

**LANDFILL GAS TECHNICAL SUBCOMMITTEE COUNTRY
SPECIFIC PROFILE**

AUSTRALIA

April 2011

**Methane to Markets – Landfill Gas Technical
Subcommittee**

Introduction

The Landfill Gas Subcommittee, at its first meeting in November 2004, agreed to develop an Action Plan to guide the activities of the Subcommittee over the next five years. To aid in developing this Plan, members agreed to complete country profiles, identifying their current situation with respect to landfill gas (LFG) activities, relevant policies and programmes, and opportunities from and barriers to the increased collection and use of LFG in their country. The following report is Australia's updated country profile.

1. The Current Development Status of Australia's Landfills and LFG Projects

For 2008 Australia's national inventory of greenhouse gas emissions total (excluding land use, land use change and forestry) was 549.5 megatonnes (Mt) carbon dioxide equivalent (CO₂-e).¹

Emissions from landfills totalled 14.4 Mt CO₂-e, accounting for 2.6% of total net national emissions. This is a decrease of 19.6% from 1990. As waste degradation is a slow process, estimates of methane generation for 2008 reflect waste disposal over more than 50 years.

Rates of methane recovery from solid waste have improved substantially since 1990, increasing from a negligible amount to 4.3 Mt CO₂-e of methane in 2008.

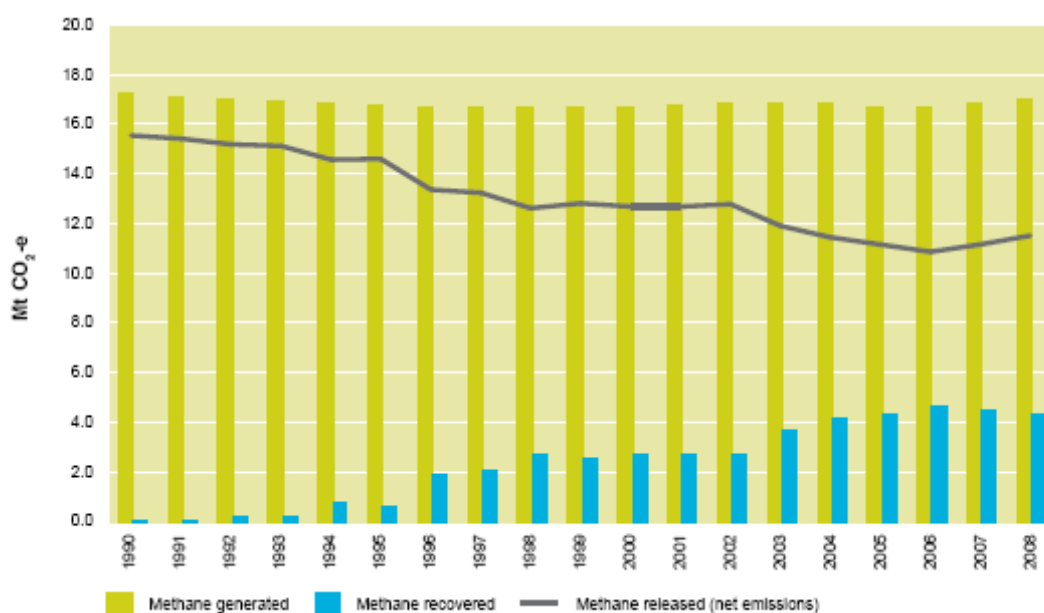


Figure 1: Methane emissions from solid waste disposal: 1990 – 2008

In terms of waste management practices in place at Australian landfills, 11% of landfills have a landfill gas collection system in place. However, in the larger scale landfills, this practice is more common meaning that around 30% of the methane generated is collected for either flaring or energy generation.

The historical decline in waste emissions reflects the fact that potential emissions from waste generated have been offset by increasing diversion of waste through recycling and increasing rates of methane recovery in the sector.

¹ Australia's National Greenhouse Gas Inventory, 2008**

Waste emissions are projected to increase slightly to 2020, reflecting increased waste generation which is primarily driven by population growth. Future emissions trends in the waste sector will depend on future policies, such as the National Waste Policy, which is yet to be finalised and has not been incorporated into Australia's emissions projections.

