How Australia’s carbon price is working

One Year On

June 2013
It is now a year since the Australian Government introduced carbon pricing to help tackle the serious environmental problem of climate change.

Scientists and institutions like the CSIRO and the Bureau of Meteorology have advised that rising concentrations of carbon pollution in the atmosphere are causing climate change. Their advice is that to avoid impacts like higher temperatures and more extreme weather events, the world needs to reduce the amount of greenhouse gases being emitted into the atmosphere.

The carbon price is designed to ensure Australia plays its part in international efforts to tackle climate change – while ensuring our economy remains strong.

It works by putting a price tag on each tonne of carbon pollution released into the atmosphere by around 370 of Australia’s largest industrial concerns, like coal-fired power stations.

It will put a cap on Australia’s greenhouse gas emissions from 2015-16. That means it is guaranteed to achieve emissions reductions to 2020 and beyond.

Carbon pricing will reduce pollution and boost investment in clean and renewable energy, like solar and wind power.

Australia’s economy has grown solidly

The carbon price starts

Note: All figures are in real terms
Source: ABS, 2013

And more than 150,000 new jobs have been created

Source: ABS, 2013
The carbon price works hand in hand with a comprehensive set of policies. The Clean Energy Future plan also includes:

- a Renewable Energy Target which will guarantee at least 20 per cent of Australia’s electricity comes from renewable sources by 2020;
- major investments in clean energy technologies;
- support for manufacturing companies to cut energy use and pollution;
- support for farmers to reduce pollution on the land;
- programs to help households, communities and business improve energy efficiency.

A year after the carbon price started, the evidence shows these Clean Energy Future policies are:

- reducing carbon pollution;
- driving investment in clean and renewable energy; and
- transforming Australia’s economy to be more competitive as the world tackles climate change.

Since the carbon price commenced, Australia’s economy has remained one of the strongest in the industrialised world.
Cleaner energy is reducing pollution

Power stations are one of Australia’s main sources of carbon pollution and account for over half of the pollution covered by the carbon price.

That means to clean up our economy we must transform our electricity generators, which have traditionally relied heavily on coal as a fuel source, towards cleaner fuel sources.

The carbon price, the Renewable Energy Target and efforts by governments, businesses and households to improve their energy efficiency have all made a start in transforming Australia’s electricity sector.

Since the carbon price started on 1 July 2012, there have been important changes in Australia’s electricity generation sector.

In the 11 months from July 2012 to May 2013, carbon pollution from the National Electricity Market was down by around 7.4 per cent compared to the same period in 2011-12.

That’s almost 12 million tonnes less pollution from electricity generation under carbon pricing.

Why is carbon pollution from electricity generation falling?

A key reason is that the electricity supplied to the national grid has been cleaner since the carbon price started.

This is because renewable energy like wind power, solar and hydro-electricity is making up a larger proportion of our energy mix.

In the 11 months to May 2013, for each megawatt hour (MWh) of electricity generated in the National Electricity Market, 0.87 tonnes of carbon pollution were released into the atmosphere.

This has fallen from 0.92 tonnes of carbon pollution for each MWh in the same period in 2011-12. That is a decline of 5.1 per cent.

The carbon price and the Renewable Energy Target are making renewable energy, and cleaner electricity generated from natural gas, more competitive when compared to higher-polluting coal-fired electricity generation.

As a result, electricity generation is switching away from high-polluting fuels like brown coal and towards lower-polluting fuels like natural gas and renewable energy sources. In fact, renewable energy output increased by almost 30 per cent and the output from the seven most highly-polluting coal generators was down 14 per cent from the same period in 2011-12.

In addition to cleaner energy, another reason emissions are down is because energy is being used more efficiently – the amount of electricity to power our homes, factories and offices is down.

In the 11 months to May 2013, the amount of electricity sent out to the National Electricity Market was down by 2.4 per cent.

This decline is driven by a range of factors. Households and businesses are responding to higher power prices and being directly supported by the Government to improve energy efficiency. They are also installing solar panels and solar water heaters on their roofs, meaning they use less electricity from the grid.

Around two-thirds of the drop in pollution from the electricity sector is estimated to have been driven by the uptake of cleaner energy sources and around one-third from energy efficiency and lower electricity demand.

Australians sweltered during the summer of 2012-13.

Yet we used less electricity. And the electricity we did use was cleaner.

The Bureau of Meteorology has reported that the summer of 2012-13 was Australia’s warmest on record in terms of both maximum and average temperatures.

