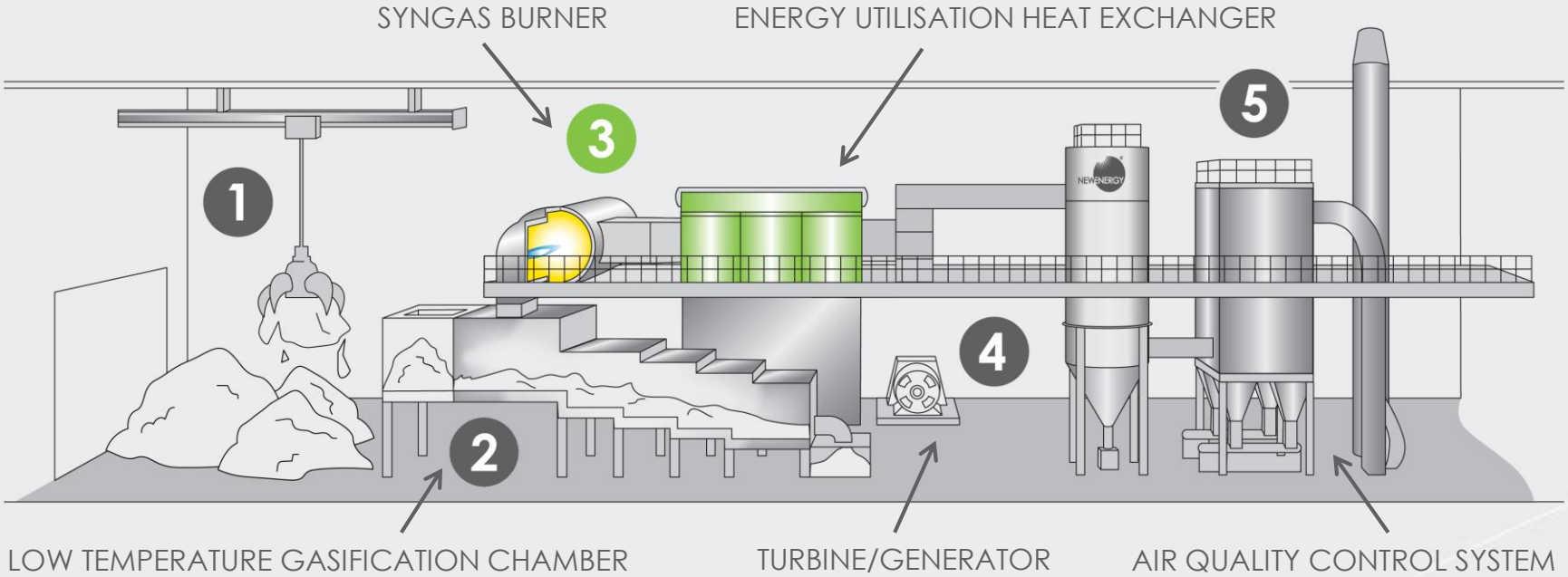
New Energy Process



Gasification Reactor

- 600 – 875°C
- Fixed bed, mechanical agitation
- Sealed ash bins with water quench
- Gentle conditions, large reactor;
  - Low air velocities
  - 16-24 hr residence time