There have been major changes in the amount of waste generated and the way waste has been managed in recent years. Recycling has increased over the period from 1996–97, when around six per cent of solid waste was diverted from landfill, to 2006–07 with around 52 per cent diverted.

Recycling is a major waste management strategy and landfill continues to be important. More broadly, waste and how we manage it play a key role in the economy as well as in achieving environmental objectives, including on climate change. The nature of waste in the three main waste streams (municipal solid waste, commercial and industrial, and construction and demolition) has also changed. Waste is now more complex and includes more products and materials which contain hazardous substances. Strategies are needed to enable society to reduce contamination, improve recycling and increase the value obtained from waste.

Landfill management practices

The Waste Management Association of Australia recently conducted a survey on landfills in Australia and their management practices. The National Landfill Survey contacted every operating landfill in Australia and asked a series of simple questions about size, siting, annual tonnage, waste types and typical features of a modern landfill site.

This survey incorporates waste type accepted; base lining and other environmental controls; and capping and rehabilitation. Environmental controls includes actions such as type of liner, landfill gas recovery, leachate collection, stormwater controls, vermin controls and vermin controls. The results are available from the Waste Management Association of Australia website (www.wmaa.asn.au).

2. Key stakeholders in the solid waste disposal sector and LFG industry

Australian Landfill Owners Association

The Australian Landfill Owners Association (ALOA) is an incorporated entity comprising landfill owners across Australia sharing a concern for the future viabilities of the environment and their businesses.

Members of the Association receive and manage over seventy per cent of the total solid waste generated in Australia. They provide services in waste disposal, waste treatment and resource recovery and employ over 12,000 people.

ALOA members operate a vast number of landfills across Australia and receive over 15 million tonnes of solid waste. These landfills employ state of the art technology to minimise any environmental impacts and generally capture methane generated by the decomposing waste to produce renewable electricity.

Clean Energy Council

The Clean Energy Council (CEC) is the peak body representing Australia's clean energy sector. It is an industry association made up of more than 500 member companies operating in the fields of

renewable energy and energy efficiency. The CEC's members are involved in the development or deployment of clean energy technologies such as bioenergy, cogeneration, energy efficiency, geothermal, hydro, solar, solar hot water, wave and tidal and wind.

The CEC is an incorporated not-for-profit association which is based in Melbourne and operates nationally. It is funded principally by membership fees, with additional income generated by events and activities such as industry accreditation programs.

In exchange it provides a variety of services to members. Its primary role is to develop and advocate effective policy to accelerate the development and deployment of all clean energy technologies. The CEC also promotes awareness of the industry and clean energy business opportunities through industry events, meetings, newsletters, its directorates, the internet and the media.

The CEC reports to a 13-person board elected by its members. The board advises on the strategic direction and financial management of the organisation.

The policy and advocacy work of the CEC is guided by a dedicated committee, comprising a representative of each sponsoring member and the chair of each directorate. The Policy and Advocacy committee reports to the board.

The CEC continues to undertake work on improving policies in Australia that will see the barriers for LFG removed.

Waste Management Association of Australia

Established in 1991, the Waste Management Association of Australia (WMAA) is Australia's peak association for waste management professionals.

The WMAA has over 1,000 members and represents more than 3,000 individuals in the waste and resource recovery industry, we have a network of State Branches, National Divisions and Special Interest Groups that provide the opportunity for networking, communication and involvement in projects aimed to encourage sustainable waste management.

Bioenergy Australia

Established in 1997 as a government-industry forum to foster and facilitate the development of biomass for energy, liquid fuels, and other value added bio-based products. Its founders were a core of Federal Government organisations with the objective of providing the focus and a forum for bioenergy development in Australia. Since its formation the membership of Bioenergy Australia has been expanded to 45 members from both Government and Industry (see below for current membership list). Bioenergy Australia is concerned with all aspects of biomass and bioenergy, from production through to utilisation, and its work embraces technical, commercial, economic, societal, environmental, policy and market issues.

3. Overview of landfill gas potential from existing disposal sites

In 2008 there were at least 665 landfills operating in Australia, although it is likely that more landfills, both operational and closed, may exist².

