

Department of the Environment, Water, Heritage and the Arts

Volume 1

Outcome 1.1

ANNUAL REPORT 2007–08

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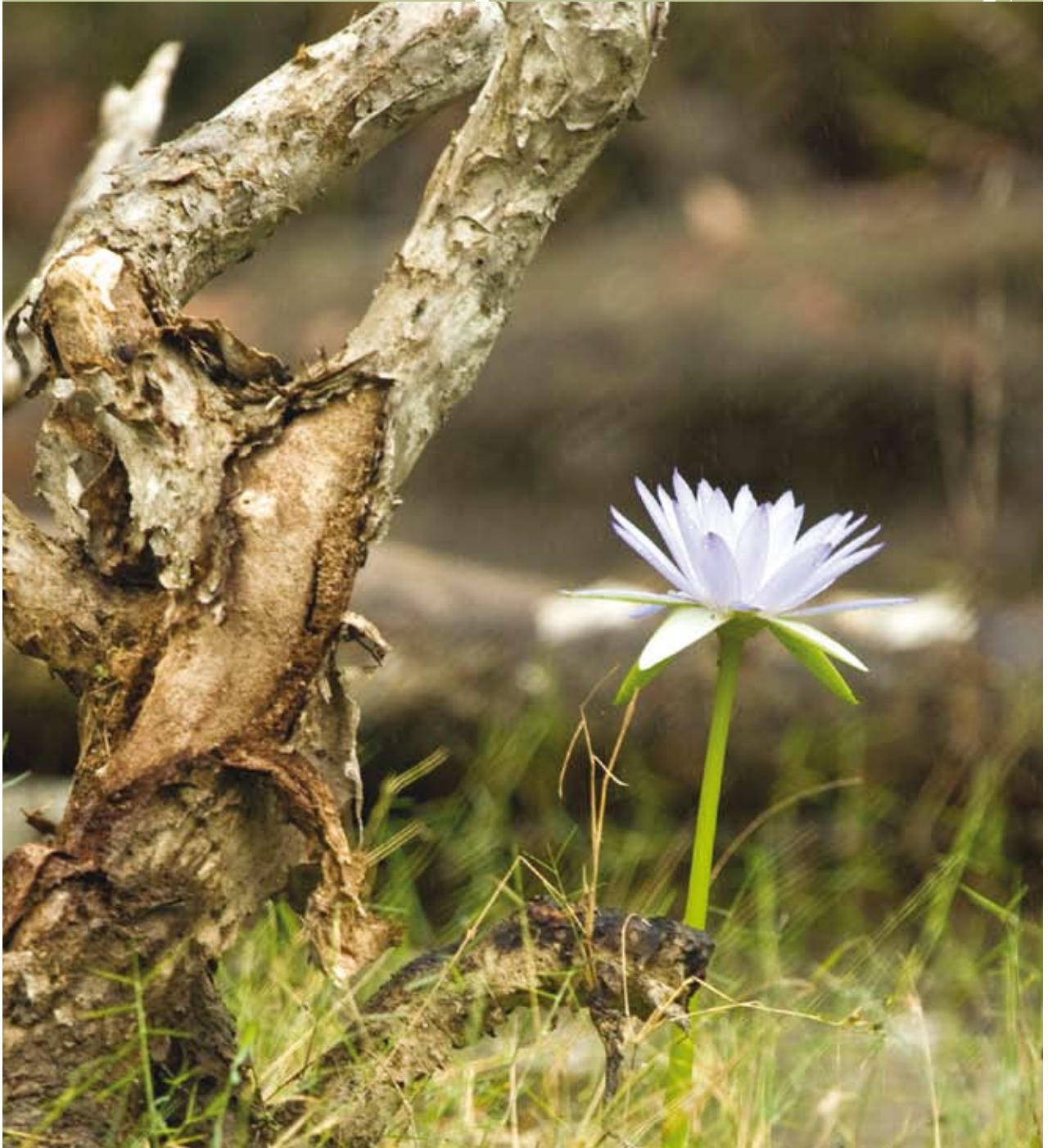
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Australian Government

Department Environment, Water, Heritage and the Arts

Outcome 1
Environment



Output 1.1 Climate change

Introduction

The department is responsible for developing policy advice and delivering on a range of the Australian Government's climate change programs. On 25 January 2008, the government determined Administrative Arrangement Orders which redefined the role of the department. Some program areas which were previously this department's responsibility were transferred to the Department of Climate Change and the Department of Resources, Energy and Tourism. The department, however, retained responsibility for many of the domestic climate change programs. This includes primary responsibility for renewable energy programs, energy efficiency, community and household climate action and greenhouse gas abatement programs.

Main responsibilities for this output

- Provide consistent reporting of greenhouse gas emissions levels
- Working with industry, business and the community across Australia to reduce greenhouse gas emissions and improve energy efficiency
- Renewable energy technology policy and programs

Renewables and
Energy Efficiency
Division

Highlights

- The Low Emission Technology and Abatement–Strategic Abatement sub-program provided multi-year support for 22 diverse projects across the country that actively engaged individuals, households, businesses and communities in local action to address climate change. Projects include building retrofits, Travel Demand Management initiatives including bike, bus and ride to work day, upgrades to facilities and engaging of sporting club members, sustainable public lighting and working with schools.
- The Low Emissions Technology and Abatement–Renewables sub-program has supported capacity building in the renewable energy industry through projects that address barriers to the uptake of renewable energy technologies, including lack of standards, training and skill needs, and information provisions. Six grants for projects were approved.