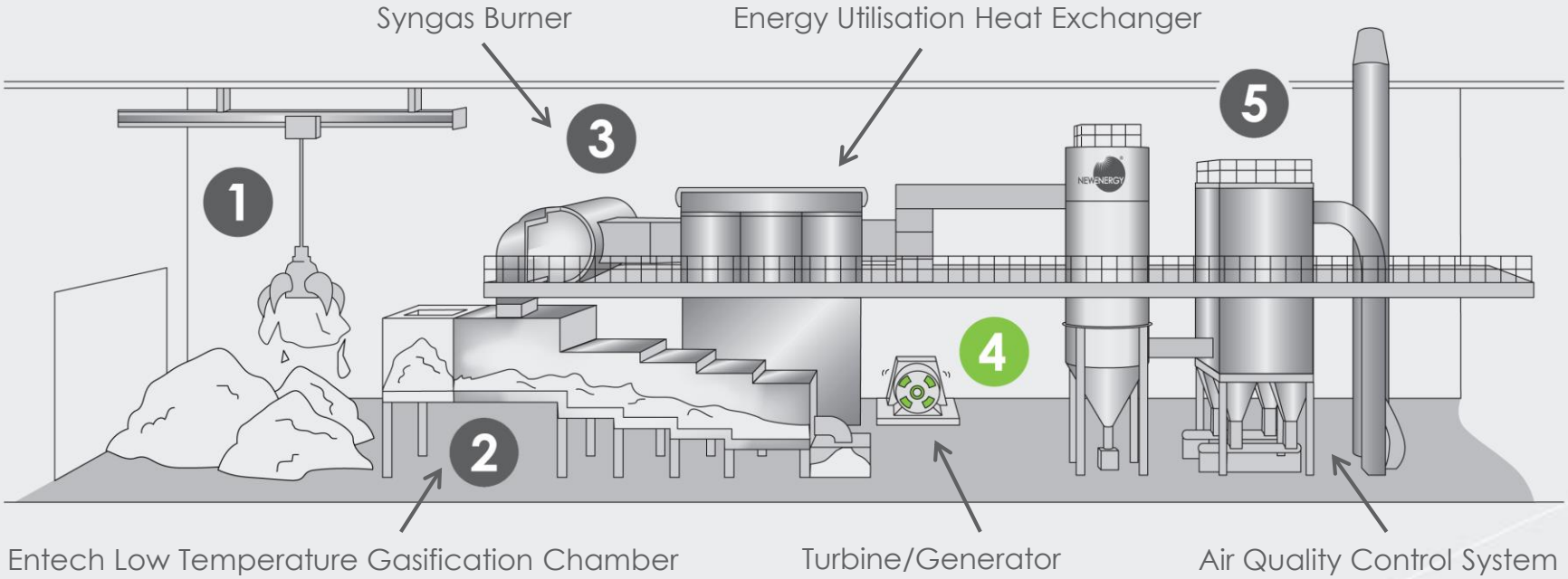
New Energy Process



Syngas Burner

- 2 second retention time
- Staged low-NO_x combustion

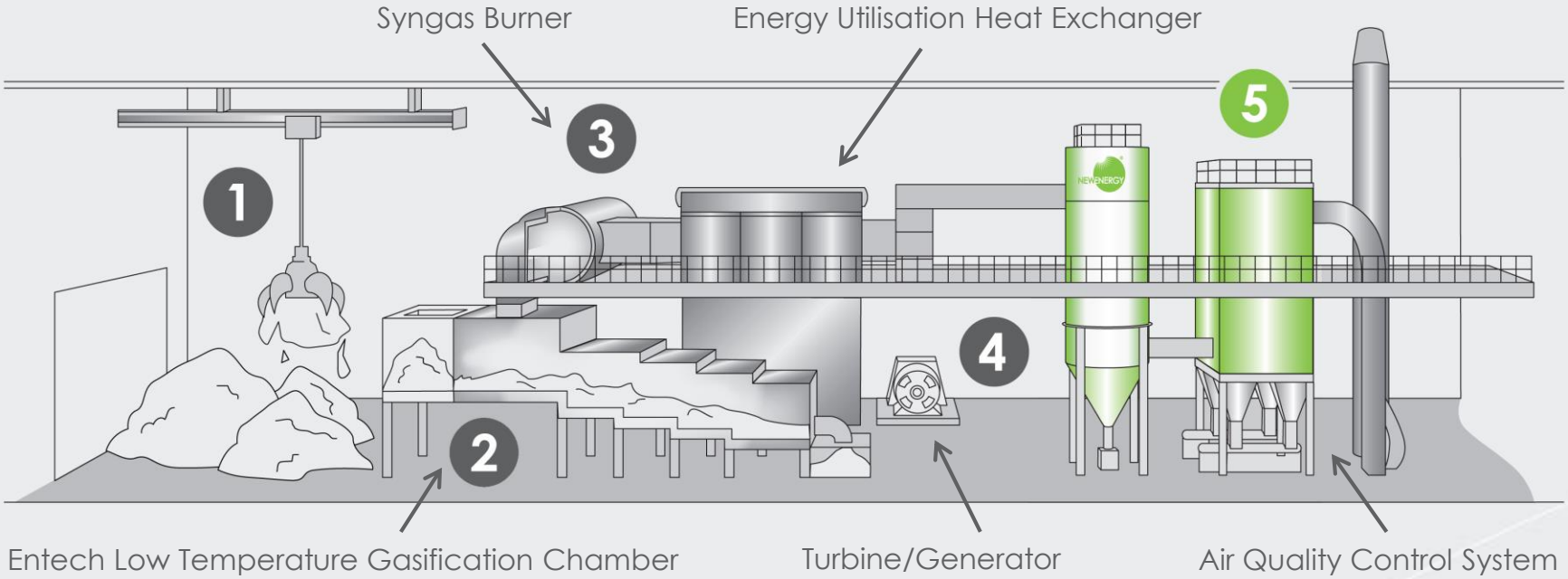
New Energy Process



Turbine & Generator

- Corner tube, high solids design (in low solids environment)
- Multi-stage turbine with bypass
- 11 kV generation with transformer to grid voltage

New Energy Process



Air Quality Management

- Lime for acid gas
- Activated carbon injection for metals
- Baghouse

"Our vision is a world with Zero Landfill™; where waste fuels a sustainable future."

