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Working Paper

GHG MITIGATION IN AUSTRALIA: AN OVERVIEW OF THE CURRENT POLICY LANDSCAPE

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EXECUTIVE SUMMARY

This report outlines Australia’s policy framework for greenhouse gas emissions reduction, identifies areas of potential change in the near term, and attempts to evaluate the impact of current policies on Australia’s emissions trajectory to 2020. It assesses Australia’s international commitments, and the major policies of federal and state institutions to reduce emissions. It also assesses the likely success of these policies in achieving Australia’s emissions reduction goals.

Australia has bipartisan political support for its international commitment to reduce emissions by 5–25 percent from 2000 levels by 2020 (see Box 1), but very little bipartisan agreement as to how to achieve these reductions. The Clean Energy Act 2011 (and associated legislation known together as the Clean Energy Future package) implemented by the current federal government comprises a three-year fixed carbon price followed by a cap-and-trade scheme linked to the European Union (EU) emissions trading scheme and some Kyoto mechanisms. The federal government plans to change the legislation to bring forward the start of the cap-and-trade scheme to July 2014. When the trading scheme starts, annual caps on Australian emissions will be set by the federal government following recommendations by the independent Climate Change Authority (CCA). At this point, Australian entities will be able to use European and to a lesser extent Kyoto permits to meet up to 50 percent of their emissions liabilities, with the balance required to be domestically sourced permits. Full bilateral trading with the EU is intended to start in 2018.

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About the Series

This working paper is part of a series that provides an overview of the current policy landscape that key countries have pursued in the interest of GHG mitigation. For each country, the series:

- Describes the country's international mitigation pledge (e.g., GHG reduction commitment, Nationally Appropriate Mitigation Action), including assumptions and conditions associated with the pledge, and in what respect – if any – it is codified domestically
- Outlines the country's key government institutions and legal authorities for mitigating climate change
- Outlines major policy instruments related to GHG mitigation, current, and under development
- Explains what is known about the country's GHG trajectory
- Identifies issues to watch in the coming years

In addition to this carbon-pricing mechanism, central federal policies are the Large-Scale Renewable Energy Target (LRET) of 41,000 gigawatt hours (GWh) renewable energy generation by 2020, the Clean Energy Finance Corporation (CEFC), which has \$A10 billion to assist deployment of low-emission technologies, and the Carbon Farming Initiative (CFI), which is expected to have relatively little impact in the short term but significant long-term potential. State-based policies include feed-in tariffs for solar photovoltaic (PV), energy efficiency obligations, and laws regulating land clearing.

The federal Opposition, two center-right parties in long-standing partnership known as the Coalition, has promised to rescind the carbon-pricing mechanism—both the fixed price and the emissions trading scheme (ETS)—and dismantle the CCA and the CEFC. The Coalition proposes to review the RET in 2014, despite a 2012 review by the CCA that warned further biennial reviews would increase investment uncertainty. The Coalition proposes to replace the carbon-pricing mechanism with a fund to purchase emissions abatement via reverse auctions, but has provided little information on how this would operate or achieve Australia's target range.¹ Legislative obstacles may prevent the removal of the current carbon-pricing framework.

Assuming the Clean Energy Future package remains in place, Australia is able to achieve its full target range, if it so chooses.

However, the degree to which this achievement relies on the purchase of international permits as opposed to emissions reduction within Australia depends on a range of factors, including the influence of European permit prices on Australia's carbon price, the maintenance of the LRET, the winding back of state-based land-clearing laws and the implementation of policies under investigation such as light vehicle emission standards and a national energy saving obligation. Under current policies and prices, the Australian government projects that domestic emissions will increase, and the country would achieve its targets by purchasing international abatement. Recent changes to electricity consumption have not been factored into these projections.

The key risks to Australia's achievement of its emission targets are:

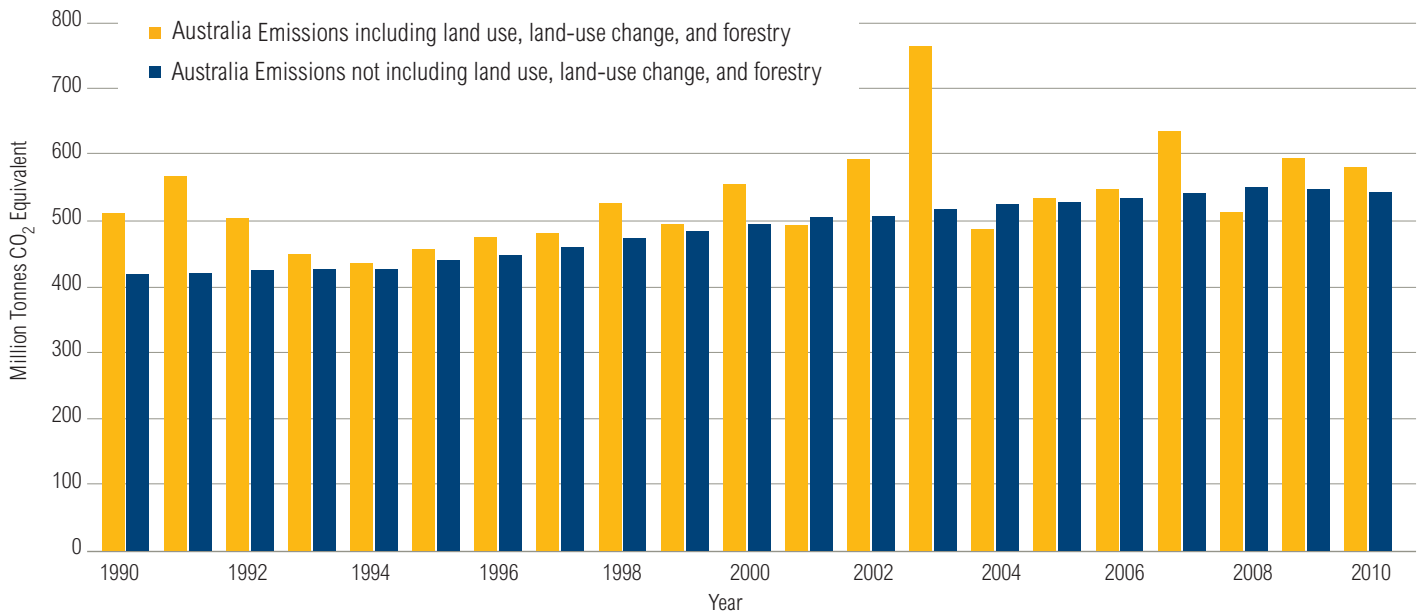
- **Ongoing policy uncertainty:** Investment in low-emission technologies is likely to be deterred by policy uncertainty around the future of Australia's carbon-pricing mechanism and the LRET. The repeal of the carbon-pricing mechanism by a Coalition government would exacerbate this problem unless the Coalition establishes a credible alternative carbon-price signal. In the absence of such a signal, investments that go ahead will attract higher risk premiums, increasing the cost of the low-carbon transition in Australia.
- **Over-reliance on international markets:** Currently low relative prices in the EU ETS and Clean Development Mechanism (CDM) would encourage Australian emitters to purchase international permits instead of reducing emissions within Australia. This practice could stymie domestic emission reductions, increasing Australia's reliance on imported emission permits. This situation, in turn, increases the exposure of the Australian economy to volatility in international carbon prices and slows the transition needed to achieve longer-term domestic transformation. Maintaining limits on international imports and direct domestic policy interventions to reduce emissions and boost energy efficiency (for example, stronger vehicle emission standards, regulatory approaches to limit fugitive emission increases, energy efficiency obligations on large energy users) would reduce these risks.

KEY METRICS

Australian greenhouse gas (GHG) emissions, excluding land use, land-use change, and forestry (LULUCF), increased by nearly 30 percent between 1990 and 2010 (Figure 1). Including LULUCF in this calculation results in

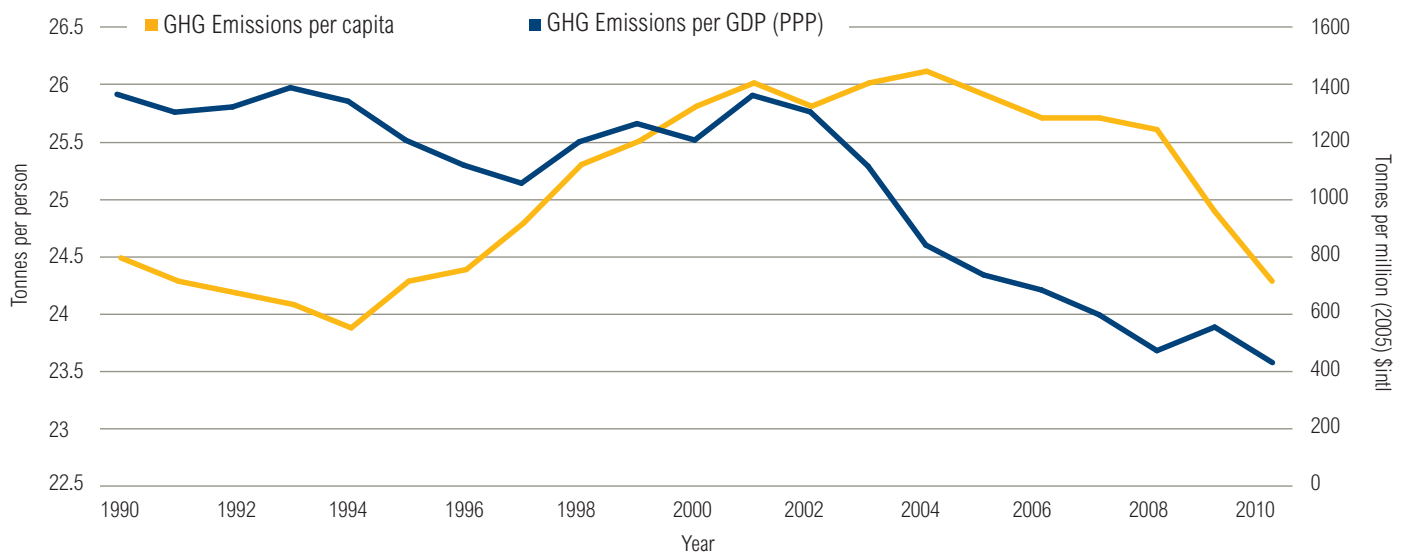
greater annual variation. In general, climatic variability, major natural disturbances and changes in the agricultural sector can lead to substantial changes in emissions and removals from the land sector. For example, in 2003, major wildfires were responsible for 190 million tonnes of carbon dioxide equivalent (CO₂-e) emissions.²

Figure 1 | Total Australian GHG Emissions



Source: Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, Australian Greenhouse Emissions Information System (AGEIS), UNFCCC Inventory.

Figure 2 | Australia GHG Emissions per Capita and GHG Emissions Intensity



Sources: Australian Government, National Greenhouse Gas Inventory for GHG emissions; World Bank, World Development Indicators for population and GDP.

As shown in Figure 2, Australian per capita emissions (excluding LULUCF) have remained between 24 and 26 tonnes of CO₂-e between 1990 and 2010. During this period, Australia's population increased by 30 percent. Since 2004, per capita emissions have been trending downward. In 2010, per capita emissions fell 5.6 percent below the 2000 level. Emissions intensity by GDP is also trending down, falling by 64 percent in 2010 compared with 1990 at approximately 480 tonnes CO₂-e per \$US1 million of gross domestic product (GDP).

Figure 3 shows that over the past 20 years, the proportion of natural gas in Australia's energy supply mix has slowly increased. The proportion of coal generation began to decline in the mid-2000s. Investment in the electricity generation sector over recent years has been dominated by open-cycle natural gas plants and, since 2010, by renewable energy (particularly solar and wind).³ Renewable energy investment has been driven by state and federal policies. Investment in new coal or combined-cycle gas plants has been inhibited by uncertainty regarding carbon pricing and, in the last few years, the decline in total demand for electricity. The decline in electricity demand has likely been driven by a range of factors including the high Australian dollar driving structural changes in the economy, the impact of energy efficiency measures, responses to high electricity prices, and increased residential use of solar photovoltaic (PV) panels.

