



Office of
Environment
& Heritage



NSW Climate Change Fund Annual Report 2011–2012



Cover photographs:

1. Electricity transmission tower
2. Water flowing at a weir
3. Photovoltaic panel
4. Coal
5. Wind turbines generating renewable energy
6. Gum trees.

Published by

Office of Environment and Heritage NSW

59–61 Goulburn Street

PO Box A290

Sydney South NSW 1232

Ph: (02) 9995 5000 (switchboard)

Ph: 131 555 (environment information and publications requests)

Ph: 1300 361 967 (national parks information and publications requests)

Fax: (02) 9995 5999

TTY: (02) 9211 4723

Email: info@environment.nsw.gov.au

Website: www.environment.nsw.gov.au

OEH 2012/0853

ISSN 1836-5310

November 2012

© Copyright State of NSW and the Office of Environment and Heritage 2012

The Office of Environment and Heritage NSW and the State of NSW are pleased to allow this material to be reproduced in whole or in part, provided the meaning is unchanged and its source, publisher and authorship are acknowledged.

Contents



Minister's foreword	ii
NSW Climate Change Fund overview	1
■ Highlights for 2011–2012	2
Power savings	4
■ Power savings for households	4
■ Power savings for businesses	8
■ Power savings for communities	12
■ Power savings for government	14
Water savings	17
■ Water savings for households	17
■ Water savings for businesses	19
■ Water savings for communities	21
■ Water savings for government	23
Clean energy	25
Solar Bonus Scheme	27
Coal Innovation NSW Fund	28
Enhanced Bushfire Management Program	29
Administration and Budget	30
■ Administration and Australian Energy Market Commission	30
■ Budget and spending status	31
Appendices	33
■ Appendix A – Legislative requirements	33
■ Appendix B – Tariffs and data sources	35
■ Appendix C – Projects discontinued during 2011–12	36
Glossary	37
List of photographs	Inside back cover



Minister's foreword

Welcome to the 2011–12 annual report for the New South Wales Government's Climate Change Fund.

The Climate Change Fund plays an important role in delivering the NSW Government's 2021 Plan to protect our environment. It is based on cost effective measures that deliver real actions and value for the environment and our community.

Rising energy and water prices are increasing the cost of living for NSW households, the cost of doing business and the cost to government of providing services.

Through the Climate Change Fund, the NSW Government is putting downward pressure on energy and water costs, and helping households and businesses reduce bills through more efficient resource use.

The Fund has expended \$331 million during the 2011–12 financial year to help households, businesses, government and communities become more sustainable, and to meet the costs of the Solar Bonus Scheme. Carefully targeted support not only increases the adoption of energy efficient technologies and reduces energy and water use in the short term; it also leads to changing attitudes and behaviours in the long term.

Climate Change Fund investments are saving an estimated 19.8 billion litres of water, 917,000 megawatt hours of electricity, 964,000 tonnes of greenhouse gas emissions and \$206 million off power and water bills are saved each year, as well as 66,000 kilowatts of peak demand.

NSW households clearly see the benefits of helping the environment and reducing power and water bills. More than 115,000 lower income households have joined the Home Power Savings Program. Together, these households are saving more than \$18.6 million off their household power bills each year.

To date, our key business programs have worked with over 17,000 small, medium and large businesses to save an impressive \$25.8 million a year on operating costs across the state.

Strong partnerships with stakeholders continue to be a highlight of program delivery, contributing to the strong take-up of programs in regional and rural areas.

The Fund has undoubtedly accelerated NSW's transition to a cleaner future – one that protects our environment, reduces energy grid demand and creates new jobs.

It's a great base on which to build. Reading this report, you'll be inspired by the breadth of programs funded across the state and the partnerships formed, all with one important goal – to build a more environmentally and economically sustainable NSW.



Hon. Robyn Parker
NSW Environment Minister

NSW Climate Change Fund



The NSW Climate Change Fund was established in 2007 under the *Energy and Utilities Administration Act 1987* (the Act) and is administered by the Office of Environment and Heritage within the Department of Premier and Cabinet NSW.

The specific functions of the Fund, as outlined in section 34F of the Act, are to provide funding:

- to reduce greenhouse gas emissions and the impacts of climate change associated with water and energy activities
- to encourage water and energy savings and water recycling
- to reduce the demand for water and energy, including addressing peak demand for energy
- to stimulate investment in innovative water and energy saving measures
- to increase public awareness and acceptance of the importance of climate change and water and energy saving measures
- for contributions made by the State for the purposes of national energy regulation.

The NSW Climate Change Fund delivers funding to achieve outcomes in two key ways:

- providing direct support to homes, businesses, government, schools and community organisations to implement measures that will save water and power (and related greenhouse gas emissions), and so reduce their water and energy utility bills, and
- stimulating investment in clean energy technologies in NSW through funding for commercialising emerging technologies and additional support for proven technologies such as wind and solar power.

How is it funded?

The main source of funding for the NSW Climate Change Fund for the 2011–12 financial year was the annual contributions from water and electricity providers, including Sydney Water, Ausgrid, Endeavour Energy and Essential Energy.

Under the Act, the Minister for the Environment requires network service providers and water utilities to make contributions to the Fund via the annual gazettal of Contributions Orders. Where required, the Minister seeks the concurrence of relevant Ministers when preparing the Contributions Orders. Additional monies added to the Fund in 2011–12 come from interest earned on cash balances and funds advanced by the Treasurer for managing the Solar Bonus Scheme.

The 2011–12 annual report

This annual report has been prepared in accordance with the requirements of the *Energy and Utilities Administration Act 1987* (section 34H). Activities under the NSW Climate Change Fund are reported for the fifth financial year of operations from 1 July 2011 to 30 June 2012.

As required by the Act, the annual report provides information on fund allocations and anticipated benefits, with reference to the key performance indicators and purposes of the Fund. The performance of the Fund is reported by grouping initiatives for power savings, water savings and clean energy.

Key performance indicators for the Fund are:

- savings in water, energy (consumption and peak demand) and greenhouse gas emissions
- savings in annual energy and water bills for households, businesses, government, community groups and other organisations
- clean energy generated
- cost effectiveness (per funding dollar spent)
- funding allocated.

Highlights for 2011–2012



\$331 million expended on projects and programs in 2011–2012

917,000 MWh annual electricity savings

964,000 tonnes annual greenhouse gas emissions savings

19.8 billion litres annual water savings

\$206 million annual utility bill savings

443,800 MWh electricity generated by the Solar Bonus Scheme

In 2011–12, the Fund expended \$331 million on energy and water savings grants; renewable and clean energy projects; bushfire hazard reduction; and a range of programs to assist businesses, communities, households and government become more water and energy efficient and save money off bills.

On average, every \$1 the Fund has invested in energy and water saving initiatives across all programs to date is expected to deliver \$4.80 in utility bill savings. Funding and savings to date by sector are shown in Table 1 below.

Households

Household programs achieved some impressive results during 2011–12. There was a significant increase in lower income households joining the \$63 million Home Power Savings Program, with 74,560 households receiving a free home power assessment, Power Savings Kit and personal action plan in 2011–12, bringing the total number of program participants to date to 115,508.

The Home Saver Rebates Program provided 16,607 rebates to make NSW households more energy and water efficient, bringing the total number of rebates paid since the beginning of the program to over 332,000. More than 9,700 households recycled their inefficient second fridge through the Fridge Buyback Program. In 2011–12, 1,015 public housing properties were fitted with more efficient hot water systems or insulation, bringing the total number to 13,182.

The Solar Bonus Scheme generated over 400,000 megawatt hours of renewable energy during the year installing 144,000 small-scale solar power systems across the state.

Businesses

In 2011–12, 133 medium-to-large business sites signed up for a subsidised energy audit under the Energy Saver Program, bringing the total number of business audits to 292. The number of small businesses participating in the Energy Efficiency for Small Business Program in 2011–12 increased by 2,885 to a total of 17,185.

During 2011–12, businesses completed eight water and energy savings grant projects to help save an estimated 16,667 megawatt hours of electricity, 742 million litres of water and \$3.3 million off their power and water bills a year. This brings the total number of completed business grant projects to 87.

Communities

During 2011–12, not-for-profit community organisations completed 170 grant funded projects that will save 3,167 megawatt hours of electricity, 595 million litres of water and \$2.2 million off their power and water bills each year. This brings the total number of completed community grant projects to 447.

In 2011–12, the Environment Line received more than 113,000 calls in relation to the NSW Climate Change Fund.

Government

During 2011–12, local and state government facilities and schools completed 55 grant funded projects that will save an estimated 4,385 megawatt hours of electricity, 191 million litres of water and \$1.4 million off power and water bills each year. This brings the total number of completed government grant projects to 332.

Under the Government Building Retrofit Program, retrofits commenced at 111 small frontline government service sites to save an estimated 4,096 megawatt hours of electricity, 26 million litres of water and over \$700,000 off power and water bills a year. This will help essential services, such as ambulance and fire stations, make financial savings that can be redirected into service delivery. The Fund will also help 43 of the largest energy-using government sites to save 38,759 megawatt hours of electricity and over \$6.5 million off their power and water bills a year. In 2011–12, 18 government sites also joined the Energy Saver Program.

Regions in focus

During 2011–12, there was very strong uptake of water and energy saving projects in regional areas of NSW. More than 44,000 lower income households in regional NSW received a free power assessment under the Home Power Savings Program. Seventy-three per cent of completed water saving grant projects aimed at helping community groups were based in regional NSW, and 108 of the government frontline service sites retrofitted under the Government Building Retrofit Program were in the Hunter and Illawarra regions.

Table 1 NSW Climate Change Fund: overview

Sector	Funding allocated	Estimated water savings	Estimated electricity savings	Estimated greenhouse gas savings	Estimated utility bill savings	Return on investment for every dollar spent
	\$	ML/year	MWh/year	tCO ₂ -e/year	\$/year	\$
Households	223,726,709	5,540	535,409	569,403	99,329,709	4.02
Business	99,833,095	11,218	273,358	276,880	78,534,814	7.87
Community	20,853,598	1,306	15,197	16,699	6,370,771	3.05
Government	65,152,301	1,732	93,504	101,323	21,869,352	3.36
Total	\$409,565,703	19,795	917,469	964,304	\$206,104,646	\$4.80



\$257 million funding for projects and programs
813,000 MWh annual electricity savings
\$140 million annual power bill savings
1.8 years average payback

Power savings

With \$257.3 million support from the NSW Climate Change Fund, households, businesses, community groups and government save an estimated 813,223 megawatt hours of electricity, 853,072 tonnes of greenhouse gas emissions and \$139.9 million off their power bills a year, as well as 48,355 kilowatts of peak demand.

These savings are being delivered through 464 grant funded projects, 215,015 residential rebates and fridge removals, 13,182 public housing retrofits, 115,508 lower income household assessments and retrofits, 154 government building retrofits, and more than 17,000 business and government sites receiving energy saving advice and implementation support.

Power savings for households

533,000 MWh annual electricity savings
\$87 million annual power bill savings
1.9 years average payback



To date, \$166 million from the NSW Climate Change Fund has helped NSW households save an estimated 532,807 megawatt hours of electricity, 566,645 tonnes of greenhouse gas emissions and \$86.8 million off their power bills a year, as well as 10,708 kilowatts of peak demand.

NSW households have embraced a range of initiatives to reduce their power bills and make their homes more energy efficient.

The Home Power Savings Program is targeted at lower income households. Eligible households receive a free in-home energy assessment by an energy expert, a free Power Savings Kit valued at around \$200 and installed by the energy assessor, plus a free Power Savings Action Plan advising how much power each area of their home is using, and tailored tips to reduce their energy use.

The Power Savings Kit includes a stand-by power board, water efficient showerhead, shower timer, tap aerator, energy efficient light bulbs, door snakes, a set of draught-proofing strips for doors and windows and a thermometer.

As at 30 June 2012, 115,508 lower income households across NSW have participated in the Home Power Savings Program and are saving an estimated 59,600 megawatt hours of electricity, 63,200 tonnes of greenhouse gas emissions and \$18.7 million off power bills each year. By June 2014, the \$63 million Home Power

Savings Program will target 220,000 lower income households across New South Wales to reduce their energy usage.

