action matters

NSW Climate Change Fund

Annual Report 2014–15

NSW GOVERNMENT | Office of Environment & Heritage

Cover: Nyngan Solar Plant (Photo: courtesy of AGL)

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Minister's foreword

The NSW Government's Climate Change Fund (the Fund) supports households, businesses, communities and government agencies reduce carbon emissions, adapt to a changing climate, and support investment and growth in the low-carbon economy.

The Fund continues to reduce energy bills, create more comfortable homes with lower running costs, drive gains in business productivity and improve community resilience. Investment from the Fund in energy efficiency programs contributes to our target to save 16,000 gigawatt hours of energy a year by 2020.

The Fund supports partnerships with the energy efficiency industry that stimulate private investment and growth by boosting research and business innovation, improving skills and creating new jobs.

In November 2014 we announced that the NSW Government will expand the NSW Energy Savings Scheme to reward gas savings and extend the scheme to 2025. We are also planning a new Gas Efficiency Improvement Program, where we will be working closely with gas efficiency product and service providers to improve information and will provide funding to assist gas-intensive businesses to implement simple gas efficiency projects.

Building on the success of the Home Power Savings Program, we established a new $26.8 million Home Energy Action Program for households facing energy hardship. The Office of Environment and Heritage will work with community housing providers to improve home fixtures, making homes cheaper to live in, and partner with appliance retailers to reduce the upfront costs of energy efficient appliances for vulnerable families.

It has been a momentous year for large-scale solar photovoltaic projects in NSW. Funding support for the 102 megawatt (MW) solar plant at Nyngan and Broken Hill's 53 MW plant demonstrates NSW's commitment to renewable energy. Nyngan, Australia's largest solar plant, reached an important milestone this year, achieving full generation capacity in June 2015. It now supplies enough renewable electricity to power 33,000 average NSW homes a year.

We are leading by example through our NSW Government Resource Efficiency Policy, launched in August 2014. NSW Government agencies will deliver energy efficiency projects that are estimated to reduce energy bills by $55 million a year.

We are also committed to protecting the community from increased fire risk. Thanks to the support of the Fund, the Enhanced Bushfire Management Program continues to deliver a proactive program of hazard reduction burning to protect community assets and allows the National Parks and Wildlife Service to quickly respond to incidents.

Investment from the Fund is helping the NSW Government to prepare the state for challenges of the future and ensure a thriving NSW. Together, households, business, communities and government are on the way to making NSW the number one place for innovative energy, competitiveness and environmental excellence in Australia.

Mark Speakman
Minister for the Environment

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Climate Change Fund highlights for 2014–15

- Australia's biggest solar power station at Nyngan in western NSW achieved full generation capacity, sending 102 megawatts (MW) of renewable electricity into the National Electricity Market. That is enough electricity to power 33,000 average NSW homes for a year, or a town the size of Dubbo for more than two years.
- 19 community energy groups received $846,000 from the Climate Change Fund (the Fund) to develop and own renewable energy projects that will meet the annual electricity needs of more than 9000 average NSW homes.
- The NSW Government Resource Efficiency Policy was launched to reduce operating costs and encourage government agencies to lead by example in energy, water and waste efficiency. Nine energy efficiency projects approved across 39 Health, Justice and Planning and Environment sites will reduce energy bills and free up resources for vital public services.
- The Enhanced Bushfire Management Program achieved 93 per cent of its hazard reduction target, helping to reduce the risk to homes and community assets from damage during extreme bushfire events.
- A new $26.8 million Home Energy Action Program was launched to assist vulnerable households to cut power bills. Industry partnerships will support improving home fixtures and reducing the upfront costs of energy efficient appliances.
- A new Gas Efficiency Improvement Program was established to assist gas-intensive businesses in NSW to implement quick gas efficiency opportunities. The data collected from these projects will assist in the development of publicly available tools, training and guides, and will inform methodologies for including gas incentives in the NSW Energy Savings Scheme.

Delivering government priorities

Overview of the NSW Climate Change Fund

The Fund was established in 2007 under the *Energy and Utilities Administration Act 1987* (the Act) and is administered by the NSW Office of Environment and Heritage (OEH).

The Fund supports activities that will help homes, businesses, communities and government agencies manage the impacts of climate change and reduce energy consumption, water use, greenhouse gas emissions and utility bills.

The Fund currently has two investment priorities:

1. supporting *NSW 2021: A Plan to Make NSW Number One* (NSW 2021) through implementation of the NSW Energy Efficiency Action Plan and NSW Renewable Energy Action Plan
2. delivering other government programs.

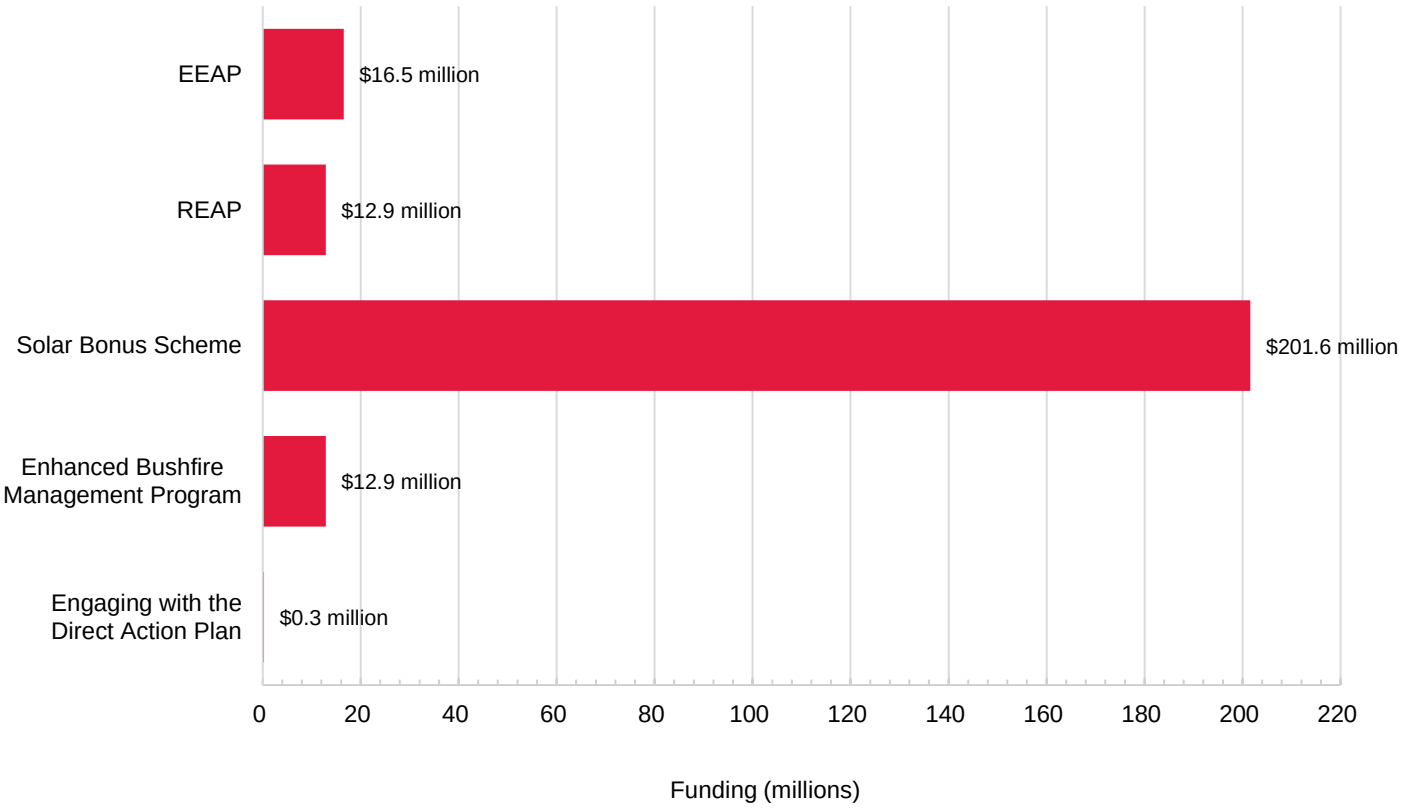

Figure 1: Fund support for NSW Government priorities in 2014–15.

Supporting the Energy Efficiency Action Plan (EEAP)

Energy efficiency programs supported by the Fund contribute to the *NSW 2021* target to deliver electricity savings of 16,000 gigawatt hours (GWh) a year by 2020, and to Goal 5: to place downward pressure on the cost of living. The EEAP includes 30 actions to grow the energy efficiency products and services industry in NSW.

The Fund provides targeted support for NSW homes, businesses, communities and government agencies to reduce their energy use and lower their energy bills.

Investment from the Fund in 2014–15 helped increase energy productivity and improve community resilience for a thriving NSW.

For more information see the NSW Energy Efficiency Action Plan:
www.environment.nsw.gov.au/energyefficiencyindustry/energy-efficiency-policy.htm

Supporting the Renewable Energy Action Plan (REAP)

Renewable energy programs supported by the Fund contribute towards the national target to achieve 20 per cent renewable energy by 2020. The REAP includes 24 actions to build community support for renewable energy, attract private sector investment and grow renewable energy expertise in NSW.

