

NSW Climate Change Fund

Annual Report 2017–18



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Cover photo: Under the Home Energy Action social housing program, OEH partnered with St George Community Housing to install rooftop solar on a home in Riverwood, New South Wales. More than 2000 social housing properties had energy efficiency upgrades in 2017– 18. These upgrades will save more than 5300 megawatt hours of electricity and more than \$1.5 million off energy bills per year. (Photo: Quentin Jones, Jonesphoto)

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Minister's foreword

The NSW Government is helping households and businesses save money on their energy bills and supporting community resilience to natural hazards and climate risks.

Government initiatives, funded through the NSW Climate Change Fund (the Fund), are delivering real benefits to NSW households. A renewed focus on energy affordability for the Fund means pensioners and low-income earners are benefiting from massive savings.

In September 2017, we announced the Energy Affordability Package with \$112.5 million in funding for vulnerable households, small businesses and responding to energy demand.

We have extended the Home Energy Action program to provide more discounts to concession card holders to buy an efficient fridge or television; and to continue to partner with social, public and Aboriginal housing providers to deliver energy efficiency improvements for households. We have expanded the program to support solar photovoltaic installation for energy hardship customers to help ease the energy bills of some of NSW's most vulnerable households.

Support for businesses is being provided through equipment upgrades and energy management training to provide them with tools to control their energy use and bills. So far, our online training courses have been accessed by more than 1000 businesses since launching on 23 December 2017.

These initiatives do much more than deliver much needed savings for households and businesses. Because of the reduced energy use and improved energy productivity by business, there is less load on the power grid and a reduction in greenhouse gas emissions.

As well as helping households and businesses save energy and money, the Fund is also providing funding for initiatives that support the resilience of our communities. Initiatives such as private land conservation, enhanced bushfire management, support for coastal communities, future-proofing Warragamba Dam and many other initiatives to reduce the effects of flood and the risk of bushfire.

Thanks to the Fund, we are able to provide world-leading local climate information through our NSW and ACT Regional Climate Model (NARCliM) which helps researchers, businesses and communities understand and put in place strategies to adapt to the impacts of climate change.

Jabreli Open.

Gabrielle Upton Minister for the Environment

NSW Climate Change Fund highlights, 2017–18

- Achieved, over the 10 years of the fund, an estimated \$186,894,769 in household energy bill savings from publicly evaluated CCF. This represents an average saving of \$61 per household per year as of 2017–18.
- The total estimated GHG savings from CCF programs to date is more than 28 million tCO2-e.
- Improved energy affordability by helping households and small businesses save energy and money, as well as reduce emissions, by delivering:
 - o 500 lighting upgrade projects with estimated bill savings of \$244,079 per year
 - 14,800 replacement fridges and televisions for eligible households with expected energy bill savings of more than \$3 million per year.
- Upskilled small businesses to save money on energy bills by providing training delivered by OEH, including:
 - free online energy management training to 1066 businesses across New South Wales
 - five free webinars (with 153 participants) on energy management topics for small business
 - an 'Introduction to Energy Management' course to 89 businesses in nine regional locations and one in Sydney.
- Launched a new consumer-focussed website which makes it simple, clear and fast for households and small businesses to understand how they can reduce their energy usage. The <u>Energy saver</u> webpage received 143,000 page views from 20 April 2018 (launch date) to 30 June 2018.
- The Gas Efficiency Funding program drew to a close. The program, which commenced in 2015, contributed \$1.24 million to 45 businesses to implement 63 gas efficiency and maintenance projects worth \$5.9 million. These projects are estimated to save more than 320 terajoules of gas and \$2.8 million off energy bills a year.
- Partnered with the Australian Renewable Energy Agency to deliver the NSW Demand Response program to help address system-demand peaks and system emergencies.
- Completed the Shoalhaven Illawarra Enabling Regional Adaptation (SIERA) project, identifying climate change vulnerabilities of key regional systems in the Shoalhaven Illawarra and opportunities for government to better serve community needs.
- Increased visits to the <u>AdaptNSW</u> website over the year by 33%, indicating growing awareness, interest and use of climate change information.
- Prepared a new Regional Hawkesbury–Nepean Flood Study, the first since 1995, to make contemporary flood risk information available to communities and decision-makers. The flood study information will be made available from February 2019.
- Installed new air quality monitoring stations in Parramatta North and Armidale to better enable us to protect the health of our local communities and increase our understanding of the impacts of climate change.

1. Delivering priorities for government

1.1 Priorities of the NSW Climate Change Fund

The NSW Climate Change Fund (the Fund) supports the NSW Government's priorities by delivering practical measures to help homes, businesses, communities and government save energy and water, reduce greenhouse gas emissions, and manage the impacts of climate change, including increasing public awareness of climate change.

The Minister for the Environment is responsible for the Fund, which is administered by the Office of Environment and Heritage (OEH). The Fund was established in 2007 under the *Energy and Utilities Administration Act 1987* (the Act). Appendix A outlines relevant legislative responsibilities.

Saving energy and reducing emissions

2017–18 was a transition year for the Fund as several programs concluded, and new programs started ramping up. Rising energy costs put pressure on households and businesses and the Government is committed to doing what it can to address this national issue. To help ease the cost of living, planned investments under the Fund were reviewed to ensure households and businesses would receive direct benefits through bill saving measures.

In 2017–18, the NSW Government announced practical initiatives to save money on energy bills and ease the cost of living while reducing emissions. In September 2017, the NSW Government announced its Energy Affordability package which includes programs to make energy affordable for households, make energy efficient appliances cheaper for homes and businesses, and upskill businesses on how to save energy and money.

Future investments from the Fund have been refocused to be better targeted and more strategic. The focus is not just reducing emissions but reducing cost-of-living pressures. Beginning in 2018–19 are the following new initiatives, which will assist households and businesses to save money on their energy bills, reduce emissions and improve energy security to benefit the whole community:

- energy efficiency upgrades for low income renters
- equipment upgrades for energy intensive manufacturers
- upgrading inefficient streetlights to efficient LEDs
- grants for community energy projects
- the emerging energy program to support the next generation of large-scale energy and storage projects in NSW
- solar for low income households
- smart batteries for schools, hospitals and other key government buildings

Strengthening our resilience to climate change impacts

In 2017–18, the NSW Government continued a range of initiatives to improve our community's resilience to the impacts of climate change. This included continuation of funding to protect our coasts and reduce flood risk, measures to safeguard the resilience of our natural ecosystems, and initiatives to improve our understanding of climate change impacts.

1.2 NSW Climate Change Policy Framework

The <u>NSW Climate Change Policy Framework</u> articulates the NSW Government's role in reducing emissions and adapting to the impacts of climate change. The framework sets two aspirational objectives for New South Wales:

- achieve net-zero emissions by 2050
- make New South Wales more resilient to a changing climate.

Investment from the fund in 2017–18 contributed to achieving these objectives.

1.3 Measuring the performance of the Fund

This annual report has been prepared in accordance with the requirements of section 34H of the Act. Activities under the Fund are reported for its 11th financial year of operation, from 1 July 2017 to 30 June 2018.

As required by the Act, the annual report provides information on fund allocations and anticipated benefits, where possible, with reference to the Fund's key performance indicators which relate to:

- energy savings (megawatt hours per year)
- greenhouse gas emissions reduction (tonnes of carbon dioxide equivalent per year)
- annual bill savings (dollars per year)
- clean/renewable energy generated (megawatt hours per year)
- funds allocated (dollars).

Funding recipients must report to OEH on the progress of projects and their success in achieving outcomes. Information on Fund programs and evaluation reports are published on the OEH website. OEH regularly reports on its progress in meeting NSW Government priorities and election commitments.

OEH developed a new Climate Change Fund Evaluation Framework in line with NSW Government policies and international best practice. The framework defines the evaluation requirements and the supporting governance arrangements under the Fund. As a basis for evaluating programs, it outlines how to obtain evidence to demonstrate the achievement of outcomes and anticipated benefits, and how to report on key performance indicators.

The New South Wales Government is implementing the evaluation framework to produce rigorous outcome evaluations by developing detailed evaluation plans for programs, and ensuring proper monitoring and data collection.

Evaluation of completed programs

The first phase of the Home Energy Action program ended in 2017–18. An independent evaluation of the program concluded:

The HEA Program has been found to be a well-designed, successfully implemented and effective intervention for improving energy efficiency among low-income households in NSW.

The <u>Energy efficiency programs evaluation</u> webpage provides program evaluation reports for the first phase of the Home Energy Action program.

The Gas Efficiency Funding program ended in 2017–18. The independent <u>Gas Efficiency</u> <u>Program Evaluation</u> of the program was completed in November 2017. The evaluation report concluded: Overall the program was very successful in achieving gas and cost savings across the majority of participating businesses. It represents excellent value for money for the NSW Government. It is evident that the program assisted with boosting the market for gas efficiency products and services.

