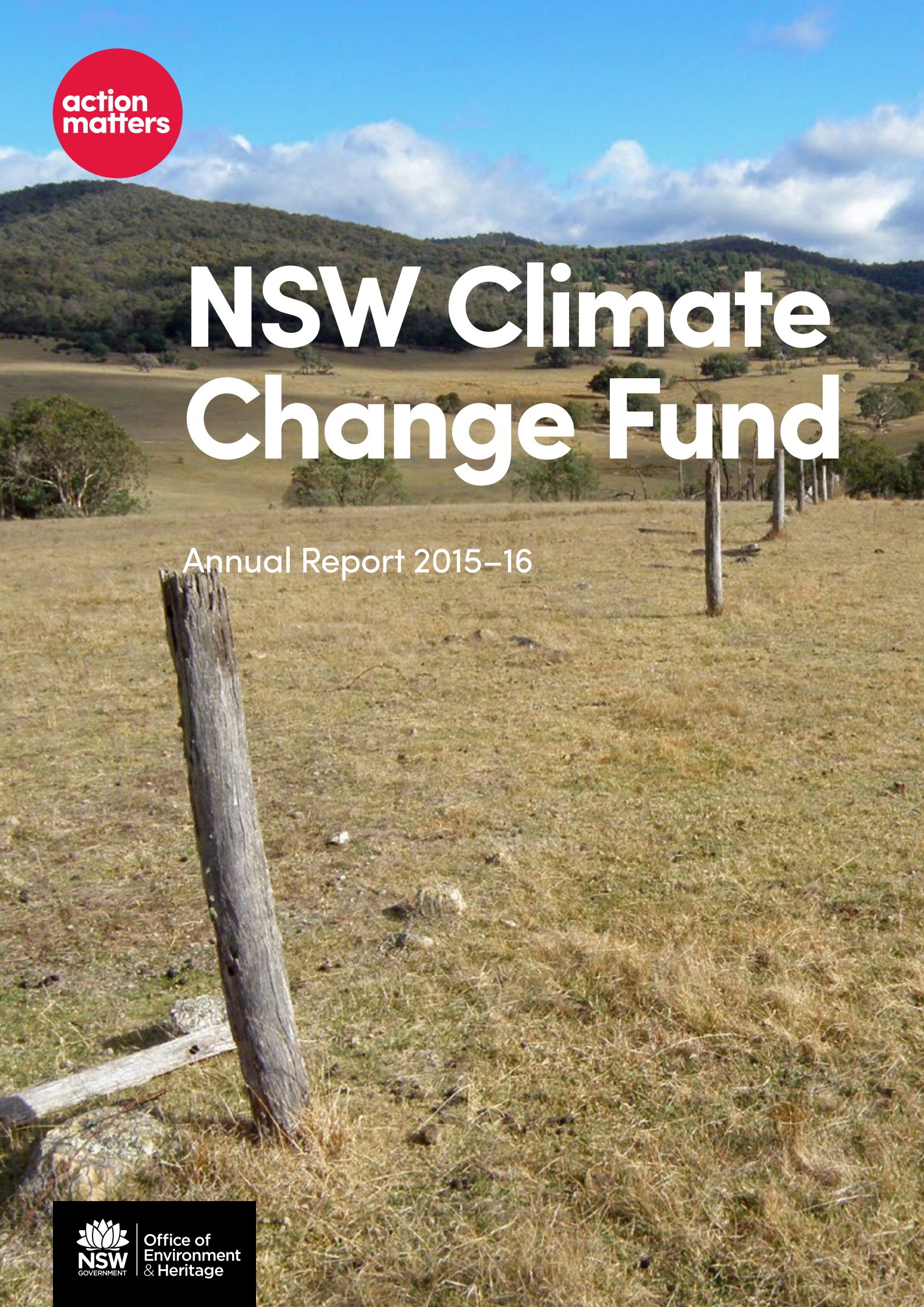


# NSW Climate Change Fund

## Annual Report 2015–16

NSW GOVERNMENT
Office of Environment & Heritage

Under the Emissions Reduction Fund, 157 hectares of native trees will be planted at Merambego in Kosciuszko National Park. This project is supported by the NSW Climate Change Fund (Photo: NPWS/Andrew Baker).

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# Minister's foreword

New South Wales rightfully holds the mantle of energy efficiency leadership in Australia.

This leadership would not be possible without the NSW Climate Change Fund (the Fund), which invests in helping the people of New South Wales to use less electricity, generate their own from renewable sources, and better understand and prepare for climate change. The work delivered by the Fund makes it easier for the people of New South Wales to be better environmental citizens.

The Energy Savings Scheme (ESS), the flagship vehicle for energy efficiency in our state, is complemented by the Fund's investment in delivering the Energy Efficiency Action Plan (EEAP). The EEAP and ESS work together to deliver energy savings that contribute to the NSW Government target to achieve 16,000 gigawatt hours of energy savings a year by 2020.

A core part of the EEAP is to improve access to the ESS. Changes to the ESS from April 2016 are estimated to save NSW households and businesses a total of $13 billion on their energy bills between 2015 and 2040, putting New South Wales on a firm footing for the national target of 40% improvement in Australia's energy productivity by 2030.

The NSW Government introduced its first round of Gas Efficiency Funding to help businesses adapt to rising gas prices. Twenty-six businesses were offered a share in $811,000 from the Fund to invest in gas efficiency. This is targeted co-investment, and the recipient businesses contributed $3.5 million of their own funding. These projects are expected to save more than 100 terajoules of gas.

Regional growth is an important aim in the Fund's work and 40% of Gas Efficiency Funding recipients are from regional areas.

Australia's two largest solar plants, in Nyngan and Broken Hill in western New South Wales, were officially opened in January 2016. Together they will generate enough renewable energy every year to power 50,000 average homes.

In a first for any Australian state or territory, the NSW Government made a successful bid in the third auction of the Australian Government's Emissions Reduction Fund for major rehabilitation works in three national parks and two conservation areas. This means 200,000 new trees will capture 80,000 tonnes of carbon dioxide in the next decade.

The Fund is helping support the Government's 10-year strategy for transforming the current social housing system to break the cycle of disadvantage. The Home Energy Action program formed a $5.4 million partnership with SGCH (St George Community Housing), the largest community housing provider in New South Wales, to retrofit 1400 properties with energy efficiency measures that improve tenants' comfort and wellbeing, while collectively saving $800,000 a year off energy bills.

Mark Speakman
Minister for the Environment

# Climate Change Fund highlights for 2015–16

- The Home Energy Action program formed a $5.4 million partnership with SGCH (St George Community Housing) to retrofit 1400 properties with energy efficiency measures, collectively saving tenants $800,000 a year off their energy bills.
- Twenty-six businesses received more than $811,000 from the Fund to improve their gas efficiency and save more than $907,000 a year off their energy bills.
- The Energy Savings Scheme (ESS) was extended to 2025 and expanded to include gas and reward energy savings in regional areas.
- The Nyngan and Broken Hill solar plants were officially opened in January 2016, on time and on budget, with both plants contributing 155MW of renewable energy to the NSW power supply.
- The Enhanced Bushfire Management Program (EBMP) achieved its hazard reduction target and continued to exceed remote area response key performance indicators, helping to reduce the risk to homes and community assets from damage during bushfire events.
- The NSW Government made a successful bid in the third auction of the Commonwealth's Emissions Reduction Fund (ERF) to plant 200,000 trees across five NSW national parks and conservation areas, which will capture almost 80,000 tonnes of carbon dioxide over the next decade.

# 1 Delivering government priorities

## 1.1 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 supports the implementation of the NSW Energy Efficiency Action Plan (EEAP), NSW Renewable Energy Action Plan (REAP) and other government programs.

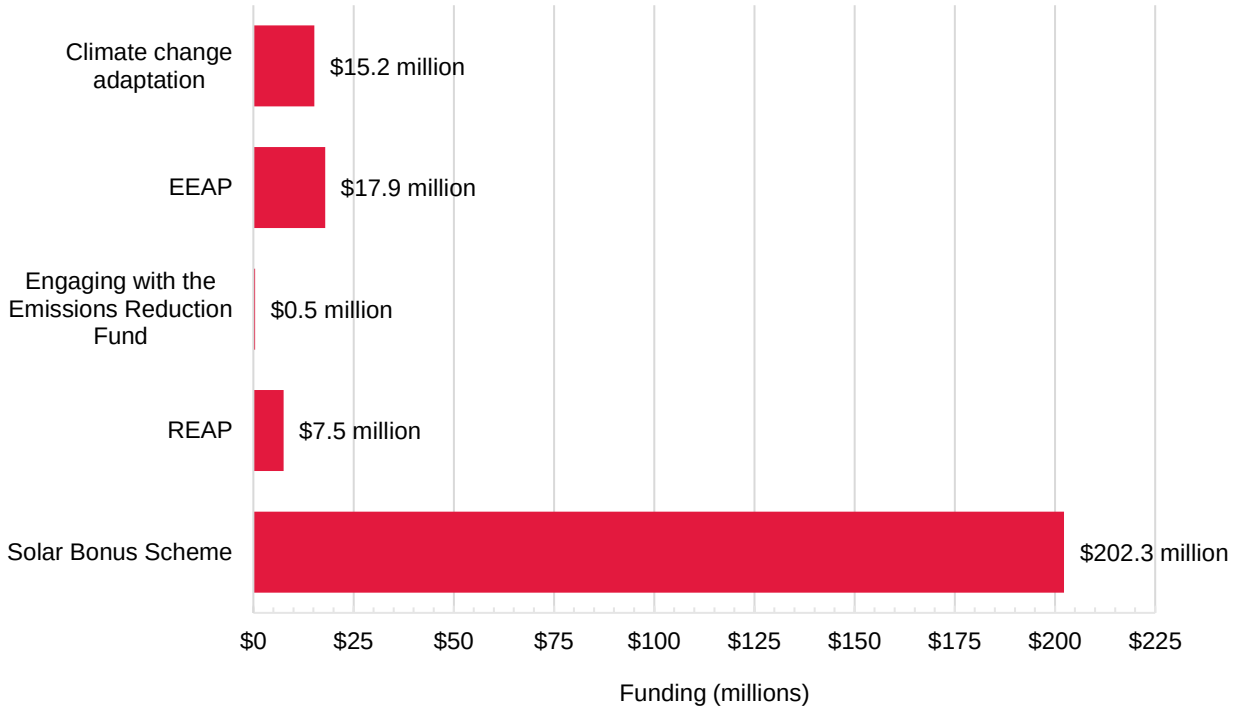


**Figure 1: Fund support for NSW Government priorities in 2015–16**

## 1.2 Energy efficiency

The EEAP includes 30 actions to grow the energy efficiency products and services industry in New South Wales. The Fund supports energy efficiency programs that provide targeted support for NSW homes, businesses, communities and government agencies to reduce their energy use and lower their energy bills. These programs contribute to the NSW Government target to deliver 16,000 gigawatt hours (GWh) of energy savings a year by 2020. The NSW ESS is the biggest contributor to the target. The Fund also supports ESS reforms and initiatives to improve the availability and rigour of energy efficiency data.

Investment from the Fund in 2015–16 helped families manage their energy costs, drive energy productivity in businesses and contribute to a healthier NSW economy.

