

# TRACKING PROGRESS TOWARDS A LOW CARBON ECONOMY



## 5. LAND-USE & WASTE

Summary Report

July 2013

Full report available at [www.climateworksaustralia.org/tracking-progress-towards-low-carbon-economy](http://www.climateworksaustralia.org/tracking-progress-towards-low-carbon-economy)

# Executive summary

## Recent Progress

**Reforestation and large reductions in deforestation have led a 32 per cent reduction in emissions from Land-use and Waste over the last decade.**

**Deforestation:** The annual deforestation rate fell by more than half between 2003 and 2011<sup>1</sup>. This reduction was mostly driven by state land clearing regulations in New South Wales and Queensland and a poorer economic outlook for farmers. The reduction in deforestation resulted in a decrease in emissions of 60 MtCO<sub>2</sub>e in 2011 compared to a peak in emissions in 2005. This emissions reduction is equivalent to eliminating around 80 per cent of emissions from brown coal generation in Australia in 2010-11.

**Afforestation:** Significant areas of plantation forests were established throughout the decade in response to investment incentives which, combined with plantings from the previous decade, doubled carbon sequestration from forests.

However, the rate of new plantations has decreased since 2008 and now represents less than 3 per cent of the rate at the peak. In 2012 the area of plantation forests cleared exceeded new plantings, resulting in a reduction in the total plantation estate for the year.

**Waste:** Emissions from waste treatment facilities such as landfills and wastewater treatment account for 12 per cent of total emissions from Land-use and Waste. The combustion of waste gases from these facilities through flaring or in power generation has reduced overall emissions, despite an increase in the volume of methane produced from these sites.

### Methane capture and combustion

Methane is produced by many activities in the Land-use and Waste sectors including agricultural manure and landfills. Methane is a greenhouse gas with more than 20 times the global warming potential of carbon dioxide.

These gases can be captured by covering landfills or animal waste collection ponds. The gas is then burnt which converts methane into carbon dioxide and water. This reaction produces heat which can be used to generate electricity, while reducing the global warming potential of the gases.

<sup>1</sup> Note that forestry emissions are reported per calendar year, whereas emissions for the rest of the inventory are calculated by financial year.

Between 2002-03 and 2010-11, there has been a 60 per cent increase in abatement from captured waste gas, which now generates enough energy to power over 200,000 homes each year.

**Agriculture:** Emissions from livestock such as cattle, sheep and pigs account for slightly more than half of emissions from Land-use and Waste. Cattle are responsible for the majority of these emissions which are produced during digestion (the enteric fermentation process) and belched into the atmosphere or emitted from manure.

A reduction in the number of sheep in the last decade due to the prolonged drought conditions led to a reduction in emissions from livestock over this period. While methodologies have been developed to reduce enteric emissions, there has been limited uptake to date due to cost and technological uncertainty.

There has been greater adoption of projects to destroy gas produced by manure, particularly at piggeries which are now beginning to capture this waste methane to use as a direct fuel for electricity generation.

Overall, emissions from forestry, agriculture and waste fell by 32 per cent from 2003 to 2011, offsetting growth in emissions from all other sectors of the economy<sup>2</sup>.

**Contribution of Land-use & Waste to recent changes in Australian emissions, MtCO<sub>2</sub>e [DIICCSRTE 2013]<sup>2</sup>**



<sup>2</sup> A detailed bibliography is available in the full report for Land-use and Waste at [www.climateworksaustralia.org/tracking-progress](http://www.climateworksaustralia.org/tracking-progress).

## Outlook to 2020

**Under current economic and policy conditions, limited emissions reduction activities in Land-use and Waste are being implemented. Without a change in these conditions emissions would increase over the next decade, as plantation forests are harvested and agricultural production recovers after a prolonged period of drought<sup>3</sup>.**

If recent trends in emissions reduction activity continue, only a small number of projects would be implemented between now and 2019-20.

This abatement would not be sufficient to offset the strong expected growth in emissions, resulting from a reduction in carbon sequestered by plantation forests (due to a significant reduction in plantation rates and expected conversion of forests deemed unviable for replanting after harvest) and a recovery in agricultural production after the prolonged recent drought. In this scenario, emissions would increase by 42 per cent, from 108 MtCO<sub>2</sub>e to 153 MtCO<sub>2</sub>e. If recent trends in abatement activity continue, emissions would be reduced to 145 MtCO<sub>2</sub>e in 2019-20.

**Deforestation:** There are no significant projects currently observed to reduce deforestation emissions, and changes to land clearing regulations in Queensland could actually increase the rate of deforestation between now and 2020.

Avoided deforestation has recently become eligible for credits under the Carbon Farming Initiative (CFI), but the extent of abatement from this activity will depend on the future price of carbon.

**Afforestation:** While some forms of reforestation can earn revenue under the CFI, there is still very limited reforestation activity expected to take place under current settings due to expectations of low future carbon prices and policy uncertainty.