I. INTERNATIONAL STATEMENTS OF FUTURE GHG MITIGATION

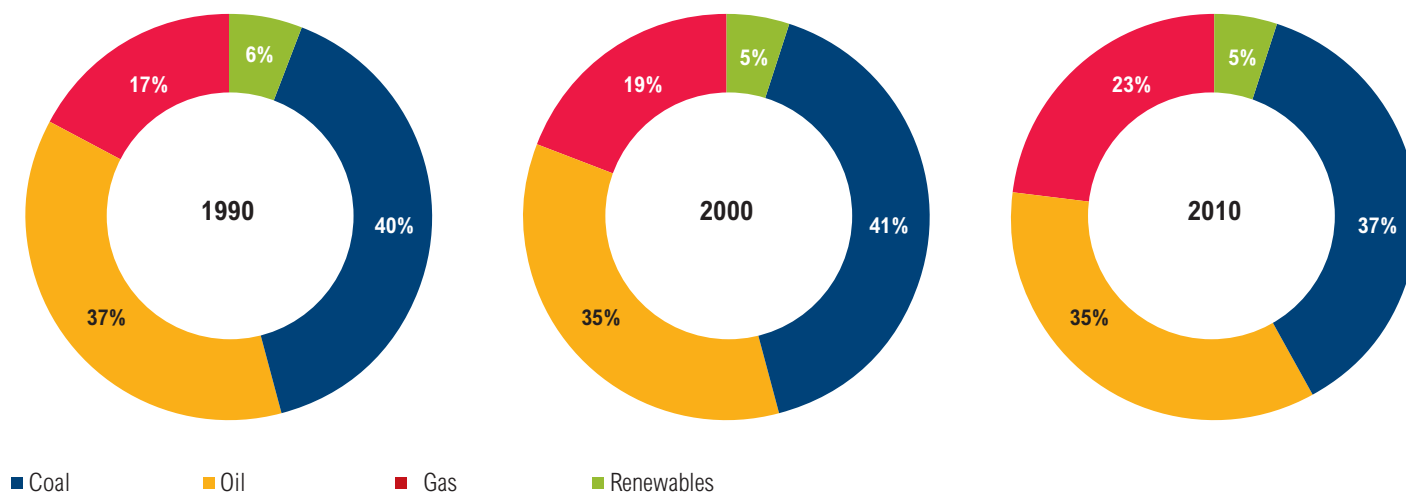
Australia's international pledges are:

- Under the Copenhagen Accord and Cancun Agreements, to reduce emissions by 5–15 or 25 percent below 2000 levels by 2020. The 5 percent target is unconditional and the higher targets are dependent on specific conditions (see Box 1).⁴
- Under the Kyoto Protocol, to limit emissions during the second commitment period (2013–20) to no more than 99.5 percent of 1990 levels.⁵ This limit is consistent with Australia's unconditional 5 percent target. Australia's full target range is also inscribed in Annex B of the Kyoto Protocol, but the target range is not legally binding.⁶

These international pledges are supported by both of Australia's major political parties, despite sharp disagreements as to the appropriate mechanism for achieving the targets.⁷

Table 1 expresses Australia's 5–25 percent target range against various baselines and in terms of absolute emissions reduction, emissions reduction per capita, and emissions intensity (emissions per unit of GDP). Since Australia's targets include the elements of LULUCF identified in Box 1, all targets in Table 1 are inclusive of LULUCF.

Figure 3 | **Australia's Fuel Mix, 1990, 2000, and 2010**



Source: Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES).

Box 1 | **Conditions Underlying Australia's GHG Pledge**

- Unconditional 5 percent reduction from 2000 levels by 2020
- Up to 15 percent reduction if a global agreement falls short of stabilizing emissions at 450 ppm and major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's (note "agreement" does not mean legally binding instrument)
- 25 percent reduction in the event of a global deal to stabilize CO₂-e emissions at 450 ppm or lower

The full set of conditions has been articulated in government press releases^{a,b} and was subject to detailed analysis by The Climate Institute.^c

Australia's conditions can be broken into two groups. Overarching conditions, such as "major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's," indicate the overall intent of the conditions and indicate the high-level commitments the government has made to the international community. A number of specific conditions have also been articulated, which elaborate the kinds of actions that may add up to achieving the overarching conditions but are not necessarily individually binding. For example, the development of "low carbon development pathways" by developing nations would not in itself be considered sufficient to move from the unconditional commitment.

A number of independent assessments indicate that the commitments and actions being undertaken by other nations warrant Australia strengthening its commitment to 10–15 percent on 2000 levels by 2020.^{d,e,f} Analysts have come to this conclusion based on an assessment of the conditions and international progress toward and after Copenhagen and/or analysis of the how Australia's commitments compare with commitments made by other major emitters (for example, emission reductions below business as usual to achieve targets).

Sectors covered: Sector/source categories of Annex A of the Kyoto Protocol (energy, industrial processes, solvent and other product use, agriculture, waste) as well as emissions from afforestation, reforestation, and deforestation.^g In its May 2013 federal budget, the government announced it would broaden coverage of LULUCF emissions to include net emissions from cropland management, grazing-land management, and revegetation activities within its second commitment period target (Kyoto Protocol voluntary article 3.4 activities).^h

The government projects that the inclusion of voluntary 3.4 activities will lessen Australia's abatement task by around 3 million tonnes in 2020. Others have suggested a much larger benefit.ⁱ The government is yet to detail the assumptions behind this assessment and assessing the validity of this claim is outside the scope of this paper. The government will release detailed analysis in its update of 2013 projections at the end of the year.

Gases covered: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆

Use of domestic or international carbon permits: Only domestic permits are eligible for use until the cap-and-trade scheme starts, after which liable entities must use at least 50 percent domestic permits and a maximum of 12.5 percent of certain other Kyoto permits to meet their obligations.^j (It is currently proposed that this limit on Kyoto permits will be strengthened to 6.5 percent in the first year of the cap-and-trade scheme.) Entities can also access EU ETS permits. Any imported units are counted as contributing to meeting the national target, and any exported units are not counted. Up to 5 percentage points of the 25 percent target could be met by the government purchasing international credits using carbon-price revenue no earlier than 2015.

Sources and Notes:

- a. Minister of Climate Change 2009.
- b. Department of Climate Change and Energy Efficiency 2010.
- c. The Climate Institute 2013.
- d. The Climate Institute 2010.
- e. Garnaut 2011.
- f. Jotzo 2010.
- g. Department of Climate Change and Energy Efficiency, "Fact Sheet."
- h. Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2013b.
- i. Macintosh 2013.
- j. Kyoto units, which are currently intended to be included and used beginning in 2015 (subject to restrictions) are: certified emission reductions (CERs) units and emission reductions units (ERUs), but with restrictions to exclude CERs and ERUs from nuclear energy projects, certain industrial gas destruction projects, large-scale hydro-electric projects that are inconsistent with World Commission on Dams criteria adopted by the European Union or certain time-limited land sector projects (known as temporary and long term CERs/ERUs) as these would expire before 2020 and Kyoto Removal Units (RMUs, which represent very long-term land sector offsets).

Table 1 | **Australia's Target Range Expressed under Various Baselines**

YEAR	TARGET (PERCENT REDUCTION)	ABSOLUTE CHANGE (PERCENT)	PER CAPITA CHANGE (PERCENT)	EMISSIONS INTENSITY CHANGE (PERCENT)
1990	Low -5	1	-31	from -35 to -46
	High -25	-20	-46	from -49 to -58
2000	Low -5	-5	-27	from -26 to -37
	High -25	-25	-42	from -42 to -50
2005	Low -5	-4	-22	from -19 to -27
	High -25	-24	-38	from -36 to -42

Data sources: World Bank, DIICSRTE, Center for International Earth Science. Calculation methodology based on Levin and Bradley 2010. See also World Bank. 2013; Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2013d; CIESIN 2002.

International Mitigation Pledge under the Kyoto Protocol

Australia's ratification of the Kyoto Protocol entered into force in domestic law in March 2008. Australia committed to limit emissions to no more than 108 percent of 1990 emissions, on average, during 2008–12. Under the Protocol's "Australia clause,"⁸ Australia was able to include in its emissions reduction baseline the emissions from deforestation. These emissions were particularly high in 1990, the baseline year, but were substantially lower in subsequent years because of changes in land management. This decline has enabled Australia to achieve its target under the first commitment period without achieving absolute emission reductions in other sectors.

Over the first four reporting years in the Kyoto period, Australia's net emissions averaged 105 percent of the base year level. Preliminary estimates suggest Australia will have overachieved its commitment during this period by 96.4 million tonnes CO₂-e.⁹

The Australian government has estimated that Australia's second commitment period pledge amounts to approximately 4.6 billion tonnes CO₂-e over the period 2013–20.¹⁰

Domestic Codification of International Pledges

The federal Clean Energy Act 2011 translates Australia's international pledges into domestic policy. The act aims to:

- Give effect to Australia's obligations under the Climate Change Convention and the Kyoto Protocol;
- Support the development of an effective global response to climate change, consistent with Australia's national interest in ensuring that average global temperatures increase by no more than 2° Celsius above preindustrial levels;
- Take action directed toward meeting Australia's longterm target of reducing its net GHG emissions to 80 percent below 2000 levels by 2050, in a flexible and cost-effective way;
- Put a price on GHG emissions in a way that encourages investment in clean energy; supports jobs and competitiveness in the economy; and supports Australia's economic growth while reducing pollution.¹¹

To achieve these aims, the act sets out a carbon-pricing mechanism, which covers approximately 60 percent of Australia's emissions. The mechanism began as a fixed price on GHG emissions for three years (beginning July 1, 2012) and is legislated to switch to a cap-and-trade scheme beginning July 1, 2015, though the government now plans to bring this forward to July 1, 2014. The purchase and surrender of carbon permits is administered by the Clean Energy Regulator (CER), an

independent statutory authority established by the Clean Energy Regulator Act 2011. The setting of emissions caps will be decided by the government following the advice of the Climate Change Authority (CCA), another independent agency created as part of the Clean Energy Future package. The CCA consists of nine appointed members with significant expertise in science, economics, and policy. The body is required to undertake reviews and make recommendations on the carbon-pricing mechanism and other core elements of federal carbon policy, but can also conduct its own research. The Climate Change Minister is obliged to respond to recommendations made by the CCA, but is not obliged to accept them.

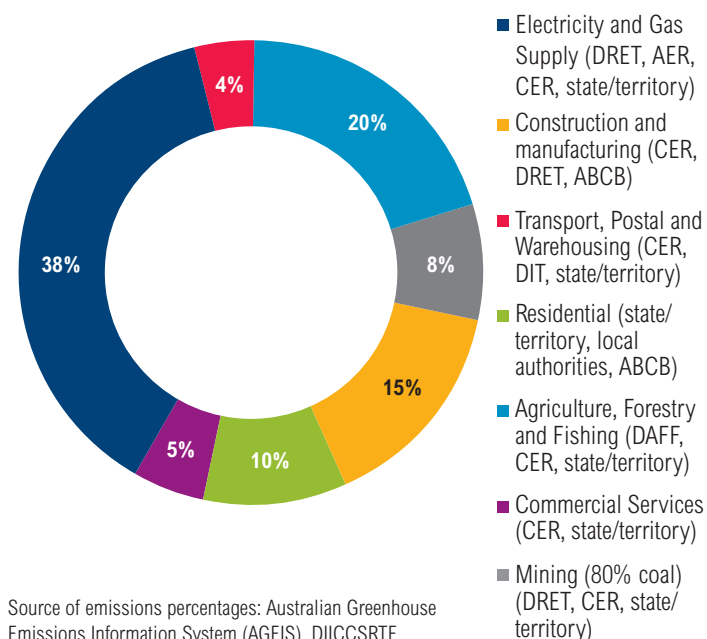
The legislation also contains default emissions caps for 2015 and beyond, in the event that Parliament disallows regulations setting Australia's caps. These default caps are intended to ensure emissions are reduced each year consistent with meeting Australia's unconditional 5 percent 2020 target at a minimum.