For more information, see the NSW EEAP: www.environment.nsw.gov.au/energyefficiencyindustry/energy-efficiency-policy.htm

## 1.3 Emissions reduction

The REAP includes 24 actions to build community support, attract renewable energy investment and grow renewable energy expertise in New South Wales. The Fund supports the Regional Clean Energy Program to ensure communities receive the necessary information and resources and have the opportunity to participate in local renewable energy projects. The Fund is also playing an important role in advancing large-scale solar projects through the Australian Government's Solar Flagships Program and reducing greenhouse gas emissions through supporting increased NSW participation in the ERF. These initiatives contribute to national renewable energy and emissions reduction objectives.

Investment from the Fund in 2015–16 helped build local capacity for communities to adopt renewable technologies, advance renewable energy in New South Wales and create a healthier environment.

For more information, see the NSW REAP: www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainable-energy/renewable-energy-action-plan

## 1.4 Adapting to climate change

The NSW Government is committed to improving information about climate change impacts and leading the community to prepare for a changing climate. The Fund supports programs such as the EBMP, Coastal Management Program and Building Resilience to Climate Change (BRCC) grants program to help minimise the impacts of climate change on community assets and infrastructure.

Investment from the Fund in 2015–16 helped local councils minimise the impacts of climate change on local communities and build the resilience of NSW's natural environment and economy.

## 1.5 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 ninth financial year of operations, from 1 July 2015 to 30 June 2016.

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

Funding recipients must report to OEH on the progress of projects and their success in achieving outcomes. Fund programs undertake a design, evaluation, monitoring, reporting and improvement process in line with the *NSW Government Program Evaluation Guidelines*. Information on Fund programs and evaluation reports are published on the OEH website. Office of Environment and Heritage regularly reports on its progress in meeting NSW Government priorities and election commitments. A new research and evaluation initiative was established this financial year to guide the development, monitoring and evaluation of Fund programs into the future (see Section 10).

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

# 2 Administration and budget

## 2.1 Climate Change Fund budget

### 2.1.1 Revenue

Electricity distribution network service providers were required to contribute to the Fund through the gazettal of the annual Energy Contributions Order.

The Fund's revenue in 2015–16 was $313.2 million. A breakdown of the Fund's revenue is shown in Table 1.

Additional revenue came from interest earned on cash balances.

**Table 1: NSW Climate Change Fund revenue 2015–16**

| Source | Amount ($) |
|---|---|
| Ausgrid | 148,688,093 |
| Endeavour Energy | 94,025,482 |
| Essential Energy | 65,886,425 |
| Interest | 4,232,546 |
| Miscellaneous revenue[1] | 319,126 |
| **Total** | **313,151,672** |

[1] includes the return of grant funds paid in previous years and the recovery of training fees and audit costs for the Action Matters for Business program.

### 2.1.2 Expenditure

The Fund's expenditure in 2015–16 was $253.2 million.

Of this, 0.6% 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. It also continued to support 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 in 2015–16**

| Program/component | Recipient | Amount ($, GST excluded) |
|---|---|---|
| Contribution to national energy regulation | Australian Energy Market Commission | 7,553,050 |
| Building Resilience to Climate Change grants | Local Government NSW | 542,480 |
| Bushfire funding – capital | National Parks and Wildlife Service | 1,064,936 |
| Bushfire funding – recurrent | National Parks and Wildlife Service | 12,134,221 |
| Cooling a City Block project | Street Coolers Pty Ltd | 20,238 |
| Coastal Management Grants | Councils | 1,433,508 |
| Emissions Reduction Fund | Office of Environment and Heritage | 468,866 |
| **Energy Efficiency Action Plan programs**[1] | | |
| Energy efficient homes | Households | 1,874,706 |
| Energy efficient business | Business | 5,338,587 |
| Energy efficient government | Government | 1,318,761 |
| Gas Efficiency Improvement Program | Business | 870,599 |
| Home Energy Action | Households | 3,201,697 |
| Markets and finance | Business and Households | 1,445,814 |
| Policy development | Various | 1,450,819 |
| Program evaluation | Various | 526,439 |
| Statewide delivery | Communities | 1,870,891 |
| **Renewable Energy Action Plan programs** | | |
| Regional Clean Energy Program | Communities and TransGrid | 2,042,520 |
| Solar Flagships | AGL photovoltaic (PV) Solar Holdings Pty Ltd | 5,000,000 |
| Solar power purchase agreements | Department of Finance, Services and Innovation | 500,000 |
| Solar Bonus Scheme Reimbursement Program | Distribution network service providers | 201,875,882 |
| Solar Bonus Scheme Communication Program | Department of Industry, Skills and Regional Development | 410,000 |
| Climate Change Fund capital project | Office of Environment and Heritage | 11,160 |
| Climate Change Fund program administration | Office of Environment and Heritage | 1,620,027 |
| Climate Change Fund research and evaluation initiative | Various | 240,648 |
| Climate Change Fund strategic plan development | Office of Environment and Heritage | 386,756 |
| **Total** | | **253,202,604** |

[1] includes capital expenditure

## 2.2 Climate Change Fund administration and market regulation

### 2.2.1 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.

### 2.2.2 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, New South Wales is responsible for 37.2% of the Australian Energy Market Commission's budget.

New South Wales paid $7.6 million as its share of the Australian Energy Market Commission's operating budget.

# 3 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 programs that help families to access household energy efficiency services and make energy efficient choices.

**Key programs and projects supported by the Fund in 2015–16:**

- Home Energy Action
- 'Cooling a City Block' project
- voluntary energy ratings for homes
- Home Energy Efficiency Retrofits (HEER) and the Home Energy Assessment Tool (HEAT)
- National Australian Built Environment Rating System (NABERS) Home Energy Explorer Tool
- Smarter Choice program

## 3.1 Home Energy Action

**Aim:** To improve access to energy efficiency for low income households through community housing upgrades and more affordable appliances.

**Approach:**

- The $26.8 million Home Energy Action program is working in partnership with community housing providers (CHPs), the community services sector and industry to deliver energy efficiency improvements to households in energy hardship and to improve household comfort, health and wellbeing. The program will operate with three streams:
    - Appliance replacement offer – financial support to replace old fridges and televisions with new energy efficient models at discounted prices, available to vulnerable households directly or through community service organisation partners
    - Clean energy – a pilot project to deliver subsidised solar photovoltaic panels, in partnership with major energy retailers, to their energy hardship customers who are tenants of community housing or homeowners
    - Community housing – a co-investment model with CHPs across the state to install energy efficiency retrofit measures on CHP dwellings for the benefit of their tenants. Retrofit measures include solar photovoltaic panels, ceiling insulation, draught proofing, LED lighting, heat pump hot water systems (HWS), split system air conditioning, ceiling fans and energy performance upgrades for new build projects.
- The Fund supports co-investment in a range of energy savings products to assist low income households to overcome barriers to accessing energy efficiency opportunities. This includes the split incentive barrier, where tenants lack the ability to make improvements to their properties, and the financial barrier, where households do not have the capacity to pay for the higher upfront cost.
- All energy efficiency measures included in the Home Energy Action program are subject to a cost–benefit analysis test to ensure a good return on investment for the NSW Government and program participants.

**Investment from the Fund in 2015–16:** $3,201,697

**2015–16 milestones:**

- OEH formed a $5.4 million partnership with SGCH in April 2016 to retrofit 1400 properties with energy efficiency measures. The Fund is contributing $2.7 million to install solar panels, insulation and draught proofing, LED lights, heat pump HWS and design upgrades to lift 6 star to 7 or 8 star NatHERS ratings for newly built SGCH dwellings. These measures are estimated to save 3400 megawatt hours of electricity and $800,000 off energy bills a year for SGCH tenants (see Case study 1).
- The Fund supported in-depth customer segmentation research and analysis to gather the evidence base for design of the appliance replacement offer. An extensive co-design process followed involving OEH, householders, community service organisations, appliance retailers, research agencies, community peak bodies and advocacy groups to determine participant eligibility criteria and program delivery pathways.
- Office of Environment and Heritage conducted a competitive procurement process for an appliance retail partner and The Good Guys was selected as the successful tenderer in May 2016.
- In June 2016, OEH developed funding partnerships with six community service organisations to act as Engagement Partners and provide direct support to households to access the appliance replacement offer.
- The Fund supported OEH to scope a potential social impact investment project with an energy retailer and non-profit community energy organisation to install solar panels for energy hardship customers.
- Eleven cost–benefit analysis tools have been developed to help determine eligible energy efficiency measures.
- The Fund also supported OEH to engage Urbis in May 2016 as the evaluation partner to develop a monitoring and evaluation framework and conduct an extensive evaluation of the Home Energy Action program. Urbis will deliver the final program evaluation in September 2017.

## 3.2 'Cooling a City Block' project

**Aim:** To collect and analyse data to establish a baseline for cooling a city block in Newtown, Sydney.

**Approach:**

- Cooling a City Block Phase 2 builds on Phase 1 (supported by the Fund in 2014–15) that developed a template for cooling a city block.
- Phase 2 supports the second year of data collection to establish a baseline for cooling a city block in Newtown, Sydney.
- Street Coolers Pty Ltd (Street Coolers) uses a range of equipment including two local weather stations, seven temperature loggers, 10 energy monitors in homes, and a road surface temperature device to measure trends in the relationship between temperature and home energy use and monitor the urban heat island effect.

**Investment from the Fund in 2015–16:** $20,238

**2015–16 milestones:**

- Street Coolers completed the installation, maintenance and replacement of monitoring equipment to improve the reliability and accuracy of data collection.
- One year of fine grain temperature and home energy use data was collected and analysed for the Newtown block. Street Coolers will use this data as the baseline or 'before' data to compare once urban heat mitigation measures are installed.
- The final report and data collected during this phase are freely available on the Street Coolers website: www.streetcoolers.com.au/research/.

## 3.3 Investigation of a voluntary energy rating system

**Aim:** To investigate a voluntary rating system to make energy efficient homes stand out at the point of sale or lease.

**Approach:**

- The NSW Government is committed under the EEAP to investigate a voluntary rating system to disclose energy efficiency information at the point of sale or lease of residential properties.
- Investigating consumer and industry needs for a voluntary residential energy efficiency rating system for use at point of sale or lease is part of the EnergyFit Homes project, led by the Cooperative Research Centre for Low Carbon Living in partnership with OEH, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Swinburne University, University of New South Wales, the Clean Energy Council, the Energy Efficiency Council and industry partners (AGL, the Australian Window Association, the Centre for Liveability Real Estate, CSR Limited, Fletcher Insulation, Knauf Insulation and Stockland).

**Investment from the Fund in 2015–16:** $152,200

**2015–16 milestones:**

- The EnergyFit Homes project final report *Enhancing the Market for Energy Efficient Homes* was completed in December 2015. The report provides a strong evidence base for high consumer demand and industry support for a national voluntary disclosure system for home energy performance. The report contains recommendations on implementation pathways and builds the business case for a national voluntary disclosure scheme for energy efficiency of existing homes. Download the final report: www.lowcarbonlivingcrc.com.au/resources/crc-publications/crclcl-project-reports/rp3016-2016-final-report-associated-working-papers.
- Building on the report's recommendations, the Fund is supporting OEH to engage with government agencies and key industry stakeholders to identify synergies and opportunities to develop the implementation options for a voluntary ratings system in New South Wales.