Normally a hotter summer pushes up electricity use as more people switch on air conditioners for longer.

But despite the hotter weather the amount of electricity generated in the National Electricity Market this summer was down by 0.8 per cent compared to the previous summer reflecting, in part, that Australians are now using energy more efficiently.
The Clean Energy Future policies are driving billions of dollars of investment in clean and renewable energy.

This investment is not only reducing carbon pollution, it is also creating new jobs and industries - there are now more than 24,000 jobs in Australia’s renewable energy industry.

One of the main policies promoting clean energy investment is the Renewable Energy Target – this will guarantee that at least 20 per cent of Australia’s electricity comes from renewable sources by 2020.

Australia now has over 370 renewable power generators accredited under the Renewable Energy Target policy.

In April 2013, the energy company AGL opened its 420 MW Macarthur wind farm in western Victoria.

This is the largest wind farm in the southern hemisphere and represents a $1 billion investment.

AGL estimates that the Macarthur wind farm can power an average of around 220,000 households, saving around 1.7 million tonnes of greenhouse gas emissions a year.

Across the country there are also large wind and solar farms operating, under construction or in advanced development (see below).

Individual households and businesses are playing their part by installing solar panels and solar hot water systems on their roofs, with support from the Government’s Small-scale Renewable Energy Scheme.
There are now more than 1,046,600 rooftop solar power systems supported under this Scheme - an increase of more than 1 million systems over the past 5 years. And new systems are being installed at the rate of around 3,300 rooftops a week.

Australia’s installed rooftop photovoltaic capacity increased from around 20 MW to around 2,500 MW between 2008 and 2013 and is expected to grow to more than 5,100 MW by 2020 and 12,000 MW by 2031.

The Clean Energy Future plan includes unprecedented levels of funding for research into renewable energy technologies and projects to deploy clean energy technologies through the economy.

The Australian Renewable Energy Agency (ARENA) commenced on 1 July 2012. It is an independent agency with funding of around $3 billion to invest in projects that improve the competitiveness of renewable technologies and increase the supply of renewable energy in Australia.

ARENA is currently supporting a range of innovative renewable energy technology projects, including bioenergy, geothermal, hydro, ocean and solar power in Australia.

The Government has also established the $10 billion Clean Energy Finance Corporation (CEFC) to invest in businesses needing funds to get innovative clean energy proposals and technologies off the ground. This will include renewable energy, energy efficiency and low emission technologies and projects.

The CEFC commenced in August 2012 and the Government has issued an investment mandate to ensure the CEFC applies commercial rigour to its investment decisions and seeks a commercial return for taxpayers.

The carbon price, the Renewable Energy Target, ARENA and the CEFC are all working together to drive billions of dollars of investment in clean and renewable energy in Australia.

MALLEE A CLEAN SOLUTION

An innovation by Renergi Pty Ltd to turn agricultural waste and mallee biomass into energy has received $3.6 million in support from ARENA to provide the technical data necessary to design a commercial-scale gasifier.

Once developed, the gasifier will transform various types of biomass, such as agricultural waste and mallee crops, into gas that can be fed into an engine to generate electricity.

Project partners include Curtin University, Cryofin, Verve Energy and the Oil Mallee Association of Australia. The total cost of the project is $6.7 million.

FUNDING CHARGES RENEWABLE ENERGY STORAGE SOLUTIONS

Cost-effective battery storage for renewable energy systems is a step closer, following a $480,000 grant through ARENA’s Emerging Renewables Program to Ecoult, aiming to optimise CSIRO’s UltraBattery technology.

ARENA will be investing in a 30-month project using the UltraBattery technology to determine whether it can lower costs by conducting testing on a storage pilot at CSIRO’s Newcastle facilities.

The $1.1 million project aims to optimise the UltraBattery technology for use in a range of settings, including residential locations, in remote areas not connected to the national electricity grid and in hybrid diesel systems.

BLUESCOPE ROOFTOP SOLAR PROJECT A WORLD LEADER

Supported by a $2.3 million grant BlueScope will use thin-film solar panels to create sleeker, more efficient roofing designs that can produce electricity for new residential and commercial buildings, and are capable of generating energy for the electricity grid.

The development of the new roofing profile will create new employment opportunities at BlueScope and is an early sign of the innovations occurring under the Government’s broader Clean Energy Future package.
Since the carbon price started, Australia’s manufacturing industry has been investing in new equipment to improve energy efficiency and reduce pollution.