II. RELEVANT GOVERNMENT INSTITUTIONS AND LEGAL AUTHORITIES

Australia has a federal system of government. To establish nationally binding emissions-reduction legislation, the Commonwealth Government must ensure its passage through both federal houses of Parliament (the House of Representatives and the Senate). Similarly, repealing carbon-reduction laws requires passage through both houses. Administration of the carbon-pricing mechanism, the Renewable Energy Target (RET) and the Carbon Farming Initiative (CFI) is carried out by the independent CER. Other relevant policies are administered by federal agencies such as the Department of Resources, Energy and Tourism (DRET), and the Department for Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE).¹²

Australia's states and territories also have legislatures with the ability to set broad or sector-specific carbon policies. The Australian Capital Territory (ACT), for example, has a strong legislated 2020 emissions reduction target and is developing and implementing policies to achieve it. States also retain varying degrees of ownership and regulatory oversight over the electricity supply sector, despite the creation of a national electricity market (which excludes Western Australia and the Northern Territory). Other rel-

Figure 4 | Emissions from Key Sectors and their Corresponding Legal Authorities



evant areas of state authority include land use, planning, and management of extractive industries.

States and territories' differing authorities and agendas result in a high degree of inconsistency among subnational jurisdictions. In addition, relationships between federal and state policies may, depending on the specific instance, be characterized by overlap, duplication, complementarity, or conflict. For example, the achievement of the federally mandated RET may be facilitated or impeded by state government policies regarding development approvals for large-scale generation. The Council of Australian Governments (COAG) is the primary intergovernmental forum for negotiation between state and territory governments and the Commonwealth Government. COAG has instituted a process for streamlining climate and energy policies based on broad principles of complementarity;^{13, 14} however, each government is free to interpret COAG's recommendations, suggesting the process will do little to drive harmonization.

Australia also has more than 500 local governments whose responsibilities for environmental management and planning can affect GHG emissions. For example, some local governments have set up mechanisms to finance environmental upgrades for buildings.¹⁵ Some local authorities are liable entities under the carbon-pricing mechanism because of their operation of landfill facilities.

III. OVERVIEW OF MAJOR POLICIES

Since the submission of Australia's fifth National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) in 2010, the country has implemented several major reforms to reduce emissions and has amended a number of policies. Other policies are in development or under investigation. This report does not cover the entire spectrum of policies with emissions reduction objectives. Instead, it focuses on policies most likely to make a measurable reduction in Australia's emissions by 2020. These policies tend to include standards and financial incentives and/or penalties. The policies and programs discussed in Table 2 are nationally applied and federally funded, unless otherwise specified.

Cross-Cutting Economic Incentives

Australia's Carbon Pricing Mechanism

The carbon pricing mechanism is the principal instrument for achieving Australia's emissions reduction targets. The mechanism, which consists of a rising fixed price for the years 2012–15 and a cap-and-trade scheme thereafter, is applied to approximately 60 percent of Australia's emissions. Covered emissions include most scope 1 emissions¹⁶ from the following source categories:

- Electricity generation
- Stationary energy combustion
- Landfills
- Wastewater
- Industrial processes
- Fugitive emissions

Table 2 | Selected Sectoral and Cross-Cutting Policies Likely to Reduce Australia's Domestic GHG Emissions

SECTOR	POLICY
Cross-cutting economic incentives	<ul style="list-style-type: none"> ■ Clean Energy Act 2011 – emission cap, carbon price, and subsidies
Electric power	<ul style="list-style-type: none"> ■ Large-scale Renewable Energy Target ■ Small-scale Renewable Energy Scheme ■ Australian Renewable Energy Agency (ARENA) ■ Clean Energy Finance Corporation (CEFC) ■ Carbon capture and storage flagships ■ State-based feed-in tariffs for solar PV
Industry	<ul style="list-style-type: none"> ■ Energy Efficiency Opportunities (EEO) program for large industrial energy users
Buildings	<ul style="list-style-type: none"> ■ Building codes ■ Minimum energy performance standards for products and equipment ■ Commercial Building Disclosure program ■ State-based energy saving obligations ■ National Energy Saving Initiative (under investigation)
Transport	<ul style="list-style-type: none"> ■ Reduced fuel tax credits equivalent to carbon price ■ Emissions performance standards for light vehicles (in development)
Agriculture, forestry, and other land use	<ul style="list-style-type: none"> ■ Carbon Farming Initiative ■ State-based land-clearing laws

Note: Grey denotes policies currently under development.

Some emissions within these source categories are excluded from coverage. The exclusions fall into two categories:

1. Emissions that are not covered by the mechanism but are covered by an equivalent emissions price:
 - Nontransport or off-road use of petroleum, excluding petroleum used by agriculture, forestry, and fishing
 - Synthetic GHGs (hydrofluorocarbons and sulphur hexafluoride)
 - Aviation fuel
2. Emissions without a carbon price or equivalent:
 - Petroleum fuels used by cars and light commercial vehicles
 - Petroleum used by agriculture, forestry, and fishing
 - Small use of coal
 - Decommissioned mines
 - Waste deposited before July 1, 2012
 - Subthreshold facilities (those emitting less than 25,000 tonnes annually)

WHO MUST PAY?

Entities liable to pay the carbon price are operating facilities emitting at least 25,000 tonnes of CO₂-e annually. An organization can be a liable entity if it is a direct emitter or if it supplies or uses large quantities of natural gas. Liable entities must report their emissions or potential emissions under the National Greenhouse and Energy Reporting (NGER) Act 2007 and either surrender a carbon permit to the government for every tonne of carbon pollution they produce or pay a unit shortfall charge. Some of the carbon units will be freely distributed through industry assistance programs (see “Industry” section).

To ease the impact of the carbon price, the government provides assistance to industries for certain emissions-intensive trade-exposed (EITE) activities. Under the federal Jobs and Competitiveness Program, certain categories of industry (mostly manufacturing and metal processing) receive free carbon permits for EITE activities worth up

to 94.5 percent, or in some cases 66 percent, of industry-average carbon costs in the first year of the carbon price.¹⁷ The assistance level is reduced by 1.3 percent each year and guaranteed until 2017. The Productivity Commission, an independent body that provides research and advice to the government on all aspects of microeconomic reform, conducts periodic reviews of the operations of the assistance program and the impact on EITE industries as well as the economic and environmental efficiency of assistance under the program.

The Coal Sector Jobs Package provides about \$A 570 million over four years to coal mines with high levels of fugitive emissions.¹⁸ The coal mining sector also receives \$A 40 million to support emissions-reduction technologies and strategies.¹⁹ The steel industry receives \$A 300 million over six years to encourage a transition to low carbon technologies.²⁰

A clean technology grants program provides around \$A 850 million to help manufacturers invest in low emissions and energy-efficient technologies and \$A 200 million to support emissions-reduction research, develop, and commercialize low-emissions technologies.²¹

HOW THE PRICE AND CAPS ARE SET

For the year beginning July 1, 2012, the price was fixed at \$A 23 per tonne of CO₂-e. It rose to \$A 24.15/tonne on July 1, 2013 and is set to rise to \$A 25.40/tonne on July 1, 2014. During this period, the government issues an unlimited number of carbon units at the specified price. These units will be automatically surrendered and no banking is allowed.

When the scheme switches to a cap-and-trade system, the carbon pollution cap will limit the total carbon units that the government can issue (by auction and in some cases free distribution) each year. At this point, international permits can be surrendered to meet up to 50 percent of an entity's carbon liability, though only 12.5 percent of offsets may be purchased through the approved Kyoto permits.²² As part of the change to bring forward the move to a cap-and-trade scheme, the government is proposing to limit the use of Kyoto units in the first year of the scheme to 6.5 percent of a company's liability.²³ The remaining international permits may be purchased through the EU ETS. Given the level of exposure to the EU ETS, European permit prices are expected to set the price of permits in Australia from the beginning of the cap-and-trade scheme. The government has proposed that the opening price at auction will be set at 80 percent of the EU allowance price for the duration of the interim link of the schemes.

In 2014, the Australian Government intends to announce annual emissions cap levels for the five years starting from FY 2014–15. Each subsequent year, it will announce the cap for the fifth future year to maintain five years of known caps. Under the Clean Energy Act, when setting the caps, the government must consider “Australia’s international obligations under international climate change agreements” and the most recent report from the CCA that deals with carbon pollution caps and carbon budgets. The government may also consider “undertakings relating to the reduction of greenhouse gas emissions that Australia has given under international climate change agreements” and “voluntary action to reduce Australia’s greenhouse gas emissions.”²⁴ However, the legislation also contains default emissions caps for 2015 and beyond, in the event that Parliament disallows regulations setting Australia’s caps.

HOW THE REVENUE IS USED

Carbon price revenue is directed toward households and industry. More than half the estimated carbon price revenue (estimated to total \$A 31 billion for the first five years²⁵) will be provided to households via tax cuts and increases in pensions, allowances, and other benefits to assist with the impact of carbon price-driven rises in the costs of goods and services. A further \$A 12.3 billion will be spent on industry assistance through the Jobs and Competitiveness Program and the Clean Technology Program during the first five years of the carbon price.

Significant revenue is directed to clean energy investment via the \$A 10 billion Clean Energy Finance Corporation and the \$A 3.2 billion Australian Renewable Energy Agency (see “Government Investment in Renewable Energy”).

IMPACT ON ENERGY SUPPLY

The carbon price has several direct impacts on Australia’s energy consumption. It raises the wholesale price of electricity and improves the competitiveness of lower-emission forms of generation. By raising the electricity prices, it also encourages more efficient energy use. In the long term, it is expected to drive investment in low-emissions generation. Currently, this role is held by the Renewable Energy Target (RET), although the carbon price supports the RET (see Box 2). In addition, state-based feed-in tariffs for small-scale solar and energy saving schemes are lowering demand for electricity supplied by large generators.

Electric Power

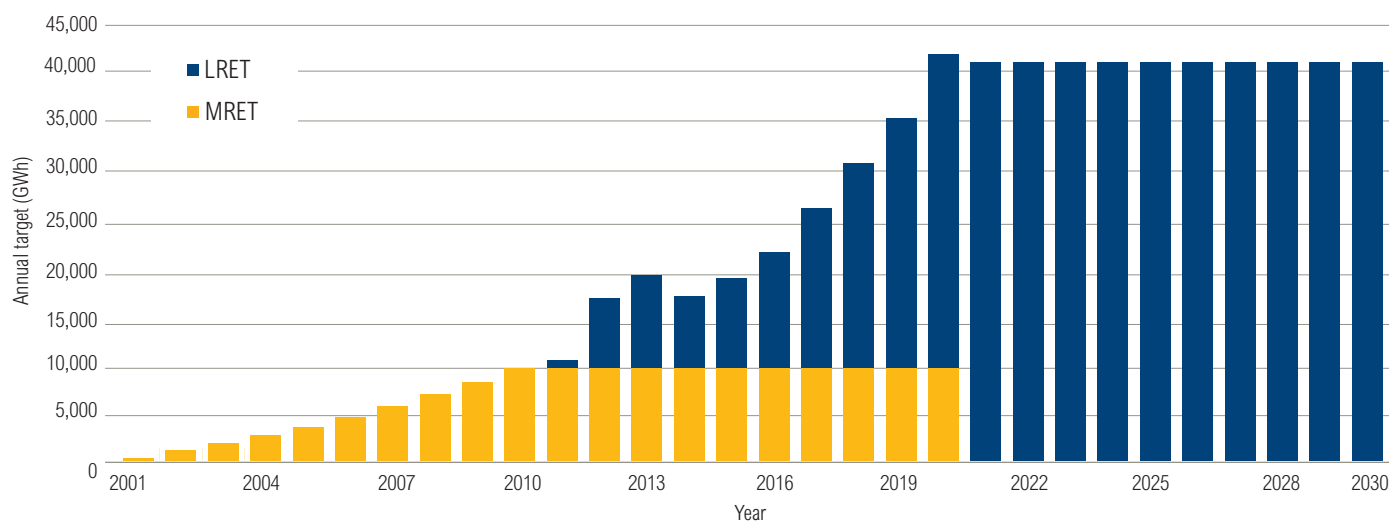
Renewable Energy Target (RET)

The Renewable Energy Target (RET) is the main driver of renewable energy investment in Australia. Originally it was established as the Mandatory Renewable Energy Target (MRET) in 2001 with the aim of increasing electricity generation from renewable sources by 9,500 gigawatt hours (GWh) by 2010.²⁶ In 2009, the government expanded the target to 45,000 GWh by 2020. The 45,000 GWh target was projected to approximate 20 percent of electricity generation in 2020.²⁷ The following year the scheme was split into two: with utility-scale generation (mostly wind) captured by the Large-Scale Renewable Energy Target (LRET), which has annual fixed targets and an ultimate target of 41,000 GWh in 2020,²⁸ and household-scale renewables such as solar PV panels covered by the Small-Scale Renewable Energy Scheme (SRES), which is uncapped and, at the time of the separation of the RET, was expected to contribute at least 4,000 GWh by 2020.²⁹ Figure 5 shows the annual targets legislated for the MRET and LRET.