An independent <u>Evaluation of the Energy Saver Program</u> which ended in 2016–17 was completed in October 2017. The evaluation report concluded that:

The Energy Saver Program has successfully delivered a market-based approach to assisting targeted NSW businesses improve their awareness and prioritisation of energy management, as well as driven real action in realising improvements in energy efficiency and productivity – although it is impossible to fully quantify these improvements.

OEH delivered programs to fulfil actions in the NSW Energy Efficiency Action Plan, which ran from July 2013 to June 2017. The Energy Efficiency Action Plan was introduced by the NSW Government as part of efforts to place downward pressure on household electricity bills, and improve the energy productivity of the NSW government and business sectors. The plan aimed to support three groups identified as particularly vulnerable to rising energy bills: low income households, small to medium-sized business, and those in regional areas.

The Energy Efficiency Action Plan: Achievements, success factors and future support report outlines what was delivered and achieved by the OEH programs, success factors and lessons learnt.

2. Climate Change Fund budget and administration

2.1 Budget

Revenue

Licensed electricity distributors and Sydney Water are required to contribute to the Fund through the gazettal of the annual contributions orders.

The Fund's revenue in 2017–18 was \$293 million. A breakdown of the Fund's revenue is shown in Table 1.

Table 1	NSW Climate C	hange Fund	revenue	2017–18
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Source	Amount
Ausgrid	\$138,381,309
Endeavour Energy	\$88,185,379
Essential Energy	\$60,380,999
Sydney Water	\$3,140,000
Interest	\$2,533,905
Miscellaneous recovery of fees1	\$358,924
Total	\$292,980,516

¹ Includes the recovery of training fees and audit costs for the Action Matters for Business program.

Expenditure

The Fund's total expenditure in 2017–18 was \$180.9 million.

Of this, 1.2% was for program administration. This provided administration, financial reporting and analysis, decision support, program evaluation, legal advice and coordination of the annual report.

Expenditure for each of the Fund's priorities is shown in Figure 1 and Table 2.

The difference between total revenue and total expenditure is mainly due to timing differences of program commitments approved by the NSW Government.

In the recent state budget, expenditure under the Fund was carried forward from 2016–17 so it can be spent in the coming years.

There is no reduction in expenditure over five years to 2021–22.



Figure 1 NSW Climate Change Fund expenditure 2017–18

Table 2 NSW Climate Change Fund expenditure 2017–18

Program Component	Responsible agency	Amount ¹
National energy regulation	Australian Energy Market Commission, Australian Government Department of Environment and Energy	\$10,215,812
Energy affordability and efficiency	Office of Environment and Heritage	\$16,577,737
Making energy affordable for households	Office of Environment and Heritage	\$11,568,713
Energy efficient upgrade for homes and businesses	Office of Environment and Heritage	\$1,605,944
Upskilling businesses to save energy	Office of Environment and Heritage	\$1,230,683
Saving gas for businesses	Office of Environment and Heritage	\$638,878
Improving awareness about energy savings (digital portal)	Office of Environment and Heritage	\$358,746

Program Component	Responsible agency	Amount ¹
Energy Efficiency Scheme Consumer Campaign	Office of Environment and Heritage	\$250,221
Other Energy Efficiency Action Plan programs	Office of Environment and Heritage	\$924,552
Responding to energy demand	Department of Planning and Environment	\$3,278,154
Smarter energy use in government	Various	\$393,435
Reducing emissions and sustainability	Various	\$5,355,059
Reducing emissions on the land	Office of Environment and Heritage	\$661,174
Sustainable use of our energy and resources	Various	\$4,693,885
Coastal and floodplain management and delivery of programs in the Hunter Valley and Hawkesbury–Nepean to prepare for major flood events	Various	\$33,663,785
Coastal management including coastal grants, planning and implementation reforms	Office of Environment and Heritage	\$5,642,192
Hawkesbury–Nepean Valley flood risk management	Infrastructure NSW	\$15,977,700
Hunter Valley flood mitigation maintenance	Office of Environment and Heritage	\$1,185,273
Supporting local government to manage flood risk	Office of Environment and Heritage	\$7,108,276
Manly Hydraulics Laboratory	Office of Environment and Heritage	\$3,750,344
Private land conservation	Biodiversity Conservation Trust	\$43,000,000
Protected area management	Office of Environment and Heritage	\$32,191,547
Enhanced bushfire management and hazard reduction (including bushfire research)	Office of Environment and Heritage	\$27,626,826
Improving our understanding of climate change impacts	Various	\$2,794,044
Equipping ourselves to adapt to climate change	Office of Environment and Heritage	\$119,174
Air quality monitoring and forecasting	Office of Environment and Heritage	\$2,474,870
Supporting innovative solutions	The Australian Climate Knowledge and Innovation Community	\$200,000
Other government priorities	Office of Environment and Heritage	\$5,787,506
Fund research and evaluation	Office of Environment and Heritage	\$2,486,713

Program Component	Responsible agency	Amount ¹
Climate and Resource Efficiency Policy	Office of Environment and Heritage	\$1,103,832
Climate Change Fund program administration	Office of Environment and Heritage	\$2,241,056
Solar Bonus Scheme Reimbursement Program 2016–17: accrual adjustment	Office of Environment and Heritage	-\$44,095
Total		\$180,883,905

¹ Includes capital expenditure

2.2 Administration and market regulation

Governance and funding arrangements

Under the Act, the Minister for the Environment requires licensed electricity distributors and Sydney Water to make contributions to the Fund via the annual gazettal of contributions orders. The Minister seeks the concurrence of the Minister for Energy and Utilities and the Treasurer as required when preparing contributions orders.

The Minister for the Environment approves payments from the Fund if satisfied that projects promote a purpose outlined in section 34F of the Act.

National energy regulation

Investment from the Fund in 2017–18: \$10,215,812

The Fund provides the NSW Government's contribution to national energy regulation initiatives, as provided for under section 34H of the Act.

Under established funding arrangements agreed between relevant jurisdictions, New South Wales was responsible for 37.2% (\$9 million) of the Australian Energy Market Commission's budget for 2017–18.

New South Wales also contributed \$1.2 million to the work of the Council of Australian Governments' Energy Council, Energy Programs and Services on national energy regulation.

3. Delivering energy savings and reducing emissions

A top priority for the NSW Government in 2017–18 was to ease cost of living pressures by helping households and businesses use new technology to reduce their energy costs.

Rising energy costs are a national issue and the NSW Government is strongly committed to doing what it can to help.

The Fund supports programs that reduce energy costs for households, businesses and government while also reducing emissions. These programs also contribute to the NSW Government target to deliver 16,000 gigawatt hours of energy savings a year by 2020.

Investment from the fund in 2017–18 helped households and businesses use energy more efficiently and save money.

3.1 Making energy affordable for households

Aim

The Home Energy Action program aims to improve access to the benefits of energy efficiency for low-income and disadvantaged households through social housing upgrades and more affordable appliances. The program aims to help these households save energy and money as well as reduce emissions. This program is part of the Energy Affordability package announced by the NSW Government in September 2017.

Approach

The program works in partnership with community housing providers, the community services sector and industry to deliver energy efficiency improvements to households experiencing energy stress to improve people's comfort, health and wellbeing.

The program operates three streams:

- Social housing upgrades a co-investment model with social housing providers to install energy efficiency retrofit measures on public, community and Aboriginal housing dwellings. Measures include solar photovoltaic panels, ceiling insulation, draught proofing, LED lighting, heat-pump hot water systems and split system air conditioning. In addition to retrofit measures, this stream assists with energy performance upgrades for new build projects.
- **Appliance replacement offer** offers financial support to replace old fridges and televisions with new energy efficient models at discounted prices.
- **Energy hardship assist** a co-investment model to deliver subsidised solar panels, in partnership with energy retailers, to their energy hardship customers in social housing.

All energy efficiency measures included in the program are subject to a cost–benefit analysis to ensure a good return on investment for the NSW Government and program participants.

Investment from the Fund in 2017–18: \$11,568,713*

* This program was funded through Energy Efficiency and Affordability packages.

2017–18 milestones:

- **Social housing upgrades** More than 2000 social housing properties had energy efficiency upgrades under OEH's existing agreements with social housing partners. These upgrades will save more than 5300 megawatt hours of electricity and more than \$1.5 million off energy bills per year.
- **Appliance replacement offer** Delivered more than 14,800 energy efficient fridges and televisions.
- Energy hardship assist Installed rooftop solar photovoltaic systems on 27 North Coast Community Housing properties, saving 70,000 kilowatt hours of grid-sourced electricity and almost \$16,000 off energy bills a year.
- Renewed strategic partnership with the Community Housing Industry Association, including targeted training for community service providers and their tenants on energy efficient behaviours. This training is combined with sessions by the Energy and Water Ombudsman and the Public Interest Advocacy Centre.
- The first phase of the Home Energy Action program ended in 2017–18. See section 1 for evaluation information.