The National Landfill Survey undertaken by the Waste Management Association of Australia had responses from 447 landfill sites around Australia. Of these sites, only 11% reported landfill gas capture, however this did capture 43% of waste in tonnes. This illustrates there is potential for higher rates of landfill gas capture from existing disposal sites.

4. Existing or planned landfill gas capture and/or use projects

Australia's Current LFG Projects

Seventeen new large-scale renewable energy power plants became operational in 2010, adding 210 MW of generating capacity to the national electricity grid. Two of these were landfill gas projects³:

The following table outlines the installed capacity of landfill gas electricity generation⁴:

Renewable Energy Target Category	Company Name	Total installed Capacity (MW)
Landfill Gas	Energy Developments Ltd (EDL)	71.6
	Landfill Management Services (LMS)	39.4
	Landfill Gas and Power	12.9
	Energy Australia	9.6
	Veolia Environmental Services	8.4
	AGL	7.8
	Thiess Services, LMS, New Hope Energy and CS Energy	7
	Energy Impact	5.7
	Boral Recycling	2.2
	Waste Gas Resources	2.1
	Global Renewables	2
	Mount Herron Engineering	1.3
	AnaeCo (prev. Organic Resource Technology Ltd)	1
	Transpacific Industries	0.5
	Mill Park Leisure Centre	0.1
	Landfill Gas Total Installed in Australia 2010	171.6

5. Legal and Policy frameworks for landfill methane recovery

Regulation of landfills

² Waste Management Association of Australia, *National Landfill Survey, 2007–2008 aggregated results*, 2009

³ Clean Energy Council, *Renewable Energy Database*, January 2011

⁴ Clean Energy Council, *Renewable Energy Database*, January 2011

Because of environmental risks and impacts, landfilling is regulated by environmental and planning agencies. The methods of regulation vary between jurisdictions and between landfill types and sizes. Typically, a putrescible landfill will need both planning approval from the local authority and works approval or similar from the state environmental regulator. There may be a pre-approval scheduling in a regional waste management plan. At large sites, state environmental regulators are often reluctant to provide blanket approval for airspace that is not expected to be needed for many years. Consequently even when regulators and planners expect a site to be used for decades, it is possible that only a few years of capacity has received full formal approval. This is a fundamental difference between landfills and other waste facilities, which are generally fully approved for the long-term.⁵

Drivers for Increasing LFG Capture and Use in Australia

It is expected that LFG capture levels throughout Australian States and Territories will increase between now and 2020. It has been assumed that, although small increases in the amounts of methane captured may occur as business as usual operations, the majority of the increase will be the result of government initiatives. Drivers for increasing landfill methane capture and use include environmental benefits such as minimising leachate and odour control, and greenhouse gas mitigation, and the government incentives and regulatory requirements that aim to address these factors. Regulators are increasingly recognising greenhouse as an additional reason for landfill gas control. It is assumed that some of the recent increase in landfill gas recovery has been driven by site liability and OHS concerns, but that greenhouse issues will become progressively more important in the future.

Currently the Australian Government's major policy driver for increasing the uptake of renewable energy projects, including utilising energy from LFG, is the Renewable Energy Target, which is discussed further in the next section. The introduction of a carbon price mechanism which covers emissions from non-legacy landfill emissions would also be a significant driver for increasing landfill gas capture and use in Australia. This is also discussed further in the next section.

A major determinant of the economic viability of LFG projects is their competitiveness vis-a-vis other energy sources in the market. Some of the Australian Government's policies and programmes affect these price relativities, and can improve the competitiveness of LFG projects. These programmes are discussed in the next section.

Federal Policy Framework

The Department of Climate Change and Energy Efficiency has been established to deliver the Australian Government's climate change framework. It provides a high level view that can be used to inform the following three pillars of:

- reducing Australia's greenhouse gas emissions
- adapting to the impacts of climate change we cannot avoid
- helping to shape a global solution.

⁵ 2010, Australian landfill capacities into the future, Hyder Consulting Pty Ltd, p4

The Department of Sustainability, Environment, Water, Population and Communities develops and implements national policy, programs and legislation to protect and conserve Australia's environment and heritage. This includes the National Waste Policy.