Carbon price revenue is funding the Government’s $1 billion Clean Technology Investment Program which is helping businesses to make these investments.

More than 220 clean technology projects are now under way at manufacturing plants around the country.

Food manufacturers are installing state of the art refrigeration equipment to cut energy costs and reduce emissions of harmful refrigeration gases.

Wineries are installing solar panels.

Sugar mills are building co-generation plants to generate renewable energy from sugar cane residue.

Brick makers are upgrading their kilns to use cleaner energy sources and cutting costs of production.

CASE STUDY

One of Australia’s largest asphalt manufacturing plants is using a $1.4 million Government grant to upgrade its facilities in Queensland.

Downer EDI is using a grant from the Government’s Clean Technology Investment Program, funded by carbon price revenue, to support upgrades at its plant in Bli Bli, north of Brisbane.

This upgrade will enable the plant to manufacture asphalt containing up to 40 per cent recycled materials.

The changes will substantially boost the company’s energy efficiency, reduce its environmental footprint and create a more sustainable future.

It is expected that this project will allow Downer to cut energy costs at the site by approximately $480,000 a year and reduce the facility’s carbon emissions intensity by up to 33 per cent.
A.J. Bush and Sons, which has a large meat rendering plant in Bromelton, is one of the largest employers in the meat industry in Queensland.

In the past, A.J. Bush has released significant amounts of methane from settlement ponds where the biological waste from its meat processing operations is deposited. Now this company is making a $12 million investment with the support from the Clean Technology Investment Program.

Instead of releasing the methane into the atmosphere, A.J. Bush will capture the gas and use it to power boilers that produce steam for the plant.

It will also install new, more energy efficient boilers, meaning the company will reduce the amount of coal it burns to fire the boilers. These investments will cut the plant’s energy costs by 46 per cent and its emissions intensity by 64 per cent.
Using energy more efficiently not only lowers carbon pollution, it also saves money.

Improvements in energy efficiency can be small individually – but they can add up across the economy and deliver significant financial and environmental benefits.

When a household turns off its appliances at the wall rather than leaving them on standby, for instance, it delivers small but noticeable savings in power bills.

When an organisation like Brisbane City Council embarks on a project to retrofit up to 25,000 street lights with more efficient and long-lasting lamps, the savings are expected to add up to around $500,000 a year.

The Government is using revenue raised by the carbon price to fund projects like this through Low Carbon Communities – a range of programs which are helping households, local councils and community organisations.

Since 1 July 2012, Low Carbon Communities has made a real difference on the ground.

The Community Energy Efficiency Program is providing $112 million in grants to 370 local governments and non-profit community groups for energy efficiency upgrades such as lighting, heating, ventilation and air conditioning. These grants will improve the energy efficiency and amenity of council and community use facilities, including museums, aquatic and leisure centres and town halls.

The Low Income Energy Efficiency Program is providing up to $64 million for energy efficiency measures for around 33,000 low income households. These measures include installing solar hot water services, household energy assessments and community workshops on energy efficiency.

The Local Government Energy Efficiency Program will assist around 250 local governments across the country to install heat pump and solar hot water systems in community buildings and facilities.

In addition to the Low Carbon Communities initiatives, the Energy Efficiency Information Grants program is providing $34 million to deliver advice to well over 200,000 small and medium-sized businesses and community organisations on practical ways they can improve energy efficiency.

BRIGHT IDEA FOR BRISBANE

Brisbane’s street lights are becoming brighter and more energy efficient in what is believed to be the largest street lighting retrofit project ever undertaken in Australia.

The Government is providing almost $5 million from the Community Energy Efficiency Program to help Brisbane City Council replace 25,000 of the city’s street lights with more energy efficient lamps.

The Council will contribute a further $5 million to the project over the next two financial years.

The existing lights are mercury vapour bulbs, which over time give off a reduced amount of light, becoming dim.

But the new more efficient lamps use less energy, provide better lighting levels and do not deteriorate as much as the existing lamps, meaning the streets will be well-lit and safer for residents.

When installed, the new lights will use 40 per cent less electricity and are expected to reduce the Council’s overall electricity consumption by 2.5 per cent.

The project will result in $500,000 worth of savings to the Council’s annual electricity bill.

The $112 million Community Energy Efficiency Program, funded by the carbon price, is helping inform the community about the benefits of smart energy use, while providing improved services and amenities, buildings and community facilities.
The Government has delivered tax cuts, increases in Family Tax Benefits and higher pensions and allowances to help low and middle income earners.