Reforestation projects rely on long-term revenue from government incentives such as the CFI and the carbon price in order to make them profitable, and as such there is a need for long-term certainty around the existence of these policies, and around the future price of carbon.

**Waste:** Continued implementation of landfill and wastewater gas capture and combustion projects in line with recent trends would increase abatement from these projects by 48 per cent between 2010-11 and 2019-20.

There are already 45 MW of new electricity generation projects from landfill gas in development, with a further 18 MW under assessment. Recent increases were particularly strong in wastewater treatment plants, and if recent trends were sustained, then on average plants in Australia would abate 60 per cent of their waste methane by 2019-20, which corresponds to best practice today.

<sup>3</sup> This differs from emissions projections undertaken by the Australian Government. A detailed description of the differences is contained in Report 1: National Progress Report in the *Tracking Progress* report series.

**Agriculture:** Projects such as savanna fire management and piggery methane destruction could deliver 1.1 MtCO<sub>2</sub>e in abatement of per year by 2019-20.

Enhanced vegetation through improved management of rangelands has the potential to contribute a further 2.6 MtCO<sub>2</sub>e of abatement if projects identified in the pipeline are realised. The delivery of this abatement is contingent on the ongoing business viability of projects.

If recent trends are sustained, only around 8 per cent of the abatement potential identified in the *Low Carbon Growth Plan for Australia* for Land-use and Waste would be captured.

### Land-use & Waste in Australia's Kyoto inventory

Forest, cropland and pasture management activities and management of non-forest vegetation have recently been included in Australia's inventory for reporting in the second commitment period of the Kyoto Protocol, with emissions from these activities included in national inventories from next year.

Abatement from these activities will now be eligible to earn revenues through the CFI, if included on the positive list and if a CFI methodology is approved. These activities hold significant opportunities for abatement in Land-use and Waste to 2019-20.

Changes to the management of large areas of state forests could significantly increase abatement from forest management, but will be dependent on state forest agreements and the economic environment for forest products. The creation of forest reserves on previously harvested multiple use forests could also contribute significantly to abatement by 2019-20.

### Savanna fire management

Currently, fires across northern Australia produce around 3% of Australia's total emissions, through the release of methane and nitrous oxide.

For hundreds of generations, Indigenous people have been using fire in the landscape. Traditional management practices encourage early season burning, which reduces more intense fires later in the season. These practices have been shown to reduce the intensity and greenhouse gas emissions from fires in the landscape.

This traditional knowledge may prove key to sustainable management of Australia's northern landscapes. These projects also improve biodiversity and social outcomes for local communities through employment and revenues from carbon offsets.

# Background

## About the *Tracking Progress* project

Tracking Progress is the first national index of Australia's progress towards a low carbon economy.

With increasing business and community focus on how best to transition to a low carbon future, it is critical to have a robust measurement and evaluation framework for low carbon activity.

In order to understand how Australia is progressing towards our national emissions reduction targets, a good understanding of this activity — and the factors that are supporting or impeding it — is required. Building this evidence is critical for achieving an efficient, least-cost transition while maintaining our economic growth, competitiveness and prosperity.

The reports that make up this project provide an assessment of activity occurring across the Australian economy that reduces or avoids greenhouse gas emissions, pulling together all the available information and data across key sectors. We have tracked and reported progress through our national progress report series covering Power, Industry, Buildings and Land-Use & Waste<sup>4</sup>.

In addition we have produced a Special Report of factors influencing large industrial energy efficiency.

No other research provides a national aggregation of data on the underlying investments and activity that lead to future abatement. National measurements currently focus on actual emissions and energy use each year. This only reveals 'the tip of the iceberg' of abatement activity.