To meet their obligations under the enhanced RET, liable entities (i.e., general electricity retailers) must create or purchase renewable energy certificates (officially termed Large-Scale Generation Certificates (LGCs), for energy generated under the LRET, and Small-Scale Technology Certificates (STCs) for energy generated by eligible installations under the SRES) or pay a shortfall fee of \$A 65 per certificate. Each certificate represents 1 megawatt hour (MWh) of renewable electricity generated above a 1997 baseline (calculated for facilities operating before this point by determining their average annual renewable energy generation during 1994–96).³⁰ When the RET was expanded in 2009, a solar credits scheme allowed the first 1.5 kw of each solar PV system to generate upfront five certificates for every 1 MWh it was expected to produce over its nominal 15-year lifetime. The solar credits scheme was designed to phase out in 2015, but in light of faster-than-expected reductions in solar PV costs, the multiplier was wound down earlier and ceased at the end of 2012.

Despite the uncertainty created by the continual amendments to the scheme, the RET has succeeded in mobilizing \$A 18 billion of investment in renewable energy since 2001.³¹ Wind generation has more than doubled in the last five years, from about 2.6 terawatt hours (TWh) in 2007 to 7.7 TWh in 2012.^{32 33} Driven by both the RET and state

Figure 5 | Annual Binding Targets for Renewable Electricity Generation under the Renewable Energy Target



Source: Australian Government, Renewable Energy (Electricity) Act 2000.

feed in tariffs (see “Government Investment in Renewable Energy”), rooftop solar PV grew from effectively zero five years ago to nearly 1 TWh in 2011.³⁴ In total, the RET has led to an additional 3.5 percent renewable electricity generation in 2011.³⁵ DIICCSRTE has estimated that abatement from the target averaged 8.8 Mt CO₂-e per year between 2008 and 2012, and that the RET will reduce annual emissions by almost 30 Mt CO₂-e in 2020.³⁶

The RET is subject to biennial review by the CCA, with the review scope limited only by the requirement that the CCA’s recommendations be consistent with the objects of the Renewable Energy (Electricity) Act. Several electricity market participants have called for the fixed GWh target to be reduced because recent declines in electricity demand have seen gas and coal power lose market share to renewables.³⁷ If electricity demand growth remains flat as projected, the increasing supply of renewables raises the possibility that the RET could achieve a greater than 20 percent share for renewables.³⁸ The CCA’s 2012 review recommended that the RET framework remain essentially unchanged and that future reviews be reduced in frequency to four-year intervals to improve industry stability. The government has accepted most of the recommendations, including retaining the fixed 41,000 GWh target and reducing the frequency of reviews,³⁹ but has not introduced legislation to change the frequency of reviews. However, the Opposition has announced its intention to review the RET again in 2014 if it wins the 2013 election.⁴⁰

Government Investment in Renewable Energy

The Commonwealth Government is providing funds for investment in renewable energy research, development, and deployment through the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation (CEFC). ARENA is an independent statutory authority established in 2011 with \$A 3 billion funding to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia. It also serves as a hub for research and information on renewable energy technologies and advises the Minister for Resources, Energy and Tourism.⁴¹ Additional funding is potentially available from discretionary dividends from CEFC as well as carbon price revenue currently allocated to industries.

For renewable energy projects closer to commercial deployment, the government has established the \$A 10 billion CEFC. The CEFC’s objective is to de-risk investment in renewable energy, low-emissions energy, and energy efficiency by providing finance at lower-than-market rates. Legislation establishing the CEFC was passed in June 2012, and the corporation was expected to commence its investment operations on July 1, 2013.⁴² At least \$A 5 billion is expected to go to renewable energy, with up to another \$A 5 billion available to low-emission energy (defined to include fossil fuel use which produces less than half the emissions intensity of comparable uses)⁴³ and energy efficiency. The CEFC

Box 2 | Relationship between the Renewable Energy Target and the Carbon-Pricing Mechanism

The introduction of carbon pricing improves the competitiveness of renewable electricity generation, and is likely to have a dampening effect on the price of Large-Scale Generation Certificates (LGCs). As LGCs act as a “top-up” on wholesale electricity prices to achieve market competitiveness, the introduction of the carbon price reduces the size of the necessary top-up. During the fixed price period of the carbon-pricing mechanism, emissions reductions achieved through the Renewable Energy Targets (RETs) are additional to those achieved through the carbon price.

With the commencement of the internationally linked trading scheme, the RET will not drive emissions reduction additional to the cap, but it will increase the proportion of abatement achieved domestically. Because Australia’s carbon price will likely be shaped by international

prices, the RET is unlikely to affect the carbon price in Australia, and will therefore not affect the abatement decisions of liable entities outside the electricity sector.

The Climate Change Authority (CCA) estimates that abatement achieved through the RET costs on average \$A 40 per tonne. In the short term, the RET is expected to increase the cost of achieving an emissions cap, because RET-driven emissions reduction will replace some cheaper opportunities (see Table B2.1).

The CCA has also modelled a range of scenarios on the impact of the RET.^a

Note

a. See Climate Change Authority 2012a.

Table B2.1. | CCA Scenarios Showing the Impact of Carbon Prices on Renewable Electricity Generation and Emissions Reduction

SCENARIO	ASSUMED CARBON PRICE	RENEWABLE GENERATION AS PROPORTION OF ELECTRICITY BY 2020	CUMULATIVE DOMESTIC EMISSION REDUCTION TO 2030
Low carbon price (CP1)	Fixed price falls to \$A 11 in 2015, rises annually at 5%/year + inflation then jumps to meet global price of \$A 36 in 2022	26 percent	217 Mt
High carbon price (CP2)	Fixed price floats at \$A 26 in 2015, rises annually	26 percent	131 Mt
No carbon price (Zero Carbon)	Fixed price falls to \$A 0 in 2015	26 percent	-137 Mt
Updated 20 percent, carbon price as for CP1	LRET reduced to 26,400 GWh in 2020	20 percent	119 Mt

Source: Climate Change Authority 2012a

is explicitly prohibited from investing in carbon capture and storage or nuclear power projects. The Opposition has promised to abolish the CEFC if it wins the 2013 election.

Australia’s states and territories have also implemented policies to encourage emission reduction in the electricity sector. In 2009–10, most states established feed-in tariffs (FIT) for small-scale solar PV with different metering models, eligible system sizes (usually 5–30 kW, but up to 100 kW in Victoria), and scheme durations. Tariffs ranged from \$A 440–600/MWh. Because the combination of generous FITs, the solar credit scheme, and the global decline in PV panel prices drove a massive and unsustainable boom in PV panel purchases, many states have reduced the prices they offer for solar PV generation. Nonetheless, the electricity generated by small-scale solar PV reached 1 TWh in 2011 and is projected to reach 7 TWh in 2020.⁴⁴

Carbon Capture and Storage

Australia has committed substantial investment to carbon capture and storage (CCS) research and development, establishing the Global CCS Institute (GCCSI), a \$A 1.2 billion CCS Flagships Program and a portfolio of demonstration projects.⁴⁵ Australia has also made progress in implementing necessary regulations to enable offshore carbon storage,⁴⁶ and announced in May 2013 \$A 60 million to fund a national CO₂ infrastructure plan to develop information on the country’s storage capacity and drilling and transport needs.⁴⁷

However, a pathway to commercial-scale CCS deployment is absent. Modelling by Treasury finds that the carbon price will not enable CCS deployment before the mid- to late-2030s.⁴⁸ The Commonwealth Government had promised in 2010 to introduce an emissions perfor-

mance standard (EPS) and CCS-readiness requirements for new coal-fired power stations. This commitment was withdrawn the following year on the basis that it would no longer be necessary under the carbon-pricing mechanism. In addition, CCS is specifically excluded (as is nuclear energy) from eligibility for financing by the CEFC.

Industry

Companies are required to pay the carbon price if they operate facilities that exceed 25,000 tonnes of CO₂-e per year, or consume large amounts of natural gas. As discussed above, emission-intensive, trade-exposed industries are eligible for assistance in the form of free permits to offset their costs. They also receive a partial exemption from the requirement to comply with the RET, worth roughly \$A 184 million in 2011. This exemption is paid for by other electricity consumers at a rate of about \$A 1.02/MWh.⁴⁹

The Department of Resources, Energy and Tourism runs the Energy Efficiency Opportunities program. Participation in the program is mandatory for all corporations using more than 0.5 petajoules (PJ) of energy per year. These corporations are responsible for 45 percent of total energy consumption in Australia.⁵⁰ Participants must identify and disclose potential energy saving opportunities, but are not required to implement them. Just over half of identified opportunities have been implemented; those that are not implemented tend to have payback periods longer than two years. With the completion of the program's first cycle (2006–11), implemented savings resulted in an emissions reduction of 8.2 Mt CO₂-e per year and net financial benefits of \$A 800 million per year, or a cost of -\$A 95/t CO₂-e.⁵¹ Almost half of the savings came from the metals manufacturing and oil and gas sectors. Since July 1, 2012, businesses below the energy consumption threshold were able to participate voluntarily. On July 1, 2013, the scheme was extended to new developments. As of May 2013, 309 corporations were registered under the scheme.⁵²

Buildings

The buildings sector accounts for 24 percent of Australia's indirect GHG emissions, about 137 Mt CO₂-e in 2007–08.⁵³ Just over half the sector's emissions (13 percent of indirect emissions) are from residential buildings, while the rest are from commercial buildings.⁵⁴ Policies to reduce buildings' emissions include minimum energy performance standards for appliances and equipment, which,

along with state energy saving schemes encourage take-up of energy-efficient products. Revisions to the building code drive construction of more energy efficient buildings, while ratings tools and disclosure requirements for large commercial office buildings facilitate market rewards for better energy performance. The introduction in 2012 of Clean Building Managed Investment Trust legislation provides for a lower rate of withholding tax for foreign investment in more energy efficiency and sustainable new construction that uses Green Star and National Australian Built Environment Rating System (NABERS) rating systems.⁵⁵ In addition, some states set energy performance requirements for major renovations and some local councils have recently begun to offer financing for upgrades that improve buildings' environmental performance. However, this patchwork of policies does not capture all the potential opportunities to reduce emissions from the sector because of most policies' limited parameters, low ambition in standard setting, and the slow turnover of building stock. The disconnected nature of policies in this sector also makes it difficult to assess the abatement associated with each policy.

Minimum Energy Standards for Appliances

Minimum energy performance standards (MEPS) for appliances and products are implemented through a collaborative initiative called the Equipment Energy Efficient Program (E3) involving all jurisdictions in Australia and New Zealand. It is mandatory for a range of electrical products manufactured in or imported into Australia to meet the MEPS levels specified in the relevant Australian standards.⁵⁶ The E3 program is expected to deliver savings of emission reductions of 250 Mt CO₂ over 2000–20, with abatement of approximately 19.5 Mt CO₂ per year by 2020.⁵⁷ The federal Greenhouse and Energy Minimum Standards Act (GEMS) 2012 replaces the multijurisdictional regulators with a single GEMS Regulator. This change is intended to make national implementation simpler and quicker and enable MEPS to be extended to nonelectricity powered products and products that affect energy consumption, such as insulation, window glass, and air conditioner ducting.⁵⁸

Several states (New South Wales (NSW),⁵⁹ Victoria,⁶⁰ South Australia,⁶¹ and Australian Capital Territory (ACT)⁶²) have energy saving obligations for electricity and gas retailers. Retailers are required to meet energy efficiency targets by implementing energy savings, encouraging their customers to do so, or paying a penalty. The schemes vary signifi-

cantly in terms of coverage, eligibility, targets, and assessment (Table 3). For example, in NSW and ACT, the targets are based on percentage of electricity sales, whereas targets in Victoria and South Australia are based on annual fixed amounts of emission reduction. The South Australia and ACT schemes are restricted to residential energy use, while Victoria and NSW also cover business energy use. In NSW, the business sector has been the source of the most savings to date. NSW and Victoria are working on harmonizing their schemes. By 2014, total cumulative abatement projected to result from all the schemes is around 25 Mt CO₂-e.⁶³ However, this projection is based on deemed lifetime abatement resulting from approved activities, rather than estimates of actual abatement achieved. Furthermore, the schemes' success in driving emissions reduction additional to business as usual has not been evaluated. Consequently, their emissions reduction achievement may be significantly less than projected.