National Waste Policy

The National Waste Policy sets Australia's waste management and resource recovery direction to 2020, to deliver economic, environmental and social benefits. The policy was agreed by all Australian environment ministers in November 2009 and endorsed by the Council of Australian Governments. Most relevant for landfill gas is Strategy 9 under the policy, which will see 'the development of a strategy for emissions from landfills and other waste activities not covered by the operation of a future Carbon Pollution Reduction Scheme'.

Further information, including future developments of the National Waste Policy and Strategy 9, is available on the Department of Sustainability, Environment, Water, Population and Communities website: www.environment.gov.au

Carbon Farming Initiative

The Carbon Farming Initiative (CFI) is a carbon offsets scheme being established by the Australian Government to provide new economic opportunities for farmers, forest growers and landholders and help the environment by reducing carbon pollution.

The Carbon Farming Initiative will include:

- Legislation to establish a carbon crediting mechanism;
- Fast-tracked development of methodologies for offset projects; and
- Information and tools to help farmers and landholders benefit from carbon markets.

Carbon credits represent abatement of greenhouse gases which is achieved by reducing or avoiding emissions, for example, through capture and destruction of methane emissions from landfills. Further information on the CFI is available on the Department of Climate Change and Energy Efficiency website: www.climatechange.gov.au

Carbon price mechanism

On 24 February 2011, the Prime Minister Julia Gillard announced the climate change framework outlining the broad architecture for a carbon price mechanism which has been considered by the Multi-Party Climate Change Committee.

The two-stage plan for a carbon price mechanism will start with a fixed price period for three to five years before transitioning to an emissions trading scheme.

The Government will propose that the carbon price commences on 1 July 2012, subject to the ability to negotiate agreement with a majority in both houses of Parliament and pass legislation this year.

A carbon price mechanism could cover all six greenhouse gases counted under the Kyoto Protocol and have broad coverage of other emissions sources encompassing:

- the stationary energy sector;
- transport sector;
- industrial processes sector;
- fugitive emissions (other than from decommissioned coal mines); and
- emissions from non-legacy waste.

Emissions from sources covered under the proposed Carbon Farming Initiative, such as agricultural emissions sources, would be excluded from coverage under the carbon pricing mechanism.

Energy White Paper

The Department of Resources, Energy and Tourism will lead the development of the Energy White Paper process, working in close consultation with other Australian Government Departments and Agencies. It is expected that a draft Energy White Paper will be released over the next 12 months for public comment and finalised during 2012. This will conclude the Energy White Paper process that commenced in 2008.

The Government recognises that the energy sector is currently facing major challenges. Growing energy demand underscores the importance of replacing ageing energy assets, increasing generation and transmission capacity and thereby ensuring continued reliability of supply.

Continued security of, and access to a competitively priced energy supply for households and industry is a critical priority. Alongside this, Australia needs to continue the transition to a low emissions and environmentally sustainable economy. This will require the development and deployment of new and cleaner low emission technologies supported through actions such as the introduction of a price on carbon.

The Energy White Paper will deliver a clear and robust whole-of-government policy framework to provide certainty for investors as well as reliability and security for the Australian community. It will be based on a full strategic review across the energy sector to identify emerging needs and plan for the future.

6. Market Assessment and Reform Issues

Renewable Energy Target

The Renewable Energy Target (RET) scheme encourages the deployment of large and small-scale renewable energy technologies, such as wind farms, solar, hydroelectric and biomass power stations including LFG generators, as well as roof top solar panels and solar water heaters. The RET scheme is designed to deliver on the Government's commitment to ensure that the equivalent of at least 20 per cent of Australia's electricity comes from renewable sources by 2020.

Since 1 January 2011, the RET scheme has been operating as two separate parts – the Large-scale Renewable Energy Target (LRET) and Small-scale Renewable Energy Scheme (SRES).

The RET creates a guaranteed market for additional renewable energy deployment using a mechanism of tradeable renewable energy certificates.