Appliance Type	Number of appliances	NSW Government investment (\$)	Estimated electricity savings (MWh/yr)	Estimated GHG savings (tCO ₂ -e/yr)	Estimated bill savings (\$/yr)	Potential cost effectiveness (\$/MWh) ¹
Televisions	3,958	\$725,148	1,886	1,735	\$624,184	\$38.45
Fridges	10,210	\$3,183,032	7,186	6,611	\$2,378,567	\$36.91
Total	14,168	\$3,908,180 ²	9,072	8,346	\$3,002,751	\$37.19

Table 3 Savings for appliance replacements 2017–18

Note: See Glossary for description/explanation of acronyms and units of measure used in the table.

¹ Refer to Appendix B for methodology; the lifetime of the savings is assumed to be 10 years for televisions and 12 years for fridges.

² This figure is based on actual sales receipt at the end of 2017–18 and is subject to include standard year end accrual.

Case study: Take control of your energy bill

Phil's story

Phil is using solar energy to get on top of his electricity bills and enjoy affordable air conditioning. Phil is 57 years old, lives alone and receives some assistance every day from a carer. He has been a tenant with North Coast Community Housing for just under a year. Phil currently spends around \$150 per quarter on his energy bill, which amounts to around \$6000 over a decade. Phil uses his home appliances as little as possible to save money and describes himself as 'very frugal' when it comes to energy use. He's always turning off the lights and never uses or leaves an appliance on unless it's 'absolutely necessary'.



Phil is a tenant at North Coast Community Housing Photo: L Madden/OEH

How we helped Phil

Summer heat and humidity used to really impact on Phil's health and happiness, and he would live without air conditioning to try to save money.

Air conditioning will now be affordable thanks to the installation of rooftop solar as part of the Home Energy Action program.

The program offers tenants like Phil access to solar energy though rooftop solar systems. This includes premium feed-in tariffs and no upfront installation costs. This is being delivered in partnership with OEH, Enova Community Energy and North Coast Community Housing. Tenants are expected to save an average of \$592 off their energy bills each year.

Phil's taking control

The new solar system will certainly help Phil financially, as well as allowing him to enjoy his summers. He'll also be less concerned about his energy use, leading to a more relaxed and happy life.

3.2 Energy efficient upgrades for homes and businesses

Aim

The Household and Small Business Upgrade program aims to help households and small businesses save energy and money as well as reduce emissions. This program is part of the Energy Affordability package announced by the NSW Government in September 2017.

Approach

The program is being delivered via a series of funding rounds, each focusing on specific technology categories.

- **Round 1 Lighting** incentivises lighting suppliers to deliver energy efficient technologies into households and small businesses across New South Wales. Projects are delivered through the Energy Savings Scheme, a regulated certificate trading program, via accredited suppliers.
- **Round 2 Air conditioners** will provide an incentive to households and small businesses to invest in higher efficiency air conditioners by providing a discount off the installed price. The offer will be launched for summer 2018–19.

Future funding rounds will include incentives for energy efficient household and business appliances and building envelope upgrades.

Investment from the Fund in 2017–18: \$1,605,944

2017–18 milestones:

- Lighting round Completed industry engagement, published the tender and awarded successful tenderers with six contracts supporting small business lighting upgrades and six contracts supporting household lighting upgrades. Since the program commenced, 500 site upgrades have been delivered and these are projected to save 10,898 megawatt hours of electricity over the lifetime of the new lights.
- Air conditioning round Completed industry engagement and published the tender.

Number of projects/ grants	Funding committed	Estimated electricity savings (MWh/yr)	Estimated GHG savings (tCO ₂ -e/yr)	Estimated bill savings (\$/yr)	Potential cost effectiveness (\$/MWh) ¹
12	\$9,043	32.7	30.1	\$10,823	\$27.7

Table 4 Lighting Round Savings for small business projects 2017–18

Table 5 Lighting Round Savings for household projects 2017–18

Number of projects/ grants	Funding committed	Estimated electricity savings (MWh/yr)	Estimated GHGsavings (tCO ₂ -e/yr)	Estimated bill savings (\$/yr)	Potential cost effectiveness (\$/MWh) ¹
488	\$289,872	704.7	648.3	\$233,256	\$27.4

Note: See Glossary for description/explanation of acronyms and units of measure used in the table.

¹ Refer to Appendix B for methodology; the lifetime of savings applied are those specified in the Energy Savings Scheme Rule for the Activity Definitions delivered under the program.

Case study: Upgrade your lights and save

Discounted energy efficient lights for households and small businesses

The NSW Government has launched a discounted lighting upgrade for households and small businesses. The offer helps recipients save energy and money and lower their environmental impact, while building a resilient energy efficiency market in the State. Another benefit is reduced maintenance as LEDs last longer than other bulbs. This program contributes to the NSW Government target to deliver 16,000 gigawatt hours of energy savings a year by 2020.

The upgrades are delivered by a network of approved suppliers across New South Wales. Each supplier has their own eligibility criteria and may require a minimum number of lights to be upgraded.

Replacing old lights with new energy efficient lights can reduce electricity bills by hundreds of dollars a year. This program sees expected savings of up to \$210 for households that change 20 halogen downlights to LED downlights; or up to \$2300 a year for small businesses that change 50 halogen downlights to LED downlights.



Approved supplier installing energy efficient lights into a household Photo: Q Jones, Jonesphoto

3.3 Upskilling businesses to save energy

Aim

The Energy Management Services program aims to train and support small businesses and those in energy-intensive industries on ways to better manage their energy use and save money while also helping to reduce emissions. This program is part of the Energy Affordability package announced by the NSW Government in September 2017.

Approach

OEH works with partners to co-design interventions for small business, develop content that meets the needs of industry and deliver the core program streams. These program streams include:

- capability development and support for prioritised energy-intensive industry sectors
- digital information delivery including online learning

 face-to-face training including workshops, masterclasses and mentoring for small businesses and their advisors.

This was the first year of the five-year program which will work with 3700 businesses and their advisors to make a sustained change to how small businesses manage their energy use.

Investment from the Fund in 2017–18: \$1,230,683

2017-18 milestones:

- Delivered free online energy management training to 1066 NSW businesses.
- Delivered five free webinars on energy management topics for 153 small business participants.
- Developed a gas efficiency masterclass and delivered it to energy efficiency service providers.
- Commissioned research to analyse energy-intensive industry sectors to determine energy management opportunities for NSW small businesses.
- Delivered pilot 'Energy Management for Facilities Managers' courses. The Energy Management for Facilities Managers program was launched nationally by the Facilities Management Association.
- Delivered an 'Introduction to Energy Management' course to 89 businesses in nine regional locations and one in Sydney.

3.4 Saving gas for business

Aim

The aim of the Gas Efficiency Funding program was to help gas-intensive businesses in New South Wales implement quick gas efficiency opportunities to save gas and money and help stimulate the market for gas-efficient products and services.

Approach

The Gas Efficiency Funding program ran from 2015 to 2018. It provided up to \$40,000 for sites that use more than 1000 gigajoules of gas a year to implement gas monitoring and efficiency projects, such as installing gas sub-meters and recovering waste heat from steam boiler exhaust gases. It also provided funding of up to \$10,000 for maintaining gas equipment such as replacing or repairing steam traps and insulating steam and hot water pipes, tanks and valves.

Data collected from these projects has helped OEH improve and develop the new methods for calculating gas savings under the Energy Savings Scheme. Financial incentives for businesses to reduce gas consumption are now available under the <u>Energy Savings</u> <u>Scheme</u>.

Investment from the Fund in 2017–18: \$638,878

2017–18 milestones:

- Completed 22 gas efficiency funding projects and 17 gas efficiency maintenance projects before the program ended and completed the program evaluation. See section 1 for evaluation information.
- Since the program commenced, the Fund has awarded \$1.24 million to 45 businesses to implement 63 gas efficiency and maintenance projects worth \$5.9 million. These projects are estimated to save more than 320 terajoules of gas and \$2.8 million off energy bills a year (see Tables 6 and 7).
- Program learnings were shared with stakeholders through case studies and newsletters. A tool to help businesses access incentives under the Energy Savings Scheme by implementing steam boiler and water heater upgrades was also launched.