Under the Home Saver Rebates Program, 181,305 energy-related rebates were provided to NSW households. The program finished on 30 June 2011 as scheduled. It provided rebates for more efficient hot water systems to help save an estimated 378,372 megawatt hours of electricity, 401,075 tonnes of greenhouse gas emissions and \$41.2 million off power bills each year. Uptake of rebates in regional NSW was very high, with regional areas driving strong demand for hot water system upgrades.

Under the Fridge Buyback Program, 33,710 households recycled their inefficient second fridge to save an estimated 26,631 megawatt hours of electricity, 28,229 tonnes of greenhouse gas emissions and \$8.3 million off power bills each year. The Fridge Buyback Program provides regular collection runs to selected areas of the Blue Mountains, the Central Coast, Cessnock, the Illawarra, Lake Macquarie, Maitland, metropolitan Sydney, Newcastle, Port Stephens, Shoalhaven and Singleton. Visit www.fridgebuyback.com.au for more details.

More than 13,000 public housing properties have been fitted with more efficient hot water systems or insulation to save an estimated 18,126 megawatt hours of electricity, 19,214 tonnes of greenhouse gas emissions and \$2.4 million off power bills a year.

NSW households have also benefited from 11 grant funded projects, including residential audits, energy efficient appliance refits, and education and awareness campaigns. These projects will help save an estimated 50,069 megawatt hours of electricity, 54,942 tonnes of greenhouse gas emissions and \$16.3 million off power bills a year. Ten of these projects were completed by 30 June 2012.

The Save Power Program helps teach people how to save power at home and work and includes information available in 19 languages. During 2011–12, more than 110,000 people visited the Save Power website to learn more about what they can do to save power at home and work, and a radio and online advertising campaign highlighted energy efficiency tips over summer. Residents also had access to a Save Power kit in 263 local libraries throughout NSW. The kit provides households with tools and information to help them reduce power and save money on bills. Ninety-six per cent of surveyed participants reported that borrowing the kit was a worthwhile experience and helped them understand how to reduce their energy use.

Households have also benefited from 142 retail stores participating in a unique program to train sales staff to help consumers choose energy efficient appliances. Ninety-two per cent of the participating stores were extremely satisfied with the program.

Households participating in the NSW Energymark Program, a partnership with CSIRO, achieved an average 12.5 per cent reduction in their energy use and each household saved around \$250 off annual power bills.

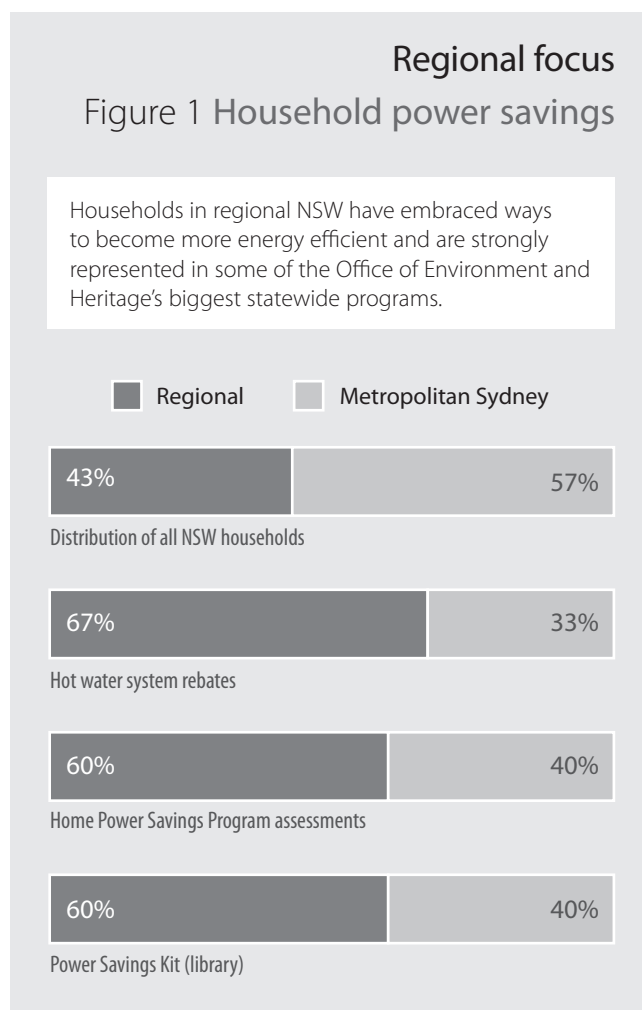


Table 2 Household power saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects or participants	Funding allocated	Estimated electricity savings	Estimated greenhouse gas savings	Estimated utility bill savings	Cost effectiveness
		\$	MWh/year	tCO ₂ -e/year	\$/year	\$ per MWh
Home Saver Rebates Program	181,305	105,609,471	378,372	401,075	41,157,975	27.91
Home Power Savings Program	115,508	29,436,133	59,609	63,186	18,657,678	98.76
Public housing retrofits	13,182	19,202,407	18,126	19,214	2,432,370	105.94
CCF grant projects	11	6,693,030	50,069	54,942	16,256,828	13.37
Fridge Buyback Program	33,710	5,045,815	26,631	28,229	8,335,472	18.95
Total		\$165,986,855	532,807	566,645	\$86,840,323	\$33.00

For reference, the cost of new electricity infrastructure is \$114 per MWh.

Case study

Working with communities

The Home Power Savings Program is helping lower income households manage the cost of living as well as providing more sustainable living environments. The program is helping community members by giving them information on their specific energy usage, providing energy efficient products and offering education on ways to change the way they use energy.

Twenty-two pre-determined geographical delivery areas ensure that the program is provided equitably across metropolitan Sydney and regional NSW.

The program is delivered in-field by a third party, which employs over 100 energy experts across the state. Energy experts work in their local community to raise awareness of the program, deliver the in-home energy assessment, install the free Power Savings Kit and provide advice on energy saving.

Local councils are often the hub of information and interaction within communities. Grants to 36 local councils across NSW have enabled them to actively promote the Home Power Savings Program and encourage their local communities to join and receive its benefits.

Invaluable program partners

To effectively engage with lower income households, the Home Power Savings Program has formed strong working relationships with local and state government agencies, non-government organisations and local community groups. The program also works closely with organisations that support culturally and linguistically diverse communities, as well as Aboriginal and Torres Strait Islander communities. Many of these groups deliver frontline services to households in need and provide invaluable guidance and advice through mechanisms such as the official Stakeholder Advisory Group.

The Stakeholder Advisory Group has representatives from:

- Aboriginal Housing Office
- Anglicare
- Brotherhood of St Laurence
- Department of Human Services
- Department of Veterans' Affairs
- Energy & Water Ombudsman NSW



- Ethnic Communities Council
- Financial Counsellors Association Australia and New Zealand
- Housing NSW
- Trade & Investment NSW
- Local Community Services Association
- Local Government and Shires Association of NSW
- NSW Aboriginal Land Council
- NSW Council of Social Services
- NSW Rural Assistance Authority
- Public Interest Advocacy Group
- Salvation Army.

A happy customer!

Mavis from South Wentworthville recently took part in the Home Power Savings Program after it was recommended by a neighbour. She is estimated to save up to \$127 a year off her power bills.

"The energy expert was very good. He explained where I could make savings and how to seal my house from the cold air. I told all my friends about the service and a few months later I saw his car at another neighbour's house, so I think the word is getting around. I think it's great to help older people," Mavis said.

Case study

Households get energy smart

The Save Power Retail Program provides energy efficiency training to sales staff in whitegoods and appliance stores across NSW, so they can advise their customers on the long-term running costs of the different appliances available. Consumers are increasingly interested in energy efficiency, reflected in an increase in sales of energy efficient appliances.

Although many customers do consider energy efficiency, consumers prioritise the upfront ticket price and brand above energy efficiency, especially if energy efficient products cost significantly more than less efficient alternatives. Buyers often don't consider that more energy efficient products cost less to run in the long term.

Save Power Retail Program staff and customers can access energy calculators to help them understand the real cost of ownership and make informed decisions when buying air conditioners, dishwashers, dryers, freezers, fridges, televisions and washing machines.

The calculators are an important tool in informing consumers about the true cost of less efficient products, rather than just focusing on the upfront ticket price and brand. For example, every extra star rating on a fridge or freezer will save 23 per cent of the running costs over its life, which could be many years.

Participating retail stores include David Jones, The Good Guys, Harvey Norman and Myer.



In total, 142 stores across NSW are engaged in the program, with 97 per cent of staff in participating stores aware of the program, over 80 per cent of staff trained in the program and 92 per cent of participating stores reporting they are extremely satisfied with the program.

Visit www.savepower.nsw.gov.au for more information.

Power savings for businesses

173,000 MWh annual electricity savings
\$33 million annual power bill savings
1.3 years average payback



To date, \$44.5 million from the NSW Climate Change Fund has helped NSW businesses save an estimated 173,042 megawatt hours of electricity, 170,010 tonnes of greenhouse gas emissions, and \$32.8 million off their power bills a year, as well as 26,594 kilowatts of peak demand.

The Fund has helped small, medium and large businesses in both regional NSW and metropolitan Sydney achieve significant savings by transforming operations and increasing knowledge, skills and capacity.

As at 30 June 2012, 17,185 businesses that spend up to \$20,000 a year on power bills or employ up to 10 full-time staff have joined the Energy Efficiency for Small Business Program. These businesses receive an energy assessment, a tailored action plan and matched funding of up to \$5,000 to make energy improvements. Businesses that have participated to date are expected to save 37,396 megawatt hours of electricity, 39,640 tonnes of greenhouse gas emissions and \$10.8 million off power bills a year.

The combination of financial incentives, access to information and support from service providers has assisted small business owners overcome barriers to implement energy saving measures. An independent program evaluation revealed that up to 91 per cent of participants acknowledge the Program gave them the ideas, confidence and skills to make energy efficiency improvements.

The program also improves service delivery to the small business sector by encouraging assessors and product suppliers to access

financial incentives and expand their services. This often results in other ancillary benefits such as sector or technology specific advice and expanding their reach to regional NSW.

Over 40 per cent of program participants are based outside Sydney, due in part to the Office of Environment and Heritage's work with peak bodies and industry to target specific sectors such as dairy and poultry farmers. By partnering with Dairy NSW, 448 dairies have received energy assessments. The Office of Environment and Heritage has also partnered with the Australian Meat Industry Association, Foodworks, IGA and NSW Farmers to identify other energy saving opportunities in their respective sectors.

The Energy Saver Program provides subsidised energy audits and support for medium-to-large businesses and government sites to identify and implement cost effective energy savings. Two hundred and six medium and large businesses have joined the program, resulting in 292 site audits. These audits have identified average potential energy savings of 28 per cent and cost savings of 31 per cent of the businesses' baselines. Businesses participating in Energy Saver are estimated to achieve savings of 36,246 megawatt hours of electricity, 148,517 gigajoules of natural gas, 48,154 tonnes of greenhouse gas emissions and \$10.1 million off power bills a year.

The Energy Saver program has also developed sector guides that are helping businesses understand common energy saving opportunities and promoting sector benchmarking.

Since 2009, the Climate Change Fund has provided over \$1 million to co-fund the Sustainability Advantage Program. During this time, the Resource Efficiency module of Sustainability Advantage has

Table 3 Business power saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects or participants	Funding allocated	Estimated electricity savings	Estimated greenhouse gas savings	Estimated utility bill savings	Cost effectiveness
		\$	MWh/year	tCO ₂ -e/year	\$/year	\$ per MWh
CCF grant projects	43	16,249,662	91,191	70,766	9,544,478	17.82
Energy Saver Program	292	9,249,663	36,246	48,154	10,061,965	25.52
Sustainability Advantage Program – Resource Efficiency module	165	1,035,000	8,209 [^]	11,452 [^]	2,422,354 [^]	12.61
Energy Efficiency for Small Business Program	15,214	17,958,385	37,396	39,640	10,807,447	48.02
Total		\$44,492,710	173,042	170,010	\$32,836,245	\$25.71

[^]This represents 22 percent of the total water and energy savings achieved by the Sustainability Advantage Program, which is proportional to the amount of co-funding provided by the Climate Change Fund.