The supply of certificates is created by renewable energy power stations using eligible sources including wind, large-scale solar, hydro-electric, biomass (including LFG) and in the future geothermal power, as well as small generation units including roof top solar panels, small wind turbines and micro hydro systems, and solar and heat pump water heaters.

Demand for certificates is created by a legal obligation that is placed on parties who buy wholesale electricity, namely retailers and large users of electricity. Liable entities are required to source a percentage of their electricity purchases from renewable energy to meet annual LRET targets which are legislated in gigawatt-hours (GWh) of renewable energy and to meet obligations under the SRES.

Liable entities can acquire and surrender certificates to meet their obligations under the LRET and SRES. Alternatively, they are required to pay a shortfall charge of \$65 per certificate that they do not surrender.

Clean Energy Initiative

Australian Government has legislated the 20 per cent by 2020 expanded Renewable Energy Target and is investing \$5 billion through the Clean Energy Initiative to support the development of clean energy and energy efficiency technologies. The Clean Energy Initiative encompasses the Australian Centre for Renewable Energy.

Australian Centre for Renewable Energy

The Australian Centre for Renewable Energy (ACRE) is a component of the Government's Clean Energy Initiative. ACRE's objective is to promote the development, commercialisation and deployment of renewable energy and enabling technologies and to improve their competitiveness in Australia. ACRE will become the Government's central point of contact for Australian Government support for renewable energy and enabling technologies.

Renewable Energy Venture Capital Fund

The new fund will make critical early-stage equity investments that leverage private funds to support the commercialisation of emerging renewable technologies, for instance in geothermal, solar, wave and bioenergy technologies.

The Australian Centre for Renewable Energy will work with financial institutions to develop structured renewable energy products to help overcome this hurdle.

State/Territory

Local and State governments have the greatest influence on the establishment and management of LFG developments. Landfills are generally regulated by State Environmental Protection Authorities (State government agencies) and are often required to install appropriate LFG management technologies to reduce odour and explosion risks. Liability and OHS concerns can also prompt a landfill manager to install a landfill gas recovery system.

Recycling targets are increasing, with more waste set to be reused, recycled, and reprocessed before final disposal. Some Australian states and territories have proposed zero waste to landfill targets. The Australian Capital Territory has a Zero Waste policy and New South Wales aims to reduce landfills by 60 percent. This will reduce the potential for methane capture from landfill in

the longer-term, however, the waste degradation process occurs slowly and methane emissions continue long after waste is placed in landfill. Estimates in any year include a large component of emissions resulting from waste disposal over the preceding 25 years. This means that recent changes in waste management practices may not have a significant immediate impact on reported methane emission levels from landfill.

In addition to waste management policies, state and local government greenhouse and emissions management programmes affect LFG projects.

Currently, New South Wales and the Australian Capital Territory have a Greenhouse Gas Reduction Scheme (GGAS), which requires electricity retailers and other large suppliers to reduce state per capita greenhouse gas emissions from the electricity sector. The Scheme imposes enforceable annual reduction targets (between 2003 and 2012) on participants, including electricity retailers, customers taking supply directly from the National Electricity Market, and some generators meeting specific supply requirements. The New South Wales Government has set a statewide benchmark of reducing greenhouse gas emissions to 7.27 tonnes of carbon dioxide equivalent per capita by 2007, which continues to 2012. This target is 5% below the equivalent NSW per capita emissions in 1989-90. Scheme participants are liable to meet their share of the state's electricity sector benchmark by reducing their emissions of greenhouse gases to the pre-set benchmark levels, or paying a penalty. The greenhouse penalty for the 2010 compliance year is \$14 for each tonne of CO₂-e and is reviewed annually and adjusted in line with the movements of the Consumer Price Index (CPI), to allow for inflation.

To reduce the costs of compliance, persons carrying out activities in Australia that abate greenhouse gases can generate abatement certificates. These certificates may be sold to participants who do not meet their benchmarks, who then surrender these off-setting certificates to reduce the emissions attributable to them. LFG operations are eligible to seek accreditation to create abatement certificates under the Scheme, and currently comprise the majority of accredited generating systems participating in the Scheme.