Through the Regional Clean Energy Program and community energy grants, the Fund creates opportunities for communities to develop new skills and produce their own electricity locally, using renewable energy sources. The Fund is also playing an important role in advancing large-scale solar projects in partnership with the Australian Government's Solar Flagships Program.

Investment from the Fund in 2014–15 helped bring new jobs, investment and innovative technologies to local economies for a thriving NSW.

For more information see the NSW Renewable Energy Action Plan:
www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainable-energy/renewable-energy-action-plan

Strengthening the energy efficiency market

The EEAP and the NSW Energy Savings Scheme (ESS) work together to deliver energy savings in NSW. The ESS is the biggest NSW program contributing to the *NSW 2021* target to realise annual energy savings of 16,000 GWh by 2020. The Fund supports EEAP actions designed to overcome barriers to more efficient energy use by:

- enhancing the ESS (including scheme and rule reform)
- improving the availability and rigour of energy efficiency data
- broadening access to energy savings for households and businesses
- increasing the demand for energy efficient products and services from consumers and suppliers.

What is the Energy Savings Scheme?

- The ESS provides financial incentives for households and businesses to save energy.
- Accredited energy service providers (known as ACPs) can create energy savings certificates when they install, upgrade or replace energy savings equipment such as insulation and lighting. Electricity retailers are required by law to purchase an amount of certificates each year or pay a penalty, which creates a financial incentive to save energy.
- Energy efficiency product and service providers use the financial incentives to make their services cheaper and more accessible to their customers. This helps overcome a range of barriers to the uptake of energy efficiency opportunities in NSW, such as high upfront costs and split incentives.
- The ESS is administered by the Independent Pricing and Regulatory Tribunal (IPART).
- For more information see the Energy Savings Scheme: www.ess.nsw.gov.au/How_the_scheme_works

Measuring 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 eighth financial year of operations, from 1 July 2014 to 30 June 2015.

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

- energy savings (MWh per year)
- greenhouse gas emissions reduction (tCO_2-e per year)
- annual bill savings ($ per year)
- clean/renewable energy generated (MWh per year)
- funds allocated ($).

The shift in current government policies has meant a move away from simple models of program delivery targeted at the level of the individual (a one to one approach) and towards a platform of interventions operating at multiple levels within a complex system (a one to many approach). Due to the time lag for some benefits to eventuate in the system, some indicators, such as the return on investment for every dollar spent, cannot be calculated for this report.

Funding recipients must report to OEH on the progress of projects and their success in achieving outcomes (e.g. energy and greenhouse gas savings). Fund programs undertake a design, evaluation, monitoring, reporting and improvement process. Information on Fund programs and evaluation reports are published on the OEH website. OEH regularly reports on its progress in meeting state plan priorities and election commitments.

This annual report details the aim, delivery approach, program partners, achievements and lifecycle phase for each program and/or project supported by the Fund.

Administration and budget

Climate Change Fund budget

Revenue

Electricity distribution and network service providers were required to contribute to the Fund through the gazettal of the annual Contributions Order. A breakdown of the Fund's revenue is shown in Table 1.

Additional revenue came from interest earned on cash balances and return of grant funds paid in previous years.

Table 1: NSW Climate Change Fund revenue 2014–15

Source	Amount ($)
Ausgrid	148,595,464
Endeavour Energy	93,651,005
Essential Energy	66,353,531
Interest	3,778,273
Miscellaneous Revenue[1]	4,994,845
Total	317,373,118

[1] Includes return of grant funds paid in previous years.

Expenditure

The Fund's expenditure in 2014–15 was $253.4 million.

Of this, 0.6 per cent was for program administration. This funding provided administrative and technical support to the Fund, including resourcing support for administration, data analysis, program evaluation, legal advice, coordination of the annual report, and a contribution towards the NSW Green Globe Awards. This year it also supported OEH to relocate staff involved in delivering the Fund's programs from the Goulburn Street, Sydney office to Parramatta.

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

The difference between total revenue and total expenditure largely relates to repayment of the Treasurer's Advance for the Solar Bonus Scheme in 2011–12 and 2012–13.

Table 2: NSW Climate Change Fund expenditure 2014–15

Investment	Recipient or sector	Amount ($, ex GST)
Support for the regulation of the Australian Energy Market and Australian Greenhouse and Energy Minimum Standards	Australian Energy Market Commission / Commonwealth Department of Industry and Science	7,667,476
Bushfire funding – capital	National Parks and Wildlife Service	1,150,673
Bushfire funding – recurrent	National Parks and Wildlife Service	11,726,366
Cooling a City Block project	Street Coolers Pty Ltd	104,725
Emissions Reduction Fund	Office of Environment and Heritage	259,442
Energy Efficiency Action Plan programs[1]		
Energy efficient homes	Homes	2,964,007
Energy efficient business	Business	6,616,325
Energy efficient government	Government	1,188,542
Gas Efficiency Improvement Program	Business	431,453
Home Energy Action Program	Homes	494,285
Markets and finance	Various	880,528
Policy development	Various	1,127,194
Program evaluation	Various	1,087,234
State-wide delivery	Communities	1,758,616
Renewable Energy Action Plan programs		
Regional Clean Energy Program	Communities	2,903,832
Solar Flagships	AGL PV Solar Holdings Pty Ltd	9,967,000
Solar Bonus Scheme	Distribution network service providers	201,564,591
Fund program administration	Office of Environment and Heritage	1,424,134
Fund program administration – capital	Office of Environment and Heritage	50,460
TOTAL		**253,366,884**

[1] includes capital expenditure

Climate Change Fund administration and market regulation

Governance and funding arrangements

- Under the Act, the Minister for the Environment requires distribution network service providers to make contributions to the Fund via annual gazettal of Contributions Orders. The Minister seeks the concurrence of the Minister for Industry, Resources and Energy and the Treasurer when preparing the 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

- The Fund provides the NSW Government contribution to national energy regulation initiatives, as provided for under section 34H of the Act.
- Under established funding arrangements agreed between relevant jurisdictions, NSW is responsible for 37.2 per cent of the Australian Energy Market Commission's (AEMC) budget.
- NSW paid $7.4 million as its share of the AEMC's annual operating budget.

Action Matters at Home

More comfortable homes with lower running costs help improve the health and wellbeing of NSW families. The Fund is assisting the NSW Government to reduce cost-of-living pressures for households by making it cheaper and easier to improve energy efficiency. The Fund supports the delivery of household energy services and programs that help families make energy efficient choices.

Key programs and projects supported by the Fund in 2014–15

1. Smarter Choice program
2. A new Home Energy Action Program
3. Voluntary energy ratings for homes
4. A new Home Energy Assessment Tool
5. 'Cooling a City Block' project

Using the Smarter Choice Calculator app (Photo: OEH)

Buying energy and water efficient appliances

Design | Plan | Implement | **Evaluate** | Report

- Aim: To help households make more informed and educated decisions about purchasing, using and disposing of appliances, and to empower sales staff to improve their own knowledge about energy and water efficiency and pass this on to customers.
- Approach:
  - Smarter Choice is a collaborative partnership between OEH, Sustainability Victoria and appliance retailers (including Harvey Norman, The Good Guys, Betta Electrical, Myer, David Jones, JB Hi-Fi and independent retailers) and

more recently the Australian Government's Equipment Energy Efficiency Program.

  - The Smarter Choice Calculator allows consumers to compare the purchase price of an appliance versus its lifetime running cost to determine the potential bill savings from different models.
  - OEH is increasing the program's online presence by replacing face-to-face retail staff training with an online learning management system from August 2015.
- Investment from the Fund in 2014–15: $327,528.
- 2014–15 milestones:
  - Smarter Choice field staff conducted 681 store visits between July and December 2014, training more than 1300 staff in program content and placing point of sale material in stores.
  - The Smarter Choice Calculator received more than 200,000 page views. Online use spiked in November 2014, with more than 6000 page views in one day following the official launch of the calculator as an App. Page views per day doubled (from 400 in July 2014 to 800 in June 2015) following functionality improvements that were recommended during usability testing.
  - OEH created eight online learning modules to enable cost-effective delivery of energy efficiency training to retail staff.
  - OEH and Sustainability Victoria discussed expansion of the program nationally with the Australian Government Department of Industry and Science, to improve consistency in consumer messaging, sharing resources and increasing the program's reach and influence.

Access to energy efficiency for low income households

- Aim: To improve access to energy efficiency for low income households through community housing upgrades and more affordable appliances.
- Approach:
  - The NSW Government completed a review of low income energy efficiency programs in NSW, which recommended that future programs should more effectively target the key barriers most affecting low income households: the upfront cost of energy efficient appliances and the incentives split between private and social housing landlords and their tenants.
  - Home Energy Action is working in partnership with community housing providers and the NSW Land and Housing Corporation to make houses cheaper and more comfortable for low income tenants to live in.
  - Home Energy Action is working with no interest loan providers and appliance retailers to help low income households with the upfront cost of purchasing energy efficient appliances.
- Investment from the Fund in 2014–15: $494,285.