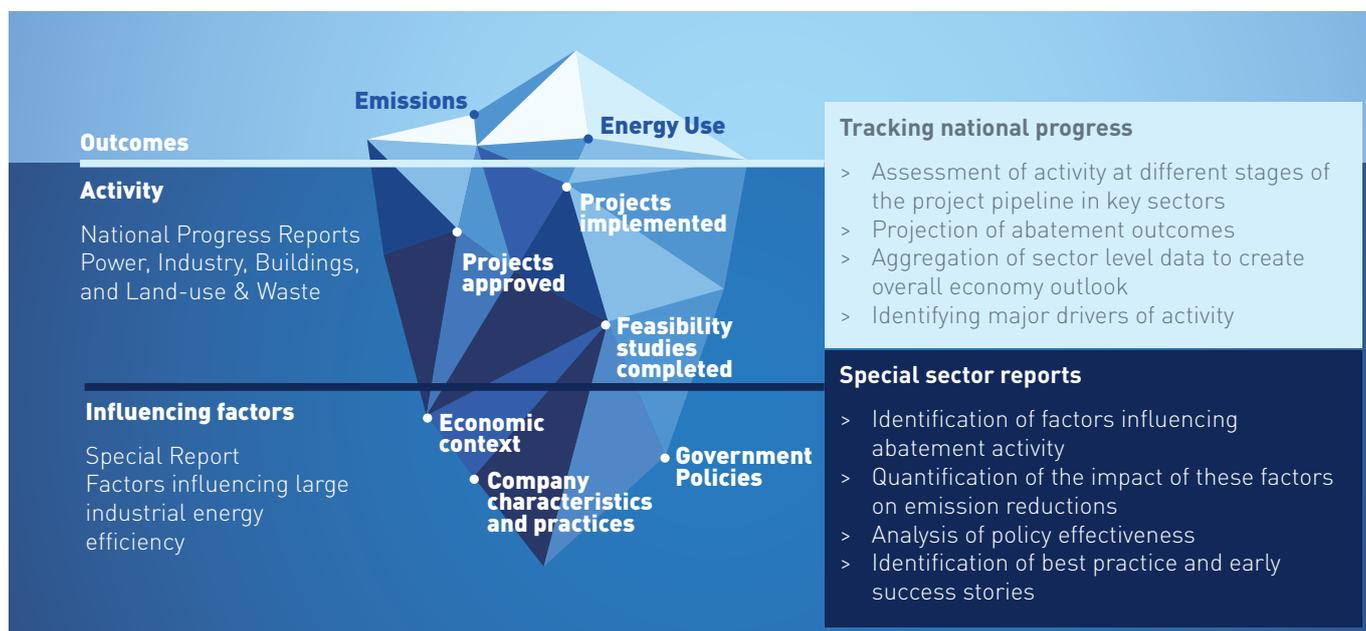
This series of reports reveals the hidden part of the story including:

**LEVEL OF CURRENT ACTIVITY** across key sectors of the economy. This includes activities that will deliver emissions savings in the future, some of which do not yet appear in national energy and emissions metrics but which are sufficiently advanced to make a known contribution to reducing future emissions.

**FUTURE ABATEMENT** that can be achieved if recent trends in abatement activity are sustained to 2019-20.

**FACTORS INFLUENCING EMISSIONS REDUCTION ACTIVITY** for large industrial energy efficiency — from broad economic influences to company specific factors — including an understanding of the common qualities of companies that achieve the most emissions reductions.

<sup>4</sup> The Transport sector has not been assessed in the 2013 *Tracking Progress* report series but will be addressed in a future report series.



## Description of the Land-use and Waste sector

This report investigates emissions reduction activities from non-energy related emissions from agriculture, forestry and waste.

This includes emissions from livestock, agricultural soils, savanna fire management, clearing of forests and gases released from solid and liquid waste.

Sequestration activities that remove greenhouse gases from the atmosphere such as afforestation (establishing a forest on cleared land), reforestation (re-establishment of an existing forest), and revegetation are also included.

A full report on progress in Land-use and Waste — along with a National Progress report, reports on progress in Power, Industry and Buildings and a Special Report on factors influencing large industrial energy efficiency — is available at [www.climateworksaustralia.org/tracking-progress](http://www.climateworksaustralia.org/tracking-progress).

## Emissions profile

Land-use and Waste activities contributed approximately 108 MtCO<sub>2</sub>e or 20 per cent of Australia's emissions in 2010-11 – the third largest source of emissions after industrial activities and buildings (see graph opposite).

Unlike other sectors of the economy where carbon dioxide is the predominant greenhouse gas produced, emissions from land and waste come mostly from the release of methane.

Methane accounts for 72 per cent of the sector's emissions with nitrous oxide (19 per cent) and carbon dioxide (9 per cent) contributing the remainder.

## Breakdown of the sector's emissions

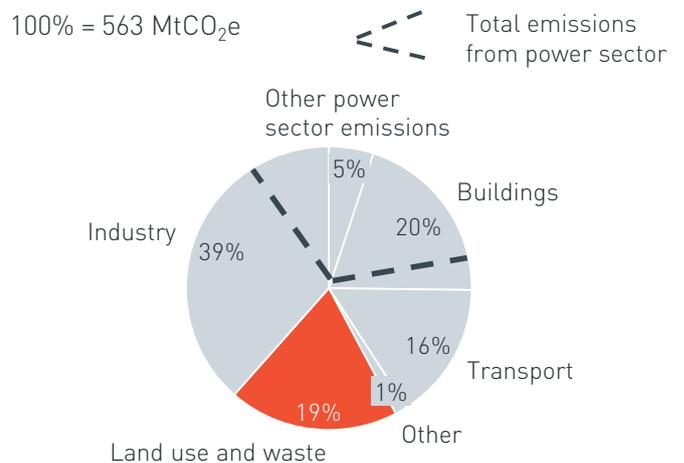
More than half of the greenhouse gas emissions from Land-use and Waste activities come from livestock enteric fermentation (see graph 'Breakdown of emissions from Land-use and Waste' to the right).