For reference, the cost of new electricity infrastructure is \$114 per MWh

helped 165 businesses save an estimated 37,312 megawatt hours of electricity, 1.8 billion litres of water, 190,760 gigajoules of natural gas and \$16.2 million a year off bills.

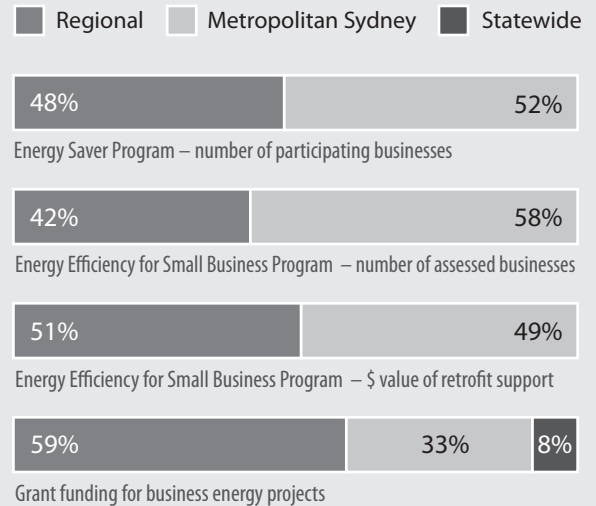
Initiatives to boost energy efficiency knowledge and skills have helped 500 key business professionals, such as facility managers, as part of the Energy Saver Program. Six thousand accountants, builders, electricians, engineers, facilities managers, plumbers and service providers (for example IT professionals and retailers) have also benefited from targeted, practical training, with 19 new vocational training and university courses as part of a joint partnership between the Office of Environment and Heritage and the Department of Education and Communities. Under this partnership, the University of Wollongong is saving almost \$200,000 each year through IT technology and behaviour changes; and NSW Clubs such as Oak Flats Bowling and Recreation Club and Wingham Services Club are achieving energy savings of up to 20 per cent, partly through training that helped deliver savings opportunities.

The Fund has also provided seed funding to seven major councils in all the major commercial business districts within NSW to assist with implementing Environmental Upgrade Agreements (EUAs). EUAs provide access to finance for environmental improvements to existing commercial, industrial, multi-unit residential and strata scheme buildings in NSW. Under this agreement, a finance provider lends funds to a building owner for water, energy and other environmental upgrades. The loan is repaid through a local council charge on the land. Being channelled through council rates means the loan repayment has statutory priority and a different status to a conventional loan. This additional level of security enables lenders to offer more competitive, longer term interest rates. A partnership between the building owner, bank and local council drives new investment in energy efficiencies and helps building owners and tenants reduce their utility bills.

The Fund provided \$16.2 million in grant funding to businesses to implement 43 projects under the Green Business Program, the Public Facilities Program and the former Energy Savings Fund.

Regional focus

Figure 2 Power savings for business



These projects will help save an estimated 91,191 megawatt hours of electricity, 70,766 tonnes of greenhouse gas emissions and \$9.5 million off power bills a year. Thirty-eight projects have already been completed as at 30 June 2012. These projects include energy efficiency, education, generation (including cogeneration) and power factor correction initiatives. Technologies include absorption chillers and high efficiency compressors in industrial processes, multi-level lighting systems, and the installation of utilities management systems and efficient speed drives.

Case study

Foundry finds further ways to reduce energy

Sustainability and power conservation have been a priority for Uralla's Phoenix Foundry for many years now. So when an Energy Saver audit identified opportunities to reduce the company's power use by a further 10 per cent – and for very little outlay – the management team was delighted.

The company, which was named Business of the Year by the Armidale Chamber of Commerce in 2010, is a founding member of the Northern Inland Sustainable Business Network.

CEO Ian Mitchell says finding the right balance between minimising energy and optimising production can be tricky.

"As a business, we're committed to reducing our carbon footprint," said Mr Mitchell, who joined Phoenix 10 years ago and has been CEO since 2005.

"The planet will face a bleak future if companies don't do their bit to protect the environment. You can't just continue to rely on old, outmoded methods of doing things. At the same time, you need to ensure that efficiency changes don't negatively impact production."

Established in 1983 in the northern NSW town of Uralla, Phoenix Foundry is Australia's leading home-grown supplier of cast bronze plaques. The niche company derives 85 per cent of its income from cemeteries, but also creates custom signage for other clients (for example, NSW Parliament House's coat of arms). In recent years, Phoenix has ventured into offshore markets and now derives 20 per cent of its business from exports, primarily to Canada and the UK.

Phoenix began operating in the historic Uralla foundry and moved to its present site in 1989. It currently occupies 1,000 square metres of factory space – including a pattern-making area, maintenance workshop, production facilities and an induction furnace building – plus 130 square metres of office space.

In 2007, Phoenix replaced its gas-fired furnace with a high-frequency induction model. While this step significantly decreased the company's overall energy consumption, its electricity use increased.

When Mr Mitchell heard about the Office of Environment and Heritage's Energy Saver audits, he was immediately interested. Phoenix's recent audit identified a number of cost-saving opportunities that will help reduce the company's electricity bill by 10 per cent.



"It's great to have a fresh pair of eyes take a look at how you do things," said Mr Mitchell. "We were pleasantly surprised by the results of our Energy Audit, which revealed that our operations were already fairly efficient.

"The audit helped us identify where our power consumption was coming from," he continued. "For example, we didn't realise that our underfloor heating consumed nearly as much energy as our induction furnace."

Phoenix is implementing a number of projects recommended by the audit, which will cost little or nothing to put in place, including:

- reducing the area for underfloor heating to just the pattern room, where resin drums are stored
- setting computer monitors to go into power saving mode
- installing motion sensors for lights in infrequently used areas
- fitting a light sensor in the furnace shed and main foundry – so lights only come on when there isn't enough natural light.

Mr Mitchell says the foundry's energy initiatives have generated considerable interest among its 40 employees. As a member of the Office of Environment and Heritage's Sustainability Advantage Program, Phoenix has obtained a Power Savings Kit that it loans to staff members. The kit contains a number of tools, including a meter to plug into individual appliances to measure electricity consumption, and a laser thermometer to identify hot and cold spots.

"The kit is very popular," said Mr Mitchell. "Raising the energy awareness of our employees at work has had knock-on effects at home also."

Case study

Bioreactor energy audit slashes power bill

The Woodlawn Bioreactor, located just outside of Goulburn, will reduce its electricity consumption by more than 17 per cent, cut carbon emissions by more than 200 tonnes and nearly halve its annual power bill after implementing the recommendations from a recent Energy Saver audit.

The bioreactor captures gases, including the harmful greenhouse gas methane, from decomposing waste, and converts them into power. It has generated more than 54,000 megawatt hours of electricity since 2004.

The facility stores waste in the pit of a former open cut mine and uses an extensive network of pipes to extract the biogas. Other pipes circulate nutrient-rich water within the waste, speeding up decomposition and the production of biogas. Veolia Environmental Services owns and operates the bioreactor.

Recently, Veolia reviewed electricity use across all its NSW sites through the Office of Environment and Heritage's Sustainability Advantage Program. The company was looking for ways to reduce its energy use and costs. With an annual electricity bill topping \$250,000, the bioreactor was a prime candidate for an Office of Environment and Heritage Energy Saver audit.

Operations & Environment Manager Henry Gundry says the audit revealed that equipment which was only used occasionally, such as stormwater pumps and evaporators, accounted for around 16 per cent of electricity use.

"It doesn't rain here often, but when it does it buckets down," said Mr Gundry, who has worked onsite for five years.

"The land is still contaminated from its mining days, so effective stormwater management is essential. The audit's recommendations will help us reduce our power load and expenditure during heavy rain periods.

"Some recommendations were relatively simple, like installing timers on the evaporators and pumps in our dams to take advantage of off-peak power. They were previously being turned on and off manually during the day.

"Big ticket items included installing a demand management system to easily shut down non-essential equipment during high-load periods, when the stormwater pumps were running."



Project Manager Stephen Bernhart, who conducts environmental monitoring, said the audit shed light on some perplexing issues.

"We knew power-factor correction was needed, but didn't know exactly what was involved or the savings that could be achieved," said Mr Bernhart. "Around 20 per cent of our electricity was being wasted.

"The Energy Saver auditors helped us to create a business case for the \$22,000 expenditure for power-factor correction, which will save us more than \$20,000 each year. The auditors also recommended we install a larger, more energy efficient compressor, which will reduce our annual power bill by \$24,000."

Mr Gundry says Veolia plans to implement most of the audit recommendations in the next 12 months, at a total cost of just over \$400,000.

The expected payback period is 3.3 years, which Veolia will reduce further by creating and trading Energy Saving Certificates.

Other projects will include replacing a number of pumps with smaller units; installing a smaller transformer at the site's dam; fitting motion or daylight sensors in infrequently used office rooms; replacing metal halide high-bay lighting with compact fluorescents in the workshop; optimising air conditioning settings; and replacing the electric hot water system with a heat pump.

Power savings for communities

14,000 MWh annual electricity savings
\$3 million annual power bill savings
2 years average payback



To date, \$6 million from the NSW Climate Change Fund has helped NSW community groups save an estimated 14,394 megawatt hours of electricity, 15,551 tonnes of greenhouse gas emissions and \$2.9 million off their power bills a year, as well as 34 kilowatts of peak demand.

The Climate Change Fund allocated \$6 million in grant funding for community groups to implement 256 projects under the Public Facilities Program and former Energy Savings Fund. These projects are estimated to save 14,394 megawatt hours of electricity, 15,551 tonnes of greenhouse gas emissions and \$2.9 million off power bills a year. As at 30 June 2012, 236 projects have already been completed.

Under the Community Savers stream of the Public Facilities Program, 250 community organisations have received financial support to reduce their energy consumption and power bills by implementing simple, low cost energy upgrades in their facilities such as lighting upgrades, and installing more efficient hot water systems, ceiling insulation and skylights. Essential community services such as not-for-profit preschools, aged care groups, disability and support services, sport and recreation clubs, and religious facilities have all been recipients.

Six large community organisations have also received funding for energy upgrades and community education initiatives under the Energy Saver Scheme and the Demonstration stream of the Public Facilities Program. Facilities such as community halls and

education centres have received insulation, lighting upgrades, optimisation of HVAC and installation of chillers. The projects also implement education initiatives such as events and workshops, signage, education brochures and websites to engage the community and encourage more savings.

Visit www.environment.nsw.gov.au/grants/ccfund.htm for details of the community power saving projects funded under the Climate Change Fund.

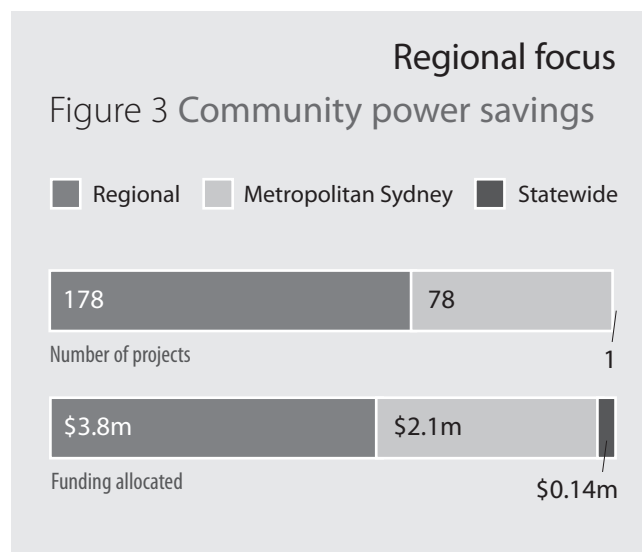


Table 4 Community power saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects	Funding allocated	Estimated electricity savings	Estimated greenhouse gas savings	Estimated utility bill savings	Cost effectiveness
		\$	MWh/year	tCO ₂ -e/year	\$/year	\$ per MWh
CCF grant projects	256	5,995,250	14,394	15,551	2,870,814	41.65

For reference, the cost of new electricity infrastructure is \$114 per MWh

Case study

From wasteful electric to gas hot water

Kiama Leagues Club has taken advantage of recent club renovations to upgrade its hot water system and is now using less energy than before – despite longer operating hours and increased membership.