Building standards are set by the Australian Building Code Board (ABCB), a Council of Australian Government standards-writing body. Under the Building Code of Australia (BCA) 2010, all new dwellings must be built to meet

a six-star energy efficiency rating under the Nationwide House Energy Rating Scheme (NatHERS) or equivalent, up from a five-star, NatHERS rating in 2006. The highest rating is ten stars meaning that the house needs no heating or cooling to achieve thermal comfort. Star ratings are calculated for 69 climate zones, so that a house in Darwin may be rated six stars if its thermal load is below 349 megajoules per square meter per year (MJ/m²/year), but a house in Sydney East must have a thermal load below 44 MJ/m²/year to achieve the same star rating.⁶⁴

The main ratings scheme for nonresidential building energy performance is the National Australian Built Environment Rating System (NABERS), administered by the NSW Office of Environment and Heritage (NSW OEH). Ratings can range from 0–6 and cover energy, water, waste, and indoor environment. On average, an improvement of one NABERS energy star equates to a decrease in GHG emissions of 15 percent based on average electricity grid emissions.⁶⁵ NABERS ratings are a component of mandatory commercial building energy efficiency rating disclosure for large office buildings required under the federal Building Energy Efficiency Disclosure Act 2010.⁶⁶ This act requires sellers or lessors of large office build-

Table 3 | State Energy Savings Schemes

STATE	SCHEME	TARGET(S)	DESCRIPTION
NSW	Energy Savings Scheme (ESS)	<ul style="list-style-type: none"> Annual targets expressed as percentage of annual NSW electricity sales Scaling up from 0.4 (2009) to 4.0% (2014) 	<ul style="list-style-type: none"> Commenced July 1, 2009, and will continue until 2020 or until national scheme is introduced Covers electricity only Residential, commercial and industrial
South Australia	Residential Energy Efficiency Scheme (REES)	<ul style="list-style-type: none"> Annual targets expressed as t CO₂ abatement Scaling up from 155,000 (2009) to 410,000 (2014) 35% of target must be achieved within low-income households 	<ul style="list-style-type: none"> Commenced January 1, 2009 Covers electricity and gas Residential only – 35% must be low-income households
Victoria	Energy Saver Incentive Scheme (ESI)	<ul style="list-style-type: none"> Annual targets expressed as Mt CO₂ abatement 2.7/year (2009–11); 5.4/year (2012–14) 	<ul style="list-style-type: none"> Commenced January 1, 2009 and will continue in three-year phases until January 1, 2030 Covers electricity and gas Residential and commercial
ACT	Energy Efficiency Improvement Scheme (EEIS)	<ul style="list-style-type: none"> Targets expressed as percentage of total electricity sales Scaling up from 7% (2013) to 14% (2015) 25% of target must be achieved within low-income households 	<ul style="list-style-type: none"> Commenced January 1, 2013 and will be reviewed in 2014 Covers electricity (target base) and gas (savings) Residential and commercial– 25% must be low-income households

Note: The Commonwealth Government is also investigating a National Energy Saving Initiative to replace the current state-based schemes with a single consistent scheme across the country (See section 4).

ings to provide an up-to-date building energy efficiency certificate (BEEC), revealing the building's energy performance, at the point of sale or lease.

Transport

The transport sector includes emissions from the direct combustion of fuels in transportation by road, rail, domestic aviation, and shipping. Transport is responsible for about 17 percent of Australia's emissions and is a fast-growing emission source.⁶⁷ From 1990 to 2011, transport emissions increased by 38 percent (23 Mt CO₂-e). In 2012, transport emissions increased by 2.8 percent from 2011 and totalled 91.5 Mt CO₂-e.⁶⁸

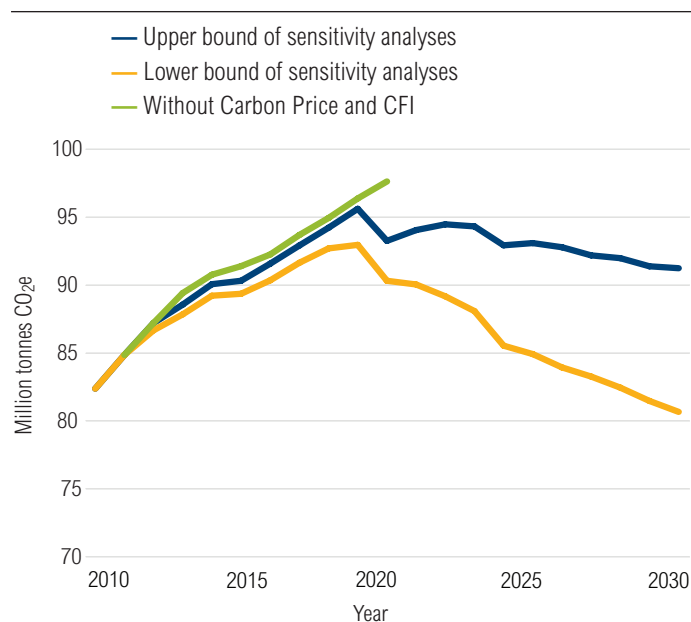
Passenger cars were the largest transport source, contributing nearly half of all transport emissions (42.5 Mt CO₂-e).⁶⁹ However, this sector is growing much more slowly than others: emissions from heavy-duty and light commercial vehicles increased by over 80 percent since 1990. Emissions from domestic air transport have experienced the largest growth since 1990, increasing to 7.7 Mt CO₂-e.⁷⁰

The carbon price is indirectly imposed on some sources of transport emissions via an equivalent reduction in business fuel tax credits.⁷¹ This mechanism applies to off-road vehicles (such as trucks at mining sites), domestic shipping, and rail. An equivalent carbon price is imposed on domestic aviation via an increase in fuel excise. However, the following vehicles are exempt from both the carbon price and the fuel tax credits reduction:

- All road passenger vehicles and commercial vehicles under 4.5 tonnes
- All vehicles used for agriculture, forestry, and fishing, or powered by natural gas or liquefied natural gas (LNG)

Beginning in 2014, heavy trucks and buses are to be subject to the carbon price. By 2020, the government projects that the carbon price will reduce transport sector emissions by 5 Mt CO₂-e, driven by fuel substitution, adoption of hybrid and electric vehicles, and increasing use of biodiesel. By 2030, transport emissions are expected to fall by 13 Mt CO₂-e.⁷² Figure 6 shows government projections of the impact of the carbon price and Carbon Farming Initiative on transport sector emissions.

Figure 6 | **Projections of Transport Emissions with and without the Carbon Price and the Carbon Farming Initiative (CFI)**



Source: DCCEE, Transport Emissions Projections 2012.

Note: The range of estimated emissions represents change assumptions around oil prices.

Agriculture, Forestry, and Other Land Use

Carbon Farming Initiative

The Carbon Farming Initiative (CFI) was created by separate legislation as part of the Clean Energy Future package and commenced in December 2011. The Clean Energy Regulator administers the program. It is a voluntary carbon offset scheme through which farmers and land managers earn Australian carbon credit units (ACCUs) by storing carbon primarily in vegetation (sequestration projects) and by reducing GHG emissions from agriculture and other land uses (emission reduction or avoidance projects) using approved methodologies to quantify the reduced emissions.⁷³ In May 2013, eligibility was expanded to include enhancing soil carbon, applying biochar to agricultural soils, and restoration of rangelands, although no methodologies to undertake these activities have yet been approved.⁷⁴ Methodologies may be proposed by industry but approved by the CFI's Domestic Offsets Integrity Committee (DOIC). Activities eligible under the CFI include those accepted under the Kyoto Protocol, meaning that liable entities may purchase ACCUs to meet their emissions obligations.

To ensure integrity, the following standards must be met by the CFI projects:⁷⁵

- Abatement must be measurable and verifiable; that is, the project must use approved methodologies.
- Measurement methods must be supported by peer-reviewed science and consistent with Australia's international accounts.
- Measurement methods must account for leakage and variability and use conservative assumptions. To address these issues, a 5 percent risk buffer applies; that is, for every 100 tonnes of carbon stored by a project, only 95 credits are issued.
- Abatement must be additional to what would occur in the absence of the project. A two-part test establishes additionality:
 - The projects are not required by law; and
 - The activity goes further than the "common practice" in a given industry and/or region.
- Sequestration must be permanent; that is, the carbon stored from this project is maintained for at least 100 years.

Table 4 provides estimates by DIICSRTE of potential annual abatement in 2020, prior to Australia's increased land sector coverage under Kyoto.

These official estimates assumed a low uptake, based on hurdles such as a low rate of carbon management expertise among landholders, high start-up costs, low competitiveness of carbon projects against traditional land-uses, and an initial lack of commercially viable examples. These estimates also assumed a lower price for ACCUs generated by activities not covered at that point by Australia's Kyoto commitment. This price distinction would no longer apply, meaning that the amount of abatement from these activities may be underestimated, although practical difficulties are still likely to keep it low. Although abatement is expected to be modest in the short to medium term, the long-term benefits are likely to include innovation and increased uptake of low-emissions technologies and practices, improved expertise in carbon management practices, and a better command of carbon as a commodity.

The government has also established the following initiatives for the land sector within the Clean Energy Future package:^{76, 77, 78}

- Carbon Farming Futures program (\$A 286 million over six years) for research, development and extension of carbon-management techniques and technologies, low-cost carbon measurement tools, and action on the ground (e.g. including direct financial support for conservation tillage equipment).
- Biodiversity Fund (\$A 800 million over eight years) to support projects that establish, restore, protect, or manage biodiverse carbon stores.
- A Regional Natural Resource Management Planning for Climate Change Fund (\$A 44 million over five years) to assist regional natural resource management organizations align carbon plantation projects with local landscape management objectives and guide planning for climate change impacts.
- Indigenous Carbon Farming Fund of \$A 22 million to help Aboriginal and Torres Strait Islander communities establish or participate in CFI projects. Indigenous Australians manage about 20 percent of the continent, and there are potentially significant social, cultural, and economic cobenefits from carbon projects.⁷⁹
- Carbon Farming Skills program worth \$A 4 million to establish a new accredited qualification in carbon farming and an accreditation scheme for carbon service providers.⁸⁰

State-Based Land Clearing Laws

Annual rates of land clearing (clearance of native vegetation, principally on private land) have decreased substantially since 1990, with consequent reductions in emissions. This significant long-term decline has been driven principally by restrictions on land clearing introduced by the governments of Queensland and New South Wales in the mid-2000s. Queensland alone was responsible for 70 percent of Australia's land clearing in the previous decade.⁸¹ The contribution of these legislative changes to emissions reduction is estimated to be about 18 Mt CO₂-e annually.⁸² However, the current Queensland Government passed legislation in May 2013 to loosen restrictions on land clearing, which could significantly increase deforestation emissions in the future.⁸³

Policies under Development

The Australian Government is investigating a national Energy Savings Initiative (ESI) to expand on and replace the various state energy-saving schemes. This initiative would require state government support. The government also committed to establish CO₂ emission standards for light vehicles. Proposed draft standards released in 2011 are weak in comparison with those of other developed countries. Since then, the momentum for each process appears to have diminished.

National Energy Savings Initiative

In 2010, the government committed to investigating the development of the national Energy Savings Initiative. As with the state-based schemes discussed earlier, a national ESI would set energy savings targets for energy retailers to encourage them to help improve their customers' energy efficiency. It is required to be "capable of delivering energy efficiency improvements at least as great as those being delivered"⁸⁴ through the NSW, Queensland, and Victorian schemes. Such a national ESI could have a noticeable impact on Australia's domestic emissions reduction.