- 2014–15 milestones:
  - The NSW Government established the Home Energy Action Program in March 2015, following an evaluation of the Home Power Savings Program that showed participating households demonstrated a need for more than a basic retrofit and education, and that a more bespoke and in-depth approach was required for households experiencing energy hardship (ARTD, 2014).
  - OEH completed research to define and identify households facing energy hardship in NSW and to determine the best strategies for reaching these households.
  - Trial projects with 17 community housing providers (responsible for 80 per cent of the community housing stock in NSW) are at various stages of design and will commence implementation in 2015–16. These projects aim to improve energy efficiency standards and provide direct benefits to tenants, while collecting information to support larger-scale program delivery.

Investigation of a voluntary ratings system

- Aim: To make energy efficient homes stand out with a voluntary rating system at the point of sale or lease.
- Approach:
  - Investigate consumer and industry decision-making and information needs at the point of sale or lease of residential properties.
  - Industry and research partners to jointly develop a business case and implementation pathway for a voluntary rating framework that could be applied nationally.
  - Delivered via a partnership between the CRC for Low Carbon Living, CSIRO, Clean Energy Council, Energy Efficiency Council, OEH, Swinburne University of Technology, Australian Window Association, AGL Energy Limited, CSR Ltd, Centre for Liveability Real Estate, Fletcher Insulation Australia, Knauf Insulation Australia and Stockland Ltd.
- 2014–15 milestones:
  - Twelve focus groups held with homeowners, renters and investors in three capital cities and two regional areas resulted in a baseline understanding of participants' perspectives on energy efficiency and energy rating tools, their key information needs, and behavioural factors that affect decision-making.
  - Reviewed and benchmarked Australian and international information and rating systems to understand key success factors and lessons learnt.
  - Conducted a national consumer survey (approximately 900 households) that established the information needs and behavioural factors for consumers' decision-making at the point of sale or lease.
  - Conducted a housing specialist and real estate industry survey (approximately 500 participants) that explored current industry practice and influence on customers' decision-making in relation to energy efficiency.

A new Home Energy Assessment Tool

- Aim: To simplify administration requirements under the ESS for accredited assessors to conduct home energy retrofits.
- Approach:
  - Develop a Home Energy Assessment Tool (HEAT) for accredited certificate providers (ACPs) to use the Home Energy Efficiency Retrofits method to create certificates from installing energy efficient fixed appliances (e.g. lighting) and upgrading building fabric (e.g. draft proofing) in residential and small business buildings.
- Investment from the Fund in 2014–15: $266,327.
- 2014–15 milestones:
  - OEH released HEAT in June 2015.
  - ACPs receive a licence to use the method upon completion of online training. Six ACPs have successfully completed HEAT online user training and are registered to use the tool.
  - OEH developed user requirements and technical specifications for businesses wanting to develop their own HEAT.

  For more information see Home retrofits: http://www.environment.nsw.gov.au/energyefficiencyindustry/home-retrofits.htm

‘Cooling a City Block’ project

- Aim: To develop a return on investment calculator for cooling an Australian city block for any land use type (i.e. residential, commercial or industrial).
- Approach:
  - Street Coolers Pty Ltd installed 10 energy monitoring stations (in nine homes and one school), two road temperature stations and seven data loggers to establish a baseline before implementing urban heat reducing actions in the project area (Newtown, in Marrickville local government area).
- Investment from the Fund in 2014–15: $104,725.

- 2014–15 milestones:
  - Street Coolers Pty Ltd developed a return on investment calculator and user guide that allows communities and councils to quantify the costs of building and installing a variety of solutions to reduce the impacts of urban heat island effect, including increased vegetation, installing cooler surfaces (pavements and roofs), improving energy efficiency, installing solar panels and enabling local composting and recycling. The cost of each solution is compared to the annual dollar value of their benefits.
  - Established a website (www.streetcoolers.com.au) to increase public awareness of the urban heat island effect, with videos on 'how to cut your bills' and 'how to cool your street'.
  - Produced a guide to the statutory and regulatory frameworks that govern the operation of solar photovoltaic (PV) systems in NSW.

Black-coloured roads and a lack of tree cover can increase the heat of our cities by more than 6ºC (Photo: courtesy of Street Coolers Pty Ltd)

What is the urban heat island effect?

Urban surface temperatures can be 10 to 20 degrees Celsius higher than the air temperature because buildings, roads and other hard surfaces absorb and store heat. High temperatures, due to climate change, will further intensify the impacts of urban heat.

Unlike hard surfaces, trees and vegetation reflect heat, and they cool and clean the air by evapotranspiration. Other benefits from increased vegetation in our urban environments include better health and wellbeing for urban-dwellers, more biodiversity and wildlife, and regulation of localised flooding.

Case study: Smarter Choice using evaluation to improve program delivery

The Smarter Choice Program encourages consumers to buy more efficient appliances, locking in lower energy and water use for years into the future. More than 280 electrical appliance retailers across NSW have been involved in the program. OEH contracted Smarter Choice field staff to conduct regular store visits, train sales staff and stock point of sale promotional materials.

At the end of 2014, the Fund supported OEH to engage the Institute for Sustainable Futures (ISF) at the University of Technology, Sydney to evaluate the program. The evaluation included a telephone survey of more than 600 residents in NSW and the Illawarra, focus groups, interviews with retail managers and sales staff, and in-store observations of sales practices.

ISF examined three interrelated social practices that are crucial to the effectiveness of Smarter Choice: consumer shopping practices, retailer sales practices and program delivery practices. This emerging approach delivered new insights into the program.

The evaluation found that some sales staff lack the motivation or skills to incorporate Smarter Choice knowledge and materials with everyday sales practices (ISF, 2015). Store visits were largely ineffective in engaging staff due to the pressures and challenges they face. One key recommendation from the evaluation was to use online training for retail staff because it delivers more engaging content more cost effectively.

OEH responded to this recommendation by ceasing store visits and developing online training in consultation with retail sales staff and managers. The training will be rolled out to retailers in 2015–16 as part of their standard staff inductions. Learning modules include using the Smarter Choice Online Calculator, insights into consumer behaviours and key elements of the energy efficient appliances covered by the program (e.g. fridges and freezers).

The evaluation also recommended that OEH form stronger partnerships with the Australian Government's Equipment Energy Efficiency (E3) Program and Sustainability Victoria to 're-energise the program' and support an integrated approach to engaging retailers. OEH is now working with these organisations to expand Smarter Choice nationally in 2015–16.

Smarter Choice Program (Photo: OEH)

Action Matters in the Community

Providing access to information and resources across the state is key to supporting vibrant and thriving communities. The Fund is helping to drive economic growth in regional NSW and foster community-led action by supporting energy efficiency and renewable energy project development in local communities.

Key programs and projects supported by the Fund in 2014–15

1. Solar PV plants at Nyngan and Broken Hill
2. Growing Community Energy grants
3. Regional Clean Energy Program
4. Statewide delivery strategy

Shoalhaven Bowling Club, which has installed 99 kW of community-owned solar through support from the Fund for Renew Shoalhaven (Photo: OEH)

Support for large-scale solar projects

Design | Plan | **Implement** | Evaluate | Report

- Aim: To support the growth of large-scale solar power stations in NSW.
- Approach:
  - Co-investment from the NSW Government, the Australian Renewable Energy Agency (ARENA) and AGL Energy Limited in the Australian Government's Solar Flagship Program.
  - $440 million project developed by AGL Energy Limited and First Solar to deploy two large-scale solar PV power stations at Nyngan and Broken Hill in western NSW.
- Investment from the Fund in 2014–15: $9,967,000.

- 2014–15 milestones:
  - AGL completed construction of the $290 million solar plant at Nyngan in April 2015, with 1.36 million solar panels installed over 250 hectares.
  - The Nyngan plant achieved total generation capacity in June 2015, delivering 102 MW of 100 per cent renewable energy to the National Electricity Market (NEM).
  - The local community and businesses around Nyngan and the wider Orana region have experienced economic benefits from local procurement and contracts and employment, which during the peak of construction reached more than 250 people on site.
  - By June 2015, half of the 650,000 solar PV modules had been installed at the 53 MW plant at Broken Hill. Construction is scheduled for completion in November 2015.

What is the National Electricity Market?

The NEM comprises five interconnected states: New South Wales (including the ACT), Queensland, South Australia, Victoria and Tasmania.

The NEM's transmission network carries power from electricity generators to local electricity distributors, who deliver it to NSW homes and businesses.

For more information see the Australian Energy Market Operator: www.aemo.com.au/About-the-Industry/Energy-Markets

Completion of PV module installation at the AGL Nyngan Solar Plant on 17 April 2015 (Photo: courtesy of AGL)

Community engagement in regional areas

- Aim: To bring new jobs, investment and technological advances to regional communities.
- Approach:
  - Through the Regional Clean Energy Program, regional co-ordinators work closely with local communities, industry and the NSW Renewable Energy

Advocate to effectively engage stakeholders with renewable energy and energy efficiency projects by providing them with better data, information and links to programs.