Enteric fermentation is the digestive process in ruminant mammals such as cows and sheep in which fibrous organic matter is digested by microbes in the stomach, producing methane as a bi-product. Other sources of agricultural emissions such as soils, manure and prescribed burning of savannas contributed 27 per cent to emissions from Land-use and Waste.

In 2011, deforestation was responsible for 38 MtCO<sub>2</sub>e emissions. This was partially offset by afforestation or reforestation which sequestered an average of 27 MtCO<sub>2</sub>e per year.

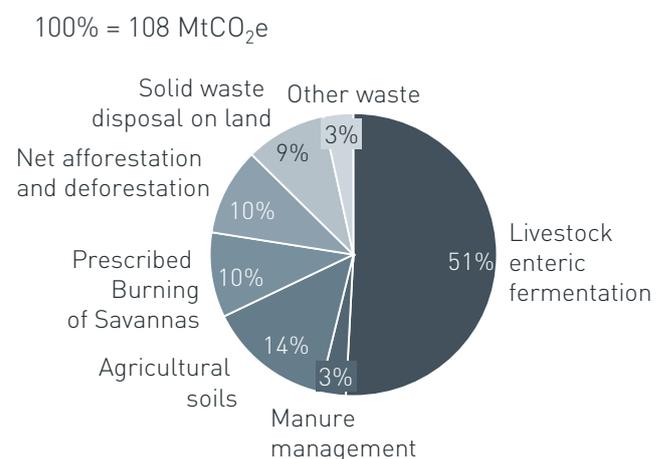
Net forestry activities therefore contributed 11 MtCO<sub>2</sub>e per year, or around 10 per cent of emissions from Land-use and Waste.

Breakdown of Australian emissions and sector coverage in 2010-11, % [DIICSRTE 2013]



Emissions from waste accounted for 12 per cent of emissions for this sector. The majority of these emissions came from gases released from the breakdown of organic matter in landfills and the treatment of domestic, commercial and industrial wastewater.

Breakdown of emissions from Land-use and Waste, 2010-11, % [DIICSRTE 2013]



# Index of Progress

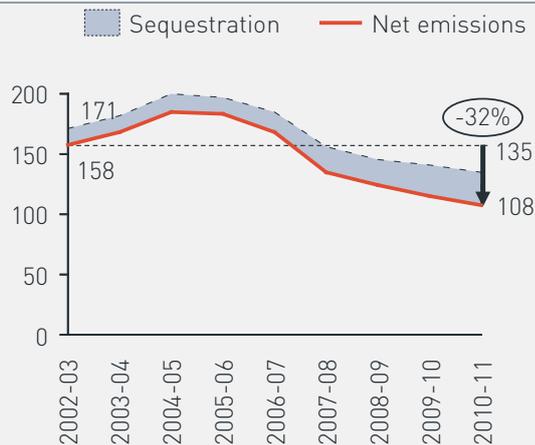
## 1. Overall sector

### Recent progress

**Emissions have reduced by over 30% since 2002-03**

Large reductions in net emissions from de- and reforestation have more than offset growth in other sectors since 2002-03

Land use and waste emissions, MtCO<sub>2</sub>e [DIICCS RTE 2013]



#### What factors influenced the abatement activity?

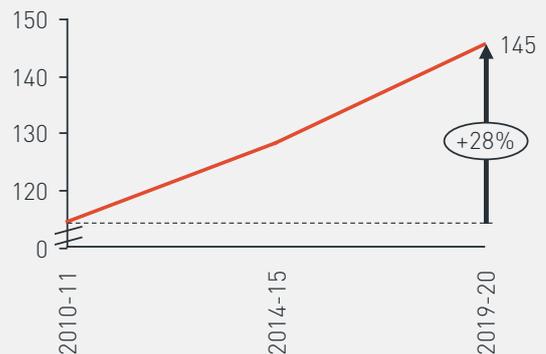
- ◆ State regulation of land clearing
- ◆ Tax concessions for forestry
- ◆ Revenue from carbon offsets
- ◆ Energy generation and renewable energy certificates for biogas

### Outlook to 2020

**Current trends would capture 8% of potential**

Regulatory uncertainty is limiting adoption of carbon sequestration activities, and forestry emissions are expected to increase as plantation forests are not replanted after harvest

Land-use and Waste emissions, MtCO<sub>2</sub>e [DCCEE 2012]



#### What factors will influence the abatement activity?

- ◆ Potential changes to land clearing regulations could lead to more deforestation
- ◆ Carbon revenue uncertainty
- ◆ Investment in research could increase adoption

#### Change relative to historical levels & expectations

- No improvement or backwards
- Patchy or limited improvement
- Some improvement
- Moderate improvement
- Strong improvement