## 3.4 Tools, training and information

**Aim:** To help households make informed decisions and become more energy efficient.

**Approach:**

- Financial incentives are available under the ESS for households to reduce energy consumption and costs. Accredited certificate providers (ACPs) use the HEAT to create energy savings certificates from installing, upgrading or replacing energy saving products under the HEER method. Eligible products include high efficiency air conditioners, ultra-low flow showerheads and window glazing.
- The NABERS Home Energy Explorer tool allows householders to perform a free online assessment of their home energy use and identify opportunities for improvement. The information entered by householders about their dwelling size, energy consumption, lighting, HWS, pool and spa, heating and cooling and other appliances can be used to generate a NABERS Home Energy Rating, where one star indicates poor energy performance and six stars represents a very energy efficient home.
- Smarter Choice is a collaborative partnership between OEH, Sustainability Victoria, 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 (E3) Program. It helps households make more informed decisions about purchasing, using and disposing of energy and water efficient appliances.

**Investment from the Fund in 2015–16:** $249,275

**2015–16 milestones:**

- Changes to the HEER method to allow greater uptake of energy savings came into effect on 15 April 2016 (see Section 5.1).
- The Fund provided $142,000 to upgrade HEAT and online user training to implement the changes to the HEER method, including the addition of new energy savings activities and a regional network factor, changes to existing energy savings activities and deemed savings factors and the removal of the bundling requirement. See the HEAT: www.environment.nsw.gov.au/energyefficiencyindustry/energy-assessment-tool.htm.
- The Fund provided $61,000 to upgrade the NABERS Home Energy Explorer. OEH released a new version in April 2016 with enhancements including a new HWS assessment, updates to algorithms to align with Australian standards, a more intuitive layout and improved output reports. See the NABERS Home Energy Explorer: http://home.nabers.com.au/.
- The Fund supported OEH to consolidate the Smarter Choice Calculator with the Sustainability Victoria and the E3 Program calculators to maximise exposure, ensure consistent advice is provided to consumers nationally and avoid duplication of effort. Both the appliance retailer Harvey Norman and appliance manufacturer Bosch have embedded this calculator on their websites. See the new Energy Ratings Calculator: www.energyrating.gov.au/calculator.
- The Fund also supported the development of eight new online training modules for appliance retail staff to become upskilled on the benefits of energy and water efficiency appliances and their appropriate use and disposal. This new approach will enable the program to deliver more in-depth training to retail staff in a cost effective way. Online training of Myer staff is underway and Harvey Norman, David Jones, JB Hi-Fi and The Good Guys are in the process of implementing it.

# Case study 1 – Homes that care for people

The $26.8 million Home Energy Action program supports energy efficiency upgrades in community housing and means-tested households. The energy savings from Home Energy Action contribute to the NSW Government target to save 16,000GWh of energy a year by 2020.

### Driving down costs

The NSW Government is forming partnerships with CHPs to lower tenants' living costs. Energy savings from community housing retrofits will be measured by an independent consultant, Urbis, during a final program evaluation.

### Comfort and health

Comfort and health are added benefits of the Home Energy Action program. As their homes become easier and less expensive to heat and cool, tenants benefit from improved thermal comfort and better health and wellbeing. By working with OEH and providing co-funding themselves, CHPs make upgrading to a more energy efficient asset portfolio a more attractive option, enabling them to offer more comfortable, efficient homes to their tenants.

### First deal signed

The NSW Government's first CHP partner is SGCH, which has also attracted investment from the Clean Energy Finance Corporation in the $5.4 million partnership. Residents in 1400 SGCH properties will receive a range of energy efficiency measures.

St George Community Housing is a leader in the CHP sector, with a large portfolio across Sydney and a dedicated team working towards environmental and social sustainability. Through the Home Energy Action program, SGCH expects to help its residents achieve a combined total of $800,000 off their power bills every year.

### Where to next?

Home Energy Action aims to deliver energy efficiency upgrades and cut power bills for 3000 to 5000 community housing tenants. OEH is forming partnerships with six other large CHPs and the NSW Federation of Housing Associations, enabling a wide-ranging offer of upgrades to large and small CHPs across the state from 2016–17. This will enable the program to meet the NSW Government's equity objective by providing access to community partners of all sizes, in urban and regional New South Wales.


**Scott Langford, CEO SGCH, Pauline McKelvey, tenant, Mayor of Sutherland Shire Council Carmelo Pesce, and Mark Speakman, Minister for Environment at the HEA–SGCH partnership event launch in Kirrawee, NSW (Photo: OEH / Emmy Eité)**

# 4 Action Matters in the Community

Providing access to information and resources across the state is key to building vibrant and connected communities. The Fund is helping to drive economic growth in regional New South Wales and foster community-led action by building the capacity of local communities to adopt energy efficiency and renewable energy initiatives.

**Key programs and projects supported by the Fund in 2015–16:**

- Regional Clean Energy Program
- state-wide and place-based delivery

## 4.1 Community engagement in regional areas

**Aim:** To provide information and bring new jobs, investment and technological advances to regional communities.

**Approach:**

- Through the $8.5 million Regional Clean Energy Program, regional coordinators 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 information and links to NSW and Australian Government programs.
- A partnership between OEH and the NSW Farmers Association helps agricultural businesses in New South Wales take advantage of renewable energy and energy efficiency opportunities.

**Investment from the Fund in 2015–16:** $1,672,493

**2015–16 milestones:**

- The Fund provided $30,000 seed funding to Uralla's Zero Net Energy Town (Z-NET) committee to recruit a project coordinator to work with the community on energy efficiency and renewable energy initiatives outlined in the Z-NET Blueprint and identify long-term funding as part of the town's plan to become Australia's first renewable energy self-sufficient town. See the Z-NET Blueprint at: www.environment.nsw.gov.au/resources/communities/uralla-blueprint-business-case-znet.pdf.
- The Fund provided $40,000 to Climate Action Now Wingecarribee Inc in support of a public, private and community partnership model to deliver pre-feasibility studies to install 7MW of solar photovoltaic (PV) in the Wingecarribee local government area (LGA). This project is supported by key project partners Boral Cement Works and Wingecarribee Shire Council. It presents an opportunity to increase both the amount of renewables in the Wingecarribee LGA and community awareness of the range of options for renewable energy.
- The Fund supported the development and publication of the following research reports:
    - *Community attitudes to renewable energy*, presenting the results of a study into community awareness, knowledge and attitudes to renewable energy technologies across New South Wales. Download the report at: www.environment.nsw.gov.au/communities/community-attitudes.htm.

- *Strategic options for delivering ownership and benefit sharing models for wind farms in NSW*, which reviews benefit sharing mechanisms implemented internationally to better understand and identify options for wind farms in New South Wales. Download the report at: www.environment.nsw.gov.au/resources/communities/EY-wind-farm-shared-benefits.pdf.
- *Review of the impact of wind farms on property values*, which is an update to a 2009 investigation into the potential impact of wind farm developments on property prices in New South Wales. Download the review at: www.environment.nsw.gov.au/resources/communities/wind-farm-value-impacts-report.pdf.

- Regional coordinators delivered more than 40 workshops in partnership with local councils, environment networks and community organisations to foster collaboration with industry and local government and build capacity in the local community (see Figure 2).
- Regional coordinators held free solar seminars at Albury, Batemans Bay, Broken Hill, Coolamon, Goulburn, Griffith, Junee, Kiama, Leeton, Narrandera, Temora, Wagga Wagga and Wollongong to help businesses better understand the range of solar products and offers available. Surveys conducted following the workshops show there was an increase in the attendees' knowledge in energy efficiency, solar technologies and solar financing and installation options.
- In partnership with the NSW Farmers Association and Local Land Services, regional coordinators also held 14 solar pumping workshops to help farmers and local landholders understand the opportunities to reduce on-farm energy consumption by using appropriate solar technologies.
- Energy and Water Saving Education Kits were distributed to 65 schools in the South West region to promote energy efficiency and renewable energy action at home and at school. Download the kit at: www.wirraminna.org/sustainability-trailer/.
- More than 280 people attended the 2015 Smart Future Cities Conference held in Newcastle. The conference was a collaboration between OEH, the Tom Farrell Institute for the Environment at the University of Newcastle, and the City of Newcastle to learn more about technical, economic, political and social responses to global warming, future energy systems and building smart economies and employment opportunities.
- Regional coordinators also attended a number of industry and community events, field days, forums, local government meetings and Community Consultative Committee meetings to promote and develop local energy efficiency and renewable energy initiatives. These events included the 2016 Renewable Cities Forum, the Local Energy and Microgrids Conference, the South East Region Renewable Energy Excellence Conference, the Renewable Energy Industry Cluster Conference, Corowa Climate Forum, Eurobodalla Climate Change Day, Goulburn Sustainability Day, Queanbeyan River Festival, Regional Develop Australia Forums, Western Enabling Regional Adaptation Workshops, Solar Irrigators Working Group meetings and the inaugural Renew Fest at Mullumbimby.