The project, which saw the replacement of seven old-style large electric storage hot water systems with five instantaneous gas hot water systems, was made possible by \$24,600 in funding from the NSW Climate Change Fund.

The club was motivated to undertake this project by a desire to reduce greenhouse gas emissions by upgrading to gas. Since the upgrade, the club has reduced its annual electricity consumption by more than 5 per cent.

It's just the start of a bigger program of energy savings for the club, said Club General Manager, John Bambury.

"Without the grant, the club just would not have been able to find that amount of money in our budget to carry out these upgrades and we would have had to continue with a more inefficient system," said Mr Bambury.

"The savings certainly help. Had it not been for these upgrades we would certainly have been paying more on our electricity bill!"



The popular Kiama club is also in the process of upgrading all its lighting, and has now replaced about 15 per cent of its quartz halogen lighting with more efficient LED (light-emitting diode) lighting.

The project is estimated to save 202 megawatt hours of electricity and 172 tonnes of greenhouse gas emissions in the first 10 years. The Club is already demonstrating savings even though it has extended trading hours and increased patronage – up by 24 per cent in 2011 to more than 5,700 members.

Power savings for government

93,000 MWh annual electricity savings
\$17 million annual power bill savings
2.3 years average payback



To date, \$40.8 million from the NSW Climate Change Fund has helped local and state government facilities and schools save an estimated 92,979 megawatt hours of electricity, 100,866 tonnes of greenhouse gas emissions and \$17.4 million off their power bills a year, as well as 11,019 kilowatts of peak demand.

The \$6.4 million Government Building Retrofit Program has assisted more than 100 small government service sites and 43 large government service sites to improve their energy efficiency and achieve financial savings which can be redirected into service delivery.

A pilot program to improve water and energy efficiency in government buildings in the Illawarra, Lower Hunter and Circular Quay assisted 111 sites, including ambulances stations, fire stations, courts, disability care residences, train stations and national park offices. Each site received an energy audit and action plan that identified small-scale retrofit opportunities such as energy efficient lights, water efficient showerheads and other water saving devices which result in power savings. The Fund also provided money to implement energy saving devices. The Program will save an estimated \$625,877 off power bills annually, which can be reinvested into frontline service delivery.

The Fund also assisted 43 of the NSW Government's largest energy-using services to make energy savings. Services such as hospitals

Case study

Sydney Opera House kicks off government energy efficiency blitz

Sydney Opera House is one of Sydney's most iconic and visited buildings. As its operation uses large amounts of energy, the Sydney Opera House wanted to improve energy use and actively sought ways to reduce its consumption.

"The Sydney Opera House's environmental sustainability plan has an objective to reduce energy consumption by 15 per cent from 2000 levels by June 2013, and lighting upgrades were an opportunity to achieve part of that," said Sydney Opera House's Director Building Development and Maintenance, Greg McTaggart.

"We also wanted to make sure that we were using the most appropriate methods and technologies available to reduce energy use."

The Sydney Opera House's retrofit project received \$890,000 from the Climate Change Fund to upgrade the lighting-control system across six key areas – Central Passage, Concert Hall and Opera Theatre foyers, Playhouse, Drama Theatre and Green Room.

A number of considerations had to be addressed as part of the retrofit program, including consultation with stakeholders (commercial partners, hirers, lighting technicians, resident companies and tourism operators), and specific heritage and conservation requirements, such as maintaining the existing heritage fixtures and architectural aesthetics.

The completed lighting upgrade is estimated to save \$110,000 each year off energy bills and around 870 megawatt hours of electricity, which is equivalent to 930 tonnes of greenhouse gas emissions.



Sydney Opera House is now looking to expand the lighting upgrades to other areas on the premises and to pursue other initiatives to reduce energy consumption, such as a major upgrade of its air conditioning systems.

"The success of this retrofit project has motivated Sydney Opera House to roll out further upgrades in the future," said McTaggart. "We also hope to inspire other building owners to take on the challenge to make their buildings more water and energy efficient."

The Government Building Retrofit Program was rolled out across government-owned and government-tenanted buildings in the Lower Hunter and Illawarra regions and the Circular Quay precinct in Sydney during 2011–12. The Sydney Opera House was the first project to receive funding from the pilot program.

received funding and access to technical expertise to develop a strong business case to implement energy saving measures with finance from a Treasury Loan Fund. Once implemented, these projects are projected to save the NSW Government an estimated \$6.5 million a year at current energy prices.

Thirty-four government sites have joined the Energy Saver Program and committed to 78 site audits to help save 9,682 megawatt hours of electricity, 39,672 gigajoules of natural gas,

12,863 tonnes of greenhouse gas emissions and \$2.5 million off power bills a year.

Under the Public Facilities Program, the Schools Energy Efficiency Program and the Energy Savings Fund, 154 projects are being implemented in schools, and local and state government sites, saving an estimated 40,443 megawatt hours of electricity, 41,245 tonnes of greenhouse gas emissions and \$7.7 million off power bills a year.

Table 5 Government power saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects or participants	Funding allocated	Estimated electricity savings	Estimated greenhouse gas savings	Estimated utility bill savings	Cost effectiveness
		\$	MWh/year	tCO₂-e/year	\$/year	\$ per MWh
CCF grant projects – local government	14	5,441,048	18,264	19,110	3,418,376	29.79
CCF grant projects – state government	12	6,988,725	13,898	13,358	2,334,472	50.29
CCF grant projects – schools	128	20,276,121	8,280	8,777	1,987,314	244.87
Government Building Retrofit Program – small sites	111	5,048,462	4,095	4,442	625,877	123.29
Government Building Retrofit Program – large sites	43	1,192,037	38,759	42,316	6,473,731	3.08
Energy Saver Program	78	1,845,393	9,682	12,863	2,532,869	19.06
Total		\$40,791,786	92,979	100,866	\$17,372,639	\$43.87

For reference, the cost of new electricity infrastructure is \$114 per MWh

Case study

A simple lighting upgrade improves passenger safety and saves more than \$50,000 a year off bills

With 307 railway stations across the RailCorp network, the cost of maintaining lighting standards for the safety of RailCorp's passengers is significant.

RailCorp sought to identify smarter ways to produce more lighting for customers at less cost. In response, RailCorp partnered with the Office of Environment and Heritage as part of the Government Building Retrofit Program to identify opportunities and trial technologies that would reduce energy use.

Glen Green, Manager Infrastructure Facilities at RailCorp, said the project has been a great success.

"The new LED lights are so far performing well and will result in some real cost savings in electricity and maintenance," he said.

Under the retrofit program, eight railway stations across the Illawarra and Hunter regions received a total of \$495,000 from the Climate Change Fund for lighting upgrades. These upgrades will result in annual savings of approximately 352 megawatts of electricity and up to \$50,000 off bills.

Across the eight stations, over 1,000 old-style fluorescent lights and floodlights were replaced with more efficient LED (light-emitting diode) lights.

The lighting upgrades are based on specifications developed by RailCorp following an earlier trial at Hurlstone Park railway



station. Using these specifications allowed RailCorp to streamline the adoption of new technology and gave the organisation confidence that savings could be achieved without compromising light quality.

Compared with old-style fluorescent lights and metal-halide floodlights, LED lamps not only use less energy for the same light output, they are also more reliable and have a longer lifespan. As a result, the new lights will lower maintenance costs and keep passengers safe.

Participating in the trial upgrade project has provided RailCorp with an excellent opportunity to test the performance of the energy savings technology at its stations and lead the way for potential wider application.

\$125 million funding for projects and programs
19 billion litres annual water savings
\$46 million annual water bill savings
2.6 years average payback



Water savings

With \$125.2 million support from the NSW Climate Change Fund, households, businesses, community groups and government save an estimated 19.2 billion litres of water and \$46.4 million off water bills a year through 605 projects, 150,907 residential rebates, 18,855 public housing retrofits and retrofits at 48 frontline government services.

Water savings for households

5 billion litres annual water savings
\$11 million annual water bill savings
4.7 years average payback



To date, \$57.7 million from the NSW Climate Change Fund has helped NSW households save an estimated 5.4 billion litres of water and \$11.5 million off their water bills a year.

By participating in the Home Saver Rebates Program, 150,907 households across regional NSW and Sydney took action to make their homes more water efficient. The program, which finished on 30 June 2011 as scheduled, provided rebates for rainwater tanks, water efficient washing machines, dual flush toilets and hot water circulators to help save an estimated 4.8 billion litres of water and \$10 million off household water bills each year. The demand for

rebates to support the purchase of water saving devices was high in both regional NSW and metropolitan Sydney. Regional areas drove demand for rainwater tanks, while many Sydney households used the rebate to purchase a more efficient washing machine.

Households have also benefited from a range of other projects to make their homes more water efficient. These projects included installing water efficient fixtures, harvesting rainwater with rainwater tanks, and using alternative water sources for laundries, gardens and toilets. Using \$3.9 million from the Fund, these 12 projects will help save an estimated 294.5 million litres of water and \$626,084 in water bills each year. Nine of these projects had been completed at 30 June 2012.

Table 6 Household water saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects or participants	Funding allocated	Estimated savings	Estimated bill savings	Cost effectiveness
		\$	ML/year	\$/year	\$ per kL
CCF grant projects	12	3,909,177	295	626,084	1.33
Home Saver Rebates Program	150,907	49,375,283	4,752	10,026,663	1.04
Public housing retrofits	18,855	4,455,393	394	\$831,487	1.13
Total		\$57,739,853	5,441	\$11,484,234	\$1.06

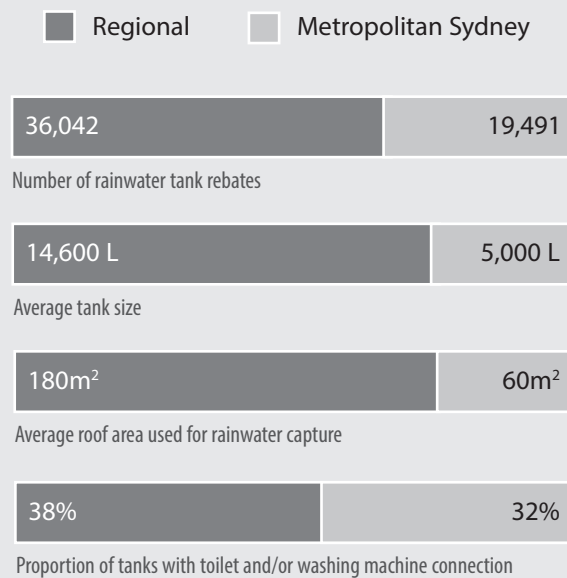
Water savings for households

More than 18,000 public housing properties have been fitted with water saving tap valves and showerheads to save an estimated 394 million litres of water and \$831,487 off water bills a year.

In addition to these savings, the Climate Change Fund has supported demand management projects delivered by Sydney Water. These projects include PlumbAssist, WaterFix and other education campaigns. PlumbAssist offers a plumbing service for customers in financial difficulty who need essential plumbing work or have a plumbing emergency. WaterFix is a paid service that offers repair and installation work of water saving devices such as toilets and showerheads. Visit www.sydneywater.com.au for more details.

Regional focus

Figure 4 Rainwater tank rebates



Water savings for businesses

11 billion litres annual water savings
\$28 million annual water bill savings
1 year average payback



To date, \$29 million from the NSW Climate Change Fund has helped NSW businesses save an estimated 10.8 billion litres of water and \$27.7 million off their water bills a year.

The Fund has helped businesses in a variety of sectors become more water efficient through programs that support diverse technologies.

A range of stormwater and rainwater harvesting, water recycling, groundwater use and water efficiency projects are being funded with grants allocated under the Green Business Program, the Central Coast Water Savings Fund and the former Water Savings Fund. Forty-nine of 63 projects had been completed at 30 June 2012. These projects include water recovery and reuse from industrial processes and equipment, and using water efficient devices and equipment.