#### Legend

- ◆ Upside factors
- ◆ Downside factors

#### Share of potential identified in the Low Carbon Growth Plan (LCGP) that current trend would deliver

- No abatement captured
- Little abatement captured (1-25%)
- Some abatement captured (26-50%)
- Moderate abatement captured (51-75%)
- Significant abatement captured (>75%)

#### Legend

- ◆ Upside factors
- ◆ Downside factors



Between 2002-03 and 2010-11, Land-use and Waste emissions decreased by 32 per cent, driven by strong reductions in net forestry emissions (forestry emissions levels in 2010-11 were a fifth of 2002-03 levels). With no further abatement activity beyond 2009-10<sup>5</sup>, emissions would be expected to grow by 42 per cent by 2020, driven mostly by renewed growth in net forestry emissions, as plantation forests are harvested and not replanted.

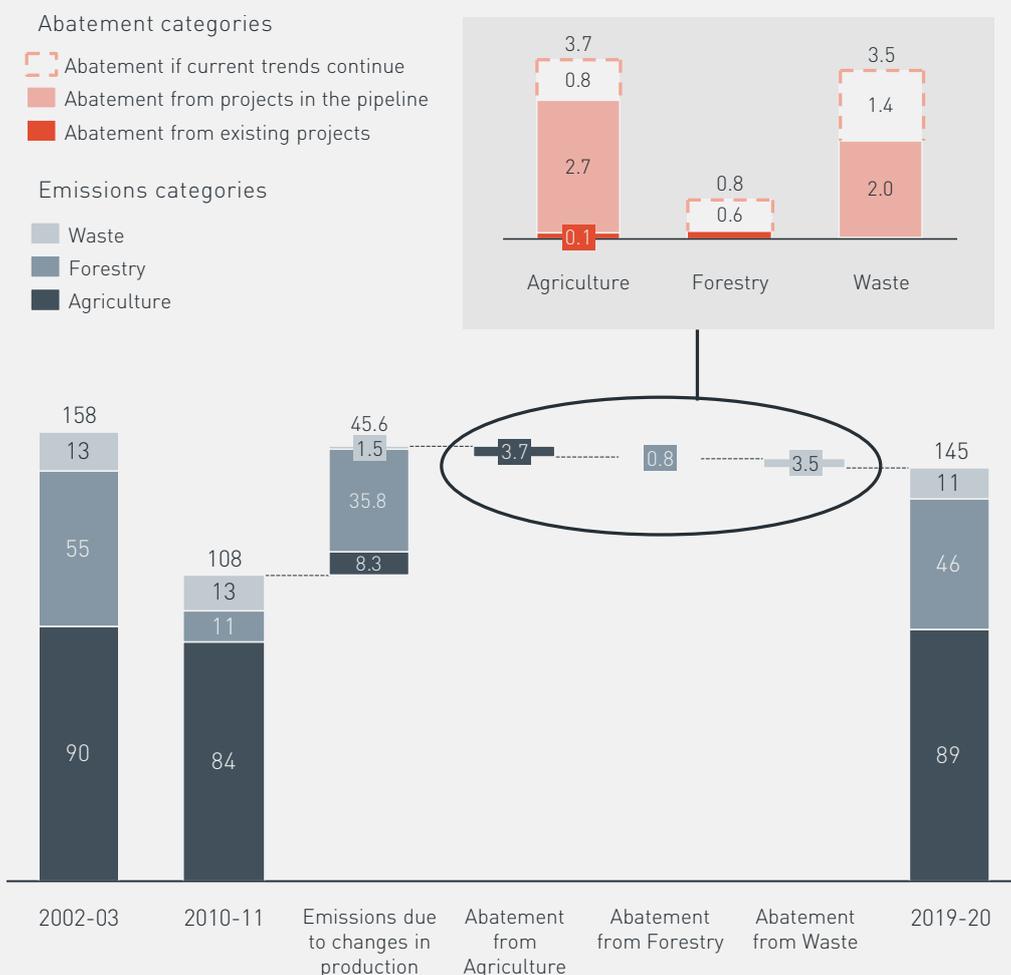
If current trends are sustained, abatement activity would deliver 8.0 MtCO<sub>2</sub>e of emissions reductions, offsetting about one sixth of the expected growth, leading to an overall increase in emissions of 35 per cent between 2010-11 and 2019-20.

The largest contribution would come from agriculture, with approximately 3.7 MtCO<sub>2</sub>e delivered by 2019-20 through improved fire management, rangeland management and power generation from manure methane in intensive agriculture.

The Waste sector would reduce emissions by 3.5 MtCO<sub>2</sub>e in 2019-20, more than offsetting its expected growth through increased methane capture at landfills and wastewater treatment plants through flaring or power generation.

The plantation of carbon forests would contribute a further 0.8 MtCO<sub>2</sub>e per year by 2019-20.