Table 4 | **Estimates of Abatements and the Underlying Assumptions**

ACTIVITY	INDICATIVE ESTIMATE OF ABATEMENT IN 2020 (MT CO ₂ -E)	
	LOW	HIGH
Reforestation	1	2
Avoided deforestation and managed regrowth on deforested lands	1.5	6
Reduced enteric fermentation	<0.5	1.3
Nitrous oxide from agricultural soils	<0.1	<0.5
Manure management	<0.1	1.1
Reduced emissions from rice cultivation	0	<0.1
Reduced emissions from field burning residues	0	<0.1
Savannah fire management	<0.5	<1
Legacy waste management	<1	3.5
THE FOLLOWING ACTIVITIES HAVE BEEN DEEMED TO COMPLY WITH AUSTRALIA'S EMISSIONS REDUCTION UNDER THE KYOTO PROTOCOL		
Forest management and revegetation under Article 3.4	~0	~0
Reforestation on non-Kyoto land	<0.5	<1
Revegetation of degraded rangeland under Article 3.4	<1	5
Increased soil carbon on cropping land	<0.5	<1
Use of biochar to enrich soil	Not able to be estimated	Not able to be estimated
Feral camel removals	Not able to be estimated	Not able to be estimated

Source: DCCEE (now DIICCSRTE), Carbon Farming Initiative, Preliminary estimates of abatement – Discussion Paper, April 2011.

Although it would replace the current state schemes, it would cover states in which there is no equivalent scheme (Queensland, Western Australia, Northern Territory, and Tasmania). Modelling of various permutations of a national ESI, commissioned by DIICCSRTE and DRET, found that a national ESI targeting 5 percent energy reduction could deliver annual emissions reduction of 1 to 4 Mt CO₂, depending on the scheme parameters and assumptions.⁸⁵

The government has not committed to implementing a national ESI. Implementation requires consent from state and territory governments through COAG. Following consultation with stakeholders, DIICCSRTE⁸⁶ and DRET are undertaking a regulatory impact analysis of the scheme's potential parameters. As with the state schemes, these parameters include design (certificates or nontradeable energy savings); targets (type and level of ambition); covered fuels (electricity, gas, potentially other fuels); eligible sectors (residential, commercial, industrial); and subtargets, such as a requirement for savings in low-income households.

The government's decision on whether to take a proposal to COAG was expected in early 2013, but has been delayed. Further progress is unlikely before the federal election in September 2013. If agreed to, the national scheme is not expected to be implemented until 2014 or 2015 at the earliest. Figure 5 shows the steps required for the establishment of a national ESI.

Light Vehicle Emissions Standards

The government made an election commitment in 2010 to introduce higher emission standards for light vehicles (defined as passenger cars, sports utility vehicles, and light commercial vehicles with a gross mass of up to 3.5 tonnes). A 2011 Department of Infrastructure and Transport discussion paper proposed standards of 190g CO₂/km by 2015 and 155g CO₂/km by 2024 as “a starting point for discussion [which] do not represent a predetermined target.”⁸⁷ By way of comparison, the average level of CO₂ emissions of Australia's new light vehicle fleet in 2010 was 213g CO₂/km, while in the EU the average was 140g CO₂/km.⁸⁸ The government has argued that these “starting point” standards would reduce emissions by an annual average of 2.6 Mt CO₂.

No developments have occurred since the consultation period on the department's discussion paper closed in December 2011. There is no indication of when the government intends to produce a regulatory impact statement on options for implementation. If the government continues the process, it should be able to regulate carbon emissions under the existing Motor Vehicle Standards Act 1989. Figure 6 shows the steps required to establish emissions standards for light vehicles.

Figure 5 | **Process for Implementing a National Energy Savings Initiative**

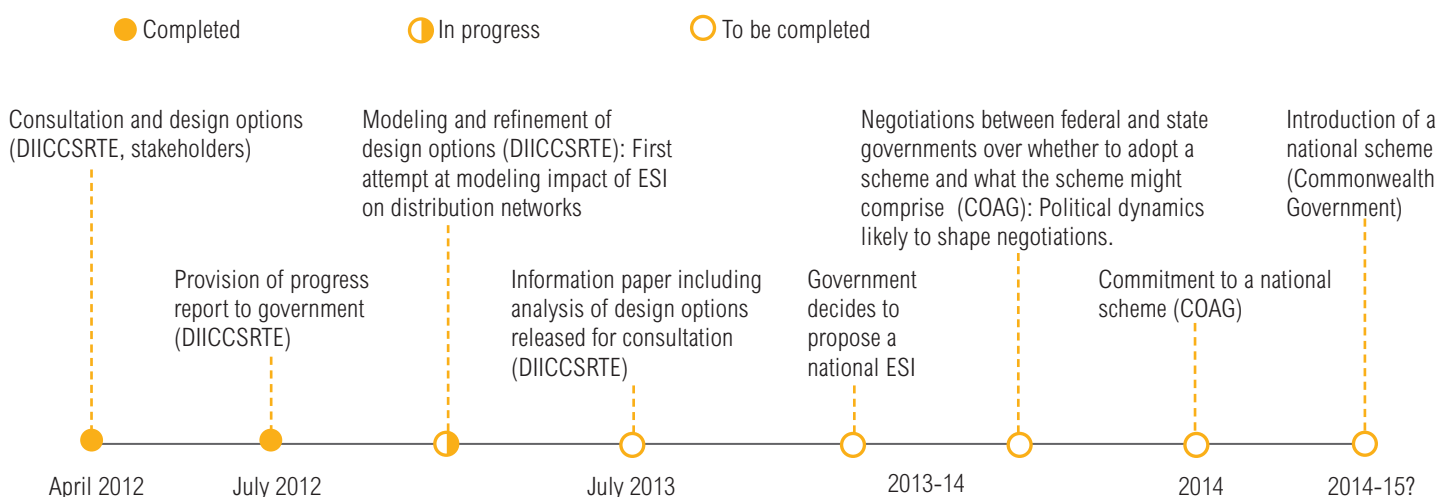
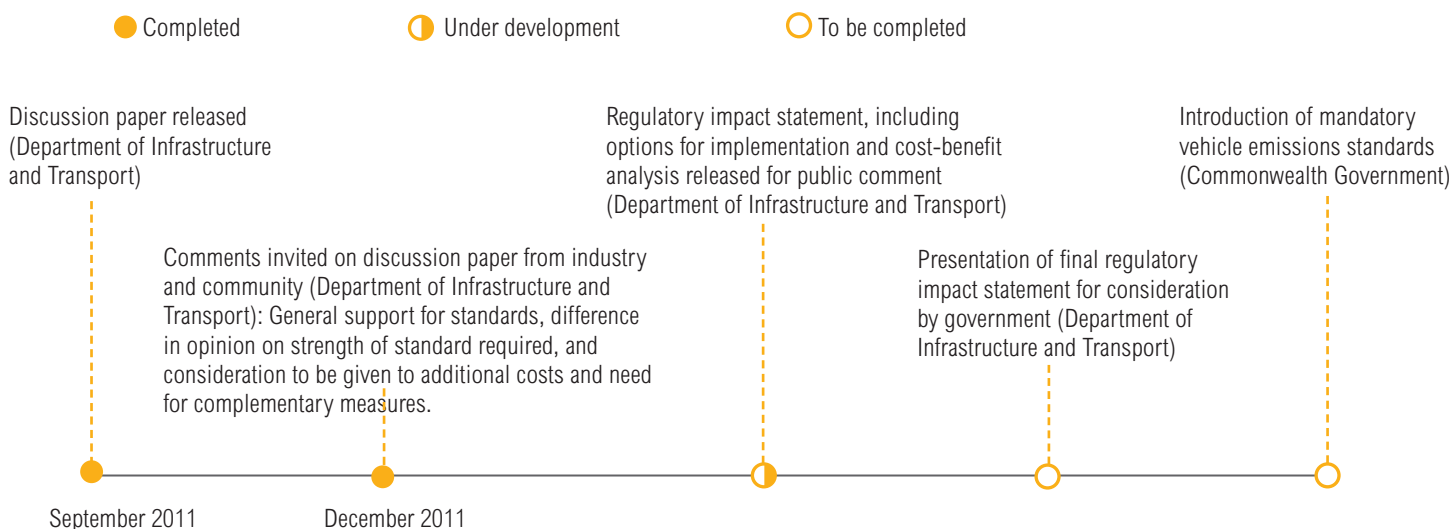


Figure 6 | **Process for Implementing Light Vehicle Emissions Standards**



IV. GHG PROJECTIONS

The Australian Government regularly publishes emission projections on the impact of the current policy mix on national and sectoral emissions.⁸⁹ These estimates are based on modeling from a range of sources inside and outside government. The Treasury is also involved in modeling the impact of national and international policy settings.⁹⁰ Treasury's work had been central to the design of Australia's domestic policy and to revenue forecasts from carbon pricing in the federal budget. The CCA has begun an assessment of the impacts of Australia's policies on emissions reduction. The Climate Institute is also undertaking modeling of both the government and the Coalition policy packages. The projections discussed in this section are based on government modeling that assumes the transition from a fixed to a floating carbon price will take place in 2015. However, the impact on domestic emissions of shifting to a cap-and-trade scheme one year earlier is unlikely to be material.

Figure 7 shows national emissions (with and without LULUCF) from 1990 to 2020. It also shows projected emissions under current policy settings and if these policies were removed (business as usual). Under these scenarios, and not considering the international imports of emission units,⁹¹ domestic emissions are projected to increase to 2020 and beyond.

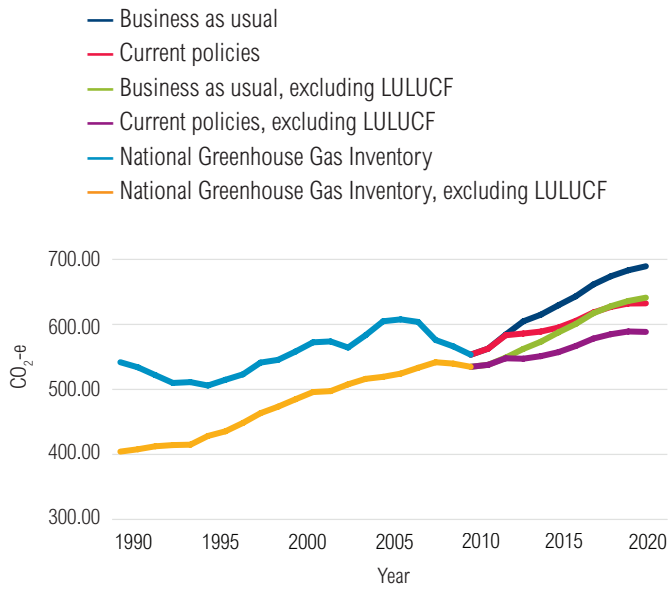
Historically, Australia's emission profile has been dominated by a rapid increase in electricity emissions and a large decline in deforestation emissions. However, this profile is expected to change substantially over the coming two decades.

Current projections indicate that electricity-sector emissions in Australia will continue to decline. However, as shown in Figure 8, this decline is more than offset by rapid increases in emissions from the expansion of coal and gas production, with a particularly large increase in direct combustion emissions from the conversion of natural gas to LNG. Less dramatic increases in transport and agriculture sector emissions are also projected. The largest uncertainty in current projections relates to the contribution of deforestation to the national emissions profile.⁹²

Australia and International Carbon Markets

Australia's contribution to avoiding dangerous climate change is not solely determined by its domestic emissions. Liable parties under the Australian emission trading scheme will also contribute by meeting up to 50 percent of their emission reduction requirements through the use of international emission permits. The demand for these nondomestic emission permits will be determined by the stringency of the emission cap on these sectors and their actual emissions. Figure 9 gives an indication of the demand for international units by liable entities under the full range of Australia's 2020 emission targets and both high and low emission projections.

Figure 7 | **Impact of Current Policies on Australia's Domestic Emissions to 2020**



Source: DIICCSRTE, Australia's Emissions Projections 2012 (2012).