The Fund provided \$13 million to the Metropolitan Water Directorate for a Recycling and Stormwater Harvesting Program. The Program, administered by the Metropolitan Water Directorate, helps potential water suppliers, distributors and customers develop localised recycling and stormwater harvesting schemes. Six completed projects will recycle around 750 million litres of water each year. Other projects currently underway, include stormwater recycling in Koola Park with Ku-ring-gai Council, stormwater recycling in Kelso Park with Bankstown Council and a Managed Aquifer Recharge project with Penrith Council. Once complete, these projects are estimated to save a further 1.2 billion litres of water a year.

The Fund also supports businesses through Sydney Water's 'one-stop shop' for business customers, which connects new business customers to Sydney Water services and works with businesses to prevent backflow, improve wastewater quality, become more water efficient and develop water contingency plans.

The Fund also enables Sydney Water's Business Customer Services and Council Partnerships Program to deliver additional water savings for businesses. Visit www.sydneywater.com.au for more information.

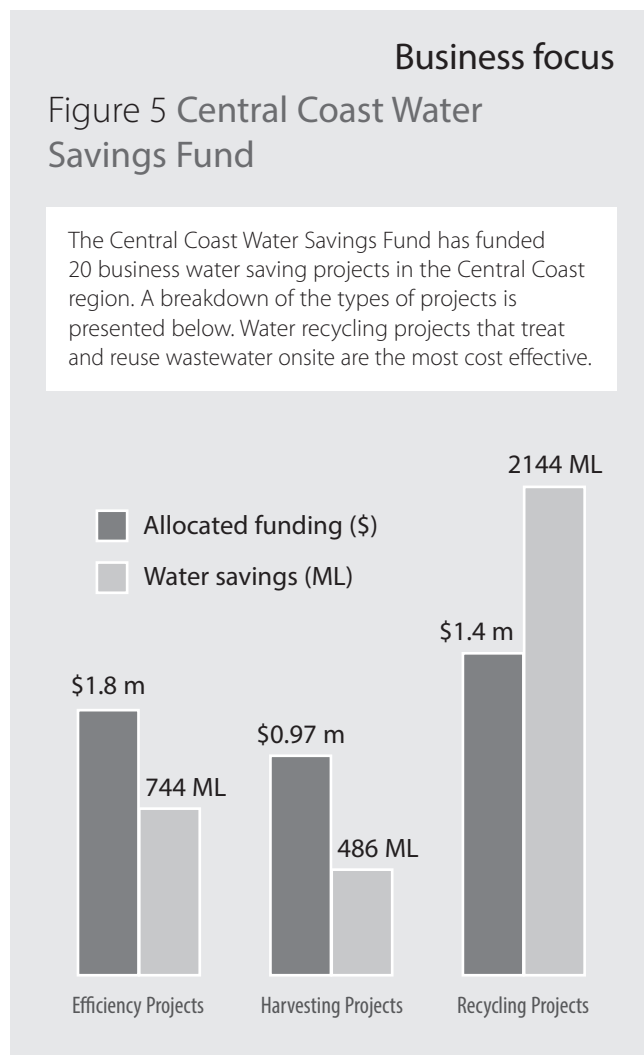


Table 7 Business water saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects	Funding allocated	Estimated savings	Estimated bill savings	Cost effectiveness
		\$	ML/year	\$/year	\$ per kL
CCF grant projects	63	29,035,101	10,811	27,675,035	0.27

Case study

Water management strategy

Erina Fair, a Lend Lease managed shopping centre on the NSW Central Coast, implemented a new water management system which will save up to 18,000 kilolitres of water each year – the equivalent of seven Olympic swimming pools.

A Climate Change Fund grant of \$652,000 made the \$1 million project possible. The centre installed a new water management system, including a 1.4 million litre water tank and a water filtration pumping station.

Rainwater captured from the extensive roof area of over 20,000 square metres is now treated and reused in other centre facilities including the car wash, cooling towers, the ice rink and for toilet flushing. Lend Lease Head of Sustainability Cate Harris said the project was the way of the future for water harvesting.

“Lend Lease prides itself on placing sustainability initiatives at the forefront of its business practices,” said Ms Harris.

Erina Fair Centre Manager Steve Beaumont said that the partnership with the Office of Environment and Heritage has allowed the centre to make a huge step in water saving initiatives that would otherwise have been impossible.



“Being less reliant on town water places less pressure on dams and allows us the opportunity to reinvest in further sustainability initiatives for the benefit of the whole community,” he said.

Erina Fair is striving to achieve zero net water use with other water saving initiatives currently in place including air-cooled (waterless) woks, flow-controlled toilet basins, synthetic grass and waterless urinals.

Case study

Crocodiles make a splash with water savings

There’s not a single crocodile tear to be seen at the Australian Reptile Park thanks to a water harvesting project that collects rainwater from the main roof for use in the crocodile pool and other internal display tanks.

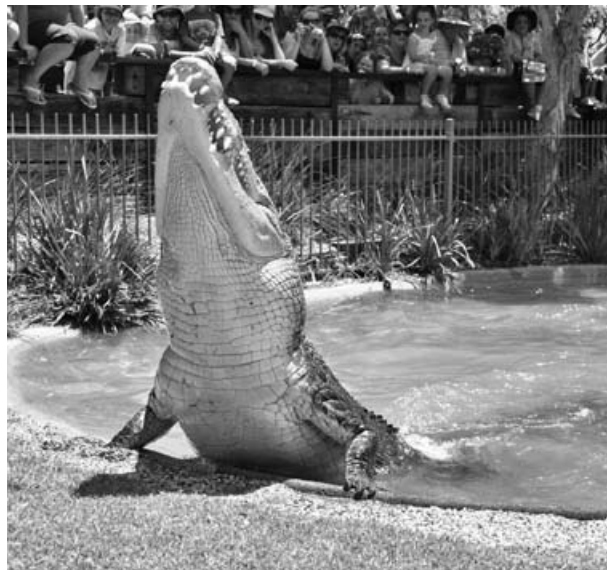
The park set itself the goal of reducing water use three years ago and had already started using recycled alligator lagoon water to irrigate park grounds.

A grant of \$79,022 under the Central Coast Water Savings Fund kicked the park’s efforts into gear and allowed for a three-pronged approach that has enabled the park to become more water efficient.

With the funding, the park installed a 107,000 litre water tank to harvest rainwater from its two main buildings. This water is used to fill the pool of park icon Elvis the crocodile, as well as other internal water exhibits.

The park also extended water pipes from the spring-fed alligator lagoon to the irrigation system for the remaining external enclosures within the park. Water efficient sensor taps and dual flush toilets were installed in all washrooms and staff were trained in how to be more water efficient.

The project is saving an impressive 2.9 million litres of water each year and has slashed the park’s water use by around 36 per cent.



General Manager Mary Rayner said that an added bonus is that visitors to the park can learn about the water saving program.

“Not only are there cost savings, our staff have become more water wise, and people think it’s quite quirky that harvested rainwater is used to fill Elvis the crocodile’s pool,” said Ms Rayner.

The park is already considering installing another underground tank to save even more water.

Water savings for communities

1.2 billion litres annual water savings

\$3 million annual water bill savings

4.4 years average payback



To date, \$14.8 million from the NSW Climate Change Fund has helped NSW community groups save an estimated 1.2 billion litres of water and \$3.1 million off their water bills a year.

Communities across NSW are implementing a range of simple, low cost water upgrades in their facilities.

A total of 241 water saving projects for community groups are being implemented with grants allocated from the Public Facilities Program, the Central Coast Water Savings Fund and the Water Savings Fund (within Sydney). As at 30 June 2012, 211 of these projects have been completed.

Funded water saving projects include upgrading and retrofitting bathroom amenities, installing rainwater tanks and recycling water for irrigation. Organisations undertaking these projects include aged care groups, disability and support services, early childhood services, and sport and recreation clubs. Larger public facilities such as community halls and leisure centres are implementing demonstration projects. Funded projects include education, groundwater harvesting, irrigation system improvements and upgrades, laundry monitoring, ozone generation, rainwater harvesting, stormwater harvesting and wastewater recycling.

Visit www.environment.nsw.gov.au/grants/ccfund.htm for details of water saving projects funded under the NSW Climate Change Fund.

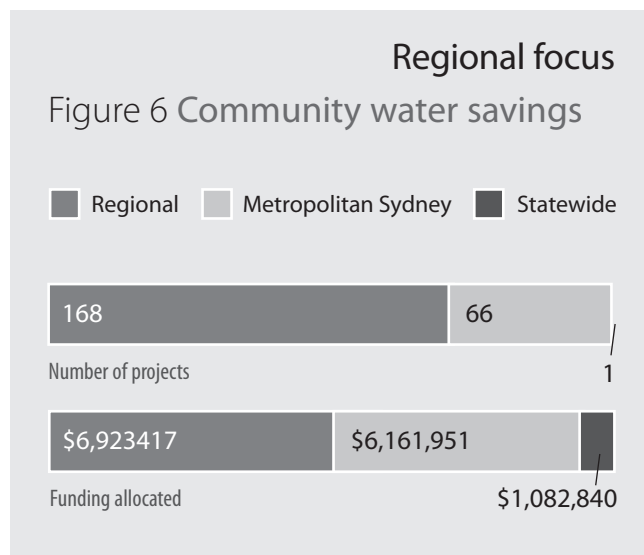


Table 8 Community water saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects	Funding allocated	Estimated savings	Estimated bill savings	Cost effectiveness
		\$	ML/year	\$/year	\$ per kL
CCF grant projects	241	14,809,939	1,239	3,080,938	1.20

Case study

Community learning to manage energy for life

A heritage-listed learning centre located in Bathurst is going green – and spreading the word, thanks to support from the NSW Government’s Climate Change Fund.

Rahamim Ecological Learning Community was established in 2007 (incorporated as Rahamim Inc in 2010) to promote and demonstrate sustainable living practices.

Thanks to a \$205,205 Climate Change Fund grant, the site is living out its intended purpose as a permanent education and demonstration environmental learning resource for visitors from across NSW and beyond.

“We used the funding to install new pipe-reticulation networks, roof water storage tanks and contour dams, diffusion tanks, a greywater reed bed, a five-kilowatt photovoltaic solar array, evacuated tube solar hot water systems, a solar office air heater, tri-phosphor lights, insulation, curtains, native and fruit tree carbon forests, a community organic market garden, a walking track and farm fences,” said Project Manager John Fry.

The staff and volunteers have also undertaken training and research in natural land management, climate-resilient carbon-rich landscapes and eco-education.



Over the past year, Rahamim attracted 9,000 visitors. Many visitors have been motivated to adopt the ideas on display, evidenced by the fact that Rahamim has facilitated the installation of solar photovoltaic systems in over 30 homes.

Mr Fry said that, thanks to the upgrades, the property is saving more than 50 per cent of water used per visitor. The payback period for the photovoltaic power system is expected to be less than seven years.

“Rahamim is now in the process of developing a five year management and succession plan which aims to establish our centre as a long-term community training and demonstration site for other regional land managers to access,” he said.

Case study

Water recycling and education initiatives for Central Coast youth

Youth Connections, a Central Coast organisation that helps young people access education, employment, recreational opportunities and training, received a \$79,000 Climate Change Fund grant to implement a water saving project at its Green Central site in Kariiong.

Green Central is a popular site for community events. Visitors can see firsthand the benefits of a sustainable approach to water management, and learn how to be more self-sustainable, grow their own vegetables and recycle waste.

The project applies advanced treatment technology to reuse greywater and water from toilets for use in the garden. Constructed wetlands act as a natural filtration system to clean harvested runoff and shallow groundwater for irrigation use.

“The whole site is a demonstration of sustainability, it’s educating people on how they can implement these projects in their own homes and live more sustainably,” said Youth Connections Chief Financial Officer, Julie Penney.

“It is also a social-enterprise activity; all the construction and management of the site provides education and training for the youth of the Central Coast, which then leads to employment.



The sustainable house and site provide proof of what can be accomplished if time is taken to consider how buildings impact on the environment, and how water and energy saving technologies can be employed.

This year, Green Central also participated in Sustainable House Day, allowing local homeowners, builders and developers to discover sustainable solutions designed to provide comfortable, energy efficient homes and save money for householders.

To combine these initiatives into social enterprises that benefit the whole community, the organisation is also incorporating an accredited course in Home Sustainability.