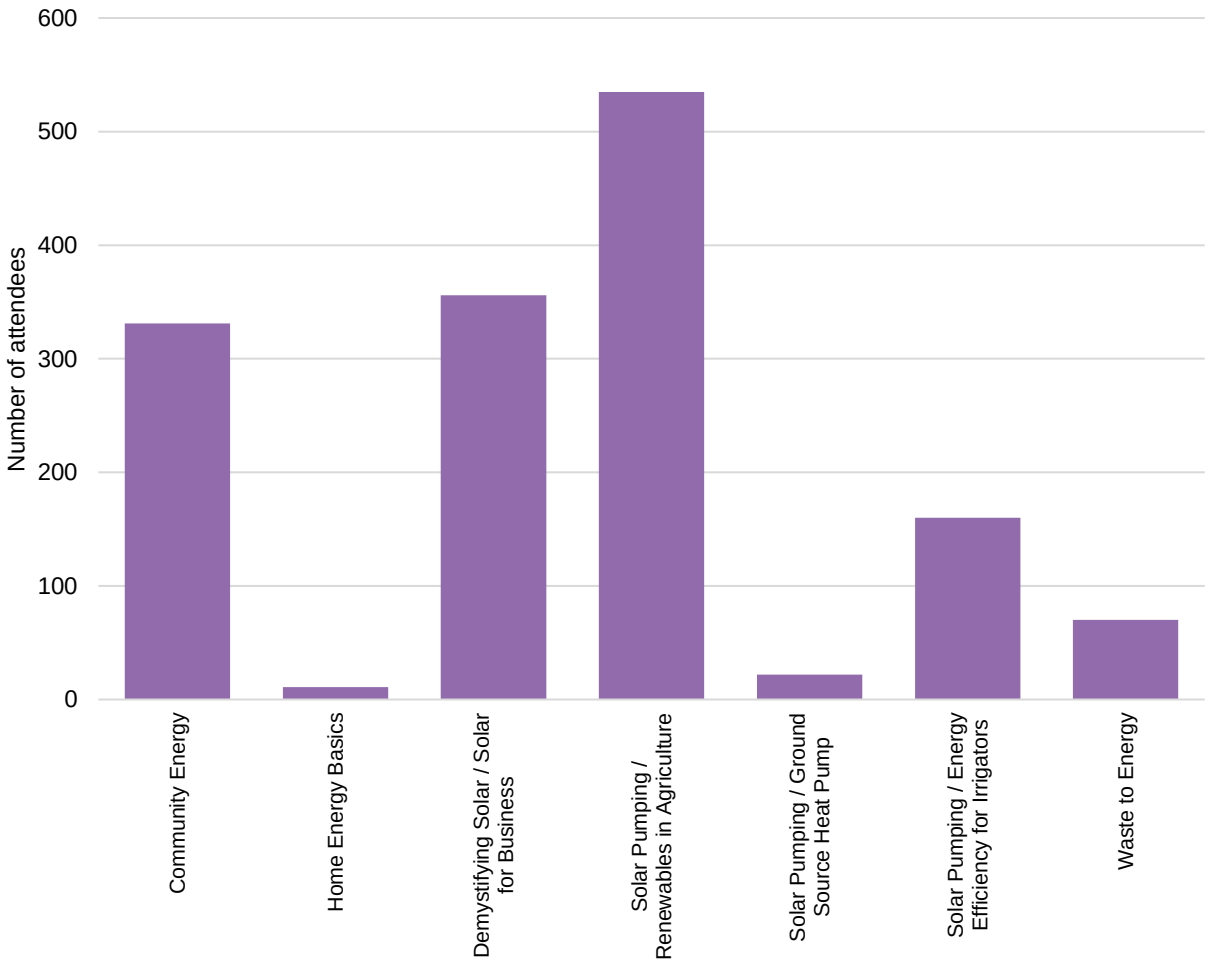


**Figure 2: Number of attendees at regional solar and energy efficiency events held in 2015–16**

## 4.2 Statewide and place-based delivery

**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.
- Place-based delivery uses best practice engagement and collaboration techniques to identify resource efficiency challenges and opportunities in regional areas and uses local understanding and partnerships to deliver program objectives in a scalable and flexible way.
- The Thriving Regional Networks (TRN) program supports the regional delivery of EEAP and REAP actions and works with a place-based partnership model, leveraging the networks of locally embedded partners to achieve regional energy efficiency outcomes for businesses, households and communities.

**Investment from the Fund in 2015–16:** $1,930,645

**2015–16 milestones:**

- OEH released six new datasets for energy efficiency programs supported by the Fund since 2007; that is about three million rows of energy efficiency data from NSW households and businesses that participated in programs such as the Home Power Savings Program, Solar Bonus Scheme and Energy Efficiency for Small Business. Download the datasets at: www.environment.nsw.gov.au/energyefficiencyindustry/business-data-download.htm or visit Data NSW http://data.nsw.gov.au/.
- OEH also released 15 evaluation reports accompanied by a plain English summary of their findings. The reports include an overarching review of energy efficiency initiatives supported by the Fund, as well as a number of evaluations covering former programs such as the Energy Efficiency Training Program, Government Building Retrofit Program and Home Saver Rebates. This adds to the evidence base already made available on the OEH digital platform. View the evaluation reports at: www.environment.nsw.gov.au/research/program-evaluation.htm.
- The Fund contributed $11,500 towards a regional partnership between TRN and the Western Sydney Community Forum (WSCF). The partnership will help bridge the boundaries between business, community and government sectors to enable collaboration for energy and other environmental and economic outcomes in the rapidly growing Western Sydney region (see Case study 2).
- The Fund provided $10,000 to OzGreen to develop energy efficiency education materials for community groups and schools in Singleton. This funding complements the 'Youth Leading the World' project in the Hunter Valley funded by the NSW Environmental Trust.
- OEH and Goulburn Mulwaree Council piloted a Home Energy Basics workshop in June 2016 in response to research within the Goulburn community that found householders wanted advice on simple and effective ways to lower their energy bills. The delivery of workshops will be extended in 2016–17 across the Goulburn, Kiama and Shoalhaven regions in partnership with Goulburn Community College and Kiama Community College.

# Case study 2 – Energy efficiency for everyone

Regional delivery is a key component of the EEAP. Specifically, Action 29 commits the NSW Government to forming partnerships with industry associations, community organisations and other government agencies running programs with existing links to regional communities.

Office of Environment and Heritage launched the TRN project in 2015–16 to help meet this commitment.

**Empowering local networks**

In June 2016, the OEH Sustainable Communities Team formed a regional partnership with the WSCF, the peak organisation championing collaborative solutions for the challenges facing Greater Western Sydney.

This partnership will increase access to energy efficiency and other sustainability programs in the region, while empowering local networks to work together.

The WSCF will identify, map and work with leaders across business, community and government to explore the potential for a shared vision and better cooperation for increasing energy efficiency in the region.

**Flow-on effects**

By bringing together these key players, TRN also aims to accelerate the objectives of OEH's resource efficiency teams.

**Where to next?**

The Sustainable Communities Team plans to establish a similar community-sector partnership in Central West New South Wales in 2016–17. It will also expand the work of WSCF to support energy projects that are realised through the 2015–16 partnership.

**WSCF and OEH engaging with stakeholders on energy initiatives (Photo: WSCF)**

# 5 Action Matters for Business

Energy productivity is the key to reducing greenhouse gas emissions and maintaining a competitive advantage. The Fund is helping the NSW Government to improve businesses' energy management and reduce costs by identifying and implementing energy efficiency opportunities that will improve their productivity.

**Key programs and projects supported by the Fund in 2015–16:**

- Energy Savings Scheme
- Gas Efficiency Funding
- targeted energy efficiency audits and technical support
- energy efficiency training and information
- Environmental Upgrade Agreements

## 5.1 Enhancing the Energy Savings Scheme

**Aim:** To enable the outcomes of the ESS Review and expand the range of energy efficiency actions that deliver savings to NSW households and businesses.

**Approach:**

- The NSW Government conducts a major review of the ESS Rule every three years and makes minor annual updates to the ESS Rule to incorporate new products and revisions to savings calculations.
- The Fund provides resources for a dedicated team to review the ESS, conduct public consultations and commission experts to provide advice on enhancements to the ESS.
- The team also manages the ACP Directory and Project Impact Assessment with Measurement and Verification (PIAM&V) Tool, which help businesses to obtain energy savings certificates and reduce energy costs.
- The Independent Pricing and Regulatory Tribunal (IPART) and the OEH-ESS Portal allows the dedicated team access to data on implemented energy savings activities to enable continual review and development of ESS methods.

**Investment from the Fund in 2015–16:** $511,330

**2015–16 milestones:**

- The NSW Government amended the *Electricity Supply Act 1995* to implement outcomes from the 2015 ESS Review, including raising ESS targets, expanding the scheme to support gas savings and extending the scheme to 2025.
- Amendments to the ESS Rule (*NSW Energy Savings Scheme (Amendment 1) Rule 2016*) commenced on 15 April 2016 following publication in the NSW Government Gazette. These enhancements included:
    - incorporating gas savings methods for households and businesses
    - introducing a regional network factor to reward energy savings in regional areas
    - simplifying and expanding the HEER method following stakeholder consultation
    - simplifying the PIAM&V method and introducing a new option to create average energy models.

- The first energy savings certificates were created under the PIAM&V method in June 2016 following a significant investment in supporting this method through training, guides, consultation and ESS Rule enhancements.
- The Fund provided resources to work with IPART to develop a technical guide detailing best practice approaches under the PIAM&V method to help upskill ACPs and reduce barriers to using the method. IPART released the guide for public consultation in May 2016.
- The Fund supported further development of the PIAM&V sampling sub-method, including conducting a real world case study. The study found that the method was technically and commercially feasible, and reduced measurement costs while maintaining the accuracy of savings estimates. The sampling sub-method has been temporarily closed for new applications while recommendations from the study are implemented.
- The Fund supported an investigation of potential enhancements to the Aggregated Metered Baseline (AMB) method and the final report was received in June. These enhancements, which include an opt-in method, are being reviewed by the NSW Government for inclusion in future ESS Rule changes.

## 5.2 Incentives for gas efficiency

**Aim:** To provide assistance to gas-intensive businesses in New South Wales 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:**

- Financial incentives are available under the ESS for businesses to reduce gas consumption and energy costs. ACPs can use several ESS methods to create energy savings certificates from implementing activities that save gas. Eligible activities include process heat recovery and fuel switching for space heating and hot water.
- The $3.5 million Gas Efficiency Funding program is providing grants of 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 refrigeration condensers.
- Data collected from these projects will assist OEH in improving and developing new methods for calculating gas savings under the ESS.

**Investment from the Fund in 2015–16:** $870,599

**2015–16 milestones:**

- Changes to the ESS Rule to provide incentives for gas came into effect on 15 April 2016 (see Section 5.1).
- Office of Environment and Heritage received 32 grant applications in Round 1, which closed on 22 January 2016. Twenty-six successful applicants were offered grants in April 2016 for projects including improving the combustion systems in manufacturing facilities, installing a solar thermal preheat system on a boiler in a NSW hospital, and recovering waste heat from a range of processes (see Table 3); 40% of these businesses are in regional New South Wales.
- Thirty-six grant applications were received in Round 2, which closed on 10 June 2016; 45% of applications came from businesses located in regional areas.

- The Fund supported the development and publication of the *Gas Measurement and Monitoring Guide*, released in May 2016 to help businesses understand and make decisions about site gas use to control costs and improve energy efficiency. Download the free guide at: www.environment.nsw.gov.au/business/gas-monitoring-guide.htm.

**Table 3: Round 1 grants for gas monitoring and efficiency projects**

| Number of projects approved | Funding approved ($) | Estimated gas savings[1] per year (GJ[2]) | Estimated GHG[3] savings per year ($tCO_2$-e[2]) | Estimated bill savings per year ($) | Cost effectiveness per gigajoule ($)[4] |
|---|---|---|---|---|---|
| 26 | 811,634 | 103,867 | 6,681 | 907,423 | 0.78 |

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

[2] GJ = gigajoules; $tCO_2$-e = tonnes of carbon dioxide equivalent

[3] GHG = greenhouse gas.

[4] For reference, the cost of gas supply is $50/gigajoule. Refer to Appendix B for methodology.

## 5.3 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 targeted technical support and best practice resources and consumer guides to businesses to identify, implement and verify energy efficiency opportunities and transform the NSW energy market.
- Ongoing collaboration agreements with peak bodies and industry associations such as the NSW Irrigators' Council, NSW Business Chamber and Australian Food and Grocery Council allow for preferential delivery of energy efficiency services to their members and continue to provide OEH with channels for communications and targeted energy efficiency projects with influential market players.
- The Energy Efficiency Professional Services panel comprises 87 pre-qualified energy efficiency service providers that businesses can engage to deliver high quality, profitable and competitive services such as energy efficiency auditing, technical engineering support and measurement and verification.
- A partnership between OEH and the Energy Efficiency Council supports NSW candidates to become certified professionals under the Energy Efficiency Certification Scheme.

**Investment from the Fund in 2015–16:** $1,821,625

**2015–16 milestones:**

- The Fund supported the delivery of 47 targeted audits, 10 technical implementation support projects and 18 measurement and verification studies.
- More than one-third of energy efficiency audits were conducted in regional New South Wales.
- More than 18,000 NSW businesses have saved an estimated $45.3 million a year in energy bills from implementing projects that were identified through energy efficiency audits (see Table 4).
- Office of Environment and Heritage signed new industry collaboration agreements with Local Government NSW (LGNSW), City of Sydney, the Refrigerated Warehouse and Transport

Association and the Facility Management Association, taking the total number of agreements in place to 11.