Status	Number of projects	Funding (\$)	Estimated gas savings (GJ/yr) ¹	Estimated GHG savings (tCO ₂ -e/yr)	Estimated bill savings (\$/yr)	Cost effectiveness per GJ (\$) ²
Complete	36	\$1,068,045	235,333	10,208	\$2,205,370	\$0.45

Table 6 Energy savings over the life of Gas Efficiency Funding projects

Table 7	Energy sav	vings over th	e life of Gas E	Efficiency Main	tenance Fund	ing projects
Status	Number of projects	Funding (\$)	Estimated gas savings (GJ/yr) ¹	Estimated GHG savings (tCO ₂ -e/yr)	Estimated bill savings (\$/yr)	Cost effectiveness per GJ (\$) ²
Complete	27	\$174 866	88 933	4 629	\$689 769	\$0.20

Complete \$174,866 88,933 4,629 \$689,769

Note: See Glossary for description/explanation of acronyms and units of measure used in the table.

¹ Gas savings include natural gas and liquefied petroleum gas (LPG).

² Refer to Appendix B for methodology; the average lifetime of the savings is assumed to be 10 years.

Improving awareness about saving energy 3.5

Aim

The Energy saver website aims to provide simple, clear and efficient information for households and small businesses to understand their energy use and make informed decisions about saving energy. This project is part of the Energy Affordability package announced by the NSW Government in September 2017.

Approach

Information about ways to save energy is delivered via a website and direct emails to mailing list subscribers. The website includes general information for households and small businesses about how to save energy. It includes what the NSW Government provides to help reduce energy use, for example, the appliance replacement offer, the lighting discount offer and energy rebates.

Investment from the Fund in 2017–18: \$358,746

2017–18 milestones:

- Launched the Energy saver website on 20 April 2018 following user research.
- Website visitation data from 20 April to 30 June 2018:
 - o 63,000 users
 - o 83,000 sessions
 - 143,000 page views
 - o 48% bounce rate
 - o 13,000 searches for approved lighting suppliers
- Website visitor acquisition data: 34% from the Department of Environment and Planning's Energy Affordability advertising campaign, 30% direct, 19% from Google and 6% from Facebook.

3.6 Responding to energy demand

Aim

The NSW Demand Response program aims to provide demand response capacity to help address energy system demand peaks and system emergencies. Lessons learnt from the program will inform the development of a demand response market, including the regulatory framework.

Approach

The NSW Government and the Australian Renewable Energy Agency have partnered to deliver the program. The program provides co-funding of \$14 million to four pilot projects in New South Wales and will run until November 2020. The Australian Energy Market Operator can activate the demand response in times of system demand peaks or system emergencies. It is intended up to 80 megawatts of demand response capacity will be available by the third year of the program. The proponents are delivering demand response through a range of technologies including demand curtailment, particularly from the commercial and industrial sector.

Investment from the Fund in 2017-18: \$3,278,154

The program has awarded funding to four pilot projects in New South Wales over three years:

- \$5.25 million to AGL
- \$2.87 million to EnergyAustralia
- \$3.6 million to EnerNOC
- \$2.64 million to Flow Power.

2017-18 milestones:

• Around 60 megawatts of demand response capacity was made available in New South Wales in the 2017–18 summer. This was achieved through the application of a range of technological and commercial solutions from the four suppliers.

• The learnings from the program are informing the development of the regulatory environment. The NSW Demand Response program has been referenced in multiple Australian Energy Market Commission papers relating to rule changes about demand response, and the Reliability and Emergency Response Trader framework (a mechanism for providing reserves during periods of reliability issues).

3.7 Smarter energy use in government

Aim

In line with its Government Resource Efficiency Policy (GREP), the NSW Government aims to use energy more efficiently so that it can:

- reduce public spending on resources in the government sector
- lead by example to reduce emissions in government operations
- increase government resilience to energy price volatility and changing energy markets.

Approach

NSW Government agencies have access to strategic planning support, advisory services, tools and panels of prequalified service suppliers to improve their resource use and reduce associated expenditure.

Investment from the Fund in 2017–18: \$393,435

The major initiatives are the Sustainable Government program and the Planning and Environment cluster sustainability strategy.

2017–18 milestones:

- GREP reporting for 2016–17 was completed; 109 energy efficiency projects were implemented across 102 government sites, saving agencies more than \$7.7 million off energy bills and reducing energy consumption by almost 36,000 MWh compared to 2015–16.
- Supported various energy measures implemented using other funds at five government sites including more efficient lighting, water conservation measures, and solar photovoltaic installations. It is estimated that these measures will generate annual savings of 3568 megawatt hours of electricity, 9073 kilolitres of water and 3470 tonnes of greenhouse gas emissions. This will save those sites about \$934,000 a year in utility and maintenance bills.
- The <u>NSW solar power purchase agreement (PPA) panel</u> (list of preferred suppliers) was established in March 2018, comprising six providers. The aim is to increase the uptake of solar photovoltaic on government buildings. A solar financing tool was developed to support agencies with choosing the right financing option for installing solar photovoltaic.
- Continued implementing annual <u>National Australian Built Environment Rating System</u> (NABERS) energy ratings to benchmark energy performance across large government office buildings. This included the NSW Government's first ratings for data centre information technology equipment.

3.8 Reducing emissions on the land

Aim

To maximise NSW investment in carbon abatement projects under the Australian Government's Emissions Reduction Fund.

Approach

The National Parks and Wildlife Service (NPWS) will undertake land rehabilitation pilot projects in national parks and reserves to contribute to carbon sequestration efforts under the Emissions Reduction Fund. There are 12 current projects with five additional land rehabilitation projects scheduled to commence in 2018–19. Actions will be taken to register these projects under the Emissions Reduction Fund and related Australian Carbon Auction on execution of the relevant supply contract.

The NSW Government promotes Emissions Reduction Fund methods to key industry sectors. Where emissions abatement opportunities are not covered by Emissions Reduction Fund methods, the NSW Government works with the Australian Government to develop suitable methods.

Investment from the Fund in 2017–18: \$661,174

2017–18 milestones:

- In August 2017, NPWS committed \$1,477,045 to undertake land rehabilitation projects in the following reserves. All six projects were successfully registered under the Emissions Reduction Fund. This registration enabled the projected 10-year carbon yield from the projects to be successfully bid at an Australian Government Carbon Auction held later that year, generating revenue of \$609,840.00 for future public land management in NSW. A total of 69,300 tonnes of carbon dioxide will be sequestered from the atmosphere by the projects.
 - Arakoola Nature Reserve (60 hectares)
 - Capertee National Park (115 hectares)
 - Everlasting Swamp National Park (45 hectares)
 - Hat Head National Park (20 hectares)
 - Lachlan Valley National Park (260 hectares)
 - Kwiambal National Park (40 hectares)
- In February–April 2018, NPWS also called tenders for the supply of five additional land rehabilitation projects worth approximately \$960,000. These projects will commence in 2018–19 in the following reserves:
 - Barwon State Conservation Area (100 hectares)
 - Yerranderie State Conservation Area (65 hectares)
 - Upper Nepean State Conservation Area (40 hectares)
 - Cattai National Park (15 hectares)
 - Monga State Conservation Area (20 hectares)

3.9 Sustainable use of our energy and resources

Aim

In line with the purposes of the Fund and the NSW Government's aspirational objective of net-zero emissions by 2050, there are a range of programs to promote sustainable solutions to our energy and resource consumption or increase our awareness of the importance of climate change and saving energy and water. These include:

- NSW Green Globe Awards
- WaterSmart Cities
- Regional Sustainability Innovation
- Sustainability Advantage
- Collaborative Sustainable Housing Initiative

Approach

- NSW Green Globe Awards The NSW Government's annual awards showcase projects making real progress towards the government's aim to achieve net-zero emissions by 2050.
- WaterSmart Cities This program drives integrated water management in Sydney's high growth areas by taking a holistic approach to drinking water, wastewater and stormwater services; better aligning land and water planning; and addressing barriers to innovative water solutions.
- **Regional Sustainability Innovation** This program was delivered in 2017–18 to test different approaches to engage hard-to-reach sections of NSW's regional community in energy affordability and energy efficiency programs. Activities in 2017–18 were focussed on:
 - o delivering targeted, direct information and support to regional communities
 - o helping regional communities develop and collaborate on energy efficiency projects
 - understanding the local and regional barriers and opportunities in order to drive higher regional engagement with Fund programs
 - creating and showcasing regional leaders and innovation.
- **Sustainability Advantage** This is a membership-based program delivered using a panel of experts to support member organisations to be more resource productive through energy efficiency and clean energy or to adapt to the risks of climate change.
- **Collaborative Sustainable Housing Initiative** This initiative builds strong partnerships between government, research organisations and the construction industry to increase the demand and supply of sustainable homes. In the next 12–18 months, the initiative will focus on delivering a Housing Construction Industry Roadmap to outline a market-led approach to sustainable housing.

Investment from the Fund in 2017–18: \$4,693,885

The total investment above includes the following major programs.