NEWENERGY®

Alternative Waste Treatment

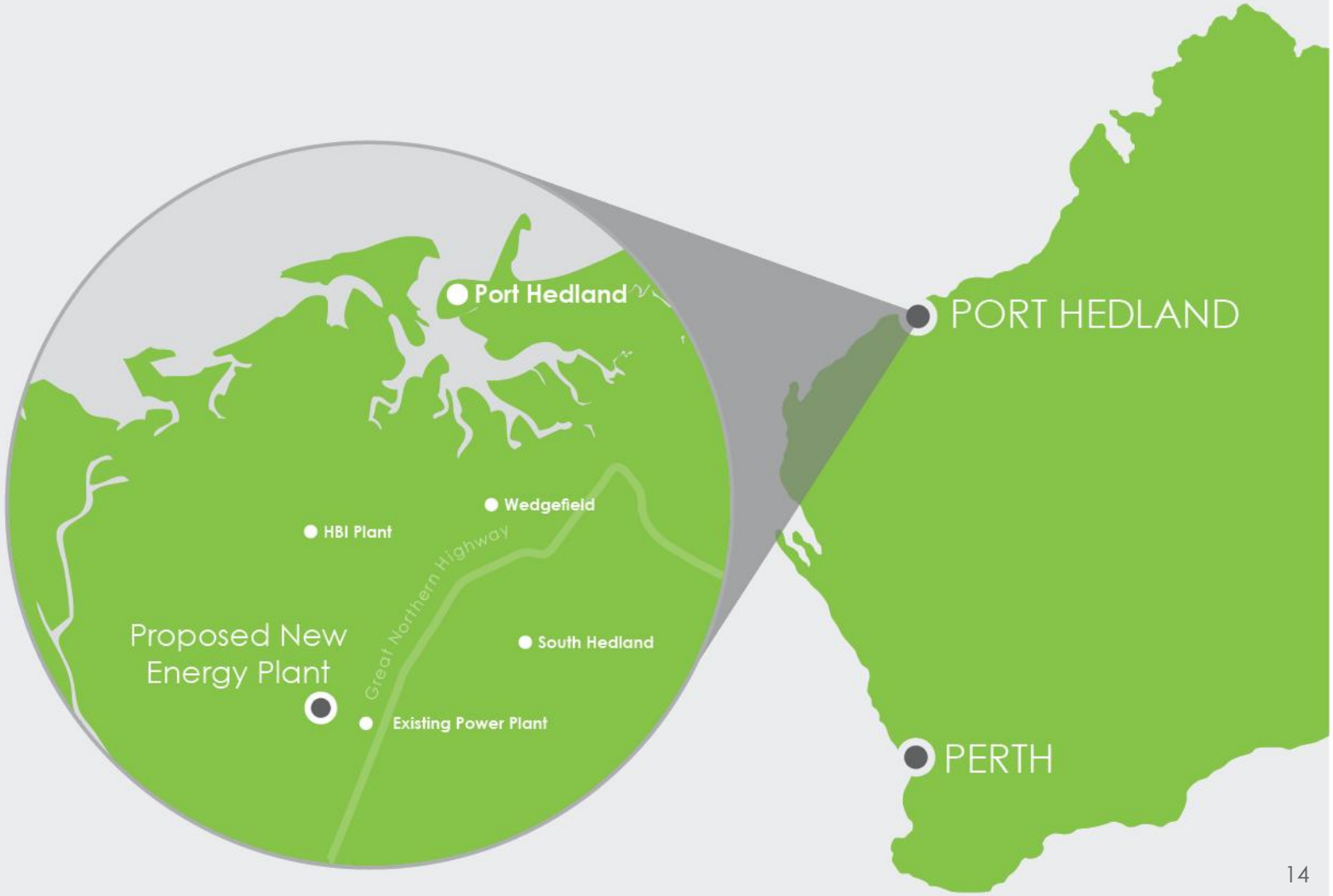
Sustainability

Pilbara Project

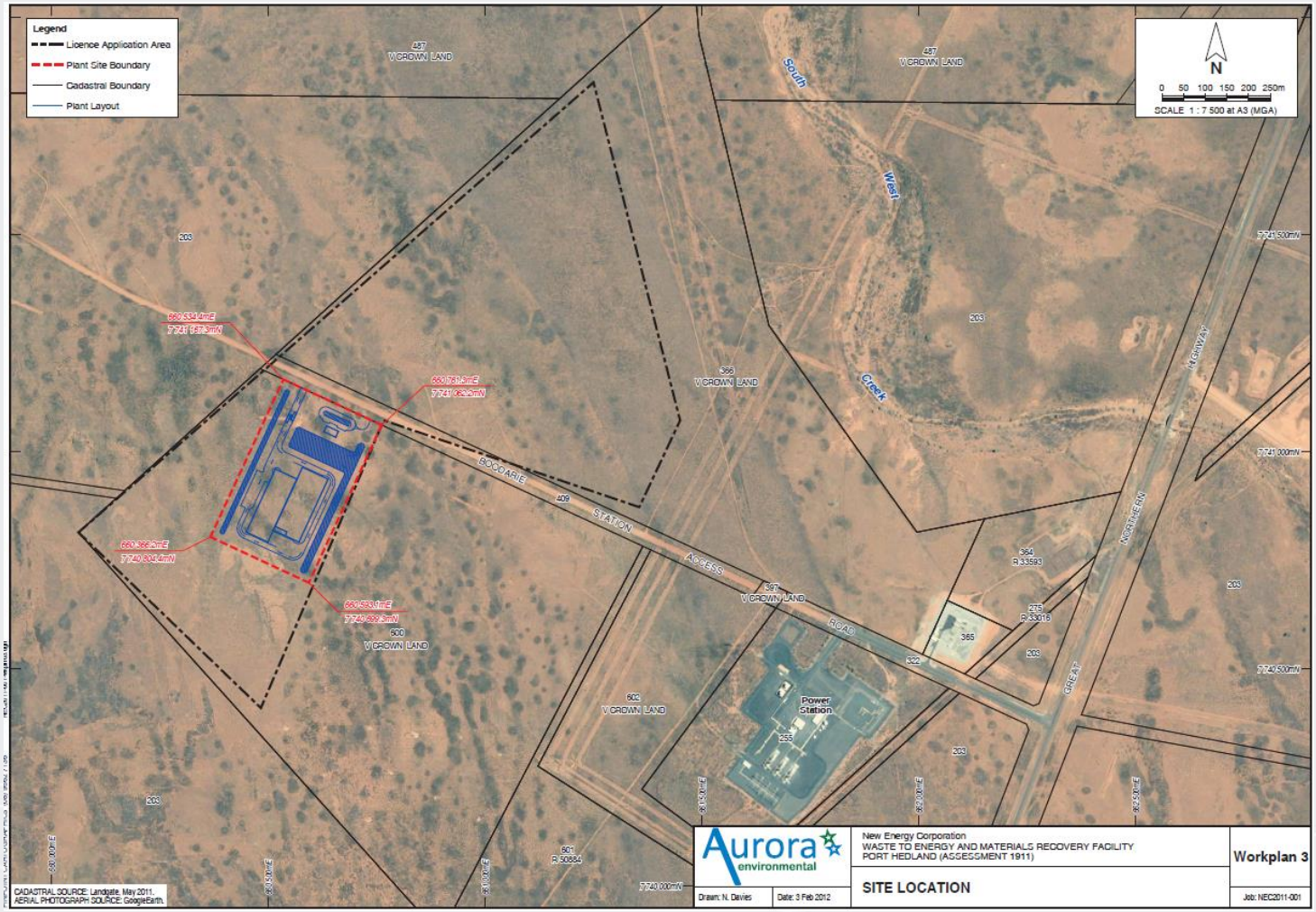
Artist's Impression

Renewable Energy

Pilbara – Site

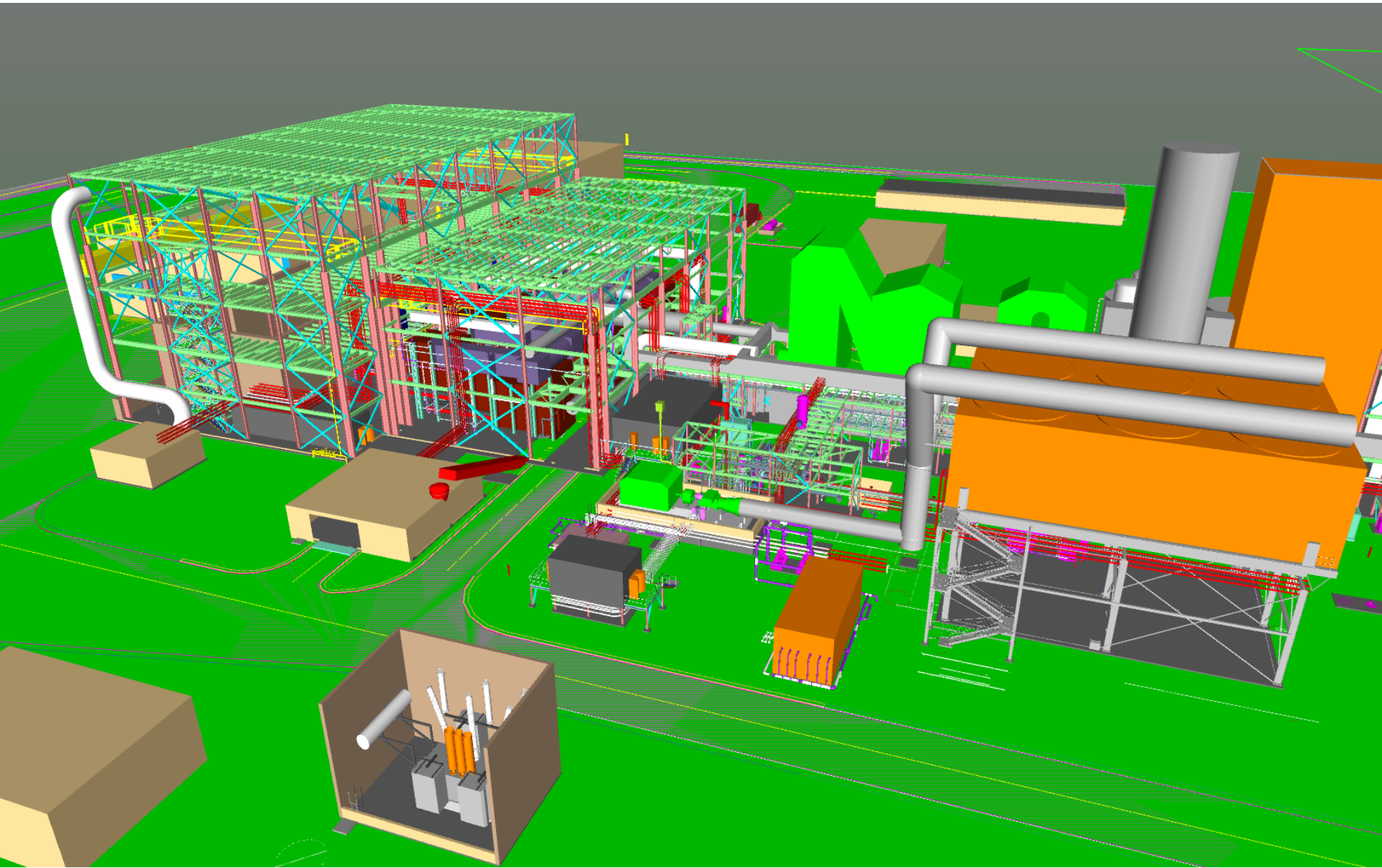


Project Location



Pilbara Waste to Energy Project

New Energy 72 MWt WtE Facility



Waste Generation per Capita

Integrity

Innovation

Waste Generation - Pilbara

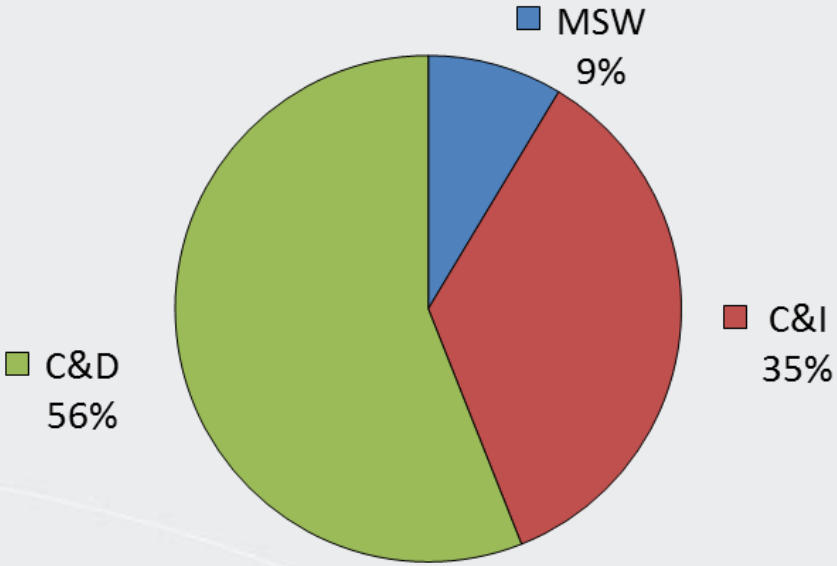
Stream	Broome	Port Hedland	Newman	Karratha	Onslow	Tom Price	Remote East Pilbara	Study Area