  - Partnership between OEH and the NSW Farmers Association (NSWFA) is helping agricultural businesses in NSW take advantage of renewable energy and energy efficiency opportunities.
  - Facilitating ongoing development of the South East Region of Renewable Energy Excellence Industry Cluster (SERREE), which was formed in 2011 with support from OEH, Regional Development Australia ACT and Southern Inland and local business groups. It now consists of a collaborative network of 500 members across government, private sector, not-for-profit and community organisations.
- Investment from the Fund in 2014–15: $2,042,832.
- 2014–15 milestones:
  - Regional coordinators held 25 workshops across the state in partnership with local councils, environment networks and community organisations to foster collaboration with industry and government and increase capacity in renewable energy technologies. For more information, see the case study on page 19.
  - The Fund provided $142,000 to NSWFA to develop two guides that practically addressed farmers' specific needs around implementing renewable energy systems on farms:
    - Renewable energy in agriculture: A farmer's guide to technology and feasibility
    - Solar-powered pumping in agriculture: A guide to system selection and design.

    For more information see AgInnovators: www.aginnovators.org.au/initiatives/energy/information-papers/dont-wait-next-fuel-bill-download-nswfa-oehs-new-free-guides-renewables-and-solar-powered.
  - The Fund provided $120,000, with $305,000 co-investment from ARENA, to assist SERREE to develop a best practice model for renewable energy industry development that can be replicated in other regions across NSW and Australia.

    For more information, see South East Region of Renewable Energy Excellence: www.serree.org.au

Support for community renewable energy

- Aim: To reduce the barriers faced by community energy groups in securing funding for early stage development of renewable energy projects.
- Approach:
  - Contestable Growing Community Energy Grants to fund pre-feasibility studies, community engagement, planning and other activities to help community groups develop projects with viable business models to attract further investment.
- Investment from the Fund in 2014–15: $861,000.

- 2014–15 milestones:
  - The Fund provided $846,000 to 19 community groups for solar, wind, hydro, bio-energy and energy efficiency projects that have the combined potential to save an estimated 60,000 MWh of electricity a year (see Table 3 and regional breakdown in Figure 2).
  - Fifty-two applications were received from 45 community groups, which represents a 73 per cent increase in applications from the Community Renewable Energy grants program in 2013–14.
  - $15,000 was provided to Byron Shire Council to trial virtual net metering. The trial will encourage the development of new business/pricing models, which will benefit all households, businesses and communities that generate electricity. The trial is running in collaboration with ARENA, the ISF at the University of Technology Sydney and the NSW Renewable Energy Advocate.

What is virtual net metering?

Virtual net metering (VNM) makes it easier for small-scale renewable energy generators to sell the excess energy they are producing. It operates by using existing energy infrastructure more efficiently. VNM could allow customers to reduce their network charges, which make up a significant component of their retail electricity bill.

For more information see ARENA: arena.gov.au/project/investigating-local-network-charges-and-virtual-net-metering

Table 3: Grants for community renewable energy

Funding round	Number of recipients	Funding ($)	Potential generation per year (MWh)
Community Renewable Energy grants (2014–15)	19	846,000	60,000
Growing Community Energy grants (2013–14)	9	371,000	55,000
Total	**28**	**1,217,000**	**115,000**

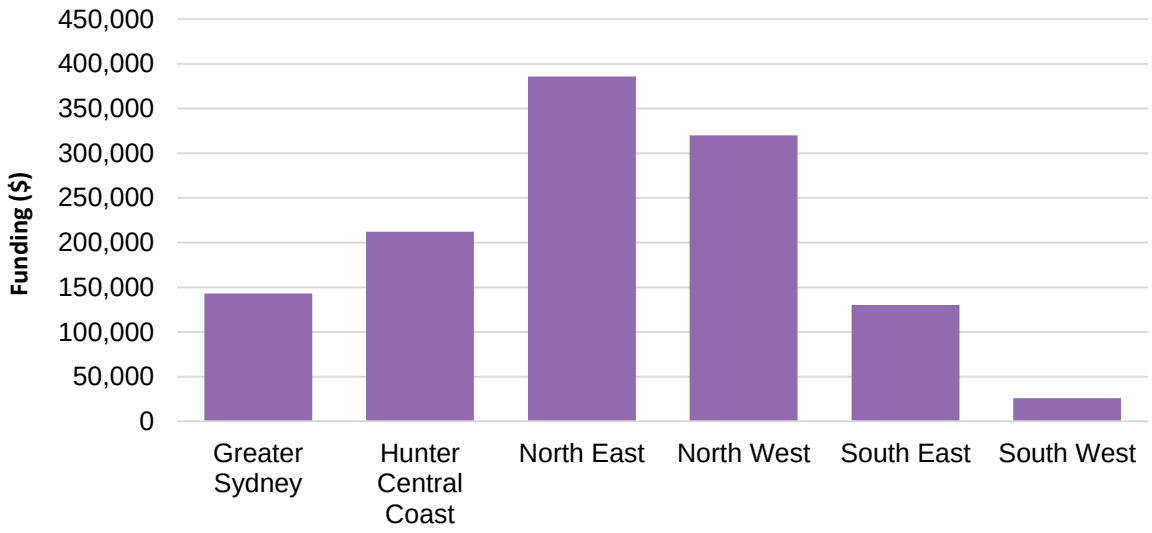

Figure 2: Fund expenditure ($) on community energy grants 2013–15 by renewable energy precinct

Statewide delivery strategy

- Aim: To assist the delivery of EEAP and REAP actions.
- Approach:
  - The Fund supports ongoing development of the OEH digital platform, which consists of online communication and engagement tools that provide customer-focused information to drive better energy management and reduce energy bills.
  - Projects work with trusted and locally embedded organisations or individuals as facilitators to address some key barriers to energy efficiency in regional locations.
- Investment from the Fund in 2014–15: $1,758,616.
- 2014–15 milestones:
  - The Fund supported the launch of the Action Matters visual identity, which provides a consistent look and feel to all activities delivered in support of the EEAP, REAP and Government Resource Efficiency Policy, as well as sustainability programs funded via the Environmental Trust.
  - OEH upgraded its website to provide customers with access to initiatives supported by the Fund via their mobile devices wherever they are – at home, in the office or on the job.
  - The Fund supported the development of an online ACP Directory that enables businesses to find energy efficiency service providers in their area. See the Accredited Certificate Provider Directory: acpdirectory.environment.nsw.gov.au
  - With support from the Fund, OEH held three regional expos for local businesses, councils and community groups to explore regional energy efficiency and renewable energy opportunities. For more information, see the case study on page 20.

Case study: Regional workshops

Workshop	Aim	Location	Attendees	Outcome(s)
Solar PV for Business	Increase knowledge and capacity so businesses can make informed decisions about installing solar PV.	Batemans Bay, Griffith, Howlong, Wagga Wagga, Wollongong, Yass and Young	175	High level of satisfaction with workshop. Many attendees indicated intent to take further action. New ongoing partnerships.
Renewables in Agriculture and Solar-powered Pumping	Provide up-to-date information on solar pumping and renewables to help agricultural enterprises take advantage of opportunities. Promote newly released guides developed by NSWFA and OEH.	Deniliquin, Griffith, Hunter, Warren and Western Sydney	200	Supplier working with the Cotton Research Development Office to develop a case study in Warren. Irrigation Association and NSW Local Land Services working together. Neighbouring farmers committed to 'water use efficiency challenge.'
Water Pumping Energy Efficiency	Engage with councils on water pumping efficiency and promote case studies.	Cooma and Wagga Wagga	40 (15 councils)	Identification and delivery of three case studies.
Community Clean Energy	Build community capacity in, and awareness of, common interest and action towards community energy projects.	Central Coast, Hawkesbury, Hunter–Newcastle, Northern Sydney, Port Macquarie, Southern Sydney and Western Sydney	300	New partnership between Hawkesbury Council and community energy and environment groups. Southern and Western Sydney working groups formed.

Adam Blakester, Executive Director of Starfish Initiatives, participating in the Albury Energy Efficiency Expo (Photo: OEH)

Case study: Two-way expos to help drive down energy costs

Engaging with businesses and communities through existing networks and face-to-face visits is key to increasing the uptake of energy efficiency and building capacity in regional areas.

The Fund supported a series of two-way expos held in Albury, Armidale and Kurri Kurri between October and December 2014. More than 200 stakeholders participated from local businesses, finance and service providers, state government agencies, local councils and community groups.

The free expos included local trade displays, detailed advice from leading experts on a wide range of energy related topics, and information on how to access OEH programs and support. The expos provided a platform for businesses and communities to showcase innovation and practical solutions for energy efficiency and clean energy, champion regional best practice, and increase regional networking opportunities.

