Enhancing Gas Extraction and Pre-treatment from Small to Large Landfills

Presentation by
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The earth is coping with a crisis

- Carbon Dioxide (CO_2) in the atmosphere is currently at 380 parts per million (ppm)
- Now 25% above the previously highest level (300ppm)
- CO_2 concentration has ranged between 180 to 300ppm in the past 650,000 years
- Increasing at the rate of 20ppm per decade

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Australian CO_2 emissions

- 565Mt of CO_2 emitted (2004)
- Majority is from stationary electricity generation plant
- Waste contributes 3%
- Methane gas from landfills has to be captured and combusted

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Landfill operators can contribute to reducing global warming by capturing methane gas generated by their landfills and combusting it

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Larger Landfills

- Generation of renewable electricity
- Power the landfill operations
- Export excess electricity into grid

Smaller Landfills

- Flare gas

OR

- Generate electricity for internal use

Landfill Gas Capture System

- Same gas extraction system for all sites
- Series of wells on a grid layout

Landfill Gas Capture System

Design parameters

- landfill characteristics
- surface area
- surface slopes
- depth of waste
- final cover

Wellfield Construction

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www.landfillgas.com.au

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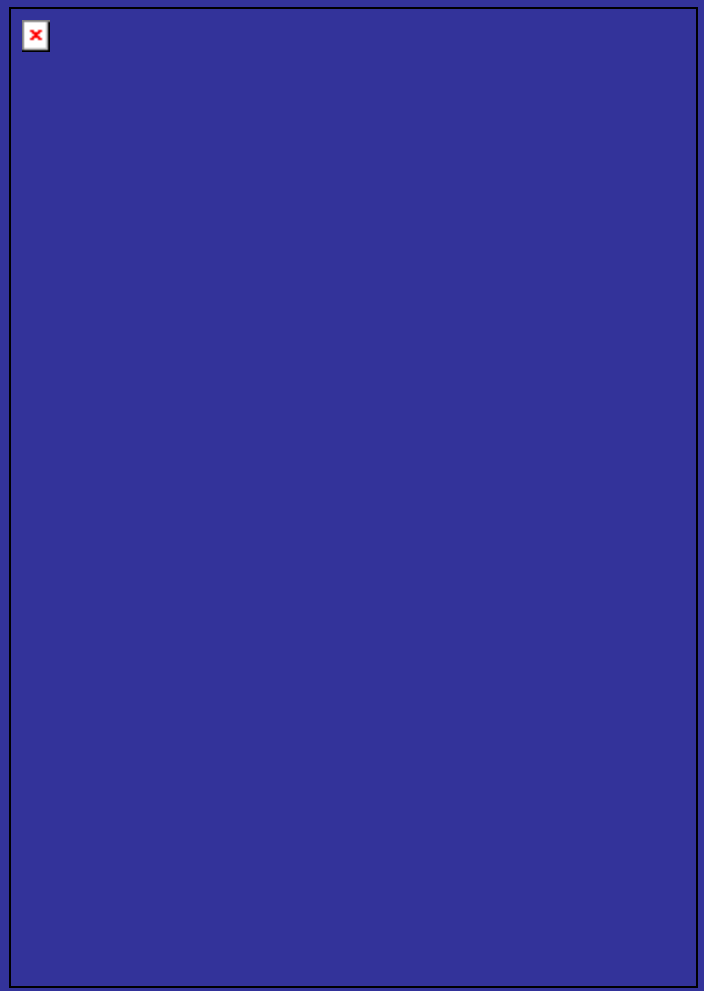
Methane Gas Pre-treatment



- Prepared for combustion:
  - Removal of particles
  - Removal of impurities
  - Cooling to desired temperature
- Intellectual property is closely guarded

Electricity Generation

- Gas is combusted in engines designed for methane (from landfills or other sources)

Longer Term

- Operate for 15 to 20 years
- Gas generated will decline, insufficient for viable electricity operations
- Power station removed
- Any remaining gas generated would be flared

Remote Monitoring

- Operations can be monitored from remote central location
- On site personnel are required to attend to well field monitoring
- Routine maintenance works undertaken locally

Australian Government Action

- Mandatory Renewable Energy Target (MRET) through until 2020
- Increase generation capacity from 300GWh in 2001 to 9,500GWh by 2010
- Maintain this level until 2020
- Low Emissions Technology Development Fund ($500 million)

Australian Government Action

- As at December 2005, 16 million Renewable Energy Certificates (RECs) had been created under MRET scheme
- 229 accredited power stations
- Landfill gas contributed 1,318,169 RECs (8% of total)

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Australian Government Action

- Carbon Emissions Trading Scheme by 2011
- Cover stationary generators and the transport sectors
- Exempts waste industry (for now)
- “Cap and trade” format

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Conclusion - General

- Our planet is changing as a result of human activity
- The level of general community awareness around this issue is changing
- It is now becoming a major political issue
- Action is required now to reverse the trends

Conclusion - Landfills

- Landfill operators are obligated to operate their landfills in an environmentally sustainable manner
- Collection and proper disposal of the landfill gas generated is a pre-requisite
- Offsets the need for additional black electricity generated from fossil fuel products (Double Benefit)