- Office of Environment and Heritage and NABERS launched the 'No More Average Buildings' campaign with the aim of having no more average energy-performing buildings by the end of 2018–19. Targeted financial and technical support for energy efficiency improvements is available to owners and managers of office buildings with a NABERS Energy Rating of three stars or less.
- The Fund supported 10 battery storage pre-feasibility studies to ascertain the viability of this new technology at a wide variety of NSW commercial sites.
- The Fund provided 10 subsidies totalling $7700 for NSW professionals under the Energy Efficiency Certification Scheme in order to help drive uptake of certification to boost the number of certified professionals in New South Wales. These professionals have the skills and experience to lead and manage all types and scales of building energy upgrades and work with a range of clients.
- The Fund provided $25,000 to the Australian Alliance to Save Energy to prepare a feasibility study into a voluntary challenge for businesses to commit to doubling their energy productivity by 2030. This project is being delivered by the Australian Government under the National Energy Productivity Plan. View the report at: www.2xep.org.au/files/2xEP_Challenge_-_Feasibility_Report_151112.pdf.

**Table 4: Fund support for small and medium-to-large business energy audits completed 2009–2016**

| Number of audits | Funding ($) | Estimated electricity savings per year (MWh[1]) | Estimated natural gas savings per year (GJ[1]) | Estimated GHG savings per year ($tCO_2$-e) | Estimated bill savings per year ($) | Cost effectiveness per MWh ($)[2] |
|---|---|---|---|---|---|---|
| 18,329 | 49,899,353 | 190,677 | 265,915 | 200,156 | 45,313,123 | 26.17 |

[1] MWh = megawatt hours; GJ = gigajoules; $tCO_2$-e = tonnes of carbon dioxide equivalent
[2] See Appendix B for methodology.

## 5.4 Tools, training and information

**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:**

- The Action Matters for Business program gives NSW businesses a competitive advantage through hands-on training to increase their energy efficiency and energy productivity. Attendees gain the skills, knowledge and insights to implement ongoing and effective energy management in their own workplace.
- Best practice information in the form of case studies, guides and tools greatly assists businesses to identify and implement opportunities to save energy.
- Post-training technical support of up to $3000 is available for training participants to help their senior management overcome barriers to the implementation of energy efficiency projects. Energy experts provide guidance to help businesses implement their energy efficiency opportunities and achieve tangible outcomes. The support provides targeted assistance when and where businesses need it – whether it is developing the business case or supporting the process of project implementation to identify credible suppliers within a complex and potentially overwhelming market space.

**Investment from the Fund in 2015–16:** $3,097,191

**2015–16 milestones:**

- The Fund supported the development and publication of the following information guides:
  - *Solar Finance Guide*, released in July 2015 to help businesses and households understand the finance and payment options for solar energy. View the free guide at: www.environment.nsw.gov.au/business/solar-finance-guide.htm
  - *HVAC Optimisation Guide*, released in August 2015 to help businesses apply strategies to better manage their existing systems to improve reliability, enhance occupant comfort and reduce maintenance costs. Download the free guide at: www.environment.nsw.gov.au/business/hvac-guide.htm
  - *Voltage Optimisation Guide*, released in March 2016 to help businesses determine if their sites can benefit from voltage optimisation, which can reduce energy use and improve equipment life. Download the free guide at: www.environment.nsw.gov.au/business/voltage-optimisation.htm.
- More than 700 professionals and energy efficiency service providers attended 47 training courses to increase their knowledge and skills in energy management, building business cases and implementing energy efficiency projects (see Figure 3). More than a third of the training courses were delivered in regional New South Wales.
- The PIAM&V training course assisted 110 measurement and verification professionals to apply the PIAM&V methodology to energy efficiency projects as part of the ESS.
- The Fund supported the completion of 32 post-training support projects, of which 59% were in regional New South Wales.
- New South Wales businesses, community organisations and local councils have identified the potential to save an estimated $2.9 million a year in energy bills from implementing energy efficiency projects that received post-training support (see Table 5).
- Five new training courses were developed and piloted with support from the Fund:
  - Introduction to Energy Management, developed to help participants gain practical knowledge, skills and tools for implementing energy management practices as core business in their organisation
  - Battery Storage for Business, a two-part workshop-oriented course designed to help businesses navigate the new and complex environment of battery technology
  - Energy Efficient Commercial Refrigeration, developed to help participants understand how upcoming changes to the refrigeration industry could affect their business, and what they should be considering when upgrading or replacing their system
  - Introduction to Voltage Optimisation, a practical online module developed around the Voltage Optimisation Guide that helps participants decide if voltage optimisation can benefit their business
  - Energy Efficient Lighting, an online course for businesses looking to upgrade their lighting as a cost effective way to improve their energy efficiency. The training has been redeveloped to be flexible so that participants can learn what they need when they need it.
- The Fund supported research into the business advisor market to identify the key sources of business advice available to NSW businesses, and how these information channels might best be leveraged to influence existing advice services for the provision of energy efficiency information. This research culminated in recommendations for advice delivery models and strategic implementation options.

**Table 5: Identified savings from post-training support grants provided 2014–2016**

| Number of projects | Funding ($) | Estimated electricity savings per year (MWh[1]) | Estimated natural gas savings per year (GJ) | Estimated GHG savings per year ($tCO_2$-e) | Estimated bill savings per year ($) | Potential cost effectiveness ($/MWh)[2] |
|---|---|---|---|---|---|---|
| 93 | 263,907 | 15,042 | 5,190 | 14,774 | 2,905,486 | 1.75 |

[1] MWh = megawatt hours; GJ = gigajoules; $tCO_2$-e = tonnes of carbon dioxide equivalent

[2] See Appendix B for methodology.

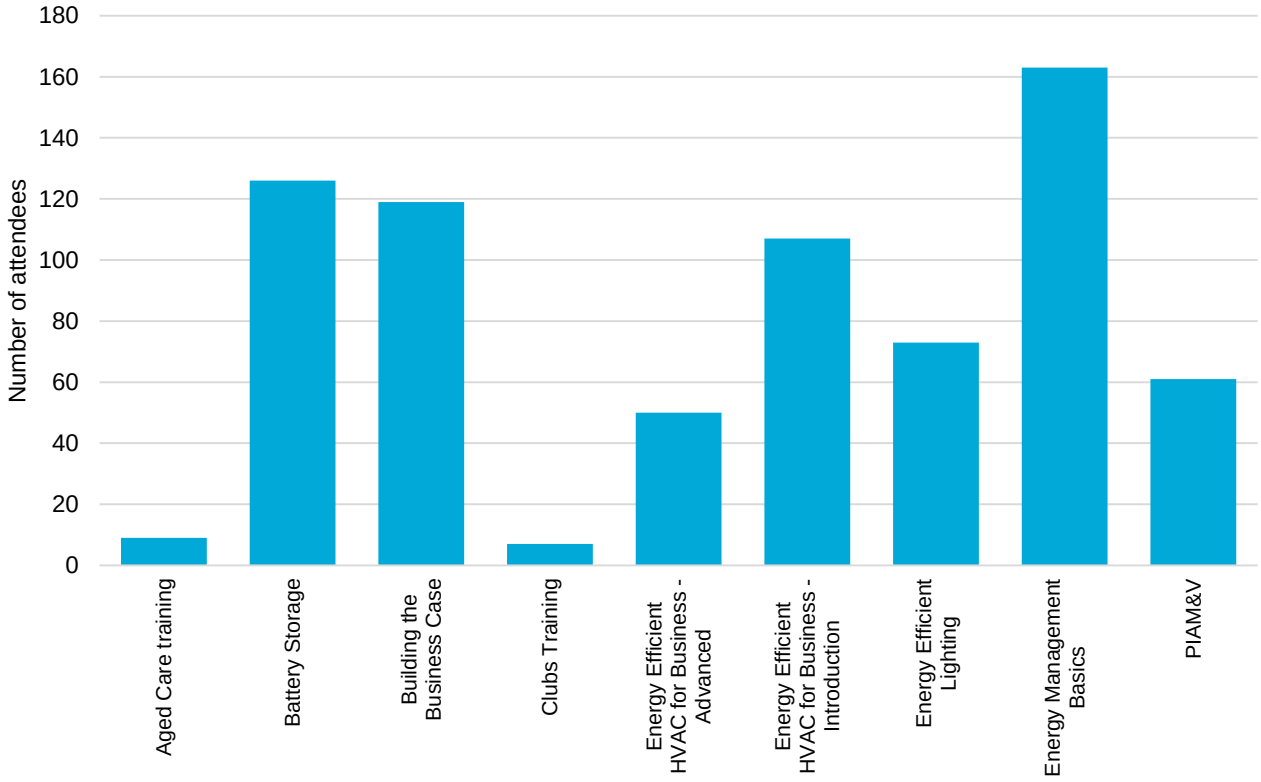


**Figure 3: Breakdown of attendance at energy efficiency training courses held in 2015–16**

## 5.5 Financing energy efficiency projects

**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 six local councils in New South Wales:
  1. City of Sydney
  2. Parramatta City Council
  3. North Sydney Council
  4. Lake Macquarie City Council
  5. The City of Newcastle
  6. Blacktown City Council.

**Investment from the Fund in 2015–16:** $1,014,498

**2015–16 milestones:**

- Blacktown City Council became the newest council to offer EUAs from December 2015.
- At 30 June 2016, more than $32 million has been lent to NSW building owners through EUAs.
- Office of Environment and Heritage made significant enhancements to the EUA delivery model to support improved service levels and reduced costs for participants. This will be facilitated by a market-based approach which places greater reliance on private sector participants such as energy service companies (ESCos) and financiers to drive the market for EUAs.
- The Fund supported an EUA coordinator to provide direct support to local governments, ESCos, financiers and building owners for the transition to a market-based approach and to develop a healthy pipeline of new councils and EUA service providers.
- The Fund also supported the development of:
    - a new EUA contract in conjunction with industry in response to feedback from key stakeholders that indicated the need for a document that better reflected standard commercial arrangements
    - guidance materials around tenant pass-through, which will greatly assist building owners and ESCos in managing this key aspect of EUAs
    - a strategic communications plan to better position EUAs as a financial solution for building owners and associated service providers.

# Case study 3 – Cottoning on to gas savings

Namoi Cotton Co-operative is headquartered in Wee Waa, New South Wales and has 10 of its 11 gins, facilities that remove cottonseed and plant material, in New South Wales, the state that grows two-thirds of Australia's crop. Its NSW operations stretch from Mungindi in the north to Hillston in the south.

Like many organisations, Namoi Cotton began by looking at its electricity use and implementing projects like lighting upgrades, as well as reducing energy in bale-pressing operations. But when the NSW Government's Gas Efficiency Funding opened late in 2015, the company considered if it was an opportunity to reduce Namoi's gas use.

