Adelaide Brighton Ltd

Wood and Waste Fired Kilns

Michael Jones

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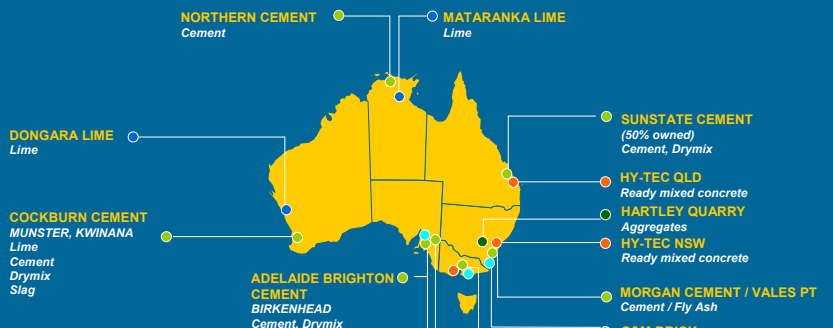
Introducing Adelaide Brighton



Birkenhead Site

- Modern, world-class plant
- Produces 1.3Mt/a
- Historically used only natural gas
- Close proximity of local community

Cement Manufacture

- Typical raw materials are limestone, clay, sand, iron ore
- Blended to achieve required chemistry
- Dried and very finely milled
- Heated to 1450°C
  - –At 900°C limestone decomposes
  - –At 1450°C formation of cement minerals
- Resultant “Clinker” cooled to recover energy
- Clinker milled with gypsum to form cement

Why Use Alternative Fuels?

- Fossil fuel is our single largest cost
- Extensive evidence from Europe that use is technically, economically and environmentally viable
- Economic benefits can now exceed preparation and supply costs
- Increased focus on sustainability and CO_2 emissions

Benefits of Combustion in Cement Kilns

- Very high temperatures
- Long residence time
- Capture of ash
- Destruction of contaminants
- Thermal stability

German Alternative Fuel Usage

Alternative Fuel	2001	2003
	('000's tonnes used)	
Waste Oil	130	116
Tyres	240	247
Solvents	35	48
Commercial and Industrial	420	626
Animal By-products	245	450
Municipal Waste	100	155
Total	1,170	1,733

Raw Waste

Joint Venture Established

- Resourceco supply partially processed waste
- "Alternative Fuel Company" formed as JV
- JV completes fuel preparation

EPA Protocol

- Pre-trial submission to EPA for approval
- Initial trials completed, immediate process effects assessed, emission data collected
- Seek EPA approval for continuous usage
- Longer term trials completed, full effect on process and product quality assessed
- Approval to modify EPA license

Challenges

- Calorific value and particle size
- Process contaminants
- Product quality impact
- Emissions
- Community and regulator acceptance
- Investment and returns

Remove Inorganic Material

Recovered Inorganic Fraction

Prepared for Shredding

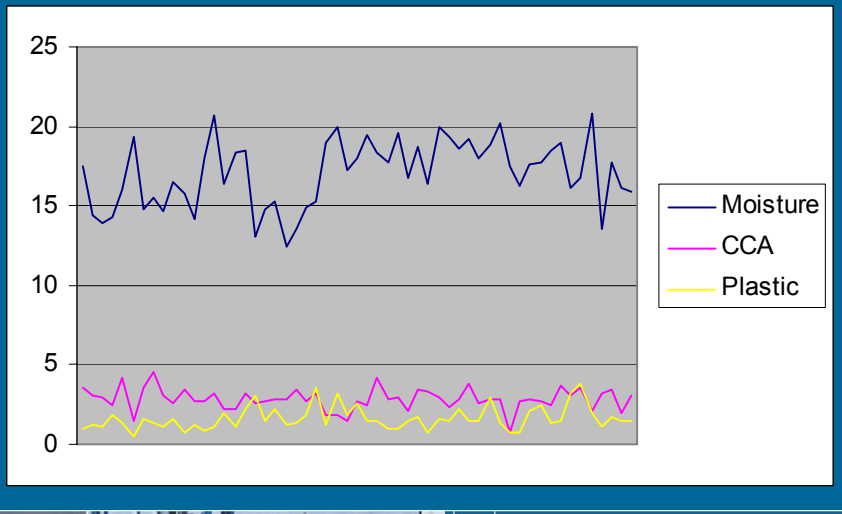
Shredding

Final Product

Timeline

- 2002: European Review, trial protocol agreed with EPA
- 2003: Q1, 10t/h trials conducted
- 2003: Q3, interim shredding plant
- 2003: Q4, EPA approval for 10t/h
- 2004: Q4, undercover processing facility
- 2005: Q2, primary shredder and 15t/h trials
- 2005: Q4, receival facility and EPA approval for 15t/h
- 2006: Q2, secondary shredder

Quality Control



Main Process Elements

- Off-site preparation to 15mm
- Walking floor truck delivery
- Drive-through receival hopper
- 300t walking floor store
- Weighfeeder to pneumatic transport line
- Blown directly into calciner above gas flame
- Fully automatic feed at 15t/h

Emission Outcomes (ug/m^3)

	Guideline	15t/h
Nitrogen Dioxide	113	50
Sulphur Dioxide	450	1
Mercury	0.33	0.003
Lead	1.5	0.005
Arsenic	0.17	0.004
Benzene	53	0.4
Poly Aromatic Hydrocarbons	0.73	0.0004

Outcomes for ABCL

- 25% reduction in natural gas usage (1.3PJ/a)
- Reduced site greenhouse gas footprint
- Development of technology and new business
- Complete destruction & utilisation of the fuel material
- No adverse effect on stack emission or product quality
- Improved business sustainability
- Developed EPA and local community relationship

Outcomes for SA

- Reduced consumption of natural resources
- Contributes to Zero Waste objectives
- >80kt/a of combustible waste diverted from landfill
- >200kt/a of inorganic waste diverted from landfill
- Greenhouse gas emissions reduced by 250,000 t CO_2-e
- Establishment of renewable energy business
- Immobilisation of heavy metals
- Employment and business sustainability