MSW	12,485	15,737	10,893	14,104	419	4,098	-	**57,736**
C&I	17,974	55,870	71,338	45,715	3,418	30,333	12,300	**236,948**
C&D	8,938	76,886	22,771	242,944	6,903	16,690	-	**375,132**
TOTAL	**39,397**	**148,493**	**105,002**	**302,763**	**10,740**	**51,121**	**12,300**	**669,816**

Source: Waste Data Study for the Pilbara and the Shire of Broome - 2013

- 9.3 tonnes of waste per person per annum.

Population 67,500 people (2014)

Waste Generation - Pilbara



Integrity

Innovation

Current Waste Infrastructure

Teamwork

Positive Outcomes

Current Waste Infrastructure

Teamwork

Positive Outcomes

Current Waste Infrastructure

Teamwork

Positive Outcomes

Current Waste Infrastructure

Teamwork

Positive Outcomes

Low Temperature

Environment

Project Features

- Site approved for up to 225,000 tonnes of waste pa
- Up to 5 gasification trains providing flexibility
- Generating 15.5 MW of electricity
- Enough to power around 21,000 homes pa
- Incorporate Materials Recovery Facility to maximise recycling opportunities
- Solution for tyres and conveyor belts
- First large scale renewable energy on the North West Interconnecting System.

Project Status

- First EPA approval for WtE project in Australia
- Head of Agreement for Town of Port Hedland - First Council in Australia to agree to power assets off their own rubbish.
- 20 year waste supply Agreement signed with City of Karratha
- Draft ETAC with Horizon Power
- Funding support from "Clean Energy Finance Corporation" ($50 million)
- Project on target to open Q4 2017.