**Climate change adaptation**

The recent introduction of round modules in the cotton industry means some harvesting happens when it is wetter, and cotton can have higher moisture levels. For optimum cotton-ginning, moisture levels in the fibre are brought to 6–7.5%. Gas burners in drying systems are used, then humidifiers are used to get the moisture levels right. It is a difficult balancing act to achieve the best outcome for the grower and avoid wasting gas.

Namoi Cotton aims to go from using around $3 of gas per bale, to under a dollar.

The project will help drought-proof the industry by adapting to climatic change at harvest each season. The largest savings will be in dry years, when yields and moisture content are down, and manual gas settings would formerly have eaten into falling profits.

**A regional co-investment success**

Twenty-six businesses were offered a share in $811,000 from the Fund to invest in gas efficiency, including Namoi Cotton. In the first round of funding 40% of successful applicants were from regional New South Wales. First-round projects are expected to save over 100 terajoules of gas, equivalent to the amount of gas used by 5000 Sydney homes.

**Where to next?**

The second round of Gas Efficiency Funding closed on 10 June 2016 and successful applicants will be announced early in the 2016–17 financial year.

# Case study 4 – UGL Unipart on track for boost in energy productivity

Office of Environment and Heritage's Action Matters for Business service helps senior management overcome barriers to implementing energy efficiency projects by making it easier to develop a business case, and then to manage retrofit projects.

For most NSW businesses, there are good opportunities available to use less energy and to be more efficient in what they do use. Effective energy use is achieved by increasing the value of output produced for every unit of energy consumed.

Increasing energy productivity can significantly improve business profitability and competitiveness. When margins are under pressure, energy spend can have a direct bearing on the viability of a business.

**Switched-on thinking**

One business that has taken advantage of NSW Government support is UGL Unipart, a joint venture between Australian engineering, asset management and service company UGL Limited and UK rail infrastructure company Unipart Rail. It provides heavy maintenance and supply-chain services to Sydney Trains' 1000 plus metro passenger carriages.

UGL Unipart knew its old and inefficient lighting was responsible for around two-thirds of its total electricity consumption so it sent staff to OEH's 'Energy Management Basics Training' course to understand the benefits of energy efficiency.

**Return on investment**

UGL Unipart received $3000 in post-training support from the Fund to get expert assistance in developing a business case for an energy efficient lighting upgrade.

The lighting upgrade is expected to reduce the energy used for lighting by more than 2000 megawatt hours or about 60%, plus a reduction in annual maintenance costs. The new lighting enhances lighting quality and uniformity across the site, and is expected to boost productivity and improve worker safety. UGL Unipart will also save 1700 tonnes of greenhouse gas emissions a year.

The final capital cost of the project was reduced by an upfront discount from the NSW ESS for the Energy Saving Certificates (ESCs) generated by the project.

**Where to next?**

Thanks to the lessons learned from this project, UGL Unipart is investigating a number of other energy saving measures at Auburn, planning to implement similar lighting projects at its other sites, and is undertaking a cultural change program.

**UGL Unipart's Environment and Sustainability Manager Katherine Adams showing the lighting upgrade at the Auburn warehouse (Photo: OEH/Manu Tejomurtula)**

**UGL Unipart CEO Gavin Harris (Photo: OEH/Manu Tejomurtula)**

# 6 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 by investing in energy efficiency and renewable energy.

**Key programs and projects supported by the Fund in 2015–16:**

- Energy Efficient Government Program (EEGP)
- Government Resource Efficiency Policy (GREP)

## 6.1 Support to implement energy efficiency projects

**Aim:** To achieve energy bill savings of up to $55 million a year from energy efficiency upgrades initiated at government sites.

**Approach:**

- The EEGP provides government agencies with access to tools and the expertise of a team of dedicated energy efficiency specialists to identify and implement cost effective energy efficiency projects.
- A panel of pre-qualified ESCos streamline the procurement process.
- Repayable capital advances to fund energy efficiency upgrades are available through the Government Finance Facility.

**Investment from the Climate Change Fund in 2015–16:** $1,318,761

**2015–16 milestones:**

- Office of Environment and Heritage facilitated the approval of $19.4 million in funding from the Government Finance Facility for energy efficiency projects at three large hospital sites. The hospitals will implement various energy efficiency measures including lighting retrofits and heating, ventilation and air conditioning (HVAC) upgrades that are estimated to save more than 15,700 megawatt hours of electricity, 10,500 gigajoules of gas and 13,800 tonnes of greenhouse gas emissions a year. The 12 sites receiving the upgrades are estimated to save more than $3 million a year in utility and maintenance bills.
- The Fund supported a successful workshop with industry stakeholders to improve service delivery of the EEGP and establish a performance management framework. The framework will improve communication and feedback between OEH and industry and better align industry partners with what government agencies expect when delivering an energy project.
- Through the EEGP, agencies have identified 25 energy efficiency projects in development worth $65 million. These projects cover building upgrades at both large and small government facilities delivering frontline services, such as hospitals, correctional centres, court houses, fire stations and recreational and cultural facilities in urban and regional centres.

## 6.2 Support to implement the Government Resource Efficiency Policy

**Aim:** To drive resource efficiency in government operations and reduce the NSW Government's operating costs.

**Approach:**

- The GREP contains 13 measures, targets and minimum standards for energy, water, waste and clean air to make resource efficiency standard practice in government operations.
- 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.
- Office of Environment and Heritage provides ongoing support and advice to NSW Government agencies in their self-assessment of the suitability of their sites for a solar power purchase agreement (PPA).

**2015–16 milestones:**

- Office of Environment and Heritage provided a data management tool to agencies to support them during their first year of GREP reporting. The tool was used to collect and collate agency resource use data in addition to statements of compliance and beyond compliance. As a result, agencies received tailored reports highlighting key opportunities and analysis of resource use.
- The Fund supported a range of activities to streamline agency reporting on GREP in the future including:
    - development of a database to store information about NSW Government energy efficiency projects and NABERS ratings
    - development of the Centralised Analysis System for Performance of Energy and Resources, an online resource efficiency portal that will be made available to agencies in 2016–17 to help them manage their resource use data, identify and implement resource efficiency projects and facilitate reporting on GREP. Users will have the ability to manage their sites, view energy consumption and expenditure data from government contracts, enter information about energy and water use purchased outside of government contracts and extract key information for reporting and analysis.
- Office of Environment and Heritage established data sharing agreements with Sydney Water and Hunter Water to collate government water consumption data on behalf of NSW Government agencies.
- The Fund supported publication of quarterly updates of NABERS ratings for government buildings. See NSW Government agency NABERS ratings: www.environment.nsw.gov.au/government/nabers-buildings.htm.
- The Fund supported the development of a map showing NSW Government sites suitable for solar PPAs and the development of a PPA fact sheet. Download the fact sheet and checklist at: www.environment.nsw.gov.au/government/solar.htm.

# Case study 5 – Huge energy savings improve patient care

A $7 million energy efficiency upgrade in six hospitals across the Northern NSW Local Health District (NNSWLHD) is improving patient care and reducing running costs.

The upgrade is one of 20 projects either under way or in development by NSW Health. Projects in train are estimated to save $4.5 million a year in utility bills once implemented.

Addressing building energy efficiency allows the NSW Government to cut its energy bills while investing in new assets and improving reliability and performance, which ultimately benefits patients.

**Large-scale improvements**

Delivering high quality patient care requires excellent staff and constantly fine tuning the vast complexity of infrastructure and equipment that make up a modern hospital.

Office of Environment and Heritage's Sustainable Government Team advised the capital works team on how to identify and implement upgrades to the six hospitals that reduce water and energy use while improving the experience for patients and staff. The Sustainable Government Team helped NNSWLHD tap into a low-cost loan from the Government Finance Facility to fund the project.

The retrofit covered lighting, heating and air conditioning, including 12,000 new LED lights installed, resulting in a combined saving of $1.1 million a year on energy costs.

The new lighting will cut NNSWLHD’s annual power bill by 19%, and reduce carbon emissions by 20%, compared with previous levels.

Water usage was also trimmed by retrofits. ‘Smart’ meters, flow control devices, and improved management systems are saving approximately 11 million litres of water a year, which is enough water to fill more than four Olympic-sized swimming pools.

Other improvements include two new chiller plants at Lismore, new building-management systems, and power factor correction to improve the supply quality of electricity.

**Leading by example**

The NSW Government is committed to incorporating resource efficiency considerations in all major decisions and rising to the challenge of escalating costs for energy, water, clean air and waste management. As a major service provider and asset manager, the NSW Government has substantial purchasing power when procuring resource efficient technology and services.

As the biggest energy consumer in the government sector, NSW Health has committed to energy efficiency projects across the state that will save at least 10% of billed energy use. Through simple, cost effective technologies and practices, NSW Health will deliver better patient care, better value for money and reduce its impact on the environment.

**Where to next?**

Office of Environment and Heritage's Sustainable Government Team will continue to work in partnership with NSW Health to improve energy efficiency in hospitals and health facilities across New South Wales.

The team includes dedicated energy efficiency specialists who identify opportunities to reduce energy consumption, handle the technical requirements of project delivery, provide access to government funding and ensure that savings can be guaranteed.

Continued cooperation between the Sustainable Government Team and NSW Health will see projects being rolled out in the majority of Local Health Districts in 2016–17.

# 7 Evaluation of energy efficiency programs

**Aim:** To ensure energy efficiency programs are being delivered efficiently, effectively and equitably to households, business and government.

**Approach:**

- Working directly with program deliverers to build evaluation capabilities and improve knowledge management practices to support evidence-based decision-making.
- Analysing the dynamics of the energy efficiency products and services market to identify early signs of market change to help improve program delivery.
- A partnership between OEH and the CSIRO to develop a 'virtual market' model to supplement real-world market monitoring and evaluation, and to inform whether programs are on track to drive market-level uptake of energy efficiency.

**Investment from the Fund in 2015–16:** $526,439

**2015–16 milestones:**

- The Fund contributed $50,000 to the Housing Stock Mapping Project with the University of Wollongong's SMART Infrastructure Facility and the Sustainable Buildings Research Centre to develop a baseline housing stock map for New South Wales. The project will also examine BASIX compliance and formalise data collection procedures. OEH identified this project as part of the Collaborative Sustainable Housing Initiative, which was formed with housing-industry organisations to address systemic barriers to the supply of and demand for sustainable housing features. The results will also help inform the new International Energy Agency Annex 70 – Building Energy Epidemiology: Analysis of real building energy use at scale.
- The Fund supported detailed HVAC and HWS market baseline studies, which delivered baseline models and supply chain mapping for New South Wales. These projects form the foundation of the continuous monitoring and evaluation of the impact of the EEAP and ESS on the HVAC and HWS markets. OEH has actively engaged the HVAC and HWS industry and will continue to explore opportunities for regular data collection and market monitoring. The results of the HVAC project will directly inform the next review of the ESS Rule.
- Office of Environment and Heritage developed a draft Evaluation Measurement and Verification Framework (EM&V) for the ESS, with industry consultation to follow in 2016–17.
- The Fund also supported OEH to engage evaluation experts to help build internal evaluation capacity and catalogue the evidence base to inform a formative evaluation report to be delivered in 2016–17.
- Office of Environment and Heritage publicly released 15 evaluation reports of energy efficiency initiatives that have been supported by the Fund since 2007 and six new datasets (see Section 4.2).