- \$129,245 for the NSW Green Globe Awards
- \$1,545,000 for WaterSmart Cities
- \$251,902 for Regional Sustainability Innovation
- \$863,113 for Sustainability Advantage
- \$150,643 for the Collaborative Sustainable Housing initiative

2017–18 milestones:

- The **NSW Green Globe Awards** in October 2017 saw 13 winners announced from 37 finalists across 12 award categories. More than a third of the finalists were from regional New South Wales. For more information visit the <u>Green Globe Awards</u> webpage.
- WaterSmart Cities commenced work on multiple projects including the Wilton Growth Area Case Study, an Integrated Water Management Options Study for the South West Growth Area, and the investigation of new stormwater delivery and funding models for high growth areas.
- The **Regional Sustainability Innovation program** delivered 40 energy efficiency events and workshops to regional communities, trained 23 emerging sustainability leaders in the Hunter Region and assisted 17 councils to develop their baseline emissions profiles. It also supported the community-led 'Empower' energy efficiency project in Junee (a partnership between Junee High School and Junee Community Power Inc.).
- Sustainability Advantage Members currently experience more than \$123 million annually in bill savings (see Table 8). Case studies for three Sustainable Development Goals, published in the Australian Government <u>Compendium of Case Studies</u> in Feb 2018, highlighted the Sustainability Advantage program's contribution towards implementing the Sustainable Development Goals.
- Collaborative Sustainable Housing Initiative Completed the Local Sustainable Housing Study; a qualitative research project to understand how sustainable housing can be better facilitated through development and approvals processes. More than 150 diverse stakeholders from local government and residential property developers participated.
- In partnership with the Cooperative Research Centre for Low Carbon Living and CSIRO, developed the My Renovation Planner platform to support renovators to include sustainable design and features in renovations. It is expected that a minimum viable product for the platform will be ready for social research testing in late 2018.

Number of paid partner members	Funding (\$)	Estimated electricity savings (MWh/yr)	Estimated natural gas savings (GJ/yr)	Estimated Water savings (ML/yr)	Estimated Waste diverted (tonnes/yr)	Estimated GHG savings (tCO ₂ -e/yr)	Estimated bill savings (\$/yr)
112	863,113	241,743	587,594	126,345	1,518,715	230,000	123,262,000

Table 8 Savings over the life of Sustainability Advantage projects

Note: See Glossary for description/explanation of acronyms and units of measure used in the table.

4. Strengthening the resilience of our communities and ecosystems

The NSW Government is committed to improving information about climate change impacts and assisting the community to prepare for a changing climate. The Fund supports programs that help NSW households and businesses reduce their exposure to natural hazards and be more resilient to a changing climate.

Investment from the Fund in 2017–18 helped both state and local governments implement adaptation projects and encourage innovation from industry.

4.1 Coastal management

Aim

The Coastal and Estuary Grants program aims to support local government and communities to make better coastal management decisions that balance economic, social and environmental outcomes, mitigate current and future risks, and enhance community understanding of the potential impacts of climate change.

Approach

The NSW Government established a new strategic framework for coastal management that consists of:

- a Coastal Management Act 2016 (which came into effect on 3 April 2018)
- a Coastal Management State Environmental Planning Policy (SEPP)
- the NSW Coastal Council that provides independent advice on coastal management
- additional funding towards the management of the coast, including grants to local councils to prepare and implement coastal management programs that set the long-term strategy for the management of the coast.

The additional funding covers three main areas:

- State responsibilities includes the delivery of statewide science and technical advice, supporting the NSW Coastal Council and the review and assessment of mapping and planning proposals to amend the SEPP.
- *Planning* includes technical and financial support to local councils to transition to the new coastal management framework and prepare coastal management programs.
- *Implementation* includes technical and financial support for local councils to implement actions in coastal management programs that effectively reduce risks, deliver broad public benefit and enable the coast to be managed sustainably into the future.

The Coastal and Estuary Grants program provides up to 50% of the funding to local councils to undertake the planning, preparation and implementation of a coastal management program.

Investment from the Fund in 2017–18: \$5,642,192

- \$2,694,368 towards State responsibilities including offshore mapping and marine LiDAR mapping (a remote sensing method used to examine the surface of the Earth).
- \$2,947,824 under the Coastal and Estuary Grants Program to support local councils to prepare and implement coastal management programs and grant administration.

2017–18 milestones:

- Completed offshore mapping of the Illawarra Coast; published scientific journal papers detailing the regional mapping of erosion and inundation hazards; and engaged Fugro Australia Marine Pty Ltd to undertake statewide marine LiDAR mapping.
- Under the Coastal and Estuary Grants program 17 planning projects totalling \$1,274,150 were approved in the 2017–18 financial year. Details for these projects are available on the OEH <u>Coastal and Estuary Grants planning stream 2016–17</u> webpage. These projects will be delivered and grant funding spent within the next three years.
- Under the Coastal and Estuary Grants program 16 implementation projects totalling \$1,169,564 were approved in the 2017–18 financial year. Details for these projects are available on the OEH <u>Coastal and Estuary Grants implementation stream 2016–17</u> webpage. These projects will be delivered and grant funding spent within the next three years.

4.2 Hawkesbury–Nepean Valley Flood Risk Management Strategy Implementation

Aim

To build community resilience to current and future flood risk to life and property in the Hawkesbury–Nepean Valley in Western Sydney.

Approach

The NSW Government committed \$58.5 million to implement Phase 1 of the Hawkesbury– Nepean Flood Risk Management Strategy from 2016–17 to 2019–20. The Hawkesbury– Nepean Flood Risk Management Directorate in Infrastructure NSW is leading Phase 1; with state and local intergovernmental working groups delivering and overseeing the implementation of the strategy. Phase 1 includes:

- community engagement activities that increase flood risk awareness for improved community preparedness, response and recovery
- easier access to flood risk information
- actions to integrate emergency, land-use and road planning
- the environmental assessment and consultation for raising Warragamba Dam wall for flood mitigation.

More details about the strategy, fact sheets and frequently asked questions are available on the <u>Hawkesbury–Nepean Flood Risk Management Strategy</u> webpage.

Investment from the Fund in 2017–18: \$15,977,700

- \$2,290,000 for the Hawkesbury–Nepean Valley Flood Risk Management Directorate strategy coordination and oversight.
- \$1,881,000 for Infrastructure NSW flood forecasting and monitoring, regional communications and engagement, and for flood risk information and decision support.
- \$9,878,000 for WaterNSW development works and environmental assessments for the raising of the Warragamba Dam wall.
- \$280,000 for Department of Planning and Environment regional land-use planning.
- \$1,649,000 for Roads and Maritime Services evacuation modelling and road evacuation signage, and for NSW State Emergency Service emergency planning.

2017–18 milestones:

- Completed social research to inform community flood risk awareness and preparedness programs being delivered in Hawkesbury–Nepean Valley communities between 2018 and 2020.
- Worked through a flood event scenario to test and exercise the current flood management arrangements with WaterNSW, NSW State Emergency Service, and the Bureau of Meteorology.
- Carried out user testing for the new road evacuation signage system to be installed from November 2018 which will direct residents out of the floodplain in the case of a flood. The signage system will be supported by a public education campaign.
- Developed a monitoring, evaluation, reporting and improvement framework for the strategy, with a minor evaluation scheduled to begin in late 2018 and a major evaluation scheduled to begin in October 2019.
- Initiated the environmental impact assessment and detailed concept design for raising Warragamba Dam wall as a flood mitigation measure.
- Prepared a new Regional Hawkesbury–Nepean Flood Study, the first since 1995, to make contemporary flood risk information available to communities and decision-makers. The Flood Study information will be made available from February 2019.

4.3 Hunter Valley Flood Mitigation Scheme

Aim

The Hunter Valley Flood Mitigation Scheme aims to provide flood protection and mitigation to the communities of the Hunter region and is designed to reduce risks associated with flooding. The program for the next five years will reduce risks to public and private assets arising from climate change.

Approach

The scheme has two key components:

- 1. The Hunter Valley Flood Mitigation Scheme maintenance program which maintains flood infrastructure valued at more than \$860 million, to protect communities, public and private assets and valuable agricultural land from flooding.
- 2. The Upper Hunter River Work maintenance program that aims to secure old river works sites that pose public safety, infrastructure and environmental risk. This program also involves re-establishing riparian vegetation.

Investment from the Fund in 2017–18: \$1,185,273

2017–18 milestones:

- Developed asset management systems in accordance with international standards to ensure the asset base is maintained in a fit-for-purpose condition.
- Finalised an environmental management plan for the scheme, to be published on the OEH website in early 2019.
- Assessed the condition of the asset base, including pipe inspections conducted via CCTV of 180 of the 258 floodgates.
- Commenced an assessment of the hydraulics and social and economic aspects of the scheme. This was commissioned as part of a review of the scheme that will include an assessment of the likely climate change scenarios impacting the scheme.