Water savings for government

1.7 billion litres annual water savings
\$4 million annual water bill savings
5.5 years average payback



To date, \$23.6 million from the NSW Climate Change Fund has helped local and state government facilities and schools save an estimated 1.7 billion litres of water and \$4.2 million off their water bills a year.

Around NSW, 289 water projects were allocated grants under the Public Facilities Program, the Central Coast Water Savings Fund, the Water Savings Fund (within Sydney) and the Rainwater Tanks in Schools Program. At 30 June 2012, 188 of these projects have been completed.

The Rainwater Tanks in Schools Program provided 218 schools with funding to purchase and install rainwater tanks. Additional funding was provided for water audits and monitoring, and to install water efficient taps, bubblers, bubbler cages and dual flush toilets. These projects also supported education activities to increase awareness about water conservation.

Forty-eight frontline government services also received help to reduce their water use and save money as part of the \$6.4 million Government Building Retrofit Program. Ambulance services, disability care residences, fire stations and other small government service sites in the Lower Hunter and Illawarra regions, and Circular

Quay in Sydney had water saving devices installed following an audit and action plan. Items typically installed included dual flush toilets, low-flow showerheads and flow restrictors. The program will help these services save more than \$34,707 off water bills annually, which can be reinvested into frontline service delivery.

The Fund also supported the wrap-up of Sydney Water's Every Drop Counts Schools Program and education resources. Visit www.sydneywater.com.au for more details.

The NSW Government's Water for Life Education and Engagement Program, coordinated by the Metropolitan Water Directorate, delivers and coordinates social marketing campaigns, water education projects and community consultation, and provides training and resources for council and non-government organisations.

In 2011–12, the Water for Life Program delivered the Advancing Sustainability Leaders Program to support sustainability and leadership capacity across local councils undertaking water projects in greater Sydney and the catchment areas. Water for Life also provided grants and resources to 14 local councils to deliver community engagement activities as part of their recycled water infrastructure projects.

Table 9 Government water saving projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects or participants	Funding allocated	Estimated savings	Estimated bill savings	Cost effectiveness
		\$	ML/year	\$/year	\$ per kL
CCF grant projects – local government	53	14,065,277	1,163	2,894,973	1.21
CCF grant projects – state government	6	1,289,959	101	259,182	1.28
CCF grant projects – schools	230	8,102,179	399	1,015,189	2.03
Government Building Retrofit Program	48	159,501	14	34,707	1.13
Total		\$23,616,916	1,677	\$4,204,050	\$1.41

Case study

New water saving technology delivers better services

Ageing, Disability and Home Care (ADHC) provides services and support to older people and people with a disability, and their families and carers, in NSW.

In an effort to increase water and energy efficiency, two of ADHC's older facilities in the Hunter region were retrofitted as part of the NSW Government's Building Retrofit Program.

The Stockton Centre and Tomaree Lodge both have buildings dating back to the 1940s and earlier, with old and inefficient electrical, water and gas fixtures. These facilities provide 24-hour care for people with intellectual and physical disabilities.

Both centres conducted onsite trials of water efficient hand-held showerheads to ensure they were fit for purpose. After four weeks of testing, staff reported the new showerheads were better than the original fixtures.

A grant of \$518,142 from the Climate Change Fund provided new water efficient showerheads as well as energy efficient light fixtures, occupancy sensors, solar and heat pump hot water systems, and timer controls on commercial dishwashers.

The two retrofits are estimated to save 465 megawatt hours of electricity, 2,497 gigajoules of natural gas and 11.7 million litres of water each year. The project will also save around \$124,000 off energy and water bills each year, which will be used to improve client services.



Bernie McMahon, Acting Manager, Engineering & Assets at ADHC said that after the success of this project, ADHC is now replicating the upgrades in other centres.

"The ability to implement water and energy efficient technology and save money without compromising care has been an outstanding result for ADHC," said Mr McMahon.

With support from the NSW Government Building Retrofit Program, the Kanangra Centre in the Hunter and the Balgownie Centre in the Illawarra are also being upgraded.

\$27 million funding for renewable technology projects
100,000 MWh renewable energy generation
\$17 million annual power bill savings
1.6 years average payback

Clean energy



The Climate Change Fund is contributing \$27.1 million toward small- and large-scale renewable energy projects that have a total project cost of \$110 million. These projects will generate 100,596 megawatt hours of renewable energy and save 106,422 tonnes of greenhouse gas emissions a year.

The Fund has supported significant projects that will enable new ways of using the state's renewable energy resources to power the development of the NSW economy.

The Fund provided 27.1 million for 11 clean energy projects under the Public Facilities Program, the Energy Savings Fund and the Renewable Energy Development Fund. These projects will help generate an estimated 100,596 megawatt hours of electricity a year, and save 106,422 tonnes of greenhouse gas emissions and \$17 million off power bills annually. Five of these projects have already been completed.

Some of the projects include harnessing methane gas from animal effluent and sewage, solar thermal technologies and installing mini hydro-generators and photovoltaic panels. These technologies are not yet deemed cost effective. The Fund is helping overcome a major barrier to investment by bridging the gap between the upfront cost of investment in these technologies and the savings on energy bills.

The Fund also allocated \$3.1 million to projects that are installing photovoltaic panels and power and water saving technologies. These projects include 'greening' community centres, schools and public buildings.

Visit www.environment.nsw.gov.au/grants/ccfund.htm for more details on clean energy projects funded under the NSW Climate Change Fund.

Another of the Fund's contributions to renewable energy is the Renewable Energy Precincts Program. This is a community partnership initiative designed to assist regional communities and industry to maximise the economic and environmental benefits of renewable energy. Six precincts are located in 47 local

government areas to promote and encourage renewable energy development in areas of NSW with the best renewable energy resources.

Initiatives under the Renewable Energy Precincts Program include a pilot energy efficiency and renewable energy program for agri-businesses in the Upper Hunter region; an online community wind map; the first feasibility study (co-funded by the Office of Fair Trading) into a community-owned wind farm in NSW; development of toolkits to help local councils determine the feasibility of renewable energy projects; consumer guides to help consumers make purchasing decisions; and workshops on planning related issues and community-owned renewable energy projects.

Under the program a guide for landholders on hosting wind turbines (in partnership with the NSW Farmers Association), and a study of low-frequency noise and infrasound on wind farm noise (in partnership with Environment Protection Authority Noise Policy section), are being developed.

The Solar Flagships Program awarded the first round of funding to build a 106 megawatt solar power station in Nyngan and a 53 megawatt solar power station in Broken Hill. The project is the first of its kind in Australia and one of the largest solar power projects in the world. It will help lay the foundations for a large-scale solar industry in Australia. The project is expected to commence in 2013, with construction planned to start in 2014 and the power stations to be commissioned by the end of 2015. During construction, around 485 jobs will be supported, in addition to new permanent positions providing ongoing benefits to western NSW. As part of the project, the University of New South Wales and University of Queensland will use the plant to undertake cutting-edge research, including a power system interface laboratory at the University of New South Wales.

Table 10 Clean energy projects and programs

Estimated savings as at 30 June 2012

Program	No. of projects	Funding allocated	Estimated electricity savings	Estimated greenhouse gas savings	Estimated utility bill savings	Cost-effectiveness
		\$	MWh/year	tCO ₂ -e/year	\$/year	\$ per MWh
CCF grant projects – clean energy	11	\$27,097,292	100,596	106,422	17,048,385	\$26.94

Case study

NSW's first community wind farm

With the help of a \$20,000 Climate Change Fund grant, a dedicated group of individuals and organisations are on their way to starting the state's first community wind farm.

The New England Wind (NEW) project aims to establish a community-owned wind farm in the New England area within six years. The farm would be capable of producing enough electricity to power up to 10,000 homes – or about half the residential energy needs of the New England tableland.

Project Director Adam Blakester said the project has been two-and-a-half years in the making.

"The Climate Change Fund grant, along with funds from the NSW Office of Fair Trading and local organisations, was a catalyst for the project," said Mr Blakester.

"It allowed us to conduct a feasibility study that really made the case for the wind farm and proved overwhelming local support. The grant, as well as the Office of Environment and Heritage's technical support and network of contacts, has been incredibly valuable."

More than 100 landholders have already offered to host wind turbines on their properties.

While the NEW project proposes a large-scale system, small wind turbines are also becoming an increasingly attractive



proposition, with many communities interested in being involved in their establishment.

To complement the NEW feasibility study and respond to demand from local communities to learn how they can become involved in this emerging sector, the Office of Environment and Heritage held workshops on small wind turbines and community-owned renewable energy.

These workshops were held in Bathurst, Jindabyne, Robertson, Tocal and Yass, and were attended by more than 225 people. They provided practical information on the best locations, costs, installation and operational issues for small-scale wind turbines suitable for homes, farms or small businesses.

\$350 million reimbursed to date
628,500 MWh renewable energy generated to date

Solar Bonus Scheme



The Solar Bonus Scheme provides eligible households and small businesses with a premium rate for the electricity they generate from small-scale solar or wind systems.

The scheme is administered by the Department of Trade and Investment Regional Infrastructure and Services and funded by the NSW Climate Change Fund.

The scheme will run for seven years from 1 January 2010 to 31 December 2016, and closed to new applicants on 28 April 2011. No new connections will be made after 30 June 2012.

The Office of Environment and Heritage is responsible for verifying and paying claims for reimbursement from the Fund to the distribution network service providers for Solar Bonus Scheme payments made to energy customers for renewable electricity generation.

As at 30 June 2012, there were 144,613 small-scale systems connected to the scheme. In 2011–12, these systems generated over 440,000 megawatt hours of renewable electricity, and the Fund provided \$211.8 million in reimbursement payments.

The scheme has had strong uptake in regional areas, as shown in Figure 7.

Visit www.trade.nsw.gov.au/energy/sustainable/renewable/solar/solar-scheme for more information on the Solar Bonus Scheme.

Regional focus
 Figure 7 Solar Bonus Scheme

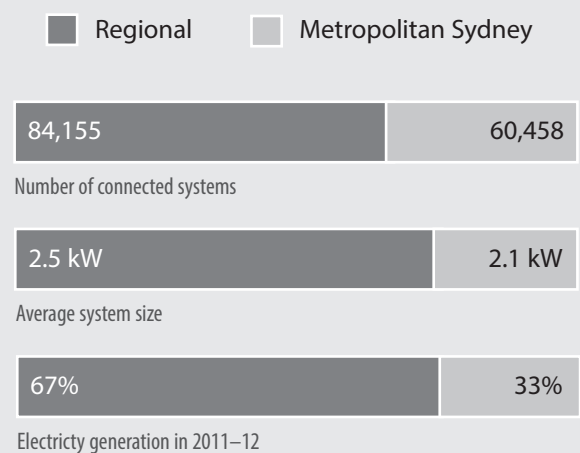


Table 11 Solar Bonus Scheme

Estimated electricity generation

Program	Year	No. of new installations	Total reimbursement	Estimated electricity generation	Cost effectiveness
			\$	MWh	\$ per MWh
Solar Bonus Scheme	Jan 2010 – June 2011	120,378	138,253,239	184,686	
Solar Bonus Scheme	2011–12	24,235	211,841,253	443,821	
Total		144,613	\$350,094,492	628,507	\$557

Coal Innovation NSW Fund



The Coal Innovation NSW Fund is administered by the Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS), with advice from Coal Innovation NSW.

The NSW Government has committed \$100 million over four years to the Coal Innovation NSW Fund:

- for research into, and development of, low-emissions coal technologies
- to demonstrate low-emissions coal technologies

- to increase public awareness and acceptance of the importance of reducing greenhouse gas emissions through the use of low-emissions coal technologies
- for the commercialisation of low-emissions coal technologies.

In the 2011–12 financial year, payments from the Climate Change Fund to the Coal Innovation NSW Fund totalled \$18.5 million. Funding provided by the Climate Change Fund to date totals \$68.6 million. The Coal Innovation NSW Fund provides a separate report to Parliament on its activities and expenditure each year.

Visit www.resources.nsw.gov.au/resources/low-emissions-coal for more information about the Coal Innovation NSW Fund.