Participants at the Armidale and Kurri Kurri expos were interviewed by independent research consultants, d-sipher, to help inform understanding of regional barriers and opportunities for energy efficiency, which will improve regional program delivery and guide future policy development. Many of the recommendations in the report, particularly around understanding and acting on the factors that shape the regional marketplace, are transferrable to other regional areas in NSW.

A case study on energy efficiency success stories in regional businesses in NSW is available on the Action Matters YouTube channel:
www.youtube.com/watch?v=p0Qu5oi9Q8U

Kurri Kurri Energy Efficiency Expo (Photo: OEH)

Action Matters for Business

A new era for business leadership is emerging. The Fund is helping the NSW Government improve businesses' energy management and reduce costs by identifying and implementing energy efficiency opportunities that will lift their productivity.

Key programs and projects supported by the Fund in 2014–15

1. New Gas Efficiency Improvement Program
2. Targeted energy efficiency audits and support
3. Energy efficiency training and information
4. Environmental Upgrade Agreements

Greg Silkman, managing director of First Creek Winemaking Services, with OEH Chief Executive Terry Bailey at the Energy Productivity in Action event. First Creek has saved more than $125,000 on its power bills through the Energy Saver program. (Photo: OEH)

Incentives for gas efficiency

Design | Plan | Implement | Evaluate | Report

- Aim: To provide assistance to gas-intensive businesses in NSW to implement quick gas efficiency opportunities in ways that provide publicly valuable gas savings data and build the market for gas-efficient products and services.
- Approach:
  - Gas efficiency product and service providers will help approximately 50 businesses to identify and implement gas savings opportunities and verify energy savings.
  - Data collected from businesses will inform publicly available tools, guides and training to reduce gas costs.
  - The data will also help the NSW Government to develop methodologies for introducing gas incentives in the ESS.
- Investment from the Fund in 2014–15: $431,453.

- 2014–15 milestones:
  - The NSW Government established the new Gas Efficiency Improvement Program in March 2015.
  - OEH has completed comprehensive stakeholder consultation on co-designing the program and identified gas saving opportunities covering residential, commercial and industrial sectors to be included in the ESS.
  - OEH has developed a Gas Sub-Metering Guide to be released November 2015.

Targeted energy efficiency audits and support

- Aim: To accelerate the uptake of energy efficiency projects and deliver significant savings to NSW businesses.
- Approach:
  - The Action Matters for Business program delivers energy efficiency audits and technical support targeted at priority industry sectors and technologies to help transform them with improved data collection and best practice information.
  - Collaboration agreements with peak bodies and industry associations allow for preferential delivery of energy efficiency services to their members and will provide OEH with channels for communications and energy-related work with influential market players.
  - Training and upskilling pre-approved experts to deliver energy efficiency services that businesses can engage will help grow the energy efficiency products and services market and help businesses to expand their capacity to increase uptake of ESS incentives, while ensuring the services they are providing are high quality, healthy, profitable and competitive.
- Investment from the Fund in 2014–15: $3,528,565.
- 2014–15 milestones:
  - OEH signed eight collaboration agreements with industry associations and peak bodies, including the NSW Business Chamber, NSW Irrigators Council, and Printing Industries Association of Australia.
  - The Fund supported the creation of the Energy Efficiency Professional Services panel, comprising 540 experts from 87 companies across energy efficiency auditing, technical engineering support, energy efficiency training, and measurement and verification services.
  - The Fund supported the delivery of 64 audits, of which 52 per cent were conducted in regional NSW.
  - More than 18,000 NSW businesses have saved an estimated $34.6 million a year from implementing energy efficiency projects that were identified through energy efficiency audits (see Table 4). Figure 3 shows the increase in energy savings over the past three years, which corresponds with the increase in additional targeted support provided under the EEAP.

Table 4: Fund support for small and medium-to-large business energy audits completed 2009–2015

Number of audits	Funding ($)	Estimated electricity savings per year (MWh)	Estimated natural gas savings per year (GJ)	Estimated GHG savings per year (tCO_2-e)	Estimated bill savings per year ($)	Cost effectiveness per MWh ($)
18,265	48,077,728	150,338	172,117	155,397	34,579,619	31.98

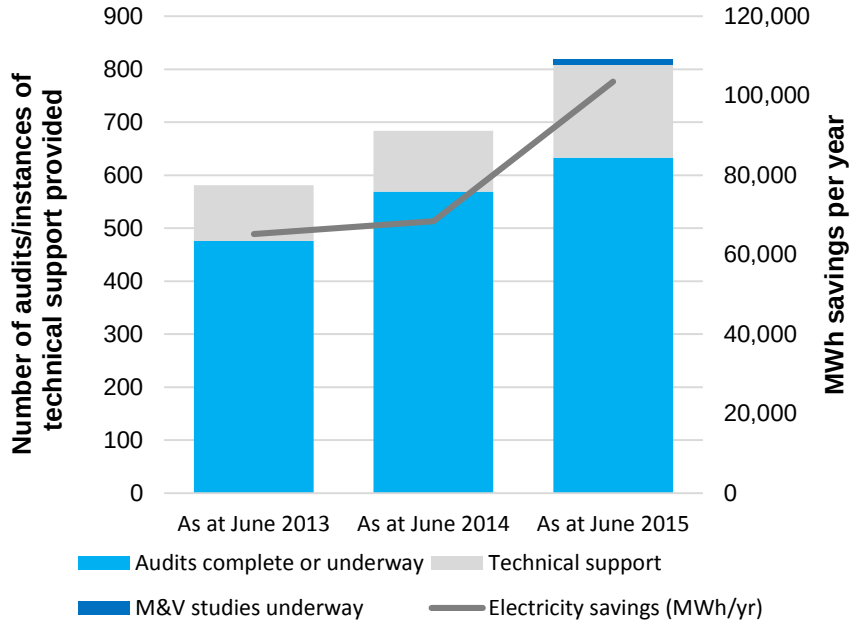

Figure 3: Estimated electricity savings from energy efficiency audits of NSW businesses

Additional support is provided to businesses that identify opportunities through these audits or energy efficiency training courses to ensure viable projects proceed with implementation.

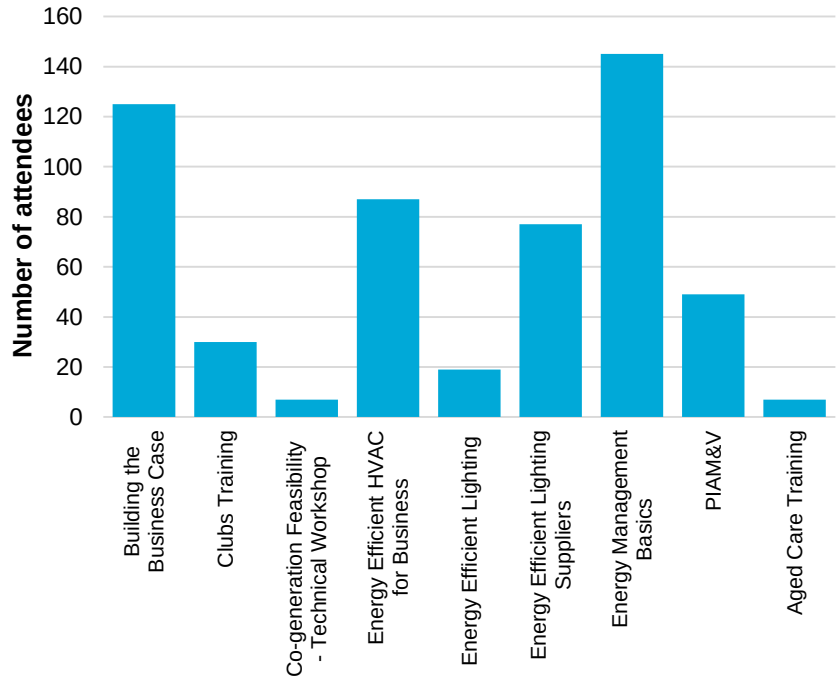

Figure 4: Breakdown of attendance at energy efficiency training courses held in 2014–15

Energy efficiency training and information

Design | Plan | **Implement** | Evaluate | Report

- Aim: To help business owners, site managers and staff identify and implement energy efficiency opportunities and apply best practice information to their own circumstances.
- Approach:
  - Building the capacity of businesses in priority industry sectors through hands-on training will enable them to become committed to ongoing energy management, and energy efficiency will become standard practice.
  - Best practice information in the form of case studies, guides and tools will greatly assist businesses to identify and implement opportunities to save energy.
- Investment from the Fund in 2014–15: $3,087,761.
- 2014–15 milestones:
  - More than 540 professionals and energy service providers attended energy efficiency training courses to increase their knowledge and skills in energy management, building business cases, measurement and verification of energy efficiency projects and implement lighting and HVAC opportunities (Figure 4). More than one-third of the training sessions were in regional locations such as Dubbo, Newcastle and Orange.
  - OEH commissioned the Clean Energy Council to develop a *Guide to Installing Solar PV for Businesses in NSW* for commercial-scale installation of solar PV systems covering NSW-specific legislation and incentives.