- A total of 13,762 solar hot water rebate applications were received in 2007–08 with 11,351 rebates paid.
- Over 8,000 applications for rebates under the Photovoltaic Rebate Program (now referred to as the Solar Households and Communities Plan) were approved in 2007–08 financial year, bringing the total approvals for the life of the program to around 20,000.
- Nearly \$30 million was spent under the Renewable Remote Power Generation Program. Seven rebates for major projects and five grants for industry support projects were approved. More than 1,000 small scale rebates were also approved.
- The *Your Building* website guide to environmentally sustainable commercial buildings was completed and launched in September 2007. This project was developed in partnership with the Cooperative Research Centre for Construction Innovation and the Australian Sustainable Built Environment Council.
- A new liquefied natural gas heavy-duty truck engine (the Westport high-pressure direct injection engine) was tested successfully under Australian conditions, through the Alternative Fuels Conversion Program. This engine was found to achieve a 20 per cent reduction in greenhouse gas emissions over a conventional diesel engine on a tank to wheels basis.
- In February 2008 the Australian Government confirmed its commitment to expand the Solar Cities Program from five to seven cities; Adelaide in South Australia, Blacktown in New South Wales, Townsville in Queensland, Alice Springs in the Northern Territory, Central Victoria (region) in Victoria, Perth in Western Australia and Coburg in Victoria. A number of Solar Cities commenced implementation of their projects, including Blacktown Solar City, which installed its first commercial solar photovoltaic (PV) system (the largest single roof-mounted solar power system in New South Wales).
- Two hundred and thirty one local governments, covering 84 per cent of Australia's population, are now participating in the Cities for Climate Protection Australia™ program funded under Local Greenhouse Action. Councils participating in the program have reported a reduction in greenhouse emissions of over 13.3 million tonnes since the program began in 1997.
- Under the Small Business and Household Climate Change Action Initiative 500 energy audits were commissioned in 2007–08.
- As part of the Energy Efficiency program, a national voluntary labelling scheme for television sets was launched. A phase-out of inefficient lighting was accelerated by implementing international engagement under the Australia Pacific Partnership and similar multilateral programs.
- The *Your Home Renovator's Guide* was launched in June 2008 to assist Australian families to improve the environmental performance of their homes. This project was developed in partnership with the home building and design industries and state and territory governments.

Objectives

- To encourage ongoing investment in the development, demonstration and deployment of low emission technologies and other cost-effective abatement activities.
- To encourage emissions abatement and help build support for an effective domestic and global response to climate change.
- To reduce Australia's net greenhouse gas emissions by supporting activities that are likely to result in substantial reductions in emissions or substantial sink enhancement, particularly in the first Kyoto commitment period (2008–2012).
- To increase public awareness and encourage the use of renewable energy in Australia.
- To assist in the transition and adjustment to a low carbon economy by building partnerships with industry, encouraging adoption of energy efficiency measures and promoting local and regional action.
- To increase understanding of climate change issues and actions.

Results

- Greenhouse Challenge Plus conference and awards held in September 2007.
- Blacktown, Adelaide and Alice Springs were formally launched as Solar Cities. Central Victoria (region) was announced as a Solar City on 19 July 2007 and on 10 June 2008 the minister announced \$4.9 million in Australian Government Solar Cities funding for the Coburg Solar City.
- A project by Envirogen Pty Ltd to produce electricity by using waste coal mine gas, otherwise vented into the atmosphere, achieved practical completion during the year. The project is expected to achieve an estimated abatement of up to 1.7 million tonnes of carbon dioxide equivalents in the period 2008 to 2012.
- Implementation of the National Travel Behaviour Change Project was completed and reports submitted. The department is currently working with the individual state and territory jurisdictions to rationalise and harmonise the project data for comparability and consistency, prior to public release.
- Virtually all of the Renewable Energy Equity Fund capital of \$17.7 million was invested in small companies developing innovative renewable energy technologies.
- In 2007–08, the Department signed Funding Agreements for eight new projects under the Renewable Energy and Distributed Generation Task Force of the Asia-Pacific Partnership on Clean Development and Climate, with funds provided from the Department of Resources, Energy and Tourism. These projects involve partnerships between member countries and cover diverse topics relevant to the renewable energy and distributed generation sector, including demonstration of large scale solar power plants, geothermal resource mapping, training and education, research and development of biomass and solar

technologies, and rural electrification. One existing project on strategies to improve business opportunities for the renewable energy industry in India was also successfully completed. In addition, the Department managed four ongoing projects and progressed three projects under development. The Department is now responsible for 16 projects, which accounts for almost half of all Renewable Energy and Distributed Generation Task Force projects put forward by member countries.