Key projects funded by the Coal Innovation NSW Fund

Delta Carbon Capture and Storage Project

The goal of this project is to demonstrate post-combustion capture, transport and permanent geological storage of carbon dioxide from a power station, storing up to 100,000 tonnes of CO₂ per year. The Coal Innovation NSW Fund has allocated \$9.43 million to co-fund the \$28.3 million Stage 1 of this project, with the Commonwealth Department of Resources, Energy and Tourism and ACA Low Emissions Technology Limited providing matched funding. Stage 1 involves planning and securing approvals, developing a storage site for CO₂ and developing front-end engineering and design. The project will be hosted at Delta's Vales Point Power Station. Suitable storage sites are currently under investigation.

NSW CO₂ Storage Assessment Program

The Coal Innovation NSW Fund has allocated \$18.1 million to co-fund a \$54.3 million NSW CO₂ Storage Assessment Program, with Geoscience Australia and Australian Coal Association Low Emissions Technologies Limited providing matched funding.

This project has two aims: to undertake a short-term storage assessment for the Delta Carbon Capture and Storage demonstration project and to assess medium to longer term potential storage opportunities in NSW. The next stage of drilling works is in the Darling Basin, which will provide quantitative data on the sealing potential and reservoir qualities that will be analysed and modelled.



Research and development projects

Nine research and development projects have been awarded \$12.8 million through a contestable funding process that was conducted by the Coal Innovation NSW Fund in 2010. These projects include: reducing fugitive methane emissions from coal mines; making efficiency improvements to the coal combustion process, including developing a prototype direct carbon fuel cell system with much higher thermal efficiency than engines or turbines; and developing techniques for the post-combustion capture and secure long-term storage of CO₂. Projects also include social research on the public acceptance of low-emission coal technologies.

Enhanced Bushfire Management Program



With increased risk to the community from more extreme bushfire events predicted as a result of climate change, the Enhanced Bushfire Management Program was developed to help the NSW National Parks and Wildlife Service (NPWS) address worsening fire weather conditions, bolster hazard reduction operations and improve bushfire response capabilities.

The Climate Change Fund will provide \$62.5 million over the five years from 2011 to 2016 to increase hazard reduction operations and improve bushfire response capabilities in NSW parks and reserves.

During 2011–12, more than 49,000 hectares of hazardous area were treated with over 200 prescribed burns and more than

1,400 mechanical hazard reduction activities, such as vegetation clearing and dry-fuel removal. The number of burns was lower than projected as NSW experienced well above average rainfall, resulting in fewer opportunities for NPWS to conduct hazard reduction burns. Dedicated fire crews have been established around NSW to deliver strategic hazard reduction works above current levels, and 94 field-based firefighters have been recruited. Six dedicated rapid-response firefighting teams and two additional helicopters are on stand-by at predetermined heli-bases. These crews are available for immediate fire suppression operations in national parks in the most fire-prone parts of NSW during the bushfire danger period.

Case study

Metro South West region protecting local areas from bushfires

Local communities and National Parks and Wildlife Service (NPWS) assets are now better protected from devastating bushfires. Using climate change funds, teams around the state dedicated to implementing fire hazard reduction operations have been employed.

The Metro South West region Enhanced Bushfire Management Program (EBMP) team commenced work in late 2011, and is charged with protecting an area that stretches from Windsor south across the Cumberland Plain to the Nattai reserves, as far south as Mittagong, and east to the heath and coastal vegetation of the Royal National Park and Kurnell.

The team consists of a local program coordinator and six field staff, who undertake a range of bushfire hazard reduction activities designed to reduce the risk of bushfires to neighbouring private properties, local communities and NPWS-managed assets.

Training and maintaining skills to a best practice level is an important part of enhancing NPWS capacity to respond to bushfires, and over the past year all members of the EBMP



team have been trained to a minimum Bushfire Fighter Crew Member level.

While the bulk of the work has consisted of mechanical hazard reduction measures in close proximity to houses neighbouring NPWS-managed land, the team has also used its fire-management skills, performing fire trail maintenance and participating in hazard reduction burns locally and further afield, as well as assisting other parts of NPWS carry out prescribed burns.

Administration and Budget



Administration and the Australian Energy Market Commission



Governance arrangements

Under the *Energy and Utilities Administration Act 1987* (the Act), the Minister approves payments from the NSW Climate Change Fund if he or she is satisfied that projects promote a purpose referred to in the legislation. The NSW Climate Change Fund is administered by the Office of Environment and Heritage.

An evaluation panel with an independent chair and members with relevant industry and technical expertise assesses contestable grants under the Fund. The Office of Environment and Heritage conducts technical assessments of all applications received, to assist the evaluation panel. Applications are assessed according to selection criteria given in the publicly available *Guide for Applicants*. The evaluation panel makes recommendations on funding to the Minister.

Principles for administering the Fund

The Office of Environment and Heritage applies the following key principles in administering the Fund:

- funding allocations and expenditure will ensure responsible financial management
- a strategic approach will be used in setting priorities for expenditure
- the detailed priority setting process and fund allocations will closely follow strategic Government policy (including the election commitment of the NSW Climate Change Fund, the NSW State Plan and the NSW Energy Efficiency Strategy).

The Office of Environment and Heritage will:

- regularly assess and review outcomes achieved through expenditure
- conduct regular reporting to provide oversight of the Fund
- establish strong accountability and adhere to clear corporate governance principles.

Evaluation and reporting

Funding recipients must report on the progress of projects and their success in achieving anticipated outcomes (e.g. water and/or energy and greenhouse gas savings).

The Fund is committed to keeping the NSW community fully informed about its progress in achieving its climate change goals, and its expenditure and achievements under the Fund. The Office of Environment and Heritage reports regularly on its progress in meeting its NSW State Plan emissions target, and publishes information on the range of funding available, as well as projects that have been awarded funding.

National energy and water regulation initiatives

The Fund provides NSW's contribution to national energy regulation initiatives, as provided for under section 34H of the Act. In 2011–12, NSW paid \$7,102,778 as its share of the Australian Energy Market Commission's (AEMC's) annual operating budget. Under established funding arrangements agreed between relevant jurisdictions, NSW is responsible for 37.2 per cent of the AEMC's budget.

The Fund also contributed \$615,426.77 in 2011–12 to support the national Minimum Energy Performance Standard, and a one-off payment of \$423,968 to support the Water Efficiency Labelling and Standards scheme.

Budget and spending status



Revenue

Electricity distributors and water utilities were required to make contributions to the Fund through annual contribution orders, gazetted on 25 November 2011 for energy and on 27 February 2012 for water. A breakdown of the Fund's 2011–12 revenue is shown in Table 12.

Expenditure

The Fund's expenditure in 2011–12 was \$330,788,440. The proportion of program administration was 1.5 per cent. Expenditure for each of the Fund's components is presented in Table 13.

Table 12 NSW Climate Change Fund revenue 2011–12

Source	Amount (\$)
Ausgrid	71,012,219
Endeavour Energy	44,683,536
Essential Energy	34,753,861
Sydney Water	17,049,925
Interest	6,564,402
Miscellaneous revenue	2,399,381
Subtotal	\$176,463,324
Treasurer's advance for the Solar Bonus Scheme	126,960,465
Total funds	\$303,423,789

Table 13 NSW Climate Change Fund expenditure 2011–2012

Program/component	Recipient	Expenditure (\$, GST excluded)
Australian Energy Market Commission	Australian Energy Market Commission	7,718,205
Bushfire funding – capital	National Parks and Wildlife Service	1,568,223
Bushfire funding – recurrent	National Parks and Wildlife Service	9,804,907
Central Coast Water Savings Fund	Various	2,257,330
Climate Change Fund program administration	Office of Environment and Heritage	4,880,177
Coal Innovation NSW Fund	Department of Trade and Investment, Regional Infrastructure and Services	18,500,000
Energy Efficiency Strategy		
• Energy Efficiency Community Awareness Program	Various	1,480,143
• Energy Efficiency Data Collection and Monitoring Program	Office of Environment and Heritage	610,740
• Energy Efficiency for Small Business Program	Businesses	7,598,611
• Energy Saver Program	Businesses	5,141,241
• Government Building Retrofit Program	Businesses/Government	5,633,348
• Government Energy Efficiency Team Program	Office of Environment and Heritage	208,748
• Home Power Savings Program	Households	15,939,249
• Skills Development Program	Various	4,456,823
Green Business Program	Various	1,920,089
Home Saver Rebates Program	Households	5,595,077
Metropolitan Water Education Fund	Metropolitan Water Directorate	2,000,000
Public Facilities Program	Various	1,463,252
Public housing retrofits	Housing NSW	2,420,352

Budget and spending status

Program/component	Recipient	Expenditure (\$, GST excluded)
Recycling and Stormwater Harvesting Program	Metropolitan Water Directorate	3,720,420
Renewable Energy Development Program	Various	5,316,373
Schools Energy Efficiency Program	Department of Education and Communities	6,005,243
Solar Bonus Scheme	Distribution Network Service Providers	211,841,253
Sydney Water Demand Management Program	Sydney Water	1,148,096
Water and Energy Savings projects	Various	3,560,540
Total		\$330,788,440

Appendices



Appendix A Legislative requirements



The NSW Climate Change Fund was established in 2007 under the *Energy and Utilities Administration Act 1987*. The Act describes the purposes of the Fund and a number of other requirements.

Relevant provisions in the legislation are provided below.

Division 2 – Climate Change Fund

34F Purposes of Climate Change Fund

The purposes of the Fund are as follows:

- (a) to provide funding to reduce greenhouse gas emissions and the impacts of climate change associated with water and energy activities
- (b) to provide funding to encourage water and energy savings and the recycling of water
- (c) to provide funding to reduce the demand for water and energy, including addressing peak demand for energy
- (d) to provide funding to stimulate investment in innovative water and energy savings measures
- (e) to provide funding to increase public awareness and acceptance of the importance of climate change and water and energy savings measures
- (f) to provide funding for contributions made by the State for the purposes of national energy regulation.

34G Payments into Climate Change Fund

- (1) There is payable into the Fund:
 - (a) all money received from contributions are required to be made to the Fund under Division 3 and
 - (b) all money advanced by the Treasurer for the Fund and
 - (c) all money appropriated by Parliament for the purposes of the Fund and
 - (d) the proceeds of the investment of money in the Fund and

- (e) all money directed or authorised to be paid into the Fund by or under this or any other Act or law
- (f) all money received from voluntary contributions to the Fund made by any other person or body.

- (2) Without limiting subsection (1) (f), State agencies are authorised by this section to make voluntary contributions to the Fund.
- (3) Subsection (2) does not authorise a State water agency or a distribution network service provider to refuse to pay a contribution to the Fund that is payable under Division 3.

34H Payments out of Climate Change Fund

- (1) There is payable from the Fund:
 - (a) any money approved by the Minister to fund all or any part of the cost of any measure that the Minister is satisfied promotes a purpose referred to in section 34F, and
 - (b) any money approved by the Minister to fund all or any part of the contributions that the State is required to make for the purposes of national energy regulation and
 - (c) any money required to meet administrative expenses related to the Fund and
 - (d) any money required to meet administrative expenses of the Minister in connection with the Minister's functions under this Act in relation to savings action plans and
 - (e) any money directed or authorised to be paid from the Fund by or under this or any other Act or law.
- (2) In exercising the Minister's functions under subsection (1) (a) (but without limiting the generality of that paragraph), the Minister may:
 - (a) approve selection criteria from time to time to be applied to determine the kinds of water or energy savings measures that will be eligible for funding and
 - (b) approve the funding of community grants from the Fund, being grants awarded on the basis of their merit in advancing one or more of the purposes referred to in

Appendix A Legislative requirements

section 34F, established through a competitive selection process and

- (c) require a person or body seeking funding for a water or energy savings measure to do either or both of the following as a precondition to applying for or obtaining funding:
 - (i) to submit a water savings action plan or energy savings action plan (as the case requires) that includes details about the measure
 - (ii) to provide any other information requested by the Minister about the measure.

and

- (d) obtain and have regard to any advice, recommendations or other information provided to the Minister by a committee established by the Minister under Division 5, or by any other person or body, that the Minister considers relevant.