4.4 Supporting local government to manage flood risk

Aim

The Floodplain Management Grants program aims to provide technical and financial support to local government to manage flood risk and the risk from climate change–associated flooding.

Approach

The NSW Government provides technical and financial support to local government under the Floodplain Management program to manage flood risk. It supports the implementation of the NSW Flood Prone Land Policy, part of the <u>Floodplain Development Manual</u> which aims to reduce the impacts of existing flooding and flood liability on communities, and to reduce private and public losses resulting from floods, using ecologically positive methods wherever possible.

The program typically provides \$2 of funding for every \$1 of local government funding to undertake flood studies, flood risk management studies and plans, undertake investigations and designs and to implement actions in those plans.

Investment from the Fund in 2017–18: \$7,108,276

• \$7,108,276 under the Floodplain Management Grants program.

2017-18 milestones:

Under the Floodplain Management Grants program, 60 projects totalling \$8,054,987 were approved in the 2017–18 financial year. Details for the: 51 projects initially approved are available on the OEH <u>Floodplain Management Grants 2017–18</u> webpage; and additional nine projects approved from the reserve list are available on the OEH <u>Flood reserve projects 2017–18</u> webpage. These projects will be delivered and grant funding spent within the next three years.

4.5 Manly Hydraulics Laboratory

Aim

To provide consistent, widespread, long-term coastal and flood data that allows changes in the coastal environment to be monitored and assessed; and provide an improved understanding and awareness of current and future risks of flooding and coastal hazards, including climate change.

Approach

OEH manages an extensive data collection network as part of its coastal, estuary and floodplain management programs. The Manly Hydraulics Laboratory (MHL) maintains and operates the network under an annual performance-based contract.

The network includes 171 flood and 48 estuary automatic water level recorders and seven offshore Waverider buoys along the coast. MHL operates and maintains multiple river entrance and ocean tidal recording stations along the NSW coast. This comprises 19 coastal ocean sites, including Lord Howe Island and four offshore tidal sites. MHL also operates and maintains 72 automatic rainfall recording stations at various coastal sites.

The data is available on the Manly Hydraulics Laboratory website.

Investment from the Fund in 2017–18: \$3,750,344

2017–18 milestones:

- A series of five annual data reports are prepared each year by MHL for an audience that includes the whole-of-government and industry. These are made available on the <u>Manly</u> <u>Hydraulics Laboratory publications</u> webpage and present the results of quality controlled (edited and quality coded) annual data monitoring from more than 320 recording stations along the NSW coast.
- In June 2017, Public Works Advisory undertook a performance review of MHL's annual contract for collecting, archiving and disseminating NSW coastal and flood data.
 Feedback from stakeholders was overwhelmingly positive with many describing the data as critical or essential. The capability of MHL and the associated data collected is a significant asset to the State as many local, state and Commonwealth government agencies and other users rely on it to carry out their activities.

Case study: OEH data proves crucial in managing flood and storm events

In March 2017, tropical cyclone Debbie brought widespread flooding and rainfall to the NSW Far North Coast, resulting in major flooding to the Tweed, Brunswick and Richmond rivers. This flood event was the first time that the levee bank at Lismore was breached since its construction in 2005, causing major flooding throughout Lismore CBD.

Manly Hydraulics Laboratory (MHL) maintains and operates a coastal and flood data network on behalf of OEH. During the flood event, near real-time data from the OEH-managed stations was made available to various clients and the public via the Bureau of Meteorology (BoM) and MHL websites.

During the flood event, the BoM used the water level and rainfall data to generate predicted water levels at warning locations on the flood-affected rivers. The water level predictions

were used by the BoM to issue flood watches, flood warnings and severe weather warnings. Emergency response agencies such as NSW State Emergency Services, NSW Police and local councils use the data to guide evacuation of towns threatened by extreme weather events.

As part of the coastal network, wave data is collected by seven wave monitoring buoys along the NSW coast. The data is used by BoM in coastal water forecasts and storm warnings. During the June 2017 storm, the Eden buoy recorded the highest wave ever recorded by the network of 17.7 metres. In the future the wave database and tide gauge network will provide baseline data to monitor possible changes in the NSW wave climate and sea level rise due to climate change.

4.6 Private land conservation

Aim

The Biodiversity Conservation Trust's (BCT) vision is to deliver a healthy, productive and resilient environment across New South Wales. The BCT does this by encouraging and supporting landholders to conserve and manage biodiversity on private land. This work contributes to the purposes of the Fund and the NSW Government's <u>Climate Change Policy</u> <u>Framework</u> in several ways:

- supporting the adaptation of our native species and ecosystems to a changing climate
- complementing carbon sequestration efforts
- adding resilience to our agricultural sector by preserving and strengthening the ecosystem services needed to support productive landscapes.

Approach

The investment in private land conservation is primarily being delivered through the BCT's Conservation Management program to provide conservation management payments to landholders. The program uses three delivery mechanisms to encourage landholders to enter into private land conservation agreements: conservation tenders, fixed rate offers and the revolving fund. More information is available in the <u>Biodiversity Conservation Trust</u> 2017–18 to 2010–21 Business Plan.

Investment from the Fund in 2017–18: \$43,000,000

Information about outcomes from this investment can be found in the BCT's annual report which is expected to be available on the <u>BCT</u> website by the end of 2018.

2017-18 milestones:

- Released first business plan in March 2018.
- Launched two conservation tenders; one in the Central Tablelands and one for koala habitat in Port Macquarie.
- Launched fixed rate offers for priority investment areas across New South Wales.
- Commenced the Conservation Partners program, including opening of grants to assist landholders maintain or enhance the conservation values of their properties.
- Purchased three properties with 2000 hectares of high conservation value land using the BCT revolving fund.
- Launched a new landholder support package aimed at providing technical support for more than 1700 existing BCT landholders.

Case Study: Conserve your land to benefit you and the NSW community

Will's story

Will Hooke's property, Wargam, comprises 11,700 hectares around Boorooban in the western Riverina area of New South Wales. His property is primarily a grazing property producing Merino sheep.

During the past year, Will became aware of the newly established NSW Biodiversity Conservation Trust (BCT), and attended an information session at Barham to understand how the planned conservation tenders would work.

How it works for Will

Will applied for a conservation agreement on his property. Will's application for a conservation tender was evaluated by BCT regional staff, and his bid to protect the environmental values of the wetland habitats on his property resulted in a conservation agreement being made.

'There are a lot of endangered animals and plants here, we've had ecologists out to do ecological surveys. These are quite renowned wetlands which are valuable in the area.'

Under the agreement, Will receives an annual payment from the BCT in exchange for him protecting a total of 4% of his property which supports important wetlands for permanent conservation. Will undertakes specific conservation management actions, including limiting grazing on specific areas at certain times of the year. He also manages the ground cover in areas of the property and undertakes weed management and monitoring.

Benefits to Will and the NSW community

For Will, the opportunity financially justifies itself with in-perpetuity payments, giving him a reason to exclude specific areas of land on his property from grazing at certain times, while still having the ability to graze there at other times.

'I think this is a fantastic program. I think it shows that the NSW Government has taken the lead; they've realised the reality for us. We can now financially justify excluding the stock at those times of the year when it's needed.'

Through conserving wetlands and managing biodiversity on his property, Will is contributing to efforts across New South Wales to strengthen ecosystems and build resilience to climate change.

'We want to put the effort in, it's nice to know these areas are protected for ever.'

4.7 Protected area management: our national parks estate

Aim

To manage our national parks and reserves to increase resilience to climate change and enhance public awareness of climate change adaptation in these parks. Managing our parks contributes to the purposes of the Fund and the <u>NSW Climate Change Policy Framework</u> by complementing carbon sequestration efforts and supporting the adaptation of native species and ecosystems to a changing climate.

Approach

The NSW Government is protecting the resilience of our ecosystems by reserving high conservation value land under the *National Parks and Wildlife Act 1974*; increasing public awareness of our parks, and actively managing our parks and associated infrastructure from climate change risks. Extending the coverage of our parks and improving their management is recognised as one of the most cost-effective means of conserving biodiversity, supporting ecosystem resilience and allowing for adaptation in the face of climate change impacts.