    For more information, see Renewable energy research: www.environment.nsw.gov.au/communities/clean-energy-tools.htm.
  - The Fund supported the development of the *Energy Efficiency and Renewables Finance Guide,* which was released in November 2014 *to* help unlock savings and other benefits of clean energy.

    For more information, see Financing your project: www.environment.nsw.gov.au/business/project-financing.htm.

Financing mechanisms for energy efficiency projects

Design | Plan | **Implement** | Evaluate | Report

- Aim: To make finance more accessible and affordable for businesses
- Approach:
  - The Fund supports the facilitation of Environmental Upgrade Agreements (EUAs) for commercial buildings. EUAs are currently available for non-strata commercial and light industrial buildings from five local councils in NSW:
    - City of Sydney
    - Parramatta City Council
    - North Sydney Council
    - Lake Macquarie City Council
    - The City of Newcastle.
  - OEH is working with industry to further enhance the EUA process through the delivery of more commercially aligned practices, including market-driven business development actions and standardised and easy-to-use contracts, to address key barriers including the incentives split between building owners and tenants.
- 2014–15 milestones:
  - One EUA at 20 Macquarie Street in Parramatta was signed, bringing the total number of EUAs signed to five (three in City of Sydney and two in Parramatta City Council). The new $1 million EUA involves upgrading to the latest lighting technologies, installing blinds to control heating and cooling loads, and replacing the HVAC system and lifts.

What are EUAs?

The NSW Government legislated EUAs to encourage building owners to upgrade to energy efficient technologies and improve the financial performance of their buildings.

EUAs are a financial arrangement between a building owner and a finance provider, with councils acting as a conduit for repayments.

The financier provides the building owner with funds for the upgrade, and the owner repays the loan through an additional charge on their rates notice, called an Environmental Upgrade Charge. The building owner uses tenant contributions to part-service the loan repayments.

For more information, see Environmental upgrade agreements:
www.environment.nsw.gov.au/business/upgrade-agreements.htm

Case study: Building a better case for energy efficiency

Businesses across NSW are taking positive action to initiate energy efficiency projects with the help of the Fund.

More than 100 individuals, service providers and business consultants have completed OEH's unique Building the Business Case (BTBC) training. Their new skills are helping them to develop strong and successful business cases for energy efficiency projects.

Post-training surveys indicated that 60 per cent of participants rated the BTBC training course as 'excellent' and 40 per cent of participants found it to be 'good'.

Key decision-makers and advisors from businesses, registered clubs, local councils and universities are fast-tracking their organisations to achieving lower energy bills. They are presenting clear and compelling business arguments that lead to approved and implemented energy efficiency projects, which is helping the NSW energy efficiency market to grow and thrive. A recent evaluation of the BTBC course (Clear Horizon, 2015) found that:

- One-third of participants have developed business cases that the training helped them with, though many participants have not yet had the opportunity to do so.
- 25 per cent of participants interviewed pointed to actual or potential savings from energy efficiency projects implemented as a result of attending the course and accessing post training support.
- 80 per cent of participants mentioned the course raised their ability to access energy efficiency finance options.
- The post-training support (up to 15 hours for identified businesses) was praised as increasing project approval rates.
- The interactive training format is a major strength as it draws upon real-life case studies and opportunities.

Examples of success…

- Actual or potential savings of more than $115,000 a year across four projects with successfully implemented business cases.
- Expected savings of $50,000 a year across two projects that benefited from post-training support.
- One business implemented a project to replace equipment and reduce energy use through behaviour change, saving 23 MWh a year.
- A carpark lighting upgrade is estimated to save $24,000 in power bills a year.
- One participant reported that the business case they were working on was rejected by the Board but that after BTBC training and post-training support the business case was approved and has been successfully implemented.

Action Matters for Government

Better energy management in the public sector means that there are more resources available to deliver vital public services, such as health and education. The Fund is helping the NSW Government to lead by example through investment in energy efficiency.

Key programs and projects supported by the Fund in 2014–15

1. Government Resource Efficiency Policy
2. Energy Efficient Government Program

Participants engaging in question time during the GREP event held at Parliament House in September 2014. (Photo: OEH)

Government Resource Efficiency Policy

Design | Plan | **Implement** | Evaluate | Report

- Aim: To drive resource efficiency in government operations and reduce the NSW Government's operating costs.
- Approach:
  - Thirteen measures, targets and minimum standards covering energy, water, waste and clean air to drive resource efficiency in government operations. Government agencies are required to identify and scope projects to reduce energy bills, including: energy efficiency retrofits; energy management and optimisation; demand management; and distributed generation (including the installation of solar panels).
  - From July 2015, agencies are required to report performance against the policy by publishing annual data on their energy and water consumption and expenditure, waste streams and compliance with minimum standards. Government performance on GREP will be made publically available.
- 2014–15 milestones:
  - The NSW Government released the Government Resource Efficiency Policy in August 2014.
  - Forty-two representatives from Health; Justice; Transport and Infrastructure; Industry, Skills and Regional Development; Education; Family and Community Services; Finance, Services and Innovation; Planning and Environment; and Premier and Cabinet attended a workshop with OEH on strategic planning to achieve resource efficiency targets, improving collaborative communication channels and promoting projects across agencies.
  - The Fund supported the development of a centralised government resource-use database to streamline processes for collecting and storing energy, water and waste use data and an online data portal with reporting and analytical capabilities, which are expected to be released in 2015–16. This will enable agencies to manage and report their own data to help inform energy efficiency strategies.
  - OEH provided agencies with a list of small sites using more than 45 MWh a year and a web-based checklist tool to self-assess site suitability for solar leasing or power purchase agreements. Agencies identified more than 200 sites as potential locations for solar panels.

For more information, see the NSW Government Resource Efficiency Policy: www.environment.nsw.gov.au/resources/government/140567NSWGREP.pdf

Support to implement energy efficiency projects

Design | Plan | **Implement** | Evaluate | Report

- Aim: To achieve energy bill savings of up to $55 million a year from energy efficiency upgrades initiated at government sites.
- Approach:
  - The Energy Efficient Government Program (EEGP) provides government agencies with access to tools and expertise to ensure that energy efficiency projects are successful.
  - A team of dedicated energy efficiency specialists provides expertise to identify and implement viable energy efficiency projects and risk management.
  - A panel of pre-qualified energy service companies (ESCos) streamline the procurement process.
  - Repayable capital advances to fund energy efficiency upgrades are available through the Government Finance Facility.
- Investment from the Fund in 2014–15: $1,188,542.
- 2014–15 milestones:
  - OEH facilitated the approval of $12.8 million in funding from the Government Finance Facility for nine cost-effective energy efficiency projects with the potential to save more than 8600 MWh of electricity and $2 million in utility bills a year. Thirty-nine sites across the departments of Health, Justice, and Planning and Environment will implement various energy conservation measures, including lighting retrofits, chiller upgrades, solar PV and power factor correction, as well as water efficiency measures.
  - Through EEGP, agencies have identified energy efficiency projects worth $50 million across more than 90 sites. These projects cover building upgrades at both large and small government facilities delivering frontline services such as hospitals, schools, corrective centres, court houses, and recreational and cultural facilities in urban and regional areas.
  - OEH has ensured a more streamlined process to access the Government Finance Facility with applications bundled up and submitted to NSW Treasury in quarterly batches.

Case study: Fairfield Hospital leads the way

Resource monitoring and optimisation

Though the Energy Efficient Government Program, a pilot project by South Western Sydney Local Health District is examining the effectiveness of using a utility monitoring and optimisation system in the complex environment of a hospital to achieve savings.

‘Continuous monitoring and optimisation is the holy grail of energy efficiency,’ the OEH Sustainable Government Team’s Richard Liao says. ‘If we establish proof of concept it has huge implications — and the potential to be rolled out to every hospital in NSW.’

The team has deployed sub-metering across Fairfield Hospital so utility use can be monitored for different equipment or areas in the hospital. ‘We’ll use continuous monitoring to identify opportunities and deliver efficiency outcomes,’ Richard explains.

Peter Cook is the Manager - Shared and Corporate Services for the South Western Sydney Local Health District and is responsible for engineering services and sustainability for Fairfield Hospital.

‘The Office of Environment and Heritage not only helped us with the contract but it provided advice around the financial aspects, the technical aspects and they also assisted us around the negotiation with the vendor, which was invaluable,’ he says.

‘The contract we put together with the Office of Environment and Heritage and the vendor, EP&T, will be suitable for others to use directly with a minimum amount of change, saving other health districts a lot of time and effort.’

The bottom line

Projected savings for the Fairfield Hospital project will total more than $800,000 over five years, which is more than double the total project cost.

‘Hospital operating budgets are fixed on an annual basis, so money that’s not spent paying utility bills can be spent on frontline staff and other key equipment,’ Richard says.

‘The bottom line is that more of the operating budget will go to funding the core service rather than paying the bills.

‘Fairfield Hospital and South Western Sydney Local Health District have shown exceptional leadership, and the Office of Environment and Heritage is glad to be working with them.’

Action Matters for Energy Service Providers

The Fund is supporting a range of actions to expand access to energy savings data and high quality energy efficiency products and services, ensuring energy services providers achieve commercial success.