- (3) The Minister is to produce an annual report detailing fund allocations and programs and anticipated benefits, by reference to key performance indicators, to be achieved in advancing any one or more of the purposes referred to in section 34F.
- (4) The annual report is to include an evaluation of the effectiveness of each program as it is completed under the Fund.
- (5) The annual report is to be tabled in each House of Parliament within six months after the end of the financial year to which it relates.
- (6) The Minister is to publish each annual report so as to promote, to the NSW public, schemes, technologies and processes that address climate change, and to inform the NSW public about consumer choices and procurement decisions.

Appendix B

Tariffs and data sources



Tariffs

This annual report uses standard tariffs to calculate this year's cost savings for grant projects and business and household programs. These tariffs and their sources are listed below.

Table B1 Energy and water tariffs 2012–13 (at current prices)

Utility	Year	Sector	Tariffs	Units	Source notes
Electricity	2012–13	Residential	31.3	c/kWh	Residential tariffs include GST. Business, community and government tariffs are ex-GST. Data sources include price guides from suppliers/retailers (Energy Australia, Integral Energy, Country Energy, AGL, ActewAGL, Origin), government electricity and gas contracts, and reports and consumption data from various government agencies, including the Independent Pricing and Regulatory Tribunal (IPART).
		Business ¹	16.8 to 28.9		
		Government ²	19.1 to 24.0		
		Community ³	16.8 to 28.9		
Natural gas	2012–13	Residential	20.5	\$/GJ	
		Business ¹	17.2		
		Government ²	17.2		
		Community ³	20.5		
Water ⁴	2012–13	Residential	1.90 to 2.13	\$/kL	Standard rates (Sydney, Hunter, Central Coast and Rous Water utilities) Standard rates + 0.5 wastewater charges (Sydney, Hunter, Central Coast and Rous Water utilities)
		Non-residential	1.73 to 2.58		

1 Calculated tariffs for small, medium, large and very large businesses, based on threshold baseline consumption.

2 Calculated tariffs for education (DET, schools, TAFEs, non-education (health) and other government organisations.

3 Calculated tariffs for non-government schools and non-government (small, medium and large) not-for-profit organisations.

4 Calculated tariffs for projects/programs covered by the major water utility areas: Sydney, Hunter and Central Coast. Rous Water tariffs apply to the remainder of the state.

Savings estimates

Fridge Buyback Program figures do not include the number of fridge collections or savings from the pilot phases, which were funded under Energy Savings Fund rounds 1 and 2.

Power savings tables include savings (MWh, tCO₂-e and dollar bill savings) from designated power savings projects. Power bill savings may also include savings attributed from natural gas and operating and maintenance costs.

Water savings tables include savings (ML and dollar bill savings) from designated water savings projects.

The cost effectiveness of funding for all programs is calculated by dividing the funding allocated or expended by 10 years of savings (five years for the Home Power Savings Program). Cost effectiveness does not take into account the water savings from power projects or power savings from water projects.

The tCO₂-e/MWh conversion factor is 1.06, from the National Greenhouse Accounts July 2012.

All program savings are conservatively estimated from the available information.

Any apparent discrepancy in the totals shown is due to rounding.

Regions

Sydney Metropolitan is defined as those local government areas within the following regional council organisations:

- Northern Sydney Organisation of Councils
- Macarthur Regional Organisation of Councils
- Shore Regional Organisation of Councils
- Southern Sydney Regional Organisation of Councils
- Sydney Coastal Councils Group
- Western Sydney Regional Organisation of Councils.

All other local government areas are designated as regional.

Appendix C

Projects discontinued during 2011–2012



Table C1 Projects where no payments were made

Applicant name – project title	Funding approved	Funding paid to applicant based on milestone met
Blacktown City Council – irrigation of public open spaces with recycled water	\$235,000	-
Catholic Parish of St Patrick's Warialda – water savings project	\$16,250	-
Central Coast Community College – 'shed some light'	\$21,018	-
Central Shoalhaven Mobile Preschool – water & energy efficiency	\$6,642	-
Corrimal Bowling Club Ltd – sustainable future	\$8,887	-
Dapto Citizens Bowling Club Ltd – 'power down'	\$4,640	-
Gosford City Council – libraries save water	\$39,758	-
Gosford City Council – monitoring & auditing the 25 highest water users	\$220,000	-
Kingsgrove to Revesby Rail Quadruplication Alliance – photovoltaic integrated noise barrier	\$840,000	-
Lake Macquarie City Council – comfort zone calculator & PC power saving	\$41,000	-
Mingara Rebels Baseball Club – Adelaide St oval, stormwater harvesting	\$66,500	-
Northern NSW Christian Soccer Association – Killarney Vale Athletics Field stormwater harvesting	\$61,000	-
Sydney Turf Club – sewer mining for irrigation water	\$773,760	-
University of Sydney – sustainable water	\$305,000	-
Wyong Shire Council – Warnervale Athletics Field stormwater harvesting	\$70,000	-
Wyong Shire Council – Lake Haven Oval stormwater harvesting	\$70,000	-
Wyong Shire Council – Chittaway Oval stormwater harvesting	\$55,000	-

Table C2 Projects with partial payments, based on milestones met

Applicant name – project title	Funding approved	Funding paid to applicant based on milestone met
Cargill Australia Limited – Wagga Wagga biogas project	\$2,900,000	\$1,500,000
Continental Carbon Australia Pty Ltd – Kurnell water recycling	\$1,255,610	\$482,128
Country Energy – minimisation of water evaporation	\$700,000	\$250,000
Warmma Pty Ltd & Sydseed Pty Ltd – water, sustainable treatment & reuse	\$175,000	\$22,500
Waterwise Systems Australia Pty Ltd – greywater gardens	\$120,729	\$103,243

Glossary



the Act	<i>Energy and Utilities Administration Act 1987</i> , under which the NSW Climate Change Fund is established.	harvesting	Collecting rain or stormwater for reuse.
biogas	A by-product of anaerobic digestion, which is the decomposition process of micro-organisms. This gas by-product can be harvested and converted to energy.	heat pump	A device that pumps heat energy used in both heating and cooling systems. As heating units, heat pumps are able to extract heat from extremely cold outdoor air to heat the inside of a structure. When used as cooling units they can extract heat from indoor air, even if the outdoor air is much hotter.
CCF	NSW Climate Change Fund.	HVAC	Heating, ventilation and air conditioning.
CO₂	The chemical formula for carbon dioxide.	IPART	The Independent Pricing and Regulatory Tribunal; the independent economic regulator for NSW.
tCO₂-e	An abbreviation of 'tonnes of carbon dioxide equivalent'; the internationally recognised measure of greenhouse gas emissions.	kilolitre (kL)	A volumetric measurement equivalent to 1,000 litres, or one cubic metre.
cogeneration	The simultaneous generation of electrical and thermal energy, where both forms of energy are put to productive use. Cogeneration is typically possible when facilities produce large amounts of waste heat (usually in the form of steam or hot water) that can be used efficiently for space or water heating or cooling, industrial use, agriculture or conversion into electricity.	kilowatt hour (kWh)	A quantitative measure of electric current flow equivalent to 1,000 watts being used continuously for a period of one hour; the unit most commonly used to measure electrical energy. A kilowatt is 1,000 watts (see definition under watt).
cost effectiveness	A cost per megawatt hour or cost per kilolitre metric that is calculated by dividing the funding allocated by 10 years of electricity or water savings. Five years for the Home Power Savings Program.	megalitres (ML)	A volumetric measurement equivalent to 1 million litres.
DPC	The NSW Department of Premier and Cabinet.	megawatt hour (MWh)	A unit of electricity equivalent to 1,000 kilowatt hours or 1 million watts.
efficiency (energy and water)	Reducing the amount of energy or water required to provide a given level of service (e.g. for lighting, air conditioning or toilet flushing).	milestone	A milestone is a planned and measurable event that indicates the completion of a major deliverable of a project.
feed-in tariff	A premium rate paid for electricity fed back into the electricity grid from a designated renewable electricity generation source.	OEH	The Office of Environment and Heritage (a division of the NSW Department of Premier and Cabinet).
the Fund	The NSW Climate Change Fund.	payback period	The time taken for savings or profit from an investment to pay for the initial capital expenditure. Payback period = capital cost divided by total annual savings. For example, a new lighting system costing \$400 with \$200 bill savings per year has a payback period of \$400/\$200 = two years.
gigajoule (GJ)	A joule is a unit of energy, equivalent to a power of one watt for one second. A gigajoule is 1,000 million joules.	peak demand	The maximum power demand on a system at a given time, or the maximum power required to supply customers at any time. This may be at a particular time of the day or a specific hour of the day.
greywater	Wastewater from a variety of sources within households or businesses, typically sourced from baths, showers, laundries or basins. Greywater is not sourced from toilets or bidets.	photovoltaic (PV)	A form of solar energy that directly converts light into energy.
groundwater	Water that has been collected in an aquifer or the water table that is below ground level.	potable water	Water that is suitable for drinking.

power factor correction (PFC) The demand for electricity a site places on the electricity network is expressed in kVA (1,000s of volt amps) and is a measure of the customer's load on the power supply network. The power factor is the ratio of the actual power in kW divided by the kVA. The ratio is between 0 and 1, where 1 means that a site is making the most effective use of its electricity supply. Power factor correction reduces peak demand on the electricity supply network by bringing the ratio closer to 1.

recycled water Water taken from a non-potable source and treated to a level suitable for its intended use.

renewable energy Energy generated from renewable sources, including the sun, waves, waste, water (hydroelectricity) and wind, as opposed to fossil fuels that emit greenhouse gases.

retrofitting Upgrading an existing system or building, typically to make it more energy or water efficient.

solar energy Solar power refers to the sun's potential to produce energy. Solar energy can be generated using a wide variety of methods, ranging from simple water recirculating systems used to heat homes and commercial offices, to sophisticated networks of solar cells that produce enough energy to supply small cities.

stormwater harvesting The collection and reuse of rainwater that would otherwise end up in the stormwater channels that lead to a river or the ocean. Harvesting stormwater generally involves two stages: storage and treatment. Stormwater usually comes in large volumes during heavy rain and, as such, must be stored to allow for reuse. Because stormwater is typically low quality with a high level of pollutants, it must be sufficiently treated. Stormwater is most commonly reused for irrigation.

wastewater (and wastewater recycling) Wastewater is water that has been contaminated by some activity, and includes greywater and sewage. It can be collected from a variety of sources, then stored and treated so it can be used as an alternative to the potable water supply.

watt (W) The unit for measuring electrical power. The rate of energy consumption by an electrical device when it is in use is measured in watts.

List of Photographs:

- i University of New South Wales students who participated in energy efficiency courses in partnership with the Office of Environment and Heritage.
- ii. The Hon. Robyn Parker MP, Minister for the Environment.
1. Myuna Bay Sport and Recreation Centre.
6. St George Migrant Resource Centre receives a free energy efficiency talk by a Home Power Savings Program assessor.
7. Save Power Retailer Program.
10. Phoenix Foundry. Courtesy Phoenix Foundry.
11. Woodland Bioreactor. Courtesy Veolia Environmental Services.
13. Kiama Leagues Club. Courtesy Kiama Leagues Club.
14. Drama theatre at the Sydney Opera House. Courtesy Sydney Opera House.
16. North Wollongong train station. Courtesy RailCorp.
20. Lend Lease representatives at the Erina Fair Water Management System launch. Courtesy Lend Lease.
20. Elvis the crocodile delights audiences. Courtesy Australian Reptile Park.
22. Installation of a rainwater tank. Courtesy Rahamim Ecological Learning Community.
22. Installation of the water savings project at Youth Connections. Courtesy Youth Connections.
24. Water saving showerhead installed at the Balgownie Centre in Illawarra. Courtesy Aging Disability and Home Care.
25. Wind turbines generating renewable energy.
26. Participants at the Small Wind Workshop.
28. Delta Pilot Carbon Capture Plant. Courtesy Delta Energy.
29. Map of metro South West Region managed by the Enhanced Bushfire Management Program team.
30. Installing energy efficient light bulbs.
33. NSW Environment Minister at one of the Sustainability Advantage recognition events.
37. Solar energy installed as part of the Maitland Fire and Rescue retrofit.