Investment from the Fund in 2017–18: \$32,191,547

2017-18 milestones:

Funding supported a total program of work undertaken by the National Parks and Wildlife Service (NPWS), including:

- Started implementing Phase 1 of the NSW National Parks Climate Change Adaptation Strategy. This internal strategy guides NPWS in prioritising works using information from the NSW and ACT Regional Climate Modelling (NARCliM) project. The strategy seeks to proactively address increasing impacts of climate change on parks, including biodiversity, Aboriginal and historic heritage, assets and people. Phase 1 integrates adaptation planning into business as usual by:
 - trialling the integration of adaptation actions into the Montague Island plan of management review
 - trialling a trigger-based decision tool in the NPWS Asset Management System to improve responsiveness to climate change
 - developing a communication and engagement strategy to educate the community about climate change impacts and adaptation actions in parks
 - embedding climate change risk management in the protection of Aboriginal cultural heritage by applying adaptation solutions to Aboriginal cultural heritage in a joint-managed park.
- Completed assessments for <u>State of the Parks</u> in 2018. This assessment framework is used to monitor and evaluate the condition of park values, severity of threats and long-term management effectiveness. This enables continuous improvement in the way parks are managed. The results will be publicly released in 2019.
- Implemented more than 1000 pest and weed management programs to support the adaptation of native species and ecosystems to a changing climate. This included removal of more than 39,000 pest animals and laying of more than 118,000 wild dog and fox baits.
- In September 2017, NPWS released a mobile app that allows park visitors to download GPS-enabled maps and content to their smartphone or tablet so they can access relevant information when they have no mobile reception. The app outlines the species and ecosystems found in each park, and explains a park's importance in protecting biodiversity from climate change and other threats. This app allows for greater public engagement with conservation and park experiences. The app has been downloaded more than 40,000 times since going live.

4.8 Bushfire management

Aim

To increase public awareness of and address the need to adapt to worsening fire weather conditions due to climate change by increasing hazard reduction operations and rapidly responding to bushfire ignitions. This contributes to supporting community resilience to natural hazards and climate risks.

Approach

The funding supports three components: hazard reduction, Rapid Aerial Response Teams (RART) which respond to wild fires, and scientific bushfire research.

- **Hazard reduction** This involves the burning and mechanical clearing of vegetation to reduce bushfire fuel loads in strategic locations across the NPWS reserve system. Hazard reduction increases the likelihood of fire agencies being able to control bushfires before they impact communities and properties at risk. The key performance indicators of the hazard reduction program are:
 - reduce the fuel hazard over 135,000 hectares of NPWS-managed land (five-year rolling annual average)
 - conduct more than 800 hazard reduction activities per year (five-year rolling annual average).
- **Rapid Aerial Response Teams** (RART) These teams provide New South Wales with increased rapid response capacity by transporting fire crews by helicopter to remote, high-risk bushfire ignition areas. The key performance indicators of the RART program are:
 - o respond to 90% of wildfires within 30 minutes of detection
 - keep 80% of fires responded to less than 10 hectares in size.
- Scientific bushfire research The Bushfire Risk Management Research Hub is a fiveyear, state-focused collaboration between fire management and environment agencies, leading Australian research institutions and bushfire experts. Research findings will inform and enhance future fire management and planning across the state to reduce the risk bushfires pose to people, property and the environment.

Investment from the Fund in 2017–18: \$27,626,826

- \$25,746,809 for bushfire management, hazard reduction activities, and RART.
- \$883,478 for capital expenditure to purchase assets, plant and equipment to support program delivery.
- \$996,539 for scientific bushfire research.

2017–18 milestones:

- 95,830 hectares of NPWS-managed land were treated in 1188 hazard reduction activities.
- RART was activated 66 times due to the risk of new fire ignitions. Of the 66 times RART was activated, 14 responses to new fire ignitions were made, and of these, 93% occurred in less than 30 minutes and 79% of these fires were contained to an area of less than 10 hectares.

• The Bushfire Risk Management Research Hub was launched in February 2018. The University of Wollongong will host the hub, leading a team of world class experts from Western Sydney University, University of NSW and University of Tasmania. A program of six priority research projects has begun.

4.9 Equipping ourselves to adapt to climate change

Aim

In line with the NSW Government's aspirational objective to make New South Wales more resilient to a changing climate, this program of works builds resilience to climate change and environmental hazards and risks in the State by providing a range of information, tools and support for the community, businesses and government.

Approach

The NSW community can access locally specific climate change data, tools and resources through the <u>AdaptNSW</u> website. This includes interactive climate change maps, assessments of climate vulnerability for state planning regions, guidance on undertaking climate risk assessment and specific adaptive responses, and contestable grants for local councils to undertake resilience measures. These tools are used by: councils to assess, plan and implement responses to minimise impacts on communities; government agencies to support well informed investment and service planning; and researchers to build knowledge and awareness on climate risks and opportunities going forward.

The NSW Government has a range of partnerships with regional decision-makers, such as local councils, to assess climate vulnerabilities and identify and implement actions to enhance government service planning and delivery, as well as minimise impacts on local communities.

This program also provides advice on cultural and ecosystem-based adaptation, for example through the development of the NSW National Parks Climate Change Adaptation Strategy, to manage the impacts of climate change on natural assets, culture, people and infrastructure.

During 2017–18, more than 100 separate projects were supported by this program, engaging more than 5000 people.

Investment from the Fund in 2017–18: \$119,174

2017-18 milestones:

- Visits to the **AdaptNSW website** increased over the year by 33%, indicating growing awareness, interest and use of NSW climate change information.
- Completed the **Shoalhaven Illawarra Enabling Regional Adaptation** (SIERA) project in partnership with the Department of Premier and Cabinet Regional Leadership Executive. This cross-government engagement process involved 65 regional decision-makers from 24 organisations. It identified climate change vulnerabilities for key regional systems in the region and opportunities to minimise climate change impacts on local communities by improving government service planning and delivery.

4.10 Air quality monitoring and forecasting

Aim

To provide the NSW community with accurate and up-to-date information about air quality from forecasting and real-time monitoring. This improves our understanding of and resilience to the impacts of climate change, and supports informed decision-making to manage the impacts of climate change.

Approach

Air quality monitoring networks continuously measure gases, particles and visibility and record wind speed and direction, air temperature and humidity. Data is recorded and air quality index values are updated hourly on the OEH website. Air quality forecasts are provided daily for the Sydney region and air quality alerts are sent out for Sydney, Hunter, Illawarra and other regional areas.

The air quality monitoring network provides accurate and up-to-date information to meet objectives in the <u>National Environment Protection Measure for Ambient Air Quality</u> and for decision-makers and the community.

Investment from the Fund in 2017–18: \$2,474,870

The total investment above includes the following major projects.

- \$25,000 for Australian Research Council Linkage project to establish advanced networks for air quality sensing and analyses is a collaborative study lead by Queensland University of Technology.
- \$200,000 towards the installation and operation of Parramatta North air quality monitoring station as an addition to the metropolitan air quality monitoring network.
- \$200,000 towards the installation and operation of Armidale air quality monitoring station as an addition to the regional air quality monitoring network.
- \$280,000 to support enhanced forecasting and incident response programs and the Sydney Air Quality Study.

2017–18 milestones:

- Installed two new air quality monitoring stations at Parramatta North and Armidale.
- Expanded and combined the former DustWatch monitoring network with the OEH rural air quality monitoring network. Data updated hourly is available on the OEH <u>Rural NSW</u> air quality monitoring network webpage.
- Improved air quality model, for example, by including consideration of hazard reduction burns in the air quality forecasting methodology. 938 new subscribers signed up to receive air quality forecasts and alerts provided daily by OEH via email and text message. Further information is available on the <u>Sydney air quality forecast</u> webpage.
- Established the Australian Research Council Linkage project to develop advanced networks for air quality sensing and analyses. This is a collaboration between various Australian universities, various NSW, Queensland and Victorian government agencies and the Australian Bureau of Meteorology.

4.11 Supporting innovative solutions

Aim

OEH's partnership with Climate Knowledge and Innovation Community (Climate-KIC) Australia seeks to support innovative solutions to the challenges New South Wales faces in reducing emissions and adapting to climate change.

Approach

Climate-KIC Australia is a public–private innovation partnership that links research, business, entrepreneurs, investors and government to identify and implement solutions to climate change. It is built on the successful Climate-KIC Europe model, adapted to the Australian context, focusing on net-zero carbon energy, sustainable resilient cities and regions in transition.

Climate-KIC Australia is partnering with EnergyLab and local universities on the Accelerator program which provides tailored support to clean energy and cleantech start-ups. As a member of the Climate-KIC Board, OEH can ensure that Climate-KIC's strategic direction and work program is influenced by government needs and priorities, and that government can leverage that work.

Investment from the Fund in 2017–18: \$200,000

2017-18 milestones:

There were three key initiatives supported by the Climate Change Fund in 2017–18:

- Support for nine clean energy start-ups in New South Wales.
- Development of a Climate Information Needs Analysis for the finance sector, building on KIC's broad network of insurance and banking partners.
- Establishment of the Fairwater Living Lab project, which will provide valuable evidence to build the case for sustainable housing using geothermal heating/cooling, providing data from both a business and consumer perspective.