Key programs and projects supported by the Fund in 2014–15

1. Energy Savings Scheme Review
2. Energy Savings Scheme tools
3. Evaluation of energy efficiency programs

The Energy Savings Scheme Review

The Fund has provided resources for a dedicated team to review the ESS, conduct public consultation and commission experts to provide advice on enhancements to the ESS.

The ESS Review report package was released for public consultation in April 2015. This package outlined a range of options to reform the ESS, including: expanding the scheme to provide incentives to save gas; extending the scheme to 2025; and increasing the ESS target.

For more information, see the Energy Savings Scheme Review: www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainable-energy/efficiency/scheme/energy-saving-scheme-review

Providing access to Energy Savings Scheme tools

- Aim: To simplify administration requirements under the ESS for ACPs.
- Approach:
  - Upgrade the IPART IT system and ESS Registry to accommodate new information requirements set out in the ESS Rule change.
  - Develop a Project Impact Assessment with Measurement and Verification (PIAM&V) tool to help ACPs calculate energy savings once a project has been implemented.
  - Develop a guide to assist ACPs apply for accreditation under the new Aggregated Metered Baseline (AMB) method and explain the statistical methods required to calculate energy savings from behaviour change programs.
- 2014–15 milestones:
  - The IPART-OEH ESS Portal was completed in December 2014. ACPs can upload Clause 6.8 data through the portal and a data sharing agreement has

been implemented between IPART and OEH to enable continual review and development of ESS methods.

– OEH released the PIAM&V tool in March 2015.

  For more information, see the Project Impact Assessment with Measurement and Verification tool: www.environment.nsw.gov.au/business/piamv-tool.htm

– The Fund provided resources to assist IPART to develop the AMB Method Guide, which was released in January 2015.

  For more information, see the Aggregated Metered Baseline method: www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/Aggregated_Metered_Baseline

Evaluation of energy efficiency programs

- Aim: To ensure energy efficiency programs are being delivered efficiently and effectively to households, businesses and government.
- Approach
  - Focus on whole-of-market analysis to enhance understanding of energy efficiency markets and energy consumption in NSW.
  - Work directly with program deliverers to build the evidence base for effective programs and inform future program delivery.
- Investment from the Fund in 2014–15: $1,087,234.
- 2014–15 milestones:
  - The Low Carbon Living CRC, OEH and Swinburne University of Technology commenced development of an energy efficiency uptake model based on social science research into knowledge of behaviours. This model will complement an analysis of technical opportunities to examine the likelihood that a particular technology will be adopted in a particular way.
  - OEH has engaged the Australian Institute of Refrigeration, Airconditioning and Heating (AIRAH) to analyse the heating, ventilation and airconditioning market to determine the contribution of the EEAP and ESS to any potential changes in product stocks and flows, and the size and shape of the industry.
  - OEH and the University of Wollongong commenced a project to develop and map resource efficiency baselines for local government areas across NSW using the SMART Infrastructure Dashboard to enable fit-for-purpose evaluation of place-based activities.
  - OEH provided analysis from seven independent evaluation reports of NSW energy efficiency programs to the Australian Energy Market Operator to inform its energy demand forecasts, which will help inform future energy infrastructure planning and investment.

For more information, see Energy efficiency program evaluation: www.environment.nsw.gov.au/energyefficiencyindustry/evaluation.htm

Other investments

Solar Bonus Scheme Reimbursement

Design | Plan | **Implement** | Evaluate | Report

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 NSW Department of Industry, Skills and Regional Development. Under the scheme, participants receive a feed-in tariff for the electricity they export to the grid between 1 January 2010 and 31 December 2016. The scheme closed to new applicants in April 2011 and no new connections were made after 30 June 2012.

OEH is responsible for verifying and paying claims for reimbursement from the Fund to the distribution network service providers for payments made to energy customers under the scheme.

At 30 June 2015, there were more than 147,000 small-scale systems connected to the scheme. In 2014–15, these systems generated more than 412,000 MWh of renewable electricity and the Fund provided $201.6 million in reimbursement payments.

For more information, see the Solar Bonus Scheme:
www.resourcesandenergy.nsw.gov.au/energy-consumers/solar/solar-bonus-scheme

Table 5: Estimated electricity generation

Year	Number of new systems	Total reimbursement ($)	Estimated electricity generation (MWh)
Jan 2010–June 2011	121,048	138,253,239	247,825
2011–12	23,405	211,841,253	380,682
2012–13	1,904 [1]	197,934,670	415,600
2013–14	68 [1]	205,093,881	424,872
2014–15	611 [1]	201,564,591	412,047 [2]
Total	147,036	954,687,634	1,881,026

[1] No new systems were connected after 30 June 2012, but this is the first year the reimbursement appeared.

[2] 2014–15 shows an apparent fall in renewable electricity generation compared with the previous year, while the number of connected properties has increased. A decrease in solar insolation (the amount of sunshine) in 2014–15 is the main cause for the fall in generation.

Engaging with Direct Action

The NSW Government allocated more than $259,000 from the Fund in 2014–15 for OEH to engage with the Direct Action Plan and maximise investment in carbon abatement projects in NSW.

The Direct Action Plan is the Australian Government's strategy to meet Australia's target to reduce carbon emissions to five per cent below 2000 levels by 2020. The Direct Action Plan consists of the:

- Emissions Reduction Fund (ERF), a $2.55 billion reverse auction program using carbon credits administered by the Clean Energy Regulator
- Safeguard Mechanism, a proposed obligation on large facilities to offset growth in their emissions to be implemented by October 2015
- Twenty Million Trees program, a $50 million grant program for revegetation projects administered by Landcare Australia.

Approximately two-thirds of the successful projects in the first auction of the ERF are based in NSW. At an average price paid by the Australian Government of $14 per tonne, this would generate approximately $440 million in funds for the successful NSW projects.

In 2014–15 the Fund supported OEH to:

- host a series of workshops for NSW industry, carbon service providers and government agencies on their opportunities to access the ERF
- work with the Australian Government to ensure that waste infrastructure projects receiving grants from the NSW Waste Less Recycle More initiative could also participate in the ERF
- assist the Australian Government to adapt calculation methods from the NSW Energy Savings Scheme for use in the Emissions Reduction Fund
- Commission Pitt and Sherry to investigate barriers to participation in the ERF, and Energeia to investigate the opportunity for the ERF to help fund energy efficiency upgrades to public lighting in NSW.

Enhanced Bushfire Management Program

The Enhanced Bushfire Management Program (EBMP) is designed to address expected worsening fire weather conditions due to climate change via increased hazard reduction operations and improved bushfire response capabilities.

The Fund is providing $62.5 million over the five years from 2011 to 2016 to more than double the National Parks and Wildlife Service (NPWS) fire management programs. NPWS has a strategic approach to adapting to climate change, targeting the areas with the greatest risk for treatment to help minimise the risk to the community from extreme bushfire events.

Climate change projections are for warming and drying over much of Australia, leading to an increased risk of severe fire weather, especially in south-eastern Australia. Managing fire regimes to reduce risk to property, people and biodiversity under climate change will be increasingly challenging.

The Fund provided $12.9 million to enhance NPWS fire operations in 2014–15, including $9.85 million for hazard reduction activities, $1.97 million for rapid response and $1.08 million capital expenditure to purchase fire related equipment and other capital items.

Season summary

NPWS took advantage of the warmest spring maximum temperatures on record and treated 20,000 hectares before the bushfire season. The trend of warmer than normal temperatures continued through October and November, however spring and summer saw regular rain and a benign fire season.

Persistent thunderstorm activity throughout December and January ended in February with warm weather, providing some opportunity for hazard reduction. Hazard reduction activities were limited by sporadic scattered rain and thunderstorm activity across the state. When conditions were suitable, NPWS treated a further 80,000 hectares up until April, when two significant East Coast Low weather events developed, bringing exceedingly heavy rain to the east coast.

May saw a few weeks of dry weather, during which a further 10,000 hectares were treated, until widespread rain and cooler temperatures limited opportunities to implement the annual program.

Modelling predicts a drier than average spring in 2015 and wetter than average autumn in 2016 in parts of NSW. NPWS will continue operations to maximise hazard reduction opportunities.

Hazard reduction activities

NPWS treated more than 118,000 hectares in 2014–15 during more than 1300 mechanical and prescribed burning activities. Some of these operations stretched beyond NPWS boundaries. Since the EBMP began, NPWS has averaged more than 1000 treatment activities per year, exceeding the EBMP target of 800 activities each year.

The EBMP has a five-year rolling average commitment of treating 135,000 hectares. Over the past four years, the EBMP has achieved an annual average of more than 126,000 hectares, including minor areas of adjoining parks under other tenure, which equates to 93 per cent of the target.

As shown in Figure 5, NPWS has a precedent for treating more than 200,000 hectares in a year and remains confident of reaching the five year target of 675,000 hectares.