This Household Assistance Package started in May 2012 with lump sum payments to more than six million Australians, including families, pensioners, self-funded retirees and people receiving income support.

From 1 July 2012, the Government tripled the tax-free threshold to $18,200 a year, delivering tax cuts to more than 7 million taxpayers earning up to $80,000 a year.

In March 2013, around 3.5 million pensioners began receiving their ongoing Clean Energy Supplement in their fortnightly payments. These pension increases are worth around $350 a year for singles and around $530 a year for couples combined.

From 1 July 2013 more than 1.6 million families who receive Family Tax Benefit payments will start receiving ongoing increases in their fortnightly family payments.

Other income support recipients such as students will also receive ongoing assistance, starting with a second lump sum payment from 1 July 2013 and an ongoing Clean Energy Supplement from 1 January 2014.

The latest Consumer Price Index figures show the inflation rate was 2.5 per cent for the year to March 2013.

Westpac and National Australia Bank economists have estimated that the carbon price has increased the CPI by just 0.4 per cent.

This means the Household Assistance Package has left many millions of Australians better off financially.

The package has been reviewed by Treasury and the Department of Families, Housing, Community Services and Indigenous Affairs.

This review found the tax cuts and increases in family payments, pensions and other benefits, together with growth in wages and other government payments, outstripped increases in the cost of living for typical low and middle income households over the year to March 2013.

### FORTNIGHTLY COST OF LIVING AND PAYMENT INCREASES FOLLOWING START OF CARBON PRICE

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<tbody>
<tr>
<td>Single maximum rate Age Pensioner</td>
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<td>Couple family with 3 children, 1 aged under 5</td>
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<td>and 2 aged 5-12 (incomes $70,000 and nil)</td>
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<td>Couple family with 2 children aged 5-12</td>
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<tr>
<td>(incomes $70,000 and $30,000)</td>
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Source: Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA), 2013
The Carbon Farming Initiative is providing new sources of income to farmers and other land managers when they reduce greenhouse gas emissions or store carbon on the land.

Carbon pollution can be reduced on the land through initiatives like growing trees and reducing emissions from livestock, fertiliser and waste deposited in landfills.

Farmers who carry out projects like this can earn carbon credits from the Government’s Carbon Farming Initiative. Each credit represents a tonne of carbon pollution that has been reduced or stored.

Farmers can then sell these credits to businesses like coal-fired electricity generators, which have a carbon price liability, or to companies that want to voluntarily offset their carbon pollution.

Carbon Farming projects need to be carried out under approved methodologies which ensure the projects deliver genuine emissions reductions.

Since the Carbon Farming Initiative started in 2011, 15 methodologies have been approved for carbon farming projects. These include: destroying methane from manure in piggeries and dairies; environmental plantings; savanna fire management; and capturing and combusting landfill gas.

To date there are 65 projects participating in the Carbon Farming Initiative.

**BLANTYRE FARMS PIGGERY**

Blantyre Farms was the first approved piggery project under the Carbon Farming Initiative and is successfully turning waste and methane gas into clean energy.

Edwina and Michael Beveridge have covered effluent ponds and are capturing methane gas from the manure produced by their 22,000 pigs. They have installed a biogas generator which takes this methane and uses it to generate renewable electricity to power the farm. Heat from the generator is also used to keep the piglets warm in their sheds.

This Carbon Farming project has reduced their monthly electricity bill from $15,000 to zero.

On top of that the farm is now earning $5,000 a month selling electricity back to the grid. And because the project reduces emissions of methane in the atmosphere, it will earn Carbon Farming Initiative credits which can be sold to emitters or other companies looking to offset their pollution.

The Beveridges have estimated they will earn another $175,000 a year from selling these carbon credits.

Their investment is expected to pay for itself in three years – making strong financial sense as well as helping the environment.
When waste is deposited into a landfill it decomposes, releasing methane into the atmosphere over many decades. Methane is over 20 times worse than carbon dioxide in warming the globe. If the methane is captured and destroyed, instead of being released into the atmosphere, these emissions are avoided which helps the environment.

If a landfill operator goes a step further and uses the methane to generate renewable electricity, then it displaces coal-fired energy, leading to further reductions in pollution. Canberra’s Mugga Lane landfill captures methane and uses the gas to generate 25,000 MWhs of renewable energy each year – reducing greenhouse gas emissions by more than 100,000 tonnes a year.