- The Energy Efficiency Sub-Group of the Council of Australian Government's Working Group on Climate Change and Water—chaired by the Department of the Environment, Water, Heritage and the Arts—commenced, in early 2008, to prepare options to accelerate or expand the uptake of energy efficiency measures, including the need for a comprehensive and integrated approach. The Sub-Group will report to the Working Group on Climate Change and Water with its findings by the end of August 2008.
- The profile of the Renewable Energy and Energy Efficiency Partnership was lifted in the region with activities including a side event at the Bali Climate Change meeting. Two renewable energy projects were undertaken in the Pacific: an energy efficiency project with local government in Indonesia; and the release of reports on renewable energy opportunities for industry in Asia and strategic program directions for the Partnership in the Pacific. Departmental staff participated in the international governance of the Partnership.
- The *Your Home Renovator's Guide* to assist Australian families to improve the environmental performance of their home was launched in June 2008. This project was developed in partnership with the home building and design industries and state and territory governments.

Strategies

Alternative Fuels Conversion Program

The Alternative Fuels Conversion Program was designed to reduce greenhouse gas emissions from Australia's heavy transport fleet, while at the same time significantly improving air quality by facilitating the uptake of heavy commercial vehicles and buses operating on liquefied natural gas, compressed natural gas, liquefied petroleum gas, hydrogen or hybrid diesel/electric drive-trains. Grants were provided to vehicle owners to partially offset the costs of replacing diesel-powered vehicles with these alternatively-powered vehicles.

The key focus of the Alternative Fuels Conversion Program has been to undertake evaluation of the environmental, operational and economic performance of heavy duty gas engines in road transport applications. Through partnerships with key transport fleet operators and engine and fuel providers, the department has been able to undertake this evaluation in the laboratory and through various road trials. The on-road performance trials in particular, provided the department with substantial information to advise the Australian transport industry on the application of gaseous fuels in their industry.

Greenhouse Challenge Plus

Greenhouse Challenge Plus helps industry integrate greenhouse issues into business decision-making, reduce greenhouse gas emissions and accelerate the uptake of energy efficiency measures. Greenhouse Challenge Plus has approximately 650 business members Australia-wide, covering key industry sectors including agriculture, electricity supply, oil and gas, aluminium, cement, mining and manufacturing. These industries account for almost 50 per cent of Australia's industrial greenhouse gas emissions. Although initially member companies participated in the program voluntarily, since July 2006 companies

receiving more than \$3 million per year of business fuel tax credits are required to join the program to continue receiving these credits.

While the number of members has fluctuated over the life of the program, the coverage of emissions has increased so the total coverage of the program is more than 40 per cent of Australia's total emissions. As part of the focus on regional areas around Australia, a series of workshops was conducted to assist small to medium businesses to better understand their greenhouse footprint.

The Greenhouse Challenge Plus conference and awards were held on 17 and 18 September 2007. The conference was well received by over 200 delegates representing members, industry associations, small, medium and large businesses. The awards event offered an opportunity to recognise and promote the achievements of member businesses over the last two years.

Low Emissions Technology and Abatement Program

The Low Emissions Technology and Abatement Program is designed to reduce greenhouse gas emissions over the longer term by supporting cost-effective abatement projects and the uptake of small scale, low emission technologies in business, industry and local communities. The program has three components (geosequestration, strategic abatement and renewable energy), and is providing:

- \$9 million to the Cooperative Research Centre for Greenhouse Gas Technologies for the Otway Basin geological storage pilot project. The project is monitoring the movement of carbon dioxide that has been geologically stored. The first stage of the project is under way with a new injection well drilled to a depth of 2,249 metres. This component was transferred to the Department of Resources, Energy and Tourism in March 2008.

- \$1.75 million in grants to local communities for 22 strategic abatement projects. This component of the program concluded in May 2008.
- Since the commencement of the program \$3.8 million has been applied to 24 renewable energy projects. This program is also funding work requested by the Environment Protection and Heritage Council on how impediments to the uptake of wind energy might be addressed, including the possibility of establishing a national code for wind farms.

Local Greenhouse Action

The Local Greenhouse Action measure focuses on assisting local government to: reduce greenhouse gas emissions from their own operations; take action with households and businesses to reduce single-passenger car reliance; and increase active transport take-up.

In 2007–08 the department paid \$400,000 in grants under the measure to support local council activities to understand and reduce greenhouse gas emissions. Activities included education initiatives for schools, businesses and the community; energy audits; energy efficient products; and community greenhouse neutral and renewable energy plans. Since the program commenced in 1997 local councils have invested \$164 million and reduced greenhouse emissions by about 13.3 million tonnes.

As of 30 June 2008 there were 231 local governments participating in the scheme, representing around 84 per cent of the Australian population. The latest results for 2006–07 show that local councils reported greenhouse emission reductions of almost 3.7 million tonnes of carbon dioxide equivalent, a 28 per cent improvement over 2005–06. The results for 2007–08 will be available in November 2008.

Results for Cities for Climate Protection™ Australia 2001–02 to 2007–08

Year	Emissions Reduction (million tonnes of carbon dioxide equivalent)	Number of Participating Councils
2001–02	Not available	170
2002–03	0.767	189
2003–04	1.0	203
2004–05	1.5	216
2005–06	2.9	220
2006–07	3.7	236
2007–08	Available November 2008	Value

Two of the major initiatives under the measure, include:

- The Cities for Climate Protection™ Australia program, which was implemented by the International Council for Local Environmental Initiatives Oceania and has been funded by the Australian Government for 11 years. The program assists local governments and their communities to reduce greenhouse gas emissions.
- The TravelSmart Australia program that supports reduced reliance on single passenger car travel and increased active transport take-up, through joint activities with the states and territories, local government and peak transport organisations.

The Household and Small Business Climate Action Initiative

The department helped households and small businesses become more energy efficient through the Small Business and Household Climate Change Action program, announced in March 2007. Under the program, Australians were provided with information about climate change, how to become more energy efficient, and how to calculate their greenhouse gas emissions. Households and small businesses will also be given the opportunity to become 'carbon neutral' through the Greenhouse Friendly™ initiative.

The Household and Small Business Climate Action initiative sought to increase community understanding of climate change and engage individuals, households and small businesses in action to reduce and offset their greenhouse gas emissions. It provided information on what the Australian Government and industry were doing in partnership to address climate change, so householders could see how their actions would help.

Building on the Government's existing Greenhouse Friendly and Local Greenhouse Action programs, the program sought from individuals and households a commitment to reduce their greenhouse gas emissions, and provided access to information, tools and assistance to help them deliver on that commitment.

The strategy is supported by a campaign to raise awareness of the impacts of climate change and encourage involvement in the initiative.

Solar Cities Program

The expanded \$93.8 million Solar Cities Program is an innovative program designed to demonstrate how solar power, smart meters, energy efficiency and new approaches to electricity pricing can combine to provide a sustainable energy future in urban locations throughout Australia. It is a partnership approach that involves all levels of Government, the private sector and the local community. The objectives of the Solar Cities Program are to:

- demonstrate the economic and environmental effects of integrating cost reflective pricing with the concentrated uptake of solar, energy efficiency and smart metering technologies
- identify and implement options for addressing barriers to distributed solar generation, energy efficiency and electricity demand management for grid connected urban areas.

The Solar Cities program is helping to change the way individuals, communities, businesses and governments think about and use energy. Each solar city is delivered on the ground by a consortium made up of a range of different organisations. A funding agreement is negotiated between the Australian Government and the lead consortium member, who then enters into agreements with the remainder of the consortium. Data about energy use is collected from each solar city and stored centrally within the department. This information is analysed to inform future energy and greenhouse policies and is also made publicly available for other agencies and researchers.

Asia-Pacific Partnership on Clean Development and Climate

In 2005 Australia was a key player in the establishment of the Asia-Pacific Partnership on Clean Development and Climate, an international public-private initiative involving the United States, China, Japan, India and the Republic of Korea. Canada joined the Partnership in 2007. The purpose of the partnership is to accelerate the development and deployment of clean energy technologies to meet partner countries' pollution reduction, energy security and climate change objectives. The partnership accounts for about half of the world's population, gross domestic product, energy use, and greenhouse gas emissions.

Of the partnership's eight task forces, the department is responsible for Australian activities in the Renewable Energy and Distributed Generation Task Force and the Buildings and Appliances Task Force.

The Renewable Energy and Distributed Generation Task Force is co-chaired by Australia (with the Republic of Korea), and has been particularly successful in generating industry engagement and support for its activities, including Australia's renewable energy industry. Australian proponents are leading 15 projects under this task force (out of a total of 36), for which the Australian Government has provided approximately \$25 million. One of the Australian-led projects, Pursuing Clean Energy Business in India, by Clean Technology AustralAsia Pty Ltd was completed during 2007–08.

The Australian Government has also approved funding of \$6.2 million for seven projects under the Buildings and Appliances Task Force.

Renewable Energy and Energy Efficiency Partnership

Australia is an active partner in the international Renewable Energy and Energy Efficiency Partnership, which works with governments, businesses, industry, financiers and non-government organisations across the world to expand the global market for clean energy technologies. Through the department, Australia supports a Regional Secretariat for South East Asia and the Pacific, and participates in management of the Partnership at the international and regional level.

Solar Hot Water Rebate Program

The Solar Hot Water Rebate Program aims to accelerate the uptake of greenhouse efficient hot water technologies, to achieve cost-effective household greenhouse gas abatement and assist in future-proofing Australian homes against possible energy price rises. The rebate seeks to reduce the difference in purchase price (after the rebate is applied) between solar (and heat pump) water heaters and comparable electric storage systems, to make solar water heaters more accessible. Revised guidelines were adopted in April 2008 to allow the implementation of improved administrative arrangements and ensure the timely processing of applications.

Renewable Remote Power Generation Program

The Renewable Remote Power Generation Program provides rebates for renewable energy generation and energy efficiency measures in rural and remote areas. The program commenced in 2001 and was extended in 2007 with additional funding. In 2007–08 this funding was revised, bringing the total Australian Government funding for the program to June 2011, to \$285 million.

The aim of the program is to increase the uptake of renewable energy technology in remote areas of Australia. Projects involve mature renewable technologies such as photovoltaics, wind turbines and small hydro-generators.

More than 5,600 rebates have been paid since the commencement of the program. These projects will increase renewable energy generation in remote parts of Australia and reduce the amount of fossil fuels used to generate electricity in areas not connected to the main electricity grid.

In 2007–08, the Renewable Remote Power Generation Program provided approximately \$29.8m in rebates to support more than 1000 small renewable generation rebates, seven major projects and several industry support activities.

Results for Solar Hot Water Rebate Program 2007–08

Number of applications received	13,762
Number of applications paid	11,351
Total paid	\$11,380,000
Number of ineligible applications	821
Number of applications being assessed ¹	1590

¹This number of applications was in-process at 30 June 2008 – received but not yet paid. All applications are assessed within 8 weeks of being received.

Action on Energy Efficiency

In 2007–08 the National Framework for Energy Efficiency continued to be the key framework for delivery of national energy efficiency information and programs. Its focus is to increase the energy efficiency of residential and commercial buildings, of appliances and equipment, and of energy use in the industrial and commercial sectors. The department chairs and supports two committees under the framework:

- The Buildings Implementation Committee, which is responsible for mandatory disclosure of building energy performance data and developing energy performance standards for inclusion in the *Building Code of Australia*.
- The Equipment Energy Efficiency Committee, which implements the national end-use product efficiency standards and labelling program. This committee sets reasonable performance requirements and then checks for compliance.

Greenhouse Gas Abatement Program

The Greenhouse Gas Abatement Program is a grant program that commenced in 2000 to support measures that assist Australia in meeting its obligations on climate change. The program will lapse in 2008–09.

The National Travel Behaviour Change Program aims to reduce the effects of car travel and facilitate voluntary changes in travel behaviour. A workshop to resolve some methodological difficulties encountered during the projects was held in June 2008. It assisted all the jurisdictions to rationalise data collected to enable comparability of results and to ensure consistency in their approaches to long-term abatement monitoring and reporting. Estimates across all Greenhouse Gas Abatement Program projects indicate that the program is on track to achieve greenhouse gas abatement of 3.5 million tonnes of carbon dioxide equivalents in 2008.

Solar Homes and Communities Plan

The Solar Homes and Communities Plan (formerly the Photovoltaic Rebate Program) is a long-standing program designed to increase the use of renewable energy in Australia. The Plan underwent major change in 2007–08 with the maximum level of rebate offered doubled to \$8000 for households and a means test of \$100,000 introduced. The Solar Homes and Communities Plan, through its household and community components, is projected to result in the installation of 14,000 photovoltaic systems on private homes and 400 photovoltaic systems on community and iconic buildings. The photovoltaic industry in Australia has grown significantly in the 2007–08 financial year, with demand for photovoltaic rebates increasing about ten fold due to the doubling of the available rebate.

Evaluation

All of the Australian Government's climate change programs were subject to the *Strategic Review of Australian Government Climate Change Programs* (Wilkins Review) that reported to the government at the end of July 2008.

The results of the Alternative Fuels Conversion Program have highlighted the difficulty of achieving greenhouse outcomes greater than those offered by diesel compression ignition engines. The results of the program have also demonstrated the need to educate many engine and fuel providers on the difference between reducing greenhouse gas emissions and reducing emissions that impact on local air quality.

In addition, there is a lack of suitable heavy-duty test facilities available to engine and fuel developers in the Australian market. This restricts the ability of Australian technology providers to design or assess new heavy engine technologies in Australia.

The results from the Alternative Fuels Conversion Program demonstrated that when launching new technologies in Australian conditions, the provision of adequate support and technical assistance is necessary to enable their full potential to be realised. The introduction of alternative fuels does not necessarily guarantee an environmental benefit, unless adequate product support and technical assistance is also available to prospective users.

An evaluation of the Greenhouse Gas Abatement Program was undertaken in 2006–07. A further internal review of the program is currently being undertaken as a precursor to an independent review intended to commence next financial year, as part of the conclusion of the program.

The termination date for the Solar Homes and Communities Plan program has been brought forward to 30 June 2010. The program will be reviewed in 2008–09 to assess its performance against its objectives.

Case Studies

The Westport Demonstration Project

In late 2006 as part of the Alternative Fuels Conversion Program, the department commissioned a Canadian company, Westport Power Inc, to develop a more powerful version of their heavy duty vehicle engine that would suit Australian conditions and could deliver a reduction of at least 10 per cent in greenhouse gas emissions over the diesel equivalent. The engine was required to meet *Australian Design Rule 80/02* – a vehicle standard under Section 7 of the *Motor Vehicles Standards Act 1989* which prescribes the exhaust emission requirements for engines used in heavy vehicles, to reduce air pollution. The Australian Government, Westport and the transport operators agreed to split the costs of the project to facilitate the introduction of this technology into Australia.

Westport developed a heavy duty vehicle engine using Westport high-pressure direct injection (HPDI) technology on a base diesel 2008 model Cummins 15 litre engine, designed to operate on liquefied natural gas. Importantly, the engine package was supported by the Original Equipment Manufacturer Cummins and by Cummins South Pacific.

The engine was commissioned into four Kenworth T408 demonstration trucks, built as prototypes, and operated by three innovative Australian heavy duty vehicle operators: Mitchell Corp (two trucks) and Sands Fridge Lines (one truck) in Western Australia; and Murray Goulburn Co-operative (one truck) in Victoria. Western Australia is a very difficult environment for heavy vehicle fleet operators because the trucks operate in high ambient temperatures, hauling high loads and covering long distances; while the more congested and cooler conditions in Victoria provided feedback on the operation of the new engine in these conditions.

Prior to the introduction of the Westport HPDI engines, the fleet operators provided driver training packages, including driving and refuelling techniques. During the six-month trial period Westport provided around-the-clock product and technical service and support.

Following the completion of the trial in March 2008 the four trucks had travelled a combined total of 276,800 kilometres. Driver feedback indicated the Westport HPDI engine's driveability and reliability was superior to diesel, with many indicating the Westport truck was preferred over the fleet's standard diesel trucks.

Independent, internationally recognised, emissions testing showed a 25 per cent reduction in greenhouse gas emissions on a tank to wheel basis, with lower levels of nitrogen oxides and particulate matter.

The project demonstrated that with the correct level of engineering, commercially and operationally viable technology could be brought to use in Australia, to deliver greenhouse and economic savings to heavy transport operators. This could not have been achieved without the commitment and expertise of these transport companies. The trucking companies involved agreed that without the government's support, the first-mover risk was too high for the private sector to invest in this new potentially lower emissions technology.



Truck featuring Westport high-pressure direct injection (HPDI) technology
Photo: Courtesy of Mitchell Corp Pty Ltd



100Kw solar system on the roof of Cadbury Schweppes factory, Blacktown Solar City. Photo: Courtesy of BP Solar

Solar Cities

The Australian Government's Solar Cities Program is a visionary new energy concept. It combines solar power, energy efficiency and market reforms to provide information that will lead to a sustainable energy future. The 2008–09 Budget allocated \$18.8m for the expansion of the Solar Cities Program to include Perth, Western Australia and Coburg, Victoria. This additional commitment increases total funding for the program to \$93.8m.

Information and data collected over the life of the program will assist in identifying and implementing options for addressing barriers to distributed solar generation. It will assist with the development of policies that take into account the needs of all Australians.

The information and data collected through the Solar Cities in Adelaide, South Australia; Blacktown, New South Wales; Townsville, Queensland; Alice Springs, Northern Territory; and Central Victoria, will be complemented by the new Solar Cities in Perth and Coburg.

Launched in July 2007, the Blacktown Solar City is a \$34 million project in the high growth region of western Sydney. Up to \$15 million in Australian Government funding is complemented by \$19 million of in-kind and cash contributions from a range of organisations forming the Blacktown

Solar City consortium. Led by BP Solar, the consortium also includes Integral Energy, Blacktown City Council, Big Switch Projects, ANZ Bank, and Landcom.

Over the life of the project the Blacktown community will have the opportunity to participate in 15 different project elements that integrate cost-reflective pricing with solar photovoltaic technology, energy efficiency and demand management. The consortium anticipates that the community will benefit from annual electricity savings of over \$3 million and a reduction of up to 25,000 tonnes in annual greenhouse gas emissions.

One of the Blacktown Solar City project elements aims to install a total of up to 200 kilowatts of solar photovoltaic systems on commercial buildings in the Blacktown local government area. This project element was designed to test and improve the economics of solar photovoltaic delivery on a commercial scale.

The Cadbury Schweppes factory in Blacktown was the first business to take up the commercial solar power offer under the Blacktown Solar City project. As a result, on 1 February 2008, the Minister for the Environment, Heritage and the Arts, the Hon Peter Garrett AM MP launched a 100 kilowatt grid-connected solar photovoltaic system on the roof of Cadbury Schweppes' Huntingwood manufacturing facility in Blacktown. Made up of 640 solar panels, the system is the largest single roof mounted system in New South Wales.

This project is a great example of the innovative trials the Solar Cities Program is enabling across Australia.

Results for performance indicators

Emissions management

Effectiveness of support for greenhouse response within sectors

Emissions management measures continued to receive a high level of support from sectors. The *Greenhouse Challenge Plus* program has 650 business members Australia-wide representing electricity supply, oil and gas, aluminium, cement, mining and manufacturing sectors. The coverage of emissions reported accounts for approximately 26 million tonnes of carbon dioxide equivalent per year, or around 4 per cent of Australia's emissions. The key industry sectors covered by the program account for almost 50 per cent of Australia's industrial emissions.

The *Greenhouse Gas Abatement Program* has been effective in supporting greenhouse response in a range of sectors such as coal mining/ stationary energy, refrigeration, transport, automotive and forestry (plantation agriculture).

Cities for Climate Protection™ Australia's membership has grown to 236 local councils, representing more than 84 per cent of Australia's population.

When fully implemented total abatement for the *Solar Homes and Communities Plan* will be approximately 0.821 million tonnes of greenhouse gas abatement. The program will also see a reduction in grid-supplied household energy consumption in the order of 821,000 megawatt hours per year.

Reported abatement activity including emissions reductions and energy savings

The combined effect of greenhouse gas abatement measures is expected to cut annual emissions by 87 million tonnes of carbon dioxide equivalent by 2010.

Overall abatement expected from *Greenhouse Gas Abatement Program* projects is 19.1 million tonnes of carbon dioxide emissions over the period 2008–2012.

The savings to the environment and the economy from the *National Framework on Energy Efficiency, Stage One* have been significant. For example, the phase-out of inefficient incandescent lights to more efficient lighting, such as compact fluorescent lamps (CFLs) will save up to four terawatt hours of electricity, equivalent to decommissioning one of Australia's smaller coal-fired power stations, four million tonnes of greenhouse gas emissions, equivalent to one million cars off the road and more than \$400 million per year saving more than \$50 per household per year in energy cost.

Once fully implemented the *Solar Hot Water Rebate program* will deliver 6.75 million tonnes of greenhouse gas abatement. The program will also see a reduction in household energy consumption in the order of 675,000 megawatt hours per year.

Electric storage hot water systems are the largest household contributor to greenhouse gas emission after the family car. The Solar Hot Water Rebate Program aims at replacing up to 225,000 existing electric storage systems with climate friendly water heater technology

At the end of June 2008, the *Rural and Remote Power Generation Program* has supported projects that are estimated to reduce annual diesel consumption by approximately 25 million litres per year, reducing emissions by around 72,000 tonnes per year.

Extent of engagement of key stakeholders

The *Solar Cities Program* is strongly supported by the consortia responsible for implementing each project on the ground. Blacktown, Adelaide and Alice Springs Solar Cities are experiencing strong community take-up of the projects following each launch. Reporting systems for the Solar Cities Program were established through funding agreements with the lead consortium member of each successful Solar City

The *Greenhouse Gas Abatement Program* projects regularly engage with stakeholders. For example, officers attended quarterly GreenStamp project participants' meetings, undertook site visits, and facilitated a workshop in Canberra for the National Travel Behaviour Change project participants.

The *National Framework on Energy Efficiency* has been delivered by the Energy Efficiency Working Group, which comprises Commonwealth, state and territory representatives. The NEE Implementation Committees have had extensive stakeholder engagement to deliver improvements in energy efficiency across the residential, commercial and industrial sectors. In September 2007, the Energy Efficiency Working Group conducted consultations on a paper: the 'National Framework for Energy Efficiency Stage 2'.

The *Solar Hot Water Rebate program* engages directly with industry members through the Clean Energy Council and has ongoing liaison with state governments and local government authorities.

Key renewable energy industry, clean technology finance, research and government stakeholders in Australia, India, China, US, Japan, Canada and the Republic of Korea have been engaged through the *Asia Pacific Partnership Renewable Energy and Distributed Generation Task Force*

The *Solar Homes and Communities Plan, Rural and Remote Power Generation Program* and *National Solar Schools Program* teams regularly liaise with the Clean Energy Council and industry participants. These teams also participate in PV Directorate meetings and have addressed meetings of the Solar Energy Installers Association of Australia, the Alternative Technology Retailers Association of Australia, the Australian and New Zealand Solar Energy Society and the Clean Energy Council.

Australia's membership under *Cities for Climate Protection™* has grown to 231 local councils, representing around 84 per cent of Australia's population.

In the *Low Emissions Technology and Abatement – Renewables program*, key stakeholders are the renewable energy peak industry organisations. Officers attend Clean Energy Council meetings on individual technologies, engage through steering committees for project management and attend regular annual conferences of the peak bodies. Commonwealth, state and territory governments have been engaged through the Environment Protection and Heritage Council and the Australian Transport Council to develop a package of proposed vehicle fuel efficiency measures.

Two national workshops were held at the end of 2007 to assess opportunities for national collaboration on travel demand management. This led to the establishment of a Travel Demand Management Working Group to facilitate ongoing dialogue between jurisdictions.

Extent of support for long-term low emission technology uptake

Greenhouse Gas Abatement Program support for long-term low emission technology uptake was provided through projects including:

- Loy Lang: demonstration plant to pre-dry raw brown coal (lignite) by mechanical thermal expression to increase fuel efficiency.
- National Association of Forest Industries: model that can be used by plantation growers and managers to fully evaluate the economic implications of growing trees for carbon sequestration.
- Green Cooling Council: technology to reduce the use of HFCs in the refrigeration industry
- Refrigerant Reclaim Australia Limited: collecting & destroying synthetic greenhouse gases in the form of refrigerants
- Australian Refrigeration Council: implementing a voluntary training and certification scheme to reduce greenhouse gas emissions through environmentally sensitive practices.

In 2007–08, the *Solar Hot Water Rebate program* provided \$11,380,000 in rebates for solar water heaters that replaced high-emission electric storage water heaters.

The *Renewable Energy Equity Fund* continued to provide venture capital to small, innovative renewable energy companies to help commercialise their technologies. The government invested an additional \$1,803,000 during 2007–2008, leveraging an additional \$901,500 in private sector investment. These investments went to companies working on biofuels and marine energy.

In 2007–2008, the Renewable Remote Power Generation Program provided approximately \$29.8m in rebates to support more than 1000 small renewable generation rebates, 10 major projects and several industry support activities.

Estimated cost (Government funds) of greenhouse abatement (\$ per tonne)

Based on 2007 projections of abatement in the Kyoto Protocol first commitment period from 2008–2012 and actual and projected Australian Government funding for programs, the cost of abatement to the Australian Government in this period averages \$5.74 per tonne.

Under *Greenhouse Challenge Plus*, 631 business members report annually and publicly about their progress towards reducing greenhouse gas emissions.

Reporting systems are appropriately targeted	<p>The International Council for Local Environmental Initiatives reports annually to the department on the progress of the <i>Cities for Climate Protection™</i> Australia program, including greenhouse gas abatement achieved by local governments and communities.</p> <p>The outcomes from <i>National Framework on Energy Efficiency</i> Stage One and plans for <i>National Framework on Energy Efficiency</i> Stage Two are reported by Implementation Committees to the Energy Efficiency Working Group. The outcomes of NFEES Stage One and plans for Stage Two can be found at www.nfee.gov.au</p> <p>The <i>Greenhouse Gas Abatement Program</i> reporting systems are appropriately targeted as they are specifically built into Deeds of Agreement with grantees.</p> <p>Reporting systems for the <i>Solar Cities Program</i> were established through funding agreements with the lead consortium member of each successful Solar City.</p> <p>Reporting systems for the <i>Renewable Remote Power Generation program</i> were established under partnership agreements between the Australian Government and participating states and territories.</p> <p>Comprehensive risk management plans are in place for each program.</p>
Risks to program delivery identified and managed	<p>The Blacktown, Adelaide, Alice Springs and Townsville <i>Solar Cities</i>, will receive up to \$57.3 million from the Australian Government and together leverage approximately \$92 million in cash and in-kind funding from other sources.</p>
Investment dollars (or contributory funding) leveraged by projects and programs from other parties	<p>15 projects funded by the Australian Government under the <i>Asia Pacific Partnership Renewable Energy and Distributed Generation Task Force</i>, to a combined value of \$26 million, will collectively leverage approximately \$54 million in cash and in-kind contributions from project partners and other sources.</p> <p>Additional funding for the <i>Renewable Remote Power Generation Program</i>, which became available in July 2007, has stimulated and increased demand for renewable energy in remote areas of Australia. Typically RRPGP rebates are provided as 50% of the cost of eligible components. Total spend in 2007–08 was approximately \$29.8m and it is estimated that this would have leveraged a similar amount in private and other investment.</p> <p>The <i>Solar Homes and Communities Plan</i> provided rebates for approximately 5,000 installations in the 2007–08 financial year, with an installed capacity of 7.8 MW. The program leveraged approximately \$46m of private and other investment during the year.</p> <p>The Australian Government's \$225,000 investment in solar water heater rebates is estimated to leverage \$525,000 in private investment</p> <p>Under the measure supporting the efforts of local councils to reduce greenhouse gas emissions the department paid \$400,000 in grants in 2007–08. Since the program commenced in 1997 local councils have invested \$164 million and reduced greenhouse emissions by about 13.3 million tonnes.</p>

Output 1.2 Climate change

Policy Adviser Role: 95% of briefs and correspondence meet department quality control standards	–	
Regulator Role: Percentage of payments that are consistent with the terms and conditions of funding (Target: 100%)	100%	
Percentage of statutory timeframes triggered that are met (Target: >90%)	>90%	
<i>Price</i>	See Resources table	

Output 1.1: Energy Efficiency and Climate Change Action

Departmental outputs	Budget prices \$000's	Actual expenses \$000's
Sub-output 1.1.1: International engagement	6 114	8 290
Sub-output 1.1.2: Emissions management	71 333	53 631
Sub-output 1.1.3: Understanding climate change	12 153	12 857
Total (Output 1.1: Energy Efficiency and Climate Change Action)	89 600	74 778
Administered items		
Greenhouse Action to Enhance Sustainability in Regional Australia	312	298
Influencing International Climate Change Policy	71	71
Greenhouse Gas Abatement Program	17 136	7 944
Renewable Energy Equity Fund	935	1 799
Alternative Fuels Conversion Program	1 300	845
Renewable Remote Power Generation Program	3 197	1 353
Action on Energy Efficiency	900	233
Local Greenhouse Action	400	393
Low Emissions Technology and Abatement	3 705	3 067
Low Emissions Technology Demonstration Fund	2 000	2 000
Advanced Electricity Storage Technologies	800	300
Securing Australia's Energy Future – Solar Cities	11 291	9 095
Solar Hot Water Rebate Program	20 000	11 345
Climate Change – Science Program	7 811	7 811
Tackling Climate Change – National Solar Schools Plan	8 979	8 999
Tackling Climate Change – Solar Homes & Communities Plan	38 000	38 156
Renewable Remote Power Generation Program (SPP)	27 000	28 573
Tackling Climate Change – Solar Homes & Communities Plan (SPP)	12 811	12 553
Total (Administered)	156 648	134 835