#### Emissions from Land-use & Waste, MtCO<sub>2</sub>e (DCCEE 2012, ClimateWorks team analysis)



<sup>5</sup> Abatement from 2009-10 to 2010-11 has been captured as 'Abatement from existing projects'

## 2. Index of progress for each abatement category



# Recent progress

	How much activity is happening?	What are some key achievements?	What factors influenced the activity?	Key metric								
DEFORESTATION	<p>The annual area deforested has halved since 2003</p> <p><b>45% reduction in emissions from deforestation since 2003</b></p>	<ul style="list-style-type: none"> <li>Reduction in deforestation decreased emissions by 60 MtCO<sub>2</sub>e in 2011 compared to a peak in 2005</li> <li>Methodology for avoided deforestation recently developed for the Carbon Farming Initiative</li> </ul>	<ul style="list-style-type: none"> <li>Regulations on land clearing have significantly reduced deforestation rates</li> <li>A poorer economic environment for farmers reduced incentives for clearing.</li> </ul>	<p>Area deforested, kha / year</p> <table border="1"> <caption>Area deforested, kha / year</caption> <thead> <tr> <th>Year</th> <th>Area deforested (kha)</th> </tr> </thead> <tbody> <tr> <td>2003</td> <td>374</td> </tr> <tr> <td>2007</td> <td>402</td> </tr> <tr> <td>2011</td> <td>181</td> </tr> </tbody> </table>	Year	Area deforested (kha)	2003	374	2007	402	2011	181
Year	Area deforested (kha)											
2003	374											
2007	402											
2011	181											
AFFORESTATION	<p>Total area of plantation forests increased by 21% in the last decade, but new plantations dropped sharply since 2007</p> <p><b>Plantation rate has slowed</b></p>	<ul style="list-style-type: none"> <li>Total area of timber plantation reached 2 million hectares in 2011, equivalent to 2.8 million soccer fields</li> <li>Forests grown for carbon sequestration have increased by 22% in the last two years and now equate to 4% of planted forest</li> </ul>	<ul style="list-style-type: none"> <li>Strong investment in plantation forestry at the beginning of the decade (now significantly reduced)</li> <li>High sequestration rate for industrial plantations</li> <li>Development of carbon offset markets (e.g. GGAS, Greenhouse Friendly)</li> </ul>	<p>Total timber plantation forestry area, '000 ha</p> <table border="1"> <caption>Total timber plantation forestry area, '000 ha</caption> <thead> <tr> <th>Year</th> <th>Area ('000 ha)</th> </tr> </thead> <tbody> <tr> <td>2003</td> <td>1,666</td> </tr> <tr> <td>2007</td> <td>1,903</td> </tr> <tr> <td>2011</td> <td>2,017</td> </tr> </tbody> </table>	Year	Area ('000 ha)	2003	1,666	2007	1,903	2011	2,017
Year	Area ('000 ha)											
2003	1,666											
2007	1,903											
2011	2,017											
WASTE	<p>Between 2002-03 and 2010-11, there has been a 60% increase in abatement of waste gas</p> <p><b>Emissions stayed stable despite more waste produced</b></p>	<ul style="list-style-type: none"> <li>Landfills and waste water treatment plants now generate enough energy to power more than 200,000 homes</li> <li>Projects have been approved to divert landfill waste to alternate waste facilities</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from energy, renewable energy certificates and carbon</li> <li>Environmental regulations</li> <li>Increase in price of electricity generated</li> </ul>	<p>Total abatement from landfill, wastewater gas, MtCO<sub>2</sub>e</p> <table border="1"> <caption>Total abatement from landfill, wastewater gas, MtCO<sub>2</sub>e</caption> <thead> <tr> <th>Year</th> <th>Abatement (MtCO<sub>2</sub>e)</th> </tr> </thead> <tbody> <tr> <td>2002-03</td> <td>4.5</td> </tr> <tr> <td>2006-07</td> <td>6.7</td> </tr> <tr> <td>2010-11</td> <td>7.3</td> </tr> </tbody> </table>	Year	Abatement (MtCO <sub>2</sub> e)	2002-03	4.5	2006-07	6.7	2010-11	7.3
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AGRICULTURE	<p>Limited emissions reductions to date, despite improvement in some areas e.g. piggery methane capture</p> <p><b>Limited adoption of emissions reductions projects</b></p>	<ul style="list-style-type: none"> <li>Piggeries representing 7% of Australia's pig herd now capture methane from manure</li> <li>Just under 3 million hectares (equivalent to 4.2 million soccer fields) are being managed to improve fire regimes and reduce emissions</li> </ul>	<ul style="list-style-type: none"> <li>Revenue or cost reductions from energy captured from manure</li> <li>Social and environmental benefits from improved fire regimes</li> </ul>	<p>Emissions reductions from abatement projects, MtCO<sub>2</sub>e</p> <table border="1"> <caption>Emissions reductions from abatement projects, MtCO<sub>2</sub>e</caption> <thead> <tr> <th>Year</th> <th>Reductions (MtCO<sub>2</sub>e)</th> </tr> </thead> <tbody> <tr> <td>2002-03</td> <td>0.00</td> </tr> <tr> <td>2006-07</td> <td>0.14</td> </tr> <tr> <td>2010-11</td> <td>0.17</td> </tr> </tbody> </table>	Year	Reductions (MtCO <sub>2</sub> e)	2002-03	0.00	2006-07	0.14	2010-11	0.17
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Change relative to historical levels & expectations