The carbon price and Renewable Energy Target make this clean energy more valuable on the wholesale electricity market. And the Carbon Farming Initiative makes it more valuable still.

Mugga Lane earns around three Carbon Farming credits for every MWh of electricity generated at this landfill. All up, the carbon price, the Renewable Energy Target and the Carbon Farming Initiative added over $3 million of value to this energy in 2012-13 – which quadruples Mugga Lane’s revenues.

In addition to carbon farming, the Government’s new Biodiversity Fund is investing over $1 billion to help land managers store carbon, enhance biodiversity and build greater environmental resilience across the Australian landscape.

Funded by carbon price revenue, the Biodiversity Fund supports the establishment of native vegetation and better management of existing native vegetation.

So far it has supported 312 projects worth $265 million to revegetate, rehabilitate and restore over 18 million hectares of land.

These projects have already generated more than 1.7 million carbon credits, reducing carbon pollution in the land sector by 1.7 million tonnes of greenhouse gas emissions.

The Government’s $4.29 billion Carbon Farming Futures initiative is using carbon price revenue to help farmers and land managers take advantage of carbon farming through research, training, and other support activities.

Carbon Farming Futures programs have already provided:

- $74.1 million for 88 research projects on ways to improve soil carbon, reduce pollution from livestock and crops, and adapt to climate change;
- $25.2 million for 59 projects to test research findings, demonstrate them to farmers and ensure laboratory results can be translated into practical on-farm measures; and
- $21.3 million for 24 projects to develop skills and knowledge on carbon farming for the livestock, dairy, horticulture, cotton and grains industries.

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Looking to the future

The incentives created by the carbon price flow through the economy.

They make clean technologies more competitive, and motivate lower carbon actions and decisions at all levels across the nation.

Over time, this will bring about profound shifts in business and consumer behaviour and to the way energy is sourced and used in Australia.

The latest emissions projections show that the carbon price together with the Renewable Energy Target has set up a long-term structure that will transform Australia’s energy market and its industrial structure.

It will mean Australia’s population and economy continue growing into the future without our emissions per person also growing.

It will enable Australia to demonstrate that our economy can be transformed and our international commitments to reduce carbon pollution can be met responsibly.

Australia’s emissions were around 25 tonnes per person in 2012 – making us the highest per person emitter among developed economies, higher even than the United States.

Without a carbon price, our emissions have been projected to increase to around 27 tonnes per person by the end of the next decade.

With the introduction of carbon pricing, emissions per person are projected to fall to around 21 tonnes by the end of the next decade, a reduction of nearly 20 per cent from levels that would otherwise occur.

The emissions intensity of the economy is also projected to decrease over the next couple of decades as capital and processes become significantly less emissions intensive.

By 2030 the emissions intensity of the economy is projected to decline by over 30 per cent from current levels.

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<tr>
<th>Year</th>
<th>Pollution per person</th>
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<td>2012</td>
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<td>21</td>
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<td>2035</td>
<td>13</td>
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Source: Australia’s Emissions Projections, 2012
These transformations will be achieved by unlocking ways of reducing pollution across all sectors.

Energy will be cleaner, industry more efficient, waste systems greener, and there will be better management practices used in agriculture and in how we manage our forest assets.

By 2020, a total of $20 billion is forecast to be invested in renewable energy sources. This is expected to increase the amount of renewable energy generated by 60 to 80 per cent.

Different opportunities will emerge in different sectors, with the most innovative producers being rewarded for finding new and cleaner ways of operating.

This transformation has started.

Since the introduction of the carbon price, emissions from electricity have declined, clean energy generation and investment have grown, and a wide range of sectors are looking at ways of cutting emissions.

Many of these new approaches have already been identified such as the installation of super-efficient lighting, heating and processing systems. Changes are already taking place in farming activities to lock carbon in our soils, protect forest assets and increase tree plantings.

But this is only the beginning.

The carbon price will continue to drive this transformation into the years and decades ahead – ensuring Australia’s economy becomes more competitive and we play our part as responsible global citizens in tackling climate change.

The rest of the world is acting to tackle climate change, increasingly through market mechanisms. The Clean Energy Future plan is the only environmentally effective, economically responsible and socially fair approach for our nation.

For more information:
www.cleanenergyfuture.gov.au
www.cleanenergymap.gov.au
Many Clean Energy Future programs are ongoing, with new projects continuing to emerge and attracting support from the Australian Government. The information in this brochure was correct at the time of its publication in June 2013.