# 8 Emissions reduction

Reducing greenhouse gas emissions can improve public health, benefit the local environment and provide new opportunities to grow the economy. The Fund is supporting NSW Government action on emissions reduction by investing in innovative programs that help increase renewable energy capacity and reduce greenhouse gas emissions in New South Wales.

**Key programs and projects supported by the Fund in 2015–16:**

- solar PV plants at Nyngan and Broken Hill
- Solar Bonus Scheme
- TransGrid Renewable Energy Hub
- solar PPAs
- Emissions Reduction Fund

## 8.1 Support for large-scale solar projects

**Aim:** To support the growth of large-scale solar power stations in New South Wales.

**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 New South Wales.

**Investment from the Fund in 2015–16:** $5,000,000

**2015–16 milestones:**

- AGL completed construction of the $150 million solar plant at Broken Hill in October 2015, with more than 677,000 solar panels installed over 140 hectares.
- The Broken Hill plant achieved full generation capacity a few days later, delivering 53 megawatts of clean, renewable energy to the National Electricity Market.
- The local community around Broken Hill experienced economic benefits with more than 150 direct, local jobs created during the construction period.
- The Nyngan and Broken Hill solar plants were officially opened in January 2016. Both plants are estimated to generate 360,000 megawatt hours of renewable energy annually, saving more than 301,000 tonnes of greenhouse gas emissions a year.

## 8.2 Solar Bonus Scheme Reimbursement and Communication Program

**Aim:** To verify and pay claims for reimbursement and inform customers what to do when the scheme ends.

**Approach:**

- The NSW Department of Industry, Skills and Regional Development administers the Solar Bonus Scheme. 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.

- The Fund supports OEH to verify and pay claims for reimbursement to energy distribution network service providers for payments made to energy customers under the scheme.
- The Solar Bonus Scheme Communication Program informs customers of the options available to them following the expiry of the scheme on 31 December 2016 and supports a number of key policy objectives including:
  - informing Solar Bonus Scheme customers about their options when the scheme ends
  - contestable metering and the market-led rollout of smart meters
  - encouraging uptake of new technologies and energy efficient appliances and products
  - supporting industry to inform the market of the new technologies.

**Investment from the Fund in 2015–16:** $202,285,882

- Solar Bonus Scheme Reimbursement Program: $201,875,882
- Solar Bonus Scheme Communication Program: $410,000

**2015–16 milestones:**

- Small-scale systems connected to the scheme generated more than 419,000 megawatt hours of renewable electricity and the Fund provided $201.9 million in reimbursement payments (see Table 6).
- The NSW Government sent a letter and fact sheet to every Solar Bonus Scheme customer informing them of the scheme's closure and options to ensure they maximise the benefits of their renewable energy systems.
- The Fund supported updates to the NSW Department of Industry's website to provide greater information to Solar Bonus Scheme customers including frequently asked questions about the scheme closure, energy retailers' contact information and consumer rights. See the Solar Bonus Scheme: www.resourcesandenergy.nsw.gov.au/energy-consumers/solar/solar-bonus-scheme.

**Table 6: Estimated electricity generation from the Solar Bonus Scheme**

| Year | Number of new systems | Total reimbursement ($) | Estimated electricity generation (MWh[1]) |
|---|---|---|---|
| **Jan 2010 – June 2011** | 121,048 | 138,253,239 | 247,825 |
| **2011–12** | 23,405 | 211,841,253 | 380,682 |
| **2012–13** | 1,904[2] | 197,934,670 | 415,600 |
| **2013–14** | 68[2] | 205,093,881 | 424,872 |
| **2014–15** | 611[2] | 201,564,591 | 412,047[3] |
| **2015–16** | 1,909[2] | 201,875,882[4] | 419,616 |
| **Total** | **148,945** | **1,156,563,516** | **2,300,642** |

[1] MWh = megawatt hours

[2] No new systems were connected after 30 June 2012 but these figures represent the first year the reimbursement appeared.

[3] A decrease in solar insolation (the amount of sunshine) is the main cause of the apparent fall in renewable energy generation between 2013–14 and 2014–15.

[4] The total reimbursement figure reported for 2015–16 includes a forecast for the last quarter which is subject to standard financial end of year adjustments.

## 8.3 TransGrid Renewable Energy Hub

**Aim:** To encourage renewable energy development in New South Wales by supporting a framework for cost effective network connection for renewable energy generation plants.

**Approach:**

- The Fund is supporting TransGrid to develop a Renewable Energy Hub (ReHub) to encourage and attract further renewable energy development to the New England region of New South Wales.
- By improving the network connection process the developers of renewable generation plants will be encouraged to implement their projects.
- The NSW Government, ARENA and TransGrid are contributing matched funding to a feasibility study for the ReHub, which will provide a framework to facilitate cost effective network connection of renewable energy projects in this region with the potential to replicate this model in other areas of New South Wales.

**Investment from the Fund in 2015–16:** $430,000

**2015–16 milestones:**

- TransGrid delivered a technical feasibility study and a knowledge sharing report of the benefits, which include local investment and job creation. The results from the study will help TransGrid negotiate the commercial terms and conditions of a cost effective network connection process with the renewable energy generation project developers in the New England region. The knowledge sharing report will be released on the TransGrid website in late 2016.

## 8.4 Solar power purchase agreements

**Aim:** To attract and expand renewable energy investment in New South Wales and provide certainty for investment in large-scale solar projects in regional New South Wales.

**Approach:**

- Implementing solar PPAs will help the NSW Government meet GREP requirements and help the NSW Government's electricity retailer to meet its existing obligations under the Australian Government's Renewable Energy Target.
- Up to 50 megawatts of new solar capacity would be built in New South Wales as part of the NSW Government's electricity retail contract.
- The NSW Government would enter into the solar PPA with the most competitive large-scale solar PV projects in New South Wales that are currently short-listed for ARENA funding.
- The solar PPA would run from mid-2018 to the end of 2030 and attract Australian Government funds to New South Wales.
- The NSW Government is also sponsoring the World Wildlife Fund Renewable Energy Buyers Forum to develop contractual structures for corporations to enter into solar PPAs.

**Investment from the Fund in 2015–16:** $500,000

**2015–16 milestones:**

- The NSW Government initiated the renewable energy procurement process with its current electricity retailer.
- The Fund provided $450,000 to the Department of Finance, Services and Innovation to coordinate legal, commercial and evaluation advice on solar PPAs for NSW Government agencies.
- The Fund provided $50,000 to the World Wildlife Fund Renewable Energy Buyers Forum to develop contractual structures for corporate solar PPAs.

## 8.5 Engaging with the Direct Action Plan

**Aim:** To maximise New South Wales's investment in carbon abatement projects under the Australian Government's ERF.

**Approach:**

- The NSW Government has allocated funding to increase NSW participation in the ERF.
- Office of Environment and Heritage analyses emissions abatement opportunities in New South Wales. Where these opportunities are covered by ERF methods, OEH promotes the opportunities to key industry sectors and within government. Where these opportunities were not covered by ERF methods, OEH seeks to have the Australian Government develop suitable ERF methods.

**Investment from the Fund in 2015–16:** $468,866

**2015–16 milestones:**

- The Fund provided resources to support the NSW Government's successful bid in the third auction of the ERF held in April 2016. OEH is partnering with CO2 Australia Limited to conduct a pilot project to undertake major rehabilitation works at three national parks and two conservation areas over the next five years, including planting more than 200,000 trees over 520 hectares. The tree plantings will sequester almost 80,000 tonnes of carbon dioxide over 10 years. The national parks involved are:
  - Brindabella National Park
  - Gwydir Wetland State Conservation Area
  - Kosciuszko National Park
  - Tinderry Nature Reserve
  - Willi Willi National Park.
- The Fund provided resources to help OEH identify significant opportunities to access the ERF in the land management and waste sector.
- Office of Environment and Heritage and the Environment Protection Authority negotiated with the Australian Government to ensure that projects developed under the *Waste Less, Recycle More* initiative were eligible for funding under the ERF. Before this intervention, all NSW waste projects were ineligible for ERF funding.

- Office of Environment and Heritage mapped the state-wide carbon potential of public land sites and identified a major opportunity to access the ERF to reduce the cost of rehabilitating public land.
- Office of Environment and Heritage assisted the Australian Government to adopt a number of methods developed for the ESS as ERF methods, allowing more than 100 NSW businesses active under the ESS to utilise their expertise in other states.
- The Fund supported OEH to host a series of workshops on the ERF for 156 industry, carbon service provider, local government and NSW Government agency representatives to help NSW businesses and the public sector understand the opportunities available to them.
- These initiatives helped contribute to good carbon abatement outcomes for the state. In the three ERF auctions held to April 2016, 47% of successful projects were from New South Wales, leading to an estimated investment of $727 million. Most of this abatement came from avoided land clearing in the western division of New South Wales, landfill gas reduction and other forms of waste methane management.

# Case study 6 – National parks gain from carbon-credit win

520 hectares will be revegetated after the NSW Government became the first state or territory to participate in the national carbon-credit scheme for the rehabilitation of national parks.

The successful bid in the third Commonwealth ERF auction means 200,000 trees will be planted in New South Wales and capture 80,000 tonnes of carbon dioxide over the next decade. The sequestration will be permanent.

The cost of the revegetation work will be offset by recouping funds from the sale of carbon credits generated in the projects.

**Protecting diverse habitats**

In Kosciuszko National Park, two sites have been selected: ‘Kalkite’ adjoins Lake Jindabyne, and is visible from towns across the lake including Kalkite, East Jindabyne and Jindabyne; ‘Merambego’ is a large site of approximately 150 hectares of former farmland surrounded by the park.

At Kalkite, the control of weed species is a priority and expensive to treat. The proposed revegetation will not only create habitat; over time it will improve sustainability and lower weed control costs as replanted trees shade out pasture weeds. Visitors also see the benefit to the native revegetation and reduction in weeds.

The Merambego revegetation increases habitat and refugia for a variety of fauna.

Tinderry Nature Reserve is part of a large, continuous tract of reserves from the Brindabella Ranges National Park to Kosciuszko National Park, and represents a unique overlap of subalpine and coastal biodiversity elements. It is also part of the domestic water catchment for Queanbeyan and Canberra. The replanting sites are former farmland cleared for grazing, surrounded by reserve. A Weed of National Significance, serrated tussock (*Nassella trichotoma*), dominates much of the grassy understorey in these former agricultural areas. Part of the replanting works will control and minimise the spread of serrated tussock.

Replanting with trees and shrubs will also improve the habitat and landscape connectivity.

The replanting sites in Brindabella National Park are on former cleared freehold grazing farmland within the reserve. They are surrounded by intact vegetation in the domestic water catchment for Canberra. Natural regeneration has been very limited on the sites since they

came into the reserve system, so an active approach that includes replanting tree and shrub layers will speed up revegetation, again leading to better habitat and landscape connectivity.

Willi Willi National Park and the Gwydir Wetlands State Conservation Area are the sites for the remaining environmental plantings. Areas of both of these reserves have been subject to past pressures from grazing and/or cropping activities and as such are ideally placed for broad-acre revegetation activities. The planting site in Willi Willi National Park is surrounded by a diverse range of vegetation types, including open and closed eucalypt forest and dry temperate rainforests, some of which contain threatened flora species. The Gwydir Wetlands State Conservation Area is a generally more open site, but equally important for its open floodplains and forests. This reserve is arguably most notable for its significant wetland environment, which is an important habitat for birds and other fauna. The planting at this site will complement these important assets.