In recent years, the NSW Government has been preparing to transition GGAS to a national carbon trading scheme. In the context of ongoing uncertainty around the timing, form and scope of national carbon pricing arrangements, the NSW Government has commenced a review of GGAS.

A further programme is Green Power, a national accreditation programme that sets stringent environmental and reporting standards for renewable energy products offered by electricity suppliers to households and businesses across Australia. Green Power was formed through the collaborative efforts of State and Territory government agencies to provide support for the establishment and governance of a national voluntary renewable energy accreditation scheme. The programme enables residential and commercial energy consumers to choose government accredited renewable energy products as a means to help reduce greenhouse gas emissions associated with electricity generation.

As at 30 September 2010, there were 784,426 domestic customers and 42,432 commercial customers nationwide producing total Green Power sales of 592,759MWh.

While the Green Power programme, the RET and GGAS share the similar objectives of reducing greenhouse gas emissions from the electricity generation sector, and drive investment in renewable energy, the schemes utilise different mechanisms to deliver this objective – Green Power relies on consumers voluntarily paying a premium for their electricity to be sourced from

renewable generators, whereas RET and GGAS are based on legislated requirements on the electricity retailers, large electricity users and suppliers.

National Opportunities and Potential for Implementing LFG Projects

Key opportunities in Australia relate mainly to new landfills, given that the LFG resource from most existing landfills is either being exploited, or uneconomic.

There are opportunities to develop and implement more effective methods to cap landfills to reduce leakage, as Bioenergy Australia estimates that the best landfills in Australia might leak approximately 50% of the methane. Australia would be interested in collaborating with other Parties who may be able to assist in solving this issue. There are investigations being undertaken on ways to better capture and store methane in landfill by use of better modelling, better designed landfill facilities, and specific anaerobic digestion cells. Maximising methane generation by better controlling what material enters landfill and reducing contamination is also a priority. Australia is interested in participating in improvements in methane capture from existing landfills to better reduce influx of oxygen, better seal landfills via carbon dioxide blankets and less permeable materials, improve monitoring of landfill dynamics and trial a range of extraction techniques.

There are opportunities to introduce advanced forms of generation technologies, in order to reduce costs associated with LFG capture and use. This will contribute to more economical electricity generation, placing LFG in a more competitive position with conventional sources of electricity, such as fossil fuels. Work is being done to investigate improvements in efficiency in gas extraction, energy conversion, generation, and energy export arrangements, including recognition of the benefits of distributed generation, grid stabilisation, and opportunities for obtaining the best energy prices at peak loads on the national electricity market.

7. Domestic Country Strategy

Australia has developed a range of models, references and tools to assist the renewable energy industry, and many of these are relevant to LFG.

The Australian Government has developed a map of all Australian renewable energy generators (including LFG). This map contains locations of Australian renewable power stations greater than 3kW installed capacity with information about fuel type, technology used, size (kW), ownership, latitude, longitude and data source. The site also contains an excel spreadsheet of all operating renewable energy generators including LFG, which may be sorted by fuel source, size, location, ownership and technology used. See: <http://www.ga.gov.au/renewable/>

The Clean Energy Council has developed a Renewable Energy Map, which includes renewable power generation and construction projects ranging from 0.1MW to 1500MW. See: <http://www.cleanenergycouncil.org.au/cec/resourcecentre/plantregistermap>

In 2008, the Australian Bioenergy Roadmap was developed in a collaborative approach working in partnership with key associations and bodies involved with the bioenergy industry in Australia. The Roadmap is designed to set the strategy to build a strong and vibrant Australian bioenergy industry by 2020. The Bioenergy Roadmap is available on the Clean Energy Council's website (<http://www.cleanenergycouncil.org.au/cec/resourcecentre/reports/bioenergyroadmap>).