Benefits to the Pilbara

- First Waste to Energy Project approved in Australia which would make Port Hedland the "home" of waste to energy in Australia a $2B industry
- Diversification of the Pilbara economy
- Significant non-mining infrastructure and investment
- Local employment & training opportunities
- Addressing very poor waste infrastructure (unlined landfills)
- Relieving a small ratepayer base the requirement to support waste infrastructure
- Australian benchmark in sustainability

Social License to Operate

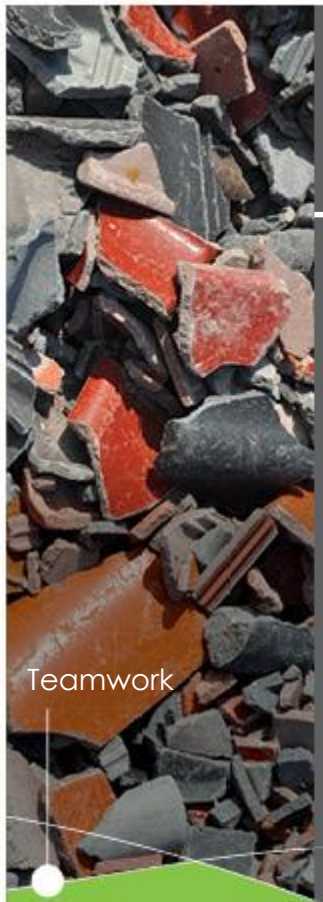
- Early stakeholder engagement
- WA EPA having taken a leadership role in education
- Projects having the highest level of assessment under the EP Act (PER)
- Community has always been recognised as major stakeholder for our projects
- The right technology at the right size i.e. Not too big
- Up-front recycling to improve recovery
- Educate and keep educating

Integrity

Innovation

The Challenges to Success

1. The State are proposing a new open market arrangement for the NWIS
2. No easily available spinning reserve or balancing load on the NWIS
3. The above makes renewable energy almost unattainable under current rules
4. Utilities unable to finalise an ETAC
5. Cities of the future don't rely solely on large scale unlined landfills
6. Support from **Energy** interests to resolve an **Environment** issue



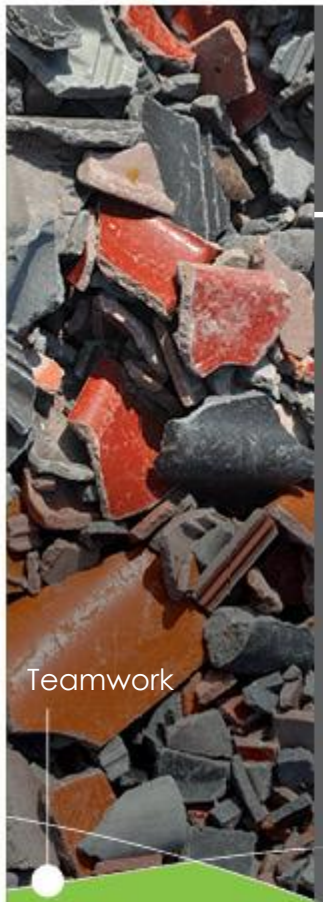
Education

Waste has Embodied Energy

When we landfill waste – the opportunity to recover the embodied energy is lost.

Teamwork

Positive Outcomes



Embodied Energy

What does it mean; that all waste has embodied energy?

Plastic bags are produced from polymers derived from petroleum. The amount of petroleum used to make a plastic bag would drive a car about 11 metres.[1]

1 http://www.environment.gov.au/settlements/waste/plastic-bags/

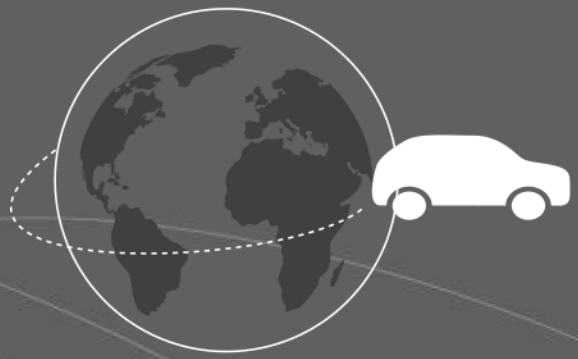
Teamwork

Positive Outcomes

Stop Landfilling!

NEWENERGY®

2.9B X = 42.9m km's



1,070 Times around the World

In 2007 Australia landfilled 2.9 billion plastic bags. That would propel a car 42.9 million km's or 1,070 times around the world.

Teamwork

Positive Outcomes

Thank you for your attention

Questions please:

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Responsibility

Future