**Where to next?**

As the five pilot projects mature and are evaluated, OEH will consider identifying new sites and bids for future ERF auctions.

**Former agricultural land 'stranded' in Brindabella National Park, which is now earmarked for revegetation as part of the ERF project (Photo: NPWS / Corinna Orscheg)**

# 9 Climate change adaptation

Being able to understand and respond to climate change risks can help avoid future costs and reduce impacts on the health and wellbeing of local communities. The Fund is helping local councils and communities in New South Wales to adapt to climate change by investing in programs that help reduce exposure to natural hazards and other climate vulnerabilities.

**Key programs and projects supported by the Fund in 2015–16:**

- Coastal Management Program
- Building Resilience to Climate Change grants
- Enhanced Bushfire Management Program

## 9.1 Coastal Management Program

**Aim:** To support local government in managing the NSW coast, risks from coastal hazards and to improve natural resilience to potential climate change impacts.

**Approach:**

- The Coastal Management Program provides up to 50% funding for local councils to implement coastal zone management plans, hazard assessments and coastal management tools and to undertake environmental repairs and construction works.

**Investment from the Fund in 2015–16:** $1,433,508

**2015–16 milestones:**

- The Fund contributed $1.4 million in milestone payments to 37 coastal management projects. This funding makes up one-third of the total grant expenditure of $4.4 million, with the remaining funds coming from the OEH budget.

## 9.2 Building Resilience to Climate Change grants

**Aim:** To address identified climate change risks and vulnerabilities facing NSW councils.

**Approach:**

- The BRCC grants program is administered by LGNSW in collaboration with the Impacts and Adaptation Team in OEH. The first two rounds were funded by OEH and the NSW Environmental Trust.
- Grants of between $15,000 and $80,000 are available to NSW local government organisations to invest in climate change adaptation projects that address regional or sectoral climate risks and vulnerabilities.

**Investment from the Fund in 2015–16:** $542,480

**2015–16 milestones:**

- The Fund provided $542,480 to LGNSW to administer a third round of the BRCC grants program, including $460,000 in grants to local government organisations to implement adaptation responses to identified climate risks and vulnerabilities. Applications open in August 2016.
- The Fund also supported the development of new grant application forms, guides and reporting requirements and recruitment of LGNSW staff to administer the program.

## 9.3 Enhanced Bushfire Management Program

**Aim:** The EBMP is designed to address expected worsening fire weather conditions due to climate change via increased hazard reduction operations and improved bushfire response capabilities.

**Approach:**

- The Fund is providing $76 million over six years to more than double the National Parks and Wildlife Service (NPWS) bushfire hazard reduction program.
- NPWS has a strategic approach to adapting to bushfire risk from climate change. This is achieved by prioritising and targeting bushfire prone areas for hazard reduction to minimise the risk to the community.
- The EBMP has a five year rolling average commitment of treating 135,000 hectares of bushland annually.
- The NPWS Rapid Aerial Response Teams (RART) provide New South Wales with increased rapid response capacity through the provision of additional remote area fire crew resources in high risk bushfire ignition areas. The RART has the following key performance indicators:
    - respond to 90% of wildfire within 30 minutes of detection
    - keep 80% of fires responded to below 10 hectares in size.

**Investment from the Fund in 2015–16:** $13,199,157

- $9,829,198 million for hazard reduction activities
- $2,305,023 million for rapid response
- $1,064,936 million for capital expenditure to purchase fire related equipment and other items.

**2015–16 milestones:**

- The NPWS treated 202,000 hectares in 1193 mechanical and 303 prescribed burning activities.
- The NPWS has met its commitment of treating more than 135,000 hectares annually as a five year rolling average. The NPWS is currently averaging 139,000 hectares per year.
- The RART responded to 100% of remote wildfire within 30 minutes of detection and kept 82% of fires they responded to below 10 hectares in size.

**ParkAir aerial ignition at a hazard reduction at Williams Ridge in the Blue Mountains (Photo: NPWS / Matt Allan)**

**Trainee Field Officer Andrew Pearce (Photo: NPWS / David Croft)**

# 10 Climate Change 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 at scales relevant to local decision-makers.

**Approach:**

- This initiative ensures that a robust evidence base is available to guide the monitoring and evaluation of Fund programs. It makes certain that these programs are delivering to the NSW Government, businesses and the community the information they require to support improved resource efficiency and to build resilience to climate change.
- An Energy and Resource Efficiency Research Hub will support research into energy and resource efficiency program and policy design, and research to identify greenhouse gas emissions reduction and energy saving opportunities across New South Wales.
- A Human Health and Social Impacts of Climate Change Research Node of the NSW Adaptation Research Hub will extend the work of the Hub by establishing dedicated research into the human health and social impacts of climate change in New South Wales.
- Examining the impacts of extreme climate events in New South Wales (extreme rainfall and winds, hail and lightning, flood and coastal inundation and erosion) and how the frequency, intensity and duration of these extreme events may change in the future will help integrate multi-hazards into risk assessment and hazard mapping and assist emergency services, water resource and bushfire managers and NSW businesses and communities to become more resilient to these events.
- Following the step change in the quality of NSW climate projections delivered by the NSW and ACT Regional Climate Modelling Project, early planning for updated projections to be delivered in 2020 will ensure that the regional climate projections for New South Wales continue to be based on the best available information.
- Operational research into the impacts of climate change on the alpine region and on bushfire management and planning will help identify and integrate risks and optimise management plans.

**Investment from the Fund in 2015–16:** $240,648

- $14,812 for energy and resource efficiency research
- $191,118 for regional climate projections and extreme climate events
- $34,718 for climate change impacts in the alpine region.

**2015–16 milestones:**

- Office of Environment and Heritage commissioned the University of New South Wales Climate Change Research Centre to begin feasibility studies into the next generation of regional climate projections for New South Wales, ensuring that they are sufficiently robust to assist in the evaluation of changes to climate extremes in New South Wales.
- The Fund provided resources to establish the *OEH and EPA Resource Efficiency Knowledge Strategy*, determining ‘priority knowledge needs’ for OEH to continue delivering knowledge to inform resource efficiency policies and programs.
- The Fund also allowed OEH to commence work on an integrated climate change impact assessment for the NSW alpine region.

# 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**

(1) 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, and
- (b) all money advanced by the Treasurer for the Fund, and
- (c) all money appropriated by Parliament for the purposes of the Fund, and
- (d) the proceeds of the investment of money in the Fund, and
- (e) all money directed or authorised to be paid into the Fund by or under this or any other Act or law, and
- (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, and

(b) any money approved by the Minister to fund all or any part of the contributions that the State is required to make for the purposes of national energy regulation, and

(c) any money required to meet administrative expenses related to the Fund, and

(d) any money required to meet administrative expenses of the Minister in connection with the Minister's functions under this Act in relation to savings action plans, and

(e) any money directed or authorised to be paid from the Fund by or under this or any other Act or law.

In exercising the Minister's functions under subsection (1) (a) (but without limiting the generality of that paragraph), the Minister may:

(f) 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

(g) 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

(h) require a person or body seeking funding for a water or energy savings measure to do either or both of the following as a precondition to applying for or obtaining funding:

(i) to submit a water savings action plan or energy savings action plan (as the case requires) that includes details about the measure, and

(ii) to provide any other information requested by the Minister about the measure, and

(i) 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.

**Table 7: Standard tariffs**

| Utility | Sector | Unit | Tariffs |
|---|---|---|---|
| **Electricity** | Residential | c/kWh[1] | 26.2 |
| | Business | c/kWh[1] | 18.7−27.5 |
| | Government | c/kWh[1] | 10.5 |
| | Community | c/kWh[1] | 18.7−27.5 |
| **Natural gas** | Residential | $/GJ[2] | 28.8 |
| | Business | $/GJ[2] | 19.8 |
| | Government | $/GJ[2] | 18.5 |
| | Community | $/GJ[2] | 28.8 |

[1] cents per kilowatt hour

[2] dollars per gigajoule

- 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 Australian Energy Regulator.

### Savings estimates

- All program savings are conservatively estimated from the available information.
- Greenhouse gas emission conversion factors are from the National Greenhouse Accounts August 2015 (see Table 8). AGL uses 0.84 tonnes of carbon dioxide equivalent per megawatt hour for the Nyngan and Broken Hill solar plants.
- Energy bill savings may include savings attributed from electricity, natural gas, LPG and operating and maintenance costs. Bill savings for Gas Efficiency Funding and Government Finance Facility projects are site-specific.
- The cost effectiveness of funding for all programs is calculated by dividing the funding allocated or expended by 10 years of savings.

**Table 8: Emissions factors**

| Fuel | Unit | Factor |
|---|---|---|
| **Electricity** | $tCO_2$-e/MWh[1] | 0.96 |
| **Natural gas** | $tCO_2$-e/GJ[2] | 0.06433 |
| **LPG** | $tCO_2$-e/GJ[2] | 0.0642 |

[1] tonnes of carbon dioxide equivalent per megawatt hour

[2] tonnes of carbon dioxide equivalent per gigajoule

**Data sources**

- New South Wales Environment Protection Authority 2015, *State of the Environment 2015*, available at: www.epa.nsw.gov.au/soe/soe2015/index.htm.

**Regions**

- Sydney metropolitan is defined as the LGAs within the following regional council organisations:
  - Northern Sydney Regional 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 LGAs are designated as regional New South Wales. For more information see *Regions of NSW*: www.nsw.gov.au/regions.

# Appendix C: Glossary

| | |
|---|---|
| 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 |
| AMB method | Aggregated Metered Baseline method; uses verified statistical analysis to determine energy savings for an activity that occurs over a large number of sites but which achieves relatively small savings at each site |
| ARENA | Australian Renewable Energy Agency; an Australian Government agency |
| BASIX | Building Sustainability Index; a sustainable planning measure that aims to deliver equitable, effective water and greenhouse gas reductions across New South Wales |
| 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 |
| ESCo | Energy service company |
| 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) |
| GHG | Greenhouse gas |
| 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 |
| HWS | Hot water system |
| IPART | The Independent Pricing and Regulatory Tribunal; the independent economic regulator for New South Wales |
| 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) |

| | |
|---|---|
| LED | Light-emitting diode; a type of energy efficient lighting |
| LGA | Local government area (or council area) |
| LGNSW | Local Government NSW; the peak industry association representing NSW councils |
| liquefied petroleum gas (LPG) | 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 |
| NatHERS | Nationwide House Energy Rating Scheme; NatHERS is a star rating system (out of 10) administered by the Australian Government Department of the Environment and Energy that rates the energy efficiency of a home, based on its design |
| NPWS | The National Parks and Wildlife Service (part of the Office of Environment and Heritage within the Planning and Environment cluster) |
| 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 |
| PIAM&V | Project Impact Assessment with Measurement and Verification; a method for verifying energy savings using internationally recognised measurement and verification principals |
| 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 |
| SGCH | St George Community Housing, the largest community housing provider in New South Wales and a partner in the Home Energy Action program |
| 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 |
| $tCO_2$-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 |