



Outcome 1—Environment | Climate change



Climate change

The Department of the Environment and Water Resources, through its Australian Greenhouse Office, leads the development and implementation of the government's major climate change strategies. The Australian Greenhouse Office comprises the Industry, Communities and Energy Division and the International, Land and Analysis Division.

The department works closely with other departments, including the Department of Foreign Affairs and Trade and the Department of Industry, Tourism and Resources, to progress this work.

Main responsibilities for this output

- International engagement
- Climate change science
- Emissions management

International, Land and Analysis Division

Industry, Communities and Energy Division

Objectives

International engagement

- Engage with other countries to help build an effective global response to climate change

Emissions management

- Work with industry, business and the community across Australia to reduce greenhouse gas emissions and improve energy efficiency
- Limit Australia's greenhouse gas emissions to 108 per cent of 1990 levels by 2008–2012

Climate change science

- Extend Australia's world-class scientific expertise in climate change, and build the capacity of regions, industries and communities to adapt to climate change
- Deliver robust projections of Australia's progress in meeting its greenhouse gas emissions target

Results 2006–07

- The department played an important role in the Prime Minister’s task group on emissions trading; the secretary of the department was a member of the group and the department is leading development of a new national greenhouse and energy reporting system, one of the key building blocks for emissions trading.
- The department continued to play a key role in international negotiations for long-term cooperative action on climate change. A senior departmental officer is co-chairing United Nations talks on global climate change action beyond 2012.
- The department was a lead player in Australia’s establishment of the new Global Initiative on Forests and Climate which aims to reduce deforestation and encourage sustainable management of forests.
- Australia worked with partner countries in establishing 63 projects under the Asia–Pacific Partnership on Clean Development and Climate. Bilateral climate change partnerships also advanced with China and other partners.
- The department played a central role in preparations for the Council of Australian Government’s adoption of the National Climate Change Adaptation Framework. The department will implement the new Australian Centre for Climate Change Adaptation.
- The Australian Climate Change Science Programme continued to support cutting-edge research to improve understanding of climate change.
- The latest annual edition of Australia’s National Greenhouse Accounts showed Australia’s emissions projections were tracking slightly above the 108 per cent Kyoto target. The government is considering further measures to help meet the target.
- Six large low emissions technology projects, which will leverage more than \$2.5 billion worth of investment from the corporate sector, were selected to receive \$410 million of government funding under the \$500 million Low Emissions Technology Demonstration Fund.
- Adelaide, Townsville, Blacktown and Alice Springs were announced as Solar Cities under this \$75 million programme.
- Support for the solar industry expanded with announcements of major extensions to rebates for solar panels in both urban and rural areas.
- Community engagement continued to grow; 220 local governments covering 82 per cent of Australia’s population are now participating in the Cities for Climate Protection Australia programme which has celebrated its 10th anniversary.
- New energy efficiency measures for appliances, equipment and buildings were announced.





Australia's climate change strategy

The Australian Government has a comprehensive strategy to respond to the challenge of climate change in which it has already invested more than \$3 billion. The strategy's major objectives are to:

- engage with other countries to build an effective global response to climate change that is environmentally effective, economically efficient and includes all major emitters
- reduce greenhouse emissions by improving energy efficiency; investing in low emissions technologies, such as renewable energy technologies and clean coal; and investing in local and regional actions
- support scientific research to improve understanding of climate change and its potential impacts, and assist industries and communities to adapt to the unavoidable impacts.

In 2006–07 the Prime Minister announced emissions trading as a major new component of the government's climate change strategy. Emissions trading will complement and build on past and present measures to tackle climate change including the 2004 energy white paper, the 2004–05 Climate Change Strategy, and the Measures for a Better Environment and Safeguarding the Future packages.

Recent developments in the international arena increased the impetus to develop a more effective long-term global agreement that extends beyond 2012 when the initial Kyoto Protocol targets expire. The need to take more effective global action is being driven by advances in scientific understanding and increasing public interest in the issue. A senior departmental officer is co-chairing United Nations talks on global climate change action beyond 2012.

Emissions trading

Emissions trading will be the primary mechanism for achieving Australia's long-term goals for greenhouse emissions reduction. Australia will adopt a domestic emissions trading system by 2012. The system will have a strong economic foundation and will take into account global developments in responding to climate change while preserving the international competitiveness of Australia's export industries that are emissions intensive. Through emissions trading, the market will help Australia develop and implement cost effective technologies for cutting greenhouse emissions.

The department played a key role in the development of the government's emissions trading strategy. The secretary, Mr David Borthwick, was a member of the Prime Minister's Emissions Trading Task Group, which provided detailed advice on the nature and design of a workable global system in which Australia would be able to participate. Departmental officers also provided technical advice to the task group, including staff being seconded to the task group secretariat.



International engagement on climate change

During 2006–07 Australia continued to pursue international action on climate change by engaging with other countries through multilateral and bilateral forums. The outcomes of these forums are discussed below.

United Nations climate change negotiations

Australia is a party to the United Nations Framework Convention on Climate Change, the primary multilateral forum for addressing climate change. The convention lays the basis for global action to protect the climate system for present and future generations. The department played a major role as part of the Australian delegation to the twice-yearly meetings of the convention, and throughout 2006–07 the department’s representatives co-chaired several key negotiations.

The head of the Australian Greenhouse Office, Mr Howard Bamsey, is currently co-chairing the convention’s two-year Dialogue on Long-term Cooperative Action to Address Climate Change. This dialogue is addressing issues such as developing technology to mitigate greenhouse gas emissions, adapting to the unavoidable impacts of climate change, and linking sustainable development and climate change. These themes are also central to the work of the Asia–Pacific Partnership on Clean Development and Climate, and the Group of Eight Plus (G8+) Dialogue on climate change, clean energy and sustainable development. Australia is also actively engaged in these forums.

In March 2007 Australia hosted a United Nations Framework Convention on Climate Change workshop on reducing emissions from deforestation in developing countries, and played a central role in driving progress on this important issue.

Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change is an international panel of scientists and researchers that is acknowledged by governments around the world, including the Australian Government, for its authoritative advice on climate change science. It was established by the World Meteorological Organization and the United Nations Environment Programme in 1988. The main function of the panel is to prepare comprehensive assessments of scientific and technical information related to climate change. Its assessments and reports are based on published and peer-reviewed scientific and technical literature.