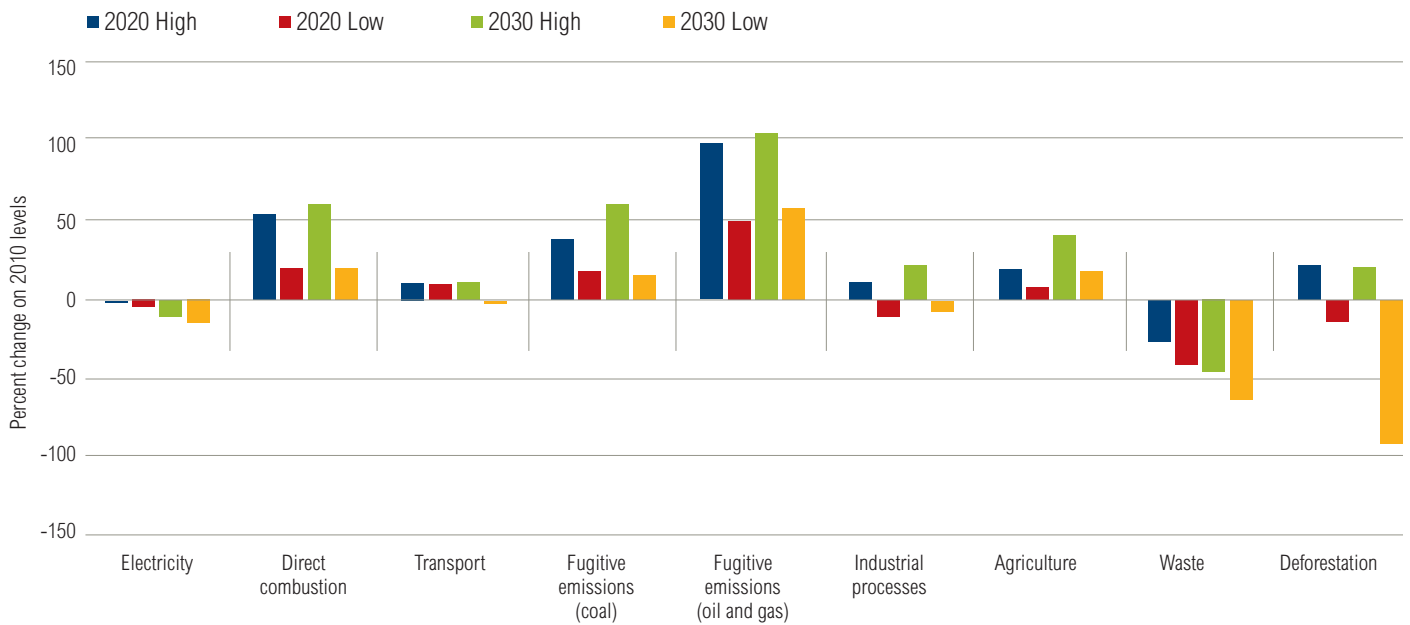
Under all target scenarios evaluated here, Australia is a significant net importer of international emission units. This fact illustrates the government's reliance on international emission units to meet its commitments. It also shows that higher emission targets in Australia could result in a decoupling of the Australian carbon price from international permit prices when liable entities reach their limit of international permit use. This decoupling would drive greater domestic emission reductions.

Risks and Opportunities with Market Linkage

A number of implications arise from the role of international emission units in meeting the nation's international commitments.

Foremost is that decisions about emission reduction ambitions may not have a material impact on domestic carbon prices. Most observers expect that Australia will be a price-taker on global permit markets. Whether this occurs in practice depends on a number of factors:

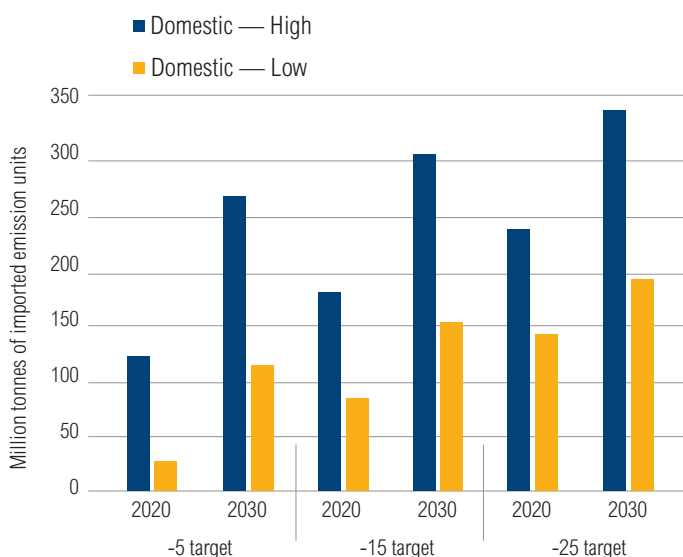
Figure 8 | **Projected Percent Change in Emissions under Current Policy by Sector, 2020 and 2030**



Source: The Climate Institute estimates based on DIICCSRTE, Australia's Emissions Projections 2012 (2012).

Note: Data excludes Kyoto Protocol voluntary article 3.4 activities. High and low scenarios represent the range of government projections.

Figure 9 | **International Permits Imported to Meet 5, 15, and 25 Percent Emission Targets in 2020**



Source: The Climate Institute estimates based on DIICCSRTE, Australia's Emissions Projections 2012 (2012).
Note: High and low scenarios represent the range of government emission projections.

■ **Which price shapes Australia's market.** Liable entities can choose a mix of domestic units, Kyoto credits, and EU units to meet part of their emission liabilities. There is a risk that in the first few years of the floating price period a combination of a weak emission cap and stable, or even declining, liable party emissions could see the pricing shaped by Kyoto units. This risk is consistent with some market forecasts.^{93, 94} The CCA is assessing whether in the first years of the scheme, tighter caps may be required to hedge against the possibility that Australian prices are driven by Kyoto markets. This is in part why the government is proposing to reduce the importation of Kyoto permits in the first year of the scheme to 6.5 percent of a company's liability.

■ **The strength of the emissions cap.** A strong emission cap and/or higher than expected emissions could see strong demand for units from the EU. These conditions could result in Australia's demand affecting the EU carbon price to some extent (although the EU price is likely to be more influenced by longer-term fundamentals of the EU market).⁹⁵ Higher EU prices would also create stronger incentives for domestic emission reductions in Australia. A strong Australian cap and/or high Australian emissions will not affect Kyoto markets.

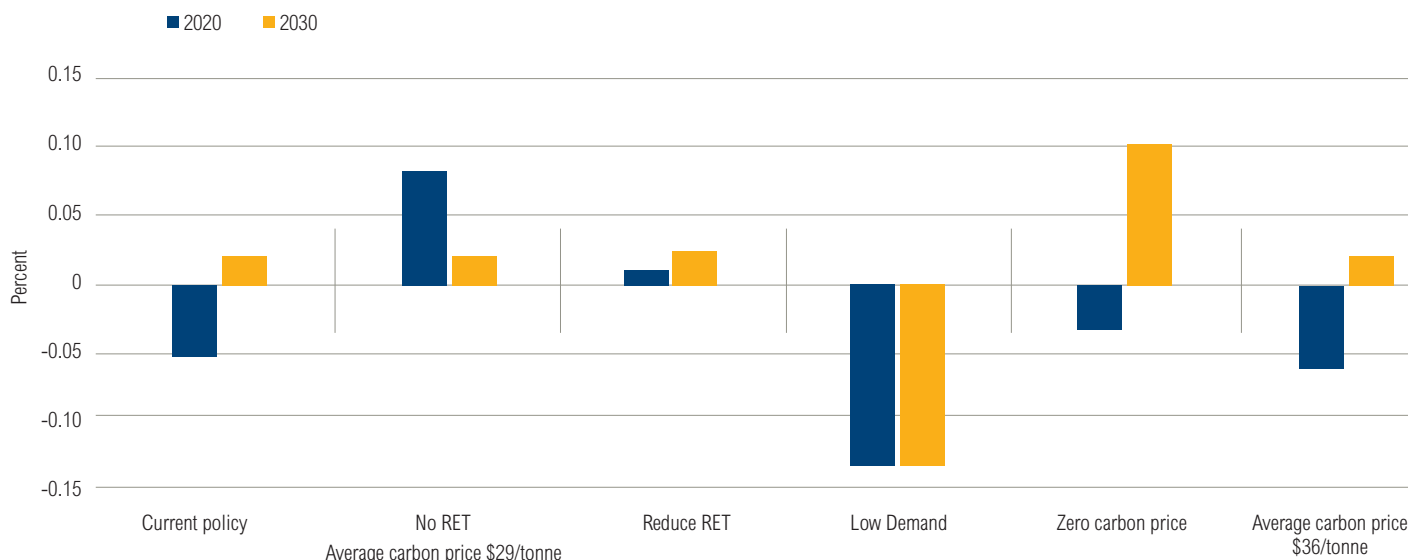
Broader opportunities and risks associated with linkages between other domestic and international carbon markets include:

- **Greater ambition:** Lower abatement costs provide an opportunity for Australia to be more ambitious in its emission-reduction commitments. The development of ambitious carbon market coalitions also provides an opportunity to use the benefits of trade to encourage greater global ambition.
- **Market immaturity:** While international markets remain immature and global prices are low or subject to substantial political risks, Australian investors may commit to long-term assets that are excessively emissions intensive. As a result, the nation risks deadweight losses from stranded assets and will have to spend on more costly abatement later.
- **Strategic use of carbon markets to build global ambition.** Australia's link with the EU emission trading scheme will likely provide a template for future linking arrangements with other markets. Transformative ambition "clubs" or coalitions could be used to build greater levels of international action.⁹⁶ Australia is yet to fully capitalize on the potential for building linking arrangements and emission-trading coalitions.⁹⁷

Changes in the Electricity Sector

Although electricity sector emissions are projected to remain relatively flat over the next two decades, emissions could increase if policy settings change or external factors such as fuel prices and technology costs impact the drivers of emissions in this sector. The CCA assessed the impact of a range of policies and other factors on electricity emissions in Australia (Figure 10). In the short term, potential changes to the Renewable Energy Target and ongoing low electricity demand would have the biggest impact on emissions. In the longer term, removal of carbon pricing would result in substantial increases in emissions even if the Renewable Energy Target remains in place because of the increased competitiveness of existing coal-fired generation.

Figure 10 | **Projected Change in Electricity Sector Emissions in 2020 and 2030 under a Range of Assumptions**



Source: The Climate Institute estimates based on CCA, "Review of the Renewable Energy Target Final Report" (2012).
Note: Change is from 2012 levels. Continued low demand or removal of the carbon price would have a substantial impact on the sector's emissions.

Lower Growth in Resource Extraction

Since the release of these projections, a number of large emission-intensive projects, including some in the oil and gas sector, have been cancelled. These cancellations could mean that current projected emission increases in this sector may be overstated.

V. LOOKING AHEAD

Repeal of the Carbon Price and Other Elements of the Clean Energy Future Package

Australia's next federal election will be held in 2013. The federal Opposition currently comprises two center-right parties in permanent partnership, known as the Coalition, which has pledged to repeal the carbon price and other elements of the Clean Energy Future package if it wins the election.⁹⁸ There are several paths to repeal, but most have obstacles: the Coalition needs to gain control of the federal upper house (the Senate) as well as the lower house (the House of Representatives), or persuade members of procarbon price parties (Labor and the Greens) to sup-

port repeal, or hold and win a double dissolution election. In the last instance, the governor-general would dissolve both houses of parliament simultaneously, and call a fresh election of all members.

If the Coalition wins control of both houses (or support from a sufficient number of cross-bench Senators), it can introduce and pass legislation to repeal the Clean Energy Future package fairly rapidly. If not, repeal could take up to several years. Alternatively, the Coalition may focus on changing or eliminating elements of the Clean Energy Future package. The earliest the scheme is likely to be able to be repealed would be late 2014 or early 2015.

The Coalition proposes to replace the carbon-pricing mechanism with a fund to purchase emissions abatement via reverse auctions sufficient to reach Australia's 5 percent 2020 target. The Coalition's policy and recent statements affirm that the fund would spend \$A 2.5 billion in its first four years, and will aim to deliver 155 Mt CO₂ abatement by 2020. Further details on the fund's operation are to be developed after the election.^{99,100} Assessments to date suggest that the Coalition's policy will struggle to deliver the necessary emission reductions to achieve the 5 percent target.¹⁰¹

Linking the Australian Carbon Price to the European Union and Other Markets

In August 2012, the Australian Government and the European Commission announced that the Australian emissions trading system would be linked to its European counterpart beginning in July 2015. The European Union–Australia scheme will initially operate as a one-way relationship, with Australian businesses able to purchase European Union Allowances (EUAs) to meet their emissions liabilities. This arrangement means that the extent of domestic emissions reduction in Australia is heavily dependent on policy developments in the EU.