Rapid Response Program

The NPWS Remote Area Response Teams (RART) continued to exceed performance indicators during the 2014–15 wildfire season. The RART responded to 94 per cent of remote wildfire within 30 minutes of detection (key performance indicator (KPI) of 90 per cent) and kept 100 per cent of fires they responded to below 10 hectares in size (KPI of 80 per cent).

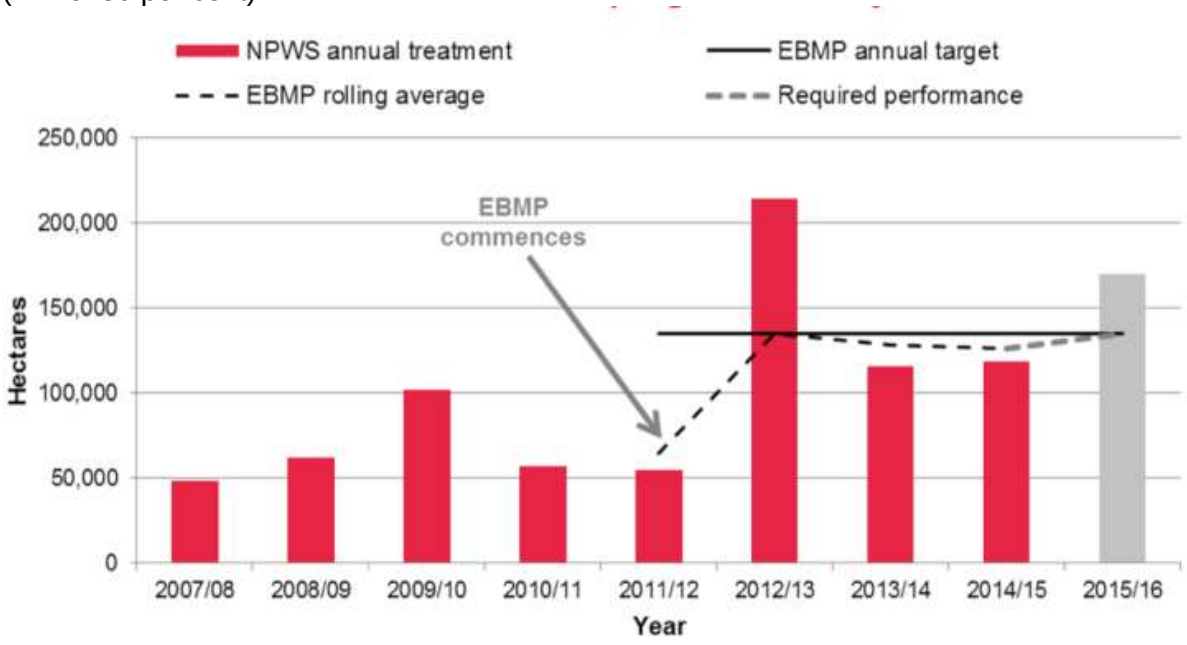

Figure 5: Increased NPWS bushfire hazard reduction since EMBP commenced

Case study: Protecting community assets and infrastructure

NPWS prioritises its bushfire hazard reduction activities by maximising bushfire risk reduction in identified areas. Managing Asset Protection Zones is of greatest importance. These zones are located close to built assets and reduce the risk of homes and other buildings being damaged by fire. They also provide fire fighters with a safe place to combat bushfires to protect houses and community assets.

NPWS has many neighbours, especially in urban areas. In Sydney, the iconic Ku-ring-gai and Royal National Parks provide the community with valuable recreation and conservation areas. NPWS faces the challenge of reducing the risk of fires spreading off-park. NPWS accomplishes this through the creation and maintenance of asset protection zones.

Through the EBMP, the local fire management team in the north of Sydney has been able to implement works that would not have occurred otherwise. The additional protective measures are appreciated by park neighbours.

With fire weather predictions expected to worsen as a result of climate change, the challenge will be to continue managing these areas as a priority to complement NPWS's broader strategic burning program.

Mr Tim Barnes, a local maintenance caretaker from a neighbouring retirement village, with EBMP Field Officer Mark Alley in a fuel-reduced Asset Protection Zone in the Metro North East Region (Photo: courtesy of NPWS).

Appendices

Appendix A: Legislative requirements

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

34G Payments into Climate Change Fund

- There is payable into the Fund:
  - all money received from contributions required to be made to the Fund under Division 3, and
  - all money advanced by the Treasurer for the Fund, and
  - all money appropriated by Parliament for the purposes of the Fund, and
  - the proceeds of the investment of money in the Fund, and
  - all money directed or authorised to be paid into the Fund by or under this or any other Act or law, and
  - 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

- There is payable from the Fund:
  - 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

  - 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
  - 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
  - any money directed or authorised to be paid from the Fund by or under this or any other Act or law.
- In exercising the Minister's functions under subsection (1)(a) (but without limiting the generality of that paragraph), the Minister may:
  - 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
  - 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 section 34F, established through a competitive selection process, and
  - 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:
    - to submit a water savings action plan or energy savings action plan (as the case requires) that includes details about the measure, and
    - to provide any other information requested by the Minister about the measure, and
    - 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.
- 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.
- The annual report is to include an evaluation of the effectiveness of each program as it is completed under the Fund.
- 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.
- 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 information sources

Tariffs

Where possible, this annual report uses standard tariffs to calculate bill savings from Fund programs and projects.

Utility	Sector	Unit	Tariffs
Electricity	Residential Business Government Community	c/kWh	23.5 16.9–24.0 14.3–22.3 16.9–22.3
Natural gas	Residential Business Government Community	$/GJ	28.5 19.7 18.5 28.5

- Residential tariffs include GST. Business, community and government tariffs exclude GST.
- Data sources include price guides from energy suppliers/retailers, government electricity and gas contracts, and reports published by IPART and the AER.

Savings estimates

- All program savings are conservatively estimated from the available information.
- The tCO2-e/MWh conversion factor is 0.96, from the National Greenhouse Accounts August 2015. The tCO2-e/GJ conversion factor for natural gas is 0.06433. AGL uses 0.87 tCO2-e/MWh for the Nyngan and Broken Hill solar plants.
- Energy bill savings may include savings attributed from natural gas and operating and maintenance costs.
- The cost effectiveness of funding for all programs is calculated by dividing the funding allocated or expended by 10 years of savings.

Program evaluations

- Campbell, J; Noonan, L Gomez-Bonnet, F; Hawkins, A; Thaler, O; Hart, K and Milne, C (2014*), Evaluation of the Home Power Savings Program (HPSP) Behaviour Change Trial*, prepared by ARTD for the NSW Office of Environment and Heritage.
- Campbell, J; Noonan, L and Hannon, T (2015*), Evaluation of the Building the Business Case Training Course*, prepared by Clear Horizon Consulting for the NSW Office of Environment and Heritage.
- Riedy, C; Wynne, L; Partridge, E; Madden, B and Herriman, J (2015), *The Smarter Choice Program: A Social Practice Evaluation*, prepared by the Institute for Sustainable Futures, University of Technology Sydney for the NSW Office of Environment and Heritage.
- Vasiliauskas, E (2015), *Regional Needs Analysis to inform the NSW Energy Action Plan*, prepared by d-sipher for the NSW Office of Environment and Heritage.

Regions

Sydney Metropolitan is defined as the 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 NSW. For more information, see Regions of NSW: https://www.nsw.gov.au/regions

Appendix C: Glossary

ACP	An accredited certificate provider is a company that is accredited under the Energy Savings Scheme to create energy savings certificates from energy savings projects.
the Act	*Energy and Utilities Administration Act 1987*, under which the NSW Climate Change Fund is established.
AER	Australian Energy Regulator; the national regulator for energy markets and networks.
ARENA	Australian Renewable Energy Agency; an Australian Government agency.
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.
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).
ESC	An Energy Savings Certificate represents the equivalent of 1 tonne of CO_2-e resulting from energy savings activities.
ESS	The NSW Energy Savings Scheme; a financial incentive for organisations to implement energy savings projects, governed by NSW legislation.
feed-in tariff	A premium rate paid for electricity fed back into the electricity grid from a designated renewable electricity generation source.
the Fund (or CCF)	The NSW Climate Change Fund.
gigajoule (GJ)	A joule is a unit of energy, equivalent to a 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).
hazard reduction	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.
HVAC	A heating, ventilation and air conditioning (HVAC) system is commonly used to provide fresh air, indoor climate and comfort control services for interior building spaces.
IPART	The Independent Pricing and Regulatory Tribunal; the independent economic regulator for NSW.
kilowatt (kW)	A unit of energy equal to 1000 watts (see definition under watt).
kilowatt hour (kWh)	A quantitative measure of electric current flow equivalent to 1000 watts being used continuously for a period of one hour; the unit most commonly used to measure domestic electrical energy (see definition under watt).
LGA	Local government area (or council area).
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).
NPWS	The National Parks and Wildlife Service (a delivery area of the Office of Environment and Heritage).

OEH	The Office of Environment and Heritage (a separate agency within the Planning and Environment cluster).
photovoltaic (PV)	A form of solar energy that directly converts light into energy.
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.
tCO2-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.