- No improvement
- Limited improvement
- Some improvement
- Moderate improvement
- Strong improvement
- Data unavailable

Share of available potential that current trend would deliver

- ▴ No abatement captured
- ▴ 1-25%
- ▴ 26%-50%
- ▴ 51%-75%
- ▴ 76%+
- ▴ Data unavailable

# Outlook to 2020

## How much activity could happen?

Recent gains from reductions in deforestation at risk due to relaxed clearing laws

**No additional abatement in the pipeline**

## What's in the pipeline?

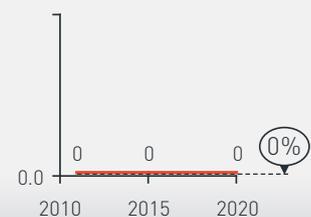
- > Some reduced deforestation projects could be incentivised by the CFI
- > There is a high risk of increased deforestation in QLD after the recent changes in land clearing regulations in that state

## What factors will influence the activity?

- ▴ Avoided deforestation is now eligible for CFI credits
- ▴ Improved carbon price revenue
- ▴ Recent changes to land clearing regulations in QLD

## Key metric

Deforestation abatement, MtCO<sub>2</sub>e



DEFORESTATION

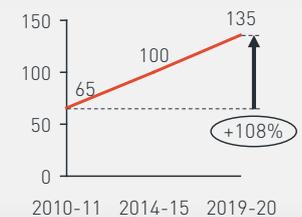
Very limited additional afforestation expected by 2020

**Current trends would capture 2% of potential identified in LCGP**

- > If the recent trend of carbon forests continues, the area planted could more than double by 2020, but will however remain marginal
- > Existing plantation forests will be harvested and likely not replanted

- ▴ High uncertainty and risk around future carbon revenues from afforestation
- ▴ Lower sequestration rates in low rainfall areas where plantation is required for CFI

Total area of carbon forestry, '000 ha



*Does not include timber plantation or native forests*

AFFORESTATION

Current trends would lead to a 48% increase in methane abatement from landfill and wastewater gas

**Current trends would capture more than LCGP potential**

- > 45 MW of capacity is in development with a further 18 MW under evaluation
- > If current trends are sustained, wastewater treatment facilities will abate 60% of their waste methane by 2020

- ▴ Mature and demonstrated technology
- ▴ Further rises in gas and electricity prices
- ▴ Financially attractive landfill facilities are approaching saturation

Total abatement from landfill and wastewater gas, MtCO<sub>2</sub>e



WASTE

Activity is increasing in some areas, but most of the potential would not be captured without further incentives, research and development

**Current trends would capture 15% of potential**

- > Large areas of northern Australia identified for improved rangeland and savanna fire management
- > Adoption of methane abatement at piggeries is expected to increase to cover 30% of Australia's pig herd by 2019-20

- ▴ Current research funding could develop less emissions intensive farming techniques
- ▴ Additional methodologies in development

Emissions reduction from agriculture projects, MtCO<sub>2</sub>e



AGRICULTURE

### 3. What more could be done?

#### There is a significant potential to increase carbon sequestration in agriculture and forestry

Each sector has the potential to contribute additional emissions reductions by 2019-20. This potential was outlined in ClimateWorks' *Low Carbon Growth Plan for Australia*.

That research, published in 2010 and updated in 2011, provides an indication of the scale of emissions reduction potential available in Australia without changes to the business mix of our economy or to our lifestyles. It also provides details of the activities that can deliver these emissions reductions.

The *Low Carbon Growth Plan for Australia* found that there is enough abatement potential to achieve a 25 per cent emissions reduction target in Australia, using technologies and practices already available. However further policy or economic incentives would be required to drive the uptake of those activities.

The graph above compares the abatement observed in Land-use and Waste to date as shown in this *Tracking Progress* report series with the potential described in the *Low Carbon Growth Plan for Australia*, noting that total abatement figures per sector do not

align exactly due to the different methodologies used for the two reports and changes in the economic context between 2011 and today<sup>6</sup>.