Purchase of Australian permits by EU businesses is intended to be operational by July 2018.¹⁰² However, under the existing framework of the EU ETS, Australian entities would not be able to sell their CFI units to Europe because the EU does not allow the use of agricultural credits to meet emissions liabilities.¹⁰³ Whether this rule will change following the linking of the two systems will depend on treaty negotiations between Australia and the EU.

Australia is also actively engaging with the development of other regional carbon markets in China and South Korea.

State-Based Changes of Land-Clearing Laws

Queensland's recent relaxation of restrictions on land clearing have potentially negative implications for emissions from deforestation.¹⁰⁴ A key feature of the legislation is a new exemption from the 2006 ban on broadscale clearing for "high value agriculture clearing," defined as including clearing for horticulture, broadacre cropping, and irrigated pasture farming.¹⁰⁵ Analysis for WWF Australia puts the extent of bushland and carbon storage at risk from the legislated changes at 1.3 million hectares of mature bushland, estimated to contain 184 Mt CO₂, and 700,000 hectares of revegetated high-conservation-value bushland, containing roughly 46 Mt CO₂.¹⁰⁶

Impact of Low Demand and Renewable Energy on Electricity Markets

The decline in Australia's electricity demand that began in 2009 may not be an anomaly but rather the start of a new trajectory. Recent forecasts of demand in 2020 have substantially reduced earlier predictions.¹⁰⁷ As the Renewable Energy Target drives further supply into the National Electricity Market (NEM), this lower level of demand is starting to strain existing suppliers, particularly black coal and natural gas generators that lose market share to renewables. The affected generators have begun to voice opposition to the Renewable Energy Target and may be inclined to oppose policies, such as energy efficiency policies, that further suppress demand for their products.

This situation reflects weaknesses in the framework of the NEM that could, in the long term, deter further low emissions investment. Wholesale electricity prices, set through a gross pool, are being driven down by the (effectively zero) short-run marginal costs of renewable generation such that it is becoming increasingly difficult for existing generators to recover their long-run marginal costs. At the same time, there is no incentive for the most marginal generators to exit the market in an orderly way, particularly as some of these generators are receiving assistance to soften the impacts of the carbon price. This situation is exacerbated by current policy uncertainty around carbon pricing and the RET. Meanwhile, regulations governing distribution and retail pricing obstruct cost-reflective price signals. This blunts incentives for energy efficiency and demand management and may encourage consumers to leave the grid, potentially setting up a "death spiral"¹⁰⁸ in which those who can afford to leave the grid do so, leaving those who cannot to pay for an increasingly expensive and inefficient system. In the long term, the need to resolve the situation may lead to policy changes of unknown implication for emissions reduction.

ABBREVIATIONS AND ACRONYMS

ABCB	Australia Building Codes Board
ACCU	Australian Carbon Credit Units
ACT	Australian Capital Territory
ARENA	Australian Renewable Energy Agency
CCA	Climate Change Authority
CCS	Carbon Capture and Storage
CEA	Clean Energy Act 2011
CEFC	Clean Energy Finance Corporation
CER	Clean Energy Regulator
CERS	Certified Emissions Reductions units
CFI	Carbon Farming Initiative
CO ₂	carbon dioxide
CO ₂ -e	carbon dioxide equivalent
COAG	Council of Australian Governments
DCCEE	Department of Climate Change and Energy Efficiency (now DIICCSRTE)
DIICCSRTE	Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (formerly DCCEE)
DRET	Department of Resources, Energy and Tourism
EITE	Emissions-Intensive Trade-Exposed
EPS	Emission Performance Standard
EU ETS	EU Emissions Trading Scheme
EU	European Union
EUA	European Union Allowance
FIT	Feed-in Tariff
GCCSI	Global Carbon Capture and Storage Institute
GHG	greenhouse gas
GWh	gigawatt hour
kWh	kilowatt hour
LGC	Large-Scale Generation Certificate
LNG	Liquefied Natural Gas
LRET	Large-Scale Renewable Energy Target
LULUCF	land use, land-use change and forestry
MEPS	Minimum Energy Performance Standards
MRET	Mandatory Renewable Energy Target
Mt CO ₂ -e	million tonnes of CO ₂ equivalent
MWh	megawatt hour
NABERS	National Australian Built Environment Rating System
NEM	National Energy Market
NSW	New South Wales
PV	photovoltaic

RET	Renewable Energy Target
SRES	Small-Scale Renewable Energy Scheme
STC	Small-scale Technology Certificate
TWh	Terawatt hour
UNFCCC	United Nations Framework Convention on Climate Change

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ENDNOTES

- 1 Liberal Party of Australia 2010.
- 2 Department of Climate Change and Energy Efficiency 2009.
- 3 Deloitte Touche Tohmatsu 2011.
- 4 Minister for Climate Change and Water 2010.
- 5 Secretary General of the United Nations 2012.
- 6 United Nations Framework Convention on Climate Change 2013.
- 7 Hunt 2011.
- 8 “Those parties included in Annex 1 for whom land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 shall include in their 1990 emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in 1990 from land-use change for the purpose of calculating their assigned amount.” Article 3.7 of the Kyoto Protocol.
- 9 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2013c.
- 10 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2012b.
- 11 Australian Government 2011c.
- 12 The former Department of Climate Change and Energy Efficiency was split in early 2013, with climate change responsibilities incorporated into DIICCSRTE and energy efficiency into DRET.
- 13 Department of Climate Change and Energy Efficiency (now DIICCSRTE) and Department of Resources, Energy and Tourism 2012.
- 14 COAG 2012.
- 15 Green Building Council of Australia 2013.
- 16 Scope 1 emissions are a designation by the GHG Protocol Corporate Standard describing direct emissions from combustion activities, including stationary combustion in facilities like power generation and manufacturing processes, as well as chemical processing and fugitive emissions. The GHG Protocol Corporate Standard also includes company-owned or operated transportation emissions, but these may be tracked separately for national inventory purposes.
- 17 Clean Energy Regulator, “Jobs and Competitiveness Program.”
- 18 Department of Resources, Energy and Tourism, “Coal Sector Jobs Package.” The package was cut from \$A 1.26 billion in the 2013-14 federal budget, and forward allocations were further reduced in July 2013. See Australian Government 2013a and 2013e.
- 19 \$A 29 million was cut from a \$A 70 million package in the 2013-14 federal budget. See Australian Government 2013a.
- 20 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2012c.
- 21 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2013f, “Clean Technology Program.” Funding for one component of the Clean Technology Program, the Clean Technology Investment Program, is to be cut by \$A 160 million. See Australian Government, 2013e.
- 22 Clean Development Mechanism credits, which are currently intended to be included and used from 2015 (subject to restrictions) are: certified emission reductions (CERs) units and emission reductions units (ERUs) but with restrictions to exclude CERs and ERUs from nuclear energy projects, certain industrial gas destruction projects, large-scale hydroelectric projects that are inconsistent with World Commission on Dams criteria adopted by the European Union or certain time-limited land sector projects (known as temporary and long-term CERs/ERUs) as these would expire before 2020 and Kyoto Removal Units (RMUs, which represent very long-term land sector offsets). See Australian Government 2013c.
- 23 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, 2013g.
- 24 Australian Government 2011b.
- 25 Australian Government 2013a and 2013e.
- 26 Australian Government 2000b.
- 27 Climate Change Authority 2012b.
- 28 Australian Government 2000a.
- 29 Climate Change Authority 2012b.
- 30 During the process of accreditation for a power station under the Renewable Energy Target, the Clean Energy Regulator determines a baseline value for generation prior to 1997 (when the scheme was first proposed). See Climate Change Authority 2012b.
- 31 Bloomberg New Energy Finance 2012.
- 32 Bureau of Resources and Energy Economics 2012.
- 33 Clean Energy Council 2013.
- 34 Bureau of Resources and Energy Economics 2012.
- 35 Ibid.
- 36 Department of Climate Change and Energy Efficiency (now DIICCSRTE) 2011. The more recent projections do not update estimates of abatement associated specifically with the RET.
- 37 Pitt and Sherry 2013.
- 38 Climate Change Authority 2012a.
- 39 Australian Government 2013b.
- 40 Priest 2013.
- 41 Australian Renewable Energy Agency 2013e.
- 42 Department of Climate Change and Energy Efficiency 2012d.
- 43 Clean Energy Finance Corporation 2013.
- 44 Merz 2012.
- 45 Department of Resources, Energy and Tourism 2013d.
- 46 Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations
- 47 Australian Government 2011a.
- 48 Treasury. 2011c, Table 5.12.
- 49 Climate Change Authority 2012a.
- 50 Department of Resources, Energy and Tourism 2012.
- 51 ACIL Tasman 2013.
- 52 Department of Resources, Energy and Tourism 2013a.
- 53 The Allen Consulting Group 2010.
- 54 Ibid.

- 55 Australian Tax Office.
- 56 Australian GEMS Regulator 2013.
- 57 George Wilkenfeld and Associates Pty Ltd. 2009.
- 58 Australian Government 2012.
- 59 New South Wales Government 2009.
- 60 Department of Primary Industries Victoria 2013.
- 61 Essential Services Commission of South Australia 2013.
- 62 ACT Government Environment and Sustainable Development Directorate 2013.
- 63 Based on Victoria deeming worth 18 MtCO₂-e, NSW saving 8 MtCO₂-e and South Australia and ACT saving around 1 MtCO₂-e each. See Department of Environment and Primary Industries 2013; NSW Trade and Investment 2013; Essential Services Commission of South Australia; and ACT Government Environment and Sustainable Development Directorate.
- 64 NatHERS - Nationwide House Energy Rating Scheme 2013.
- 65 Department of Resources, Energy and Tourism 2013b.
- 66 Commercial Building Disclosure 2013.
- 67 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2013c.
- 68 Ibid.
- 69 Ibid.
- 70 Ibid.
- 71 Department of Climate Change and Energy Efficiency (now DIICCSRTE) 2012e.
- 72 Ibid.
- 73 Department of Climate Change and Energy Efficiency (now DIICCSRTE) 2012b.
- 74 Department of Industry, Innovation, Climate Change, Research, Science and Tertiary Education 2013d.
- 75 Ibid.
- 76 Ibid.
- 77 Minister of Climate Change and Treasurer 2013.
- 78 Australian Government, 2013e.
- 79 Department of Agriculture, Fisheries and Forestry and Department of Sustainability, Environment, Water, Population and Communities 2013.
- 80 Department of Agriculture, Fisheries and Forestry 2013.
- 81 McGrath 2007.
- 82 Department of Climate Change and Energy Efficiency (now DIICCSRTE) 2012c.
- 83 Queensland Government 2013a.
- 84 DIICCSRTE and DRET 2013.
- 85 SKM MMA. 2013.
- 86 Until April 2013, the climate change elements of DIICCSRTE and the energy efficiency elements of DRET comprised the Department of Climate Change and Energy Efficiency (DCCEE). Related government documents before this date may, therefore, be produced by DCCEE.
- 87 Department of Infrastructure and Transport 2011.
- 88 Ibid.
- 89 Department of Climate Change and Energy Efficiency (now DIICCSRTE) 2012a.
- 90 Treasury 2011b.
- 91 Projections use a fixed carbon price to June 30, 2015, and a floating price starting at \$A 29/t CO₂-e in 2015 and rising thereafter. A lower carbon price starting at \$A 10 in 2012 was modelled as a sensitivity.
- 92 Department of Climate Change and Energy Efficiency (now DIICCSRTE) 2012a.
- 93 Reputex 2013a.
- 94 Reputex 2013b.
- 95 Bloomberg New Energy Finance 2013.
- 96 Weischer, Morgan and Patel 2012.
- 97 Mazouz and Jackson 2012.
- 98 Abbott 2012.
- 99 Liberal Party of Australia 2010.
- 100 Hunt 2012.
- 101 Treasury. 2011a; Daley and Edis 2011.
- 102 Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2012a.
- 103 Australian Government 2013, "Linking and the Carbon Farming Initiative."
- 104 Macintosh 2013.
- 105 Queensland Government 2013b.
- 106 Taylor 2013.
- 107 Australian Energy Market Operator 2013.
- 108 Simshauser and Nelson 2012.

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WRI focuses on the intersection of the environment and socio-economic development. We go beyond research to put ideas into action, working globally with governments, business, and civil society to build transformative solutions that protect the earth and improve people's lives.

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