5. NSW Climate Change Fund research and evaluation

5.1 Fund Research and Evaluation Initiative

Aim

To ensure that a robust evidence-base is available to guide the development, monitoring and evaluation of Fund programs, and provide information on the likely impacts of climate change in New South Wales, supporting the NSW Climate Change Policy Framework.

Approach

The Fund Research and Evaluation Initiative is built around four research programs that deliver: strategic research; operational research; social research, and program monitoring and evaluation. These programs are designed to address important information gaps or commission new work that will provide the foundations for the knowledge generation and management into the future.

OEH's strategic research initiatives are ensuring that the NSW Government, business and communities have access to the best available information on future climate change and related impacts. These include the Energy and Resource Efficiency Research Hub, the Human Health and Social Impacts Research Node and a partnership with the Australian Research Council Centre of Excellence for Climate Extremes.

OEH operational climate research has continued the monitoring and evaluation of the quality of NSW climate projections delivered by the NSW and ACT Regional Climate Modelling (NARCliM) project to ensure regional climate projections for the State continue to be based on the best available information. This included a collaboration with the University of NSW and an independent evaluation of the NARCliM project.

OEH is delivering social research to inform program design and evaluation. This supports the Fund's objective to increase public awareness and acceptance of the importance of climate change and water and energy savings measures.

OEH developed a new Climate Change Fund Evaluation Framework. The NSW Government is implementing the evaluation framework by developing detailed evaluation plans for programs and ensuring proper monitoring and data collection to demonstrate the achievement of outcomes and benefits, and report results.

Investment from the Fund in 2017-18: \$2,486,713

The total investment above includes the following major initiatives.

- \$19,277 for energy and resource efficiency research.
- \$58,060 for human health and social impacts of climate change.
- \$1,265,459 for regional climate projections and extreme climate events.
- \$217,027 for climate change impacts in the alpine region.
- \$273,541 for urban heat and green cover and evaluation.
- \$393,023 for social research.
- \$26,064 contribution towards evaluation.

• \$285,000 research and evaluation capital and reversal of \$7,746 as minor financial adjustments.

2017–18 milestones:

- Launched the Energy Efficiency Decision Making Node in October 2017.
- Launched the Human Health and Social Impact Node in October 2017. For more information see the <u>NSW Adaptation Research Hub</u> webpage.
- OEH completed a review of best practice in the evaluation of green cover strategies and began preparing a fine-scale urban heat and green cover baseline for Sydney. This includes the conversion of raw stereo imagery that will provide a baseline for monitoring and evaluation of green cover programs. This mapping will allow for best practice and standards to be followed in New South Wales.
- Completed a climate change impact assessment for the NSW alpine region to identify risks relating to factors such as water availability, biodiversity, cropping, and soil erosion modelling. A technical report will be published on the OEH website.
- OEH delivered a range of social research projects to inform program design and evaluation including:
 - a survey of NSW local government climate adaptation capacity and responses in partnership with Local Government NSW
 - a qualitative study of motivations, drivers and barriers to implementing residential energy savings and other sustainability features
 - behavioural research and capability building through a partnership with Monash University's applied behavioural research consortium BehaviourWorks Australia.

Appendix A – Legislative requirements

The Energy and Utilities Administration Act 1987

The 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 required to be made to the Fund under Division 3
 - (b) all money advanced by the Treasurer for the Fund
 - (c) all money appropriated by Parliament for the purposes of the Fund
 - (d) the proceeds of the investment of money in the Fund
 - (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.

Without limiting subsection (1)(f), state agencies are authorised by this section to make voluntary contributions to the Fund.

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
 - (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
 - (c) any money required to meet administrative expenses related to the Fund
 - (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
 - (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
 - (b) approve the funding of community grants from the Fund, being grants awarded based on their merit in advancing one or more of the purposes referred to in section 34F, established through a competitive selection process
 - (c) require a person or body seeking funding for a water or energy savings measure to do either or both 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 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 information sources

Savings estimates

All program savings are conservatively estimated from the available information. Any apparent discrepancy in the totals shown is due to rounding.

Where possible, this annual report uses retail prices published by the Australian Energy Market Operator for National Electricity and Gas Forecasting. Bill savings for some programs such as Gas Efficiency Funding are site-specific.

Energy bill savings may include savings attributed from electricity, natural gas, LPG and operating and maintenance costs.

The cost-effectiveness of funding is calculated by dividing the funding allocated or expended by the lifetime of the savings, which varies by technology (e.g. 10 years for a television, 12 years for a refrigerator).

Greenhouse gas emission conversion factors are from the National Greenhouse Accounts Factors July 2018 as shown in the table below.

Emissions factors

Fuel	Unit	Factor
Electricity	tCO ₂ -e/MWh	0.92
Natural gas	tCO ₂ -e/GJ	0.06
LPG	tCO ₂ -e/GJ	0.07

Regions

Regional New South Wales is defined as the local government areas outside Greater Metropolitan Sydney. For more information see Department of Environment and Planning's <u>Regional plans</u> webpage.

Glossary

Term	Definition
the Act	Energy and Utilities Administration Act 1987, under which the NSW Climate Change Fund is established
ACT	Australian Capital Territory
BASIX	Building Sustainability Index; a sustainable planning measure that aims to deliver equitable, effective water and greenhouse gas reductions across New South Wales
cleantech	An industry term for clean technology, which includes a broad range of technologies that reduce negative environmental impacts
cost-effectiveness	A cost per megawatt hour or other metric that is calculated by dividing the funding allocated by the energy savings over their lifetime
efficiency (energy or 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)
Energy Savings Scheme (ESS)	The Energy Savings Scheme creates financial incentives for organisations to invest in energy savings projects. Energy savings are achieved by installing, improving or replacing energy savings equipment. The ESS is governed by NSW legislation and places a mandatory obligation on scheme participants to obtain and surrender energy savings certificates, which represent energy savings.
feed-in tariff	A premium rate paid for electricity fed back into the electricity grid from a designated renewable electricity generation source
the Fund	The NSW Climate Change Fund
gigajoule (GJ)	A joule is a unit of energy, equivalent to the power of one watt for one second; a gigajoule is 1000 million joules
gigawatt hour (GWh)	A gigawatt hour is equivalent to 1000 megawatt hours or one million kilowatt hours. Gigawatt hours are often used as a measure of the output of large electricity power stations (see definition under kilowatt hour)
GHG	Greenhouse gas, usually with reference to emissions
hazard reduction	In the context of bushfire management, hazard reduction provides areas of reduced fuel that can significantly reduce fire behaviour and aid fire suppression activities. Hazard reduction activities may include prescribed burning or mechanical clearing like slashing undergrowth, mowing or reducing the ground fuel by hand
kilowatt (kW)	A unit of energy equal to 1000 watts (see definition under watt)
kilowatt hour (kWh)	A measure of energy use equivalent to consumption of 1000 watts for one hour
LED	Light-emitting diode; a type of energy efficient lighting
LiDAR	Light detection and ranging is a remote sensing method used to examine the surface of the Earth. It uses pulsed laser light to measure ranges (variable distances) to the earth and data is often collected by air. These light pulses — combined with other data recorded by the airborne system — generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. A LiDAR instrument comprises a laser, a scanner, and a specialized global positioning system (GPS) receiver.

Term	Definition
LPG (liquefied petroleum gas)	A type of fuel often used in industrial, commercial, agricultural and manufacturing applications
megawatt (MW)	A unit of energy equal to one million watts (see definition under watt)
megawatt hour (MWh)	A megawatt hour is equal to 1000 kilowatt hours (see definition under kilowatt hour)
NABERS	National Australian Built Environment Rating System; NABERS is managed nationally by OEH, on behalf of Commonwealth, state and territory governments
NPWS	National Parks and Wildlife Service (part of the Office of Environment and Heritage within the Planning and Environment cluster)
OEH	Office of Environment and Heritage (a separate agency within the Planning and Environment cluster)
passive housing design	A sustainable building standard that makes use of local climate and site conditions to provide for greater indoor temperature stability. It reduces energy use by incorporating renewable energy to provide household heating, cooling, ventilation and lighting.
photovoltaic (PV)	A form of solar energy that directly converts light into energy
PPA	A power purchase agreement (PPA) is a financial arrangement in which a solar service provider owns and pays for the installation of a solar PV system, and a customer hosts the system on their property and purchases the energy it produces from the solar services provider for a predetermined period and price, usually cheaper than the retail electricity rate paid to the customer's energy retailer
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
retrofit	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
sustainable housing	Sustainable housing features include passive housing design, insulation, double glazing, solar energy, efficient appliances and sustainable materials
tCO ₂ -e	An abbreviation of 'tonnes of carbon dioxide equivalent', the internationally recognised measure of greenhouse gas emissions
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