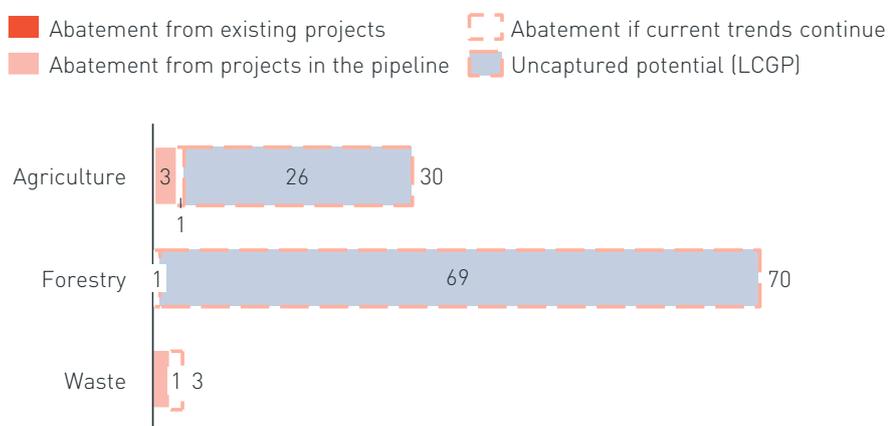
An additional 93 MtCO<sub>2</sub>e would be required in 2019-20 to meet the 25% emissions reduction potential for Land-use and Waste modelled in ClimateWorks' *Low Carbon Growth Plan for Australia* (LCGP) for this sector.<sup>7</sup>

Most of the additional potential resides in further decreases in net forestry emissions (69 MtCO<sub>2</sub>e), in particular with a high potential for increased afforestation identified in the LCGP (around 6 million hectares).

A significant amount of abatement could also be delivered in the agriculture sector (26 MtCO<sub>2</sub>e), through reductions in cropland and livestock emissions, and increased carbon sequestration activities (through improved land management practices).

If current trends are sustained, methane recovery in the waste sector would exceed the potential identified in the LCGP by 2 MtCO<sub>2</sub>e.

Relative share of emissions reduction potential by sector, MtCO<sub>2</sub>e (ClimateWorks 2011, ClimateWorks team analysis)



<sup>6</sup> The *Low Carbon Growth Plan for Australia* (LCGP) is used only as a benchmark indication of how much potential remains available. The numbers presented in this report differ from the numbers presented in the LCGP given that those two analyses have slightly different scopes: the LCGP assessed abatement potential above the Australian Government's business-as-usual emissions projection, whereas this *Tracking Progress* study reports on all abatement activity undertaken, including abatement that would have been regarded as part of business-as-usual by government projections. For example, installation of new renewable capacity to meet the Renewable Energy Target was included in the Government's business-as-usual projection, but has been included in our abatement calculation in this report. This means that the 'total potential' referenced in this report appears larger than what was reported in the LCGP.

<sup>7</sup> The total uncaptured potential from forestry and agriculture adds up to 95 MtCO<sub>2</sub>e, however we have subtracted 2 MtCO<sub>2</sub>e of the abatement that can be achieved through waste, which is additional to the opportunity identified in the LCGP.

# Case studies



## Pork power – When a pig farm becomes a power station

Blantyre Farms near Young in New South Wales was the first piggery in Australia to secure approval to participate in the Carbon Farming Initiative (CFI) scheme through capturing and destroying methane from effluent ponds to generate energy.

Michael and Edwina Beveridge, who own and operate the farm, covered effluent ponds so that gases produced could be collected and used to power a biogas system to generate electricity from manure.

The biogas system features three 80 kW generators with an integrated heat exchanger that can be used to provide warmth for piglets in winter.

The system has not only eliminated the farm's \$15,000 a month electricity and gas bill but actually earns \$5,000 a month from electricity sold back to the grid. This removes the risk of rising energy prices eating away at the farm's profit margins.

The upgrades to the farm have already been credited with reducing emissions by 8,000 tCO<sub>2</sub>e under the CFI.

The Beveridges expect to earn \$175,000 per year from the sale of carbon credits. Along with revenue from energy generated, they are expecting to return their investment within two years.



Full case studies are available in the full Land-use and Waste report in this Tracking Progress report series



## Talent to burn: Using Indigenous knowledge to better manage savanna landscapes

The North Australian Indigenous Land and Sea Management Alliance Ltd (NAILSMA) Carbon Program was established to highlight how traditional burning can be a unique environmental service that creates local, national and global benefits.

Through partnerships with government, local communities and scientists, NAILSMA are demonstrating how traditional burning of northern savanna landscapes reduces wildfires and creates a patchwork of habitats for plants and animals, while reducing greenhouse gas emissions.

Current projects using these enhanced fire management methods already contribute 110,000 tCO<sub>2</sub>e of abatement per year, equivalent to removing almost 30,000 cars from the road.

Through the United Nations University Indigenous Knowledge Initiative, these practices are being investigated for application in savanna regions in developing countries with