The Australian Government funded the publication 'Waste to Energy: A Guide for Local Authorities', which provides local governments (who have responsibility for landfill and waste management) with information on opportunities, costs, technologies and potential for generating energy from waste in their jurisdictions. This guide includes information on LFG opportunities. This publication is available on the Clean Energy Council website:

http://www.cleanenergycouncil.org.au/cec/resourcecentre/reports/Past-Reports/mainColumnParagraphs/0/text_files/file13/WasteToEnergy%20Report.pdf

8. International Strategy

Australia is actively involved in a number of international fora to promote the uptake of renewable energy and increase exports, including international bilateral meetings and the Asia-Pacific Economic Cooperation (APEC). Industry and government also collaborate through the Australian Renewable Energy Export Network, to increase Australia's success in exporting renewable energy technologies and services abroad. Australia is a member of the Renewable Energy and Energy Efficiency Partnership (REEEP), a global partnership that structures policy initiatives for clean energy markets and facilitates financing for energy projects.

Australia participates in the International Energy Agency Implementing Agreement on Bioenergy, through Bioenergy Australia. One of IEA's 40 Implementing Agreements, IEA Bioenergy aims to develop cost-effective and sustainable opportunities to increase the use of biomass (including LFG) with the potential to meet 50% of global energy demand this century.

Australia also has a number of bilateral climate change partnerships (with the United States, China, New Zealand, the European Union, and Japan) and bilateral energy partnerships (with the United States, China, Japan, Korea, Taiwan, Indonesia, the Philippines, India and Mexico), which may provide opportunities to pursue joint LFG projects in the future.

9. Australia's Objectives and Support Needs to Facilitate Implementing New LFG Projects

The outcomes of the National Waste Policy indicate a need to:

- develop a nationally consistent classification system that clarifies when a material or product has ceased to be a waste
- clarify how domestic and international classifications of waste and hazardous waste intersect and simplify domestic classifications to ensure that all Australians enjoy equivalent levels of environment protection, to cut red tape for business and governments, to facilitate efficient and effective decision making and to enable Australia to meet its international reporting obligations, and
- explore the development of a nationally consistent classification of biohazardous waste to ensure clarity in the marketplace on how to safely manage these materials and to facilitate the development of sustainable infrastructure.

These will be objectives for future landfill policy makers and will provide Australia with comprehensive, consistent data to underpin decision-making on LFG strategies.

Australia's objectives for developing LFG projects are based on two general aims: reducing greenhouse gas emissions, and driving investment in renewable energy. Both of these objectives can be met through practical and concrete actions to deploy existing technologies leading to LFG

capture and utilisation. The increased use of LFG as an energy source has the additional benefit of diversifying Australia's energy supply.

As outlined above, Australia's current waste management policies are aimed at reducing the total amount of putrescible waste that goes to landfill, in some instances to zero. As such, a further objective is to develop opportunities in international markets for Australian companies specialising in LFG.

There are a number of technological and economic barriers to the implementation and uptake of increased LFG capture and use in Australia. We are looking forward to working with Partners to:

- Identify opportunities for the Australian renewable energy industry to participate in LFG projects in other countries, thereby transferring expertise and technology built up through years of practical experience in Australia.
- Improve economies of scale and reduce operating costs to make LFG projects more competitive with conventional energy generation. Achieving lower prices is a key objective of the Australian renewable energy industry through targeted innovation, achieving economies of scale and managing raw material and processing costs.
- Develop more effective technologies and practices for capturing LFG. Improved practices for capping landfills to contain methane, which is generally problematic because of poor cover material, would increase the amount of LFG available for use in existing projects and reduce leakage to the atmosphere, and may make future projects more economically attractive.
- Attract additional foreign investment in LFG projects. Foreign direct investment would enhance Australia's renewable energy industry by stimulating growth and development, financing capital needs, boosting jobs, and enabling technology transfer.

10. Conclusions and Observations

The Australian Government continues to work with industry to build and develop the LFG industry as outlined in this report update

11. References and sources

Australian Landfill Owners Association www.aloa.com.au

Bioenergy Australia www.bioenergyaustralia.org

Clean Energy Council, Clean Energy Australia Report, 2010

Available from: Clean Energy Council www.cleanenergycouncil.org.au

Department of Climate Change and Energy Efficiency www.climatechange.gov.au

Department of Resources, Energy and Tourism www.ret.gov.au

Department of Sustainability, Environment, Water, Population and Communities www.environment.gov.au

Geoscience Australia www.ga.gov.au

Waste Management Association of Australia www.wmaa.asn.au