In the first half of 2007 the Intergovernmental Panel published the first three volumes of its Fourth Assessment Report, Climate Change 2007. These volumes



deal with the physical science basis of climate change; impacts, adaptation and vulnerability to climate change; and mitigation of climate change. The final volume of the report, known as the Synthesis Report, consolidates key findings from the other reports into an integrated form suitable for decision-makers from government, business and industry. It will be released in November 2007. The Fourth Assessment Report finds that warming of the climate system is unequivocal, and confirms and strengthens the major conclusions detailed in the Third Assessment Report, *Climate Change 2001*, on the impacts of climate change for Australia and the world.

The department is the Australian Government's contact point with the Intergovernmental Panel and played a key role in facilitating the government's review of the draft volumes of the Fourth Assessment Report. The department was the lead Australian Government agency at the Intergovernmental Panel meetings that approved the report, and negotiated the content of the summary for policy makers for each volume. The department is currently leading the Australian Government review of the draft Synthesis Report and the first draft of an Intergovernmental Panel on Climate Change Technical Paper on Climate Change and Water, which will be released in April 2008.

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, a regional initiative with the United States, China, Japan, India and the Republic of Korea. The purpose of the partnership is to develop, deploy and transfer technologies to address climate change (see website at www.asiapacificpartnership.org). The partnership accounts for almost half of the world's population, gross domestic product, energy use and greenhouse gas emissions.

At the inaugural ministerial meeting of the partnership in January 2006 the Prime Minister announced an Australian Government commitment of \$100 million over five years to support practical projects; at least 25 per cent of the funding is earmarked for renewable energy.

The partnership's eight taskforces (on cleaner fossil energy, renewable energy and distributed generation, power generation and transmission, aluminium, buildings and appliances, cement, coal mining, and steel) have developed action plans which were released by the Prime Minister in November 2006. At the same time the Prime Minister announced the first \$60 million of Australian Government funding for 42 of the initial cooperative projects. Since then, the government has announced its support for an additional 21 projects, which fully commits project funding under the \$100 million initiative.



Australia co-chairs the Renewable Energy and Distributed Generation Taskforce with the Republic of Korea. This taskforce has been particularly successful in generating very strong industry engagement and support, including from Australia's renewable energy industry.

The department also has a lead role in the Buildings and Appliances Taskforce and the Australian Government has approved funding of \$6.2 million for seven projects under this taskforce.

Ministers from all partner countries will meet again in the latter half of 2007 to review progress under the Asia–Pacific Partnership.

G8+ Dialogue on Climate Change, Clean Energy and Sustainable Development

The aim of the G8+ dialogue is to address the strategic challenge of transforming existing energy systems to create a more secure and sustainable future. Members representing more than 20 major greenhouse gas emitting countries have agreed to work together on clean energy technologies. Other commitments include devising a new model for cooperation between developed and developing countries, and sharing experiences on adapting to the impacts of climate change. Australia has participated in this important dialogue since its launch in 2005.

Global Initiative on Forests and Climate

On 29 March 2007 the Australian Government announced its \$200 million Global Initiative on Forests and Climate to support and encourage practical action to help save the world's forests and reduce global greenhouse gas emissions. Deforestation is responsible for about 20 per cent of global greenhouse gas emissions. Reducing deforestation, planting new forests and encouraging sustainable forest management practices can quickly reduce global emissions. For example, halving the rate of deforestation would reduce annual global greenhouse gas emissions by around three billion tonnes.

The initiative will provide financial incentives to reduce deforestation, encourage sustainable forest use and reforestation, support effective law enforcement, build technical capacity, and develop and deploy the technology needed to help developing countries monitor and produce robust assessments of their forest resources.

The Minister for the Environment and Water Resources visited Indonesia and the United States in April 2007 and both countries agreed to work with Australia on this initiative. Officers from the department, AusAID and the Department of Agriculture, Fisheries and Forestry held discussions in Papua New Guinea and



Indonesia in May about potential projects. Follow-up discussions to develop projects in Indonesia, Papua New Guinea and other regional countries are planned. Other countries including Brazil, Canada, the United Kingdom, Germany and New Zealand have welcomed the initiative. Australia hosted a major, high-level meeting in Sydney in July 2007 that brought together countries and organisations committed to reducing global deforestation.

Bilateral partnerships

Australia continued to work with its bilateral climate change partners—China, the United States, New Zealand, Japan, the European Union—and more recently with South Africa. More than 60 cooperative projects responding to global climate change are now under way through these partnerships. The partnerships also provide a positive framework for high-level engagement on policy issues.

China: Further practical actions to address climate change were agreed under the Australia–China Climate Change Partnership. In October 2006 ministers from the two countries agreed on a statement of intent establishing the priority areas for future project activity, and on 11 new joint projects in the areas of renewable energy, energy efficiency, coal mine methane, and climate change science. The then Minister for the Environment and Heritage used this opportunity to lead a major renewable energy and energy efficiency business mission to China with the involvement of over 36 Australian and more than 150 Chinese companies. Early in 2007 the Australian Government announced the establishment of an Australia–China joint coordination group on clean coal technology which will complement work being undertaken through the bilateral partnership and the Asia–Pacific Partnership.

United States: Five new bilateral climate change projects were agreed with the United States in November 2006, bringing to 43 the total number of projects agreed under the Australia–United States Climate Action Partnership. The projects come under six themes: emissions measurement and accounting, climate change science, stationary energy technology, engagement with business to create economically efficient climate change solutions, forestry and agriculture, and collaboration with developing countries to build their capacity to deal with climate change.

New Zealand: Australia continued to work closely with New Zealand under the Australia–New Zealand Climate Change Partnership to improve climate change science and monitoring, and assist Pacific Island countries to address the regional challenges posed by climate change. In March 2007 Australia and New Zealand co-hosted a United Nations workshop to discuss policy approaches to reducing emissions from deforestation in developing countries. Australia and New Zealand

continued their support for the Fiji Equipment Energy and Efficiency Programme to help Fiji implement a national energy efficiency standards and labelling scheme.

Japan: The Japan–Australia Practical Collaboration on Climate Change continued to support useful exchanges of information and expertise between the two countries, for example through the Asia–Pacific Seminar on Climate Change, an annual network of climate change policy makers from the region, which is primarily sponsored by Japan.

European Union: In 2005 the department signed a memorandum of understanding on end use energy efficiency programmes with the European Commission’s Joint Research Centre. This agreement continues to promote energy efficiency in Australia and the European Union through technical exchanges including developing methodologies to assess the impact of energy efficiency policies on buildings, mapping the potential to reduce the power consumption of electronic appliances when on standby, and benchmarking the performance of residential air conditioners.

South Africa: In May 2006 Australia announced a new bilateral climate change partnership with South Africa. The partnership focuses on climate change impacts and adaptation in the agriculture sector; climate change and biodiversity; greenhouse gas emissions reporting and monitoring; and exchanging experiences and lessons learned on climate change policies and measures, with particular emphasis on clean coal technologies and regulatory and institutional frameworks. In August 2006 South Africa hosted a delegation of Australian government, industry and research organisation representatives under the partnership. Three new bilateral projects are now being developed and implemented.





Greenhouse gas emissions management

The Australian Government has implemented a range of policies and programmes to reduce Australia's greenhouse gas emissions. The programme's aims are to build partnerships with industry to improve energy efficiency, develop low emissions technologies, and invest in local and regional actions to reduce emissions.

Some policies and programmes are focused on ensuring that Australia is meeting its commitment to reduce Australia's greenhouse gas emissions to the levels agreed during the 1997 Kyoto negotiations (108 per cent of the level of 1990 emissions by 2008–2012). Others are designed to support the development of new technologies that will be required to make much larger cuts in Australia's emissions in the longer term.

Renewable and low emissions energy

The \$75 million **Solar Cities** programme is demonstrating the costs and benefits of solar power, energy efficiency, cost-reflective pricing and smart metering technologies on a large scale. Successful Solar Cities sites announced during 2006–07 were Adelaide, Townsville, Blacktown and Alice Springs.

The Australian Government's \$500 million **Low Emissions Technology Demonstration Fund** is operating from 2005–2020 to support the demonstration of new low emission technologies with long-term greenhouse abatement potential. The fund, which is managed jointly by the department and the Department of Industry, Tourism and Resources, will leverage more than \$2.5 billion worth of investment from the corporate sector. Six projects were announced in 2006–07.

Three projects, totalling \$1.5 billion including \$225 million in government funding, will be undertaken in Victoria. The government will contribute:

- \$75 million for the construction of the world's largest solar concentrator in the Mildura region. This renewable energy power station will focus concentrated sunlight onto high-efficiency photovoltaic cells to generate electricity
- \$50 million for the Hazelwood 2030 project to retrofit brown coal drying technology and incorporate a pilot carbon dioxide capture and underground storage facility
- \$100 million to build a 400 megawatt integrated drying gasification combined-cycle power generation plant in the Latrobe Valley.

Two projects, totalling \$643 million including \$125 million in government funding, will be undertaken in Queensland. The government will contribute:

- \$75 million for a project to extract and burn methane from coal and inject and store the carbon dioxide emissions underground



- \$50 million for a world-first oxy-fuel demonstration project to retrofit the Callide power plant. This \$188 million project involves burning coal in an oxygen-rich environment to produce electricity. The resulting carbon dioxide exhaust gases will be captured and stored underground.

A third project in Western Australia is receiving \$60 million in funding. The project will demonstrate liquefying of carbon dioxide from liquefied natural gas processing, piping it to the injection site, injecting it 2.5 kilometres underground into a geological structure and monitoring the stored carbon dioxide to ensure its safety.

The **Low Emissions Technology and Abatement** programme will 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 programme 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. The injection of carbon dioxide is expected to take place in the second half of 2007.
- \$3.5 million for 15 renewable energy projects. This component is also funding development of a national wind code for the location of wind farms. The code will provide consistency, certainty and transparency in public consultation and approval processes.
- \$1.75 million in grants to local communities for 22 strategic abatement projects following assessment of 170 expressions of interest for grants.

The **Wind Energy Forecasting Capability** initiative will help increase the value of wind energy in electricity markets by more accurately predicting wind energy generation. An agreement was signed with the National Electricity Market Management Company to implement software and systems. Under an international tender process, a system provider was secured to implement the wind energy forecasting system. Research to support system development is ongoing.

The department participates in selecting projects for funding under the **Renewable Energy Development Initiative**. The initiative is administered by AusIndustry and supports innovative renewable energy technologies through grants for research and development, proof of concept and early stage commercialisation. The initiative provides \$100 million to industry from 2004–2011. So far over \$51.9 million has been approved for 24 projects.

The **Advanced Electricity Storage Technologies** programme is funding five projects worth more than \$17.6 million to develop and demonstrate advanced



technologies for storing electricity generated through intermittent renewable sources, such as wind and solar. The projects commenced in June 2007 and will run for three years. Further projects are being considered and more grants may be approved later in 2007.

In August 2006 the Australian Government expanded the **Renewable Remote Power Generation Programme** and extended it from June 2007 to June 2011. This brings total Australian Government funding for the programme to over \$328.5 million.

In 2006–07 \$13.8 million was committed under the programme for around 400 grants to increase renewable energy generation in remote parts of Australia and to reduce the amount of diesel used to generate electricity in areas not connected to the main electricity grid. These grants brought the total number of projects funded to over 4,000 and the total committed funding to \$124 million. Projects cover all mature renewable technologies including solar, wind and small hydroelectricity.

The **Renewable Energy Commercialisation Programme** ended in 2006–07. Of the 49 projects funded, 34 were successfully completed. Of the remainder, nine are being finalised and six have been terminated by mutual agreement. Promising technologies funded included Origin Energy's SLIVER solar cells, Solar Systems' solar dishes, Oceanlinx's wave powered generator, T3Energy's Fusion6 solar home heating system and Geodynamics' hot rock energy project. High impact demonstrations supported include the Solar Sailor solar-powered watercraft, a building-integrated solar wall at Melbourne University, and solar panels on the roof of Melbourne's Queen Victoria Markets.

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 \$549,000 during 2006–07, leveraging an additional \$275,000 in private sector investment. These investments involve three companies working on biofuels and marine energy.

The **Photovoltaic Rebate Programme** provides cash rebates for consumers who install grid-connected or stand-alone photovoltaic systems. In 2006–07 the programme provided over 1,200 rebates, representing more than \$5.8 million invested by the government in photovoltaic infrastructure. This brings the total number of photovoltaic systems installed over the life of the programme to more than 8,500. In the 2007 Budget the programme was expanded and the rebate doubled.

The **Mandatory Renewable Energy Target** scheme aims to encourage investment in renewable energy technologies to reduce greenhouse gas emissions. The scheme sets up a national renewable energy market based on a system of tradable certificates. The Office of the Renewable Energy Regulator administers the scheme, although policy responsibility remains with the department.



The Australian Government committed to a mandatory renewable energy target of 9,500 gigawatt hours by 2010 in the energy white paper *Securing Australia's Energy Future*. In 2006 the government made a number of legislative and regulatory amendments to the *Renewable Energy (Electricity) Act 2000* to enhance market transparency and improve business certainty, provide increased opportunities for solar and bioenergy technologies, and improve the operational effectiveness and efficiency of the legislation. The amendments were passed by parliament in June 2006 and came into effect on 11 September 2006.

Action on energy efficiency

The department continued to support implementation of the **National Framework for Energy Efficiency**. The framework delivers national energy efficiency information and programmes. It focuses on increasing the energy efficiency of residential and commercial buildings, appliances and equipment, and energy use in the industrial and commercial sectors. It also covers training and accreditation and increasing consumer awareness.

The department chairs and supports two committees under the framework. The Building Energy Efficiency Committee is responsible for mandatory disclosure of building energy performance data and developing energy performance standards for inclusion in the Building Code of Australia. In 2006–07 the committee completed a residential mandatory disclosure scoping study and issues paper, and launched the Nationwide House Energy Rating Scheme website (www.nathers.gov.au).

The National Appliance and Equipment Energy Efficiency Committee implements the national Minimum Energy Performance Standards and Labelling programme. In 2006–07 the committee finalised strategies to reduce to a maximum of one watt the standby power used by appliances and to phase out incandescent light bulbs. It also increased its focus on enforcement with suppliers being held accountable for misleading statements on energy efficiency where they cause a cost to consumers.

Building industry partnerships

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 720 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 member companies participate in the programme voluntarily, since July 2006 companies receiving more than



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

Greenhouse Challenge Plus has built the capacity of Australian business to understand and address climate change and to report their greenhouse gas emission levels more consistently. While the number of members has fluctuated over the life of the programme, the coverage of emissions has increased. In 2006–07 this increase accounted for coverage of an additional 26 million tonnes of carbon dioxide equivalent per annum, or approximately 4 per cent of Australia's emissions. The total coverage of the programme is now more than 40 per cent of Australia's total emissions.

Greenhouse Friendly™ is part of Greenhouse Challenge Plus. Its focus is to develop a credible, rigorous and independently verified voluntary greenhouse gas abatement offset and carbon neutral certification scheme. Increasing public awareness about climate change and growing business interest in the voluntary offset market in Australia have resulted in a significant increase in interest in Greenhouse Friendly™.

Greenhouse Friendly™ currently manages 17 carbon neutral certifications, with a further 26 prospective carbon neutral certifications in the pipeline. In 2006–07, Greenhouse Friendly™ abatement projects grew from 13 to 23 individually approved projects. The programme is currently servicing 29 prospective abatement providers seeking approval under the programme. Current total abatement for the programme is now close to four million tonnes of carbon dioxide equivalent, with nearly two million tonnes of carbon dioxide equivalent approved in 2006–07.

This year Greenhouse Friendly™ approved a variety of new abatement projects and certified a number of greenhouse neutral services, products and organisations including Virgin Airlines, Channel 7's *Sunrise*, Mystique Printers and Renewtek IT Services.

Examples of Greenhouse Friendly™ approved abatement projects include:

- **Minding the Carbon Store.** This project, operated by The Carbon Pool Pty Ltd, offered financial inducement to landowners in Queensland for not clearing remnant natural vegetation from land over which they have a valid tree-clearing permit. Participating landowners vest carbon rights in The Carbon Pool Pty Ltd.
- **Lighten Your Load Australia.** This project, operated by Easy Being Green, seeks to reduce household electricity consumption and associated greenhouse gas emissions by facilitating the replacement of incandescent lights with more efficient compact fluorescent lights.

The **Greenhouse Gas Abatement Programme** provides funding for large-scale projects that use low emissions technologies and practices including



energy efficiency, travel demand management, alternative fuels, coalmine gas technologies and fuel conversion. Twelve projects are on track to deliver emissions reductions from 2008–2012. The most recent emissions projections show that the programme will deliver a reduction of 4.74 million tonnes of greenhouse gas emissions in 2010.

The department is working with major transport fleet operators to assess the environmental and economic case for using compressed natural gas, liquefied natural gas and liquefied petroleum gas in heavy vehicle fleet operations under the **Alternative Fuels Conversion Programme**. This programme has shown that alternative fuels make economic and environmental sense for some transport tasks. The department will continue to work with transport operators, engine manufacturers and fuel producers to explore practical options to improve the efficiency of transport fuel usage.

Greenhouse and energy reporting

The department continued to deliver on the Australian Government's 2004 energy white paper commitment to streamline greenhouse and energy reporting by business. Streamlined reporting will reduce the burden placed on businesses participating in greenhouse and energy programmes, and improve the quality of the data reported.

The department continued to work with the states and territories to develop a nationally consistent and streamlined framework for greenhouse and energy reporting by business. In April 2007 the Council of Australian Governments agreed to establish a national greenhouse gas emissions and energy reporting system, one of the key building blocks for establishing an emissions trading scheme.

Local and regional action

The Australian Government helps local governments to reduce their greenhouse gas emissions through the **Local Greenhouse Action** programme. The programme includes **Cities for Climate Protection™ Australia**, which provides assistance, information and incentives for local governments and communities to understand and reduce the potential impacts of climate change.

In 2006–07 the department paid \$400,000 in grants to support local council activities to 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 programme commenced in 1997 local councils have invested \$144 million, including \$79 million for corporate measures and \$65 million for community measures, to reduce greenhouse emissions by about 8.8 million tonnes.



As of 30 June 2007 there were 220 local governments participating in the scheme, representing more than 82 per cent of the Australian population. The latest results for 2005–06 show that local councils reduced their greenhouse emissions by almost 2.9 million tonnes of carbon dioxide equivalent, a 43 per cent improvement over 2004–05. The results for 2006–07 will be available in November 2007.

Results for Cities for Climate Protection™ Australia 2001–02 to 2006–07

Year	Emissions reduction (million tonnes 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	218
2006–07	Available November 2007	220

Greenhouse Action to Enhance Sustainability in Regional Australia is a \$25 million programme funded to 2009. The programme works with partners to trial new and improved agricultural and land management techniques, support forest sink activities, and integrate greenhouse gas management with regional resource management. Partnerships with rural research and development corporations are increasing investment and ensuring practical outcomes that can be adopted by industry.

In 2006–07 more than \$7 million was invested in new projects, adding to the \$44 million previously invested by government and industry. The projects explored ways to reduce methane emissions from livestock, studied emissions from agricultural soils, and supported workshops for forest growers. The workshops showed forest growers how to achieve carbon sequestration from forest sink projects, and trained them to use the National Carbon Accounting Toolbox.

In April 2007 the Council of Australian Governments agreed to develop emissions intensity benchmarking for agriculture. Industry views are contributing to development of a framework for continuous improvement in both emissions management and productivity.

The government announced a new measure in the 2007 Budget providing tax deductions for investors who want to establish forests dedicated to removing carbon dioxide from the atmosphere. This initiative is designed to stimulate investment in this emerging type of greenhouse emissions abatement.

Work underpinning the initiative was carried out by the department and Treasury.



New householder and business initiatives

Phase-out of inefficient light bulbs

The Australian Government, working with the states and territories, will gradually phase out all inefficient incandescent light bulbs and is aiming for full enforcement of new lighting standards and legislation by 2009–2010.

The transition to more efficient lights, such as compact fluorescent light bulbs, which use just 20 to 25 per cent of the power of a comparable incandescent bulb and last four to 10 times longer, should reduce Australia's annual greenhouse gas emissions by four million tonnes from 2012. The reduction in emissions will increase as the phase-out progresses and the annual average reduction between 2008 and 2012 is estimated at around 800,000 tonnes. Household lighting costs could also be reduced by up to 66 per cent.

Small Business and Household Climate Change Action

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

Greenhouse friendly refrigerants

The Australian Government is investing up to \$2 million under the Greenhouse Gas Abatement programme to increase the uptake of greenhouse friendly refrigerants. The minister launched a pilot programme in February 2007 through which the Natural Refrigerants Transition Board Ltd is trialling natural refrigerant technologies in five supermarkets across Australia. The project has the potential to be rolled out to an estimated 150 supermarkets across Australia and to cut greenhouse gas emissions by more than 380,000 tonnes between 2008 and 2012.



The Hawkesbury Forest Experiment



Tree chambers cover growing eucalyptus saplings. Photo: Sally Tsoutas, University of Western Sydney

The department is providing \$1.2 million to help fund the Hawkesbury Forest Experiment being conducted at the Richmond campus of the University of Western Sydney. The experiment is using whole tree chambers to obtain information on how increased levels of atmospheric carbon dioxide will affect the growth of eucalyptus trees and the amount of water they use. This project will provide new information about the impacts of climate change on rates of carbon sequestration.

The sealed chambers create a mini ecosystem. Some of the chambers have carbon dioxide at the current level in the atmosphere, and others have double that amount. The carbon dioxide levels and temperature can be changed. Some of the trees will be well watered and others will be subjected to drought conditions. The experiment will show how trees cope under different conditions.

This information will help scientists make predictions about how Australia's eucalypt forests and woodlands will respond to rising carbon dioxide levels over the next 50 years and what effect this will have on water availability in catchments. For example, rising carbon dioxide may increase forest productivity by accelerating the growth of the canopies and stems of trees. Denser canopies may reduce the amount of rainfall reaching the soil, and this in turn may reduce water flow into streams, rivers and groundwater storage, resulting in less water available for industry and people.

The information will also help scientists work out the carbon storage potential of forests and woodlands. For example, increased stem productivity may lead to greater carbon storage in forests, thereby decreasing the amount of carbon dioxide in the atmosphere, an important factor for determining carbon credits.



Understanding climate change

The Australian Government's response to climate change depends on having high quality scientific knowledge about the contributing influences and mechanisms. The government's response also depends on the capacity to accurately measure greenhouse gas emissions at a national and sectoral level, and the ability to identify and respond to emerging issues.

Australian Climate Change Science Programme

The Australian Climate Change Science Programme is supporting research into the nature, causes, timing and implications of climate change for Australia. The programme helps to maintain Australia's world-class climate modelling capacity, and is one of the main reasons Australia is recognised internationally for the quality of its climate change science.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Bureau of Meteorology and a number of Australian universities are collaborating to develop the Australian Community Climate and Earth System Simulator with support from the Australian Climate Change Science Programme. This simulator is a major step forward in climate modelling that will allow Australia to keep pace with emerging world's best practice as the scope, sophistication and power of climate modelling continues to grow.

National Climate Change Adaptation Programme

Some degree of climate change is inevitable due to the level of greenhouse gases already in the atmosphere. The National Climate Change Adaptation Programme is helping Australians manage the consequences of climate change.

In April 2007 the Prime Minister announced an intention to commit up to \$26 million to establish and manage the Australian Centre for Climate Change Adaptation, and \$100 million programme funding for the centre over five years. The new centre will commission scientific work to develop practical responses to climate change. The work will assist planning bodies, farmers, businesses and local governments to understand the impacts of climate change and develop responses. The centre will work closely with the states and relevant bodies to ensure the National Climate Change Adaptation Framework, endorsed by the Council of Australian Governments in April 2007, is adopted. The department played a leadership role in developing the framework.

Other work under the programme in 2006–07 included:

- a \$2 million partnership between the department and the Great Barrier Reef Marine Park Authority to develop a climate change action plan for the reef, which will be completed in 2007



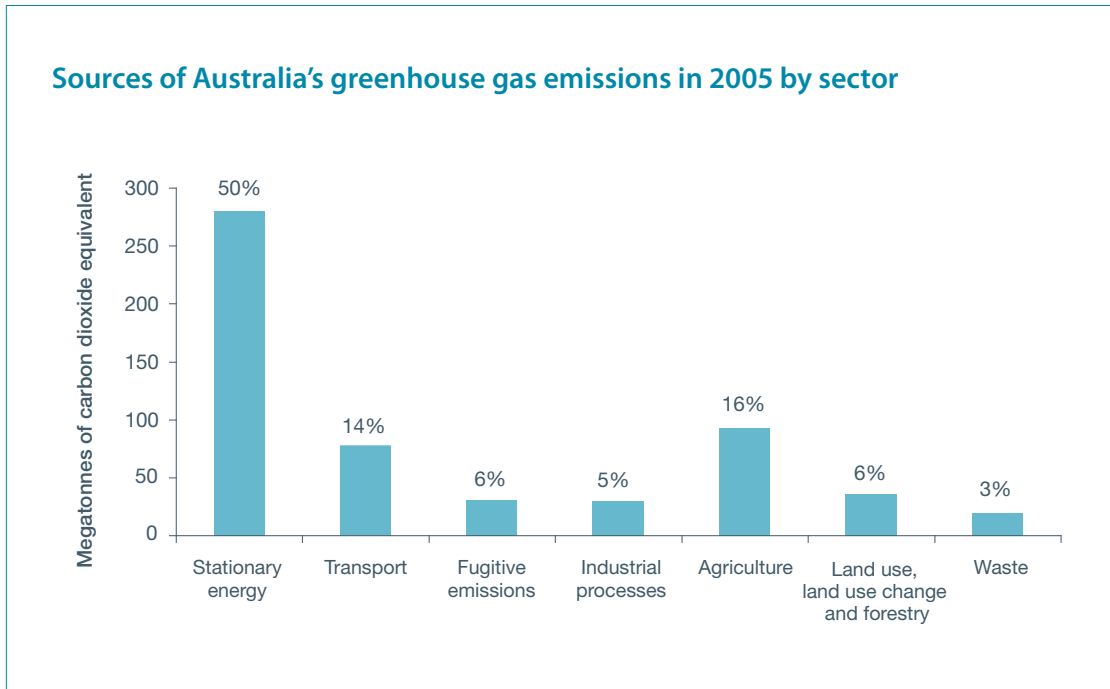
- a preliminary assessment of the risk climate change poses to Australian water resources, and a partnership to study risks to Sydney's water supply
- progress on a national assessment of the vulnerability of Australia's coastal zone to the impacts of climate change, spanning risks to infrastructure, settlements and ecosystems
- scoping studies of the implications of climate change for Australia's World Heritage properties and National Reserve System.

National Greenhouse Gas Inventory

In 2006–07 a new set of Australia's National Greenhouse Accounts was released. The accounts were prepared in accordance with international guidelines under the guidance of a national committee of federal, state and territory government representatives. The accounts comprise:

- the National Greenhouse Gas Inventory 2005, which is estimated on a Kyoto Protocol basis and is relevant for measuring progress towards the 108 per cent target
- the State and Territory Greenhouse Gas Inventories 2005, which are also estimated on a Kyoto Protocol reporting basis
- the National Inventory by Economic Sector 2005, which includes estimates of emissions by economic sector (e.g. residential) at both national and state levels
- the National Inventory Report 2005, which is Australia's official submission to the United Nations Framework Convention on Climate Change and is prepared according to the convention's reporting provisions.

The National Greenhouse Gas Inventory 2005 was released in May 2007. The inventory shows that national greenhouse gas emissions in 2005 were 2.2 per cent higher than 1990 levels. This small increase in emissions is consistent with the updated projections released in December 2006. The methods used to estimate emissions, and the emission estimates, are available through the Australian Greenhouse Emissions Information System at www.greenhouse.gov.au/inventory.



The National Inventory Report is subject to annual international expert review. The draft review of the 2004 National Inventory Report recognised the completeness and high quality of Australia's inventory, and welcomed the refinements made to a number of emissions estimation methodologies.

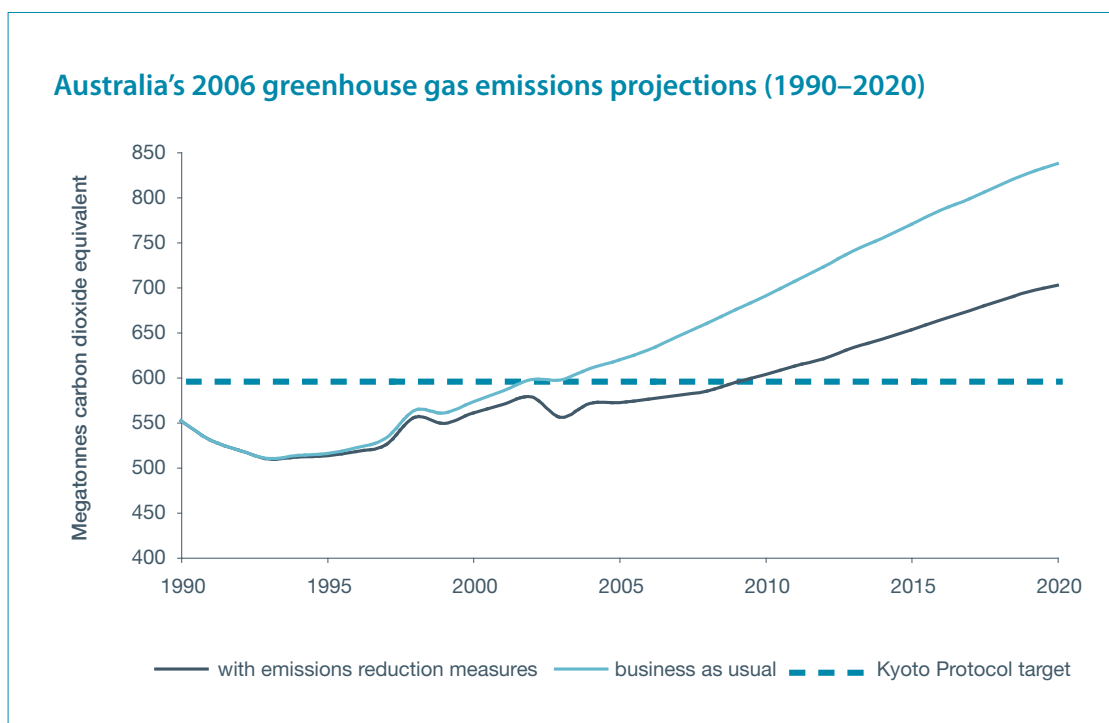
The review report will be published in the second half of 2007.

Greenhouse gas projections

The department prepares projections of Australia's future greenhouse gas emissions. The projections help the government to determine the extent to which its policies and programmes have Australia on track to meet its international emissions target. Updated projections, which follow accounting rules developed under the Kyoto Protocol, were released in December 2006 in *Tracking to the Kyoto Target 2006*. More information is available at www.greenhouse.gov.au/projections.

Tracking to the Kyoto Target 2006 forecasts Australia will reach 603 million tonnes of greenhouse emissions (carbon dioxide equivalent) annually over 2008–2012, which is 109 per cent of 1990 levels. The new projection is slightly higher than the Kyoto Protocol target and reflects stronger growth of emissions from electricity generation. Without the current measures emissions growth would have reached 125 per cent of the 1990 level by 2010. The Australian Government is considering further measures to help meet the Kyoto Protocol target.

Current actions by all levels of government and by industry and households are projected to reduce Australia's greenhouse gas emissions by 87 million tonnes of carbon dioxide equivalent by 2010—equal to eliminating all emissions from the transport sector.



National Carbon Accounting System

Australia's ability to account for greenhouse gas emissions from the nation's land systems is provided through the world-leading National Carbon Accounting System, which uses computer-based land systems modelling and observations to provide a national map of emissions at a sub-hectare scale.

This year many of the fundamental datasets, such as climate and remotely sensed vegetation cover change, were updated to current time. Research and development activities, largely jointly conducted with state and territory agencies, the CSIRO, universities and private sector interests, also helped to improve the system and expand its capability.

The National Carbon Accounting Toolbox released in March 2005 enables landholders to examine the history of their properties through a time-series archive of remotely sensed images, and to model the greenhouse gas implications of agricultural and forestry activities. The toolbox is being widely adopted, and training and support has become a major activity. Widespread use of the toolbox is producing more consistent, robust data to underpin policy and market decisions.



Results for performance indicators

Performance indicator	2006–07 results
International engagement—influencing international climate change policy	
Extent of influence in key international, regional and bilateral climate change processes on issues for which the department has lead responsibility	<p>Played a key role in developing 8 industry–government task force action plans under the Asia–Pacific Partnership on Clean Development and Climate</p> <p>Announced 63 projects including developing renewable energy technologies, clean fossil fuels, and increased energy efficiency worth \$100 million</p> <p>Hosted the United Nations Framework Convention on Climate Change workshop on reducing emissions from deforestation in developing countries and provided 13 submissions to influence broader international climate change policy</p> <p>Oversaw the review of the draft volumes of the Fourth Assessment Report, Climate Change 2007</p> <p>Was the lead Australian Government agency at the Intergovernmental Panel on Climate Change and was instrumental in negotiating the Summary for Policy Makers for each volume. Currently leading the Australian Government review of the draft Synthesis Report and the first draft of an Intergovernmental Panel on Climate Change technical paper on climate change and water</p> <p>Implemented the Global Initiative on Forests and Climate announced in March 2007 with \$200 million project funding</p> <p>Played a key role in several other international forums on post-2012 action on climate change and continued to develop and deliver both bilateral and plurilateral climate change partnerships</p>
Number of initiatives delivered through key international, regional and bilateral processes	<p>Delivered almost 50 new initiatives, including 27 under the Asia–Pacific Partnership on Clean Development and Climate;</p> <p>17 new cooperative climate change projects under Australia’s bilateral partnerships with the United States, China, Japan, the European Union, New Zealand and South Africa; and the new Global Initiative on Forests and Climate</p>
Effectiveness in reducing greenhouse gas emissions	
Percentage of total emissions in Australia by sector (i) stationary energy (ii) transport (iii) fugitive emissions (iv) industrial processes (v) agriculture (vi) land use change and forestry and (vii) waste	<p>2005 (latest available figures, published May 2007): (i) stationary energy 49.9% (ii) transport 14.4% (iii) fugitive emissions 5.6% (iv) industrial processes 5.3% (v) agriculture 15.7% (vi) land use change and forestry 6% (vii) waste 3%</p>
Actual and projected greenhouse emissions in Australia (megatonnes of carbon dioxide equivalents) from 1990 base compared with business as usual	<p>Australia’s net greenhouse gas emissions across all sectors totalled 559.1 million tonnes carbon dioxide equivalent in 2005 under the accounting provisions applying to Australia’s 108% emissions target. This is a 2.2% increase over 1990 levels</p> <p>Australia’s greenhouse gas emissions are currently projected to reach 109% of 1990 levels or 603 million tonnes carbon dioxide equivalents over the period 2008–2012</p> <p>In the absence of greenhouse measures, emissions would have reached 125% of 1990 levels by 2010</p>



Performance indicator	2006–07 results
Emissions management	
Effectiveness of support for greenhouse response within sectors	<p>Emissions management measures continued to receive a high level of support from sectors. Greenhouse Challenge Plus has 720 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% of Australia's emissions. The key industry sectors covered by the programme account for almost 50% of Australia's industrial emissions</p> <p>The most recent projections show the Greenhouse Gas Abatement Programme will deliver a reduction of 4.74 million tonnes of carbon dioxide equivalent by 2010</p> <p>Greenhouse Friendly™ achieved nearly 2 million tonnes of carbon dioxide equivalent abatement</p> <p>Cities for Climate Protection™ Australia's membership has grown to 220 local councils, representing more than 82% of Australia's population</p>
Reported abatement activity including emissions reductions and energy savings	<p>Reported in <i>Tracking to the Kyoto Target 2006</i>, released on 20 December 2006</p> <p>The combined effect of greenhouse gas abatement measures is expected to cut annual emissions by 87 million tonnes of carbon dioxide equivalent by 2010</p>
Extent of engagement of key stakeholders	<p>There is a high level of engagement with all major sectors and key stakeholders in greenhouse gas emissions management strategies. (Refer to examples provided for 'effectiveness of support for greenhouse response within sectors')</p>
Extent of support for long-term low emission technology uptake	<p>Six significant long-term low emissions technology projects, announced in 2006–07, are being supported under the \$500 million Low Emissions Technology Demonstration Fund with corporate investment of more than \$2.5 billion. State and territory governments will be providing \$130 million to support these projects</p>
Estimated cost (government funds) of greenhouse abatement (\$ per tonne)	<p>Based on 2006 projections of abatement from 2008–2012, and actual and projected Australian Government funding for programmes, the cost of abatement to the Australian Government in this period averages \$5.60 per tonne</p>



Performance indicator	2006–07 results
Emissions management (continued)	
Reporting systems are appropriately targeted	<p>The National Greenhouse Gas Inventory was reviewed independently for the United Nations Framework Convention on Climate Change and, in addition to complying with requirements, was recognised for its completeness, high quality inventory and emissions estimation methodologies</p> <p>Under Greenhouse Challenge Plus, 720 business members report annually and publicly about their progress towards reducing greenhouse gas emissions. While the number of members has fluctuated over the life of the programme, the coverage of emissions increased by approximately 4% of Australia's emissions in 2006–07</p> <p>The International Council for Local Environmental Initiatives reports annually to the department on the progress of the Cities for Climate Protection Australia programme, including greenhouse gas abatement achieved by local governments and communities</p> <p>Reporting systems for the Renewable Remote Power Generation programme were established under partnership agreements between the Australian Government and participating states and territories</p>
Risks to programme delivery identified and managed	Comprehensive risk management plans are in place for each programme
Investment dollars (or contributory funding) leveraged by projects and programmes from other parties	Under the Low Emissions Technology Demonstration Fund alone, the Australian Government's investment of \$410 million is leveraging corporate investment of \$2.5 billion
Understanding climate change	
Investment dollars (or in-kind contribution) leveraged from other parties for climate change science priorities	Over \$7.3 million leveraged from other parties in 2006–07
Extent to which climate change policy is integrated in national policies and programmes and inter-jurisdictional processes	<p>The Council of Australian Governments (COAG) implemented the Plan for Collaborative Action on Climate Change to coordinate national climate change policy</p> <p>In April 2007 COAG agreed to develop and implement a national mandatory greenhouse and energy reporting scheme to commence in 2008</p> <p>The Australian Centre for Climate Change Adaptation will work closely with the states and relevant bodies to implement the National Climate Change Adaptation Framework. COAG endorsed the framework in April 2007</p> <p>The Australian Climate Change Science Programme supports collaboration with CSIRO, the Bureau of Meteorology and Australian universities in developing the Australian Community Climate and Earth System Simulator</p> <p>Climate change is included in the Environment Protection and Heritage Council's Strategic Plan 2006–2008</p> <p>The Natural Resource Management Ministerial Council is responding to climate change through 11 priority projects</p>



Performance indicator	2006–07 results
Understanding climate change (continued)	
Trends in community responses to key policy issues	Developmental research was undertaken during the year. Results have yet to be finalised
Climate change publications that meet targeted stakeholder needs	The department prepared more than 30 publications (reports, guidelines etc) to meet the needs of industry, government and non-government stakeholders and the public, and received a strong positive response from stakeholders Newsletters, fact sheets and similar material were published, providing up-to-date information about climate change activities to stakeholder groups
Comprehensiveness and timeliness of monitoring and public reporting on the implementation of programmes	Milestones in programme development and implementation were announced publicly and in a timely fashion
Development of consistent measurement of abatement across programmes	An ongoing programme of continuous improvement is in place to project greenhouse gas emissions, measure abatement across sectors and programmes, and estimate overall abatement
Number of reports and submissions made in accordance with national and international commitments and level of user interest	The National Greenhouse Account reports, methodology papers and related products were published. There were 23 publications in total Updated projections in the sub-sectors of stationary energy, industrial processes, transport, fugitive emissions, waste, agriculture and land use change were published. An update of Australia's projected emissions, Tracking to the Kyoto Target 2006, showed Australia is close to meeting its Kyoto target
Output 1.1—Response to climate change	
Policy advisor role: The minister is satisfied with the timeliness and accuracy of briefs and draft ministerial correspondence provided by the department	Minister was satisfied with timeliness and quality of briefs. The department has experienced challenges in responding to the unprecedented volume of correspondence now being received, but procedural adjustments and new systems have improved timeliness
Provider role ¹ : Percentage of payments that are consistent with the terms and conditions of funding (Target: 100%)	100%
Price	See resources table below

¹ Applies only to the administration of grants programmes funded entirely from departmental funding for this output. Any grants programmes within this output that are wholly or partially funded through administered appropriations are separately reported.

Resources

Elements of pricing	Budget prices \$'000	Actual expenses \$'000
Departmental outputs		
Sub-output 1.1.1: International engagement	13,744	14,416
Sub-output 1.1.2: Emissions management	30,512	30,642
Sub-output 1.1.3: Understanding climate change	17,749	17,752
Total Output 1.1	62,005	62,810
Administered items		
Influencing international climate change policy	3,050	3,038
Solar Cities	3,000	3,000
Advanced Electricity Storage Technologies	500	500
Action on Energy Efficiency	850	850
Local Greenhouse Action	400	400
Low Emissions Technology and Abatement	6,769	6,736
Greenhouse Gas Abatement Programme	17,912	17,721
Alternative Fuels Conversion Programme	2,358	2,354
Renewable Energy Commercialisation Programme	1,079	1,519
Renewable Energy Equity Fund	1,116	819
Photovoltaic Rebate Programme	6,245	6,242
Renewable Remote Power Generation Programme	14,120	13,837
Greenhouse Action to Enhance Sustainability in Regional Australia	3,853	3,854
Climate Change Science Programme	7,850	7,834
Total (Administered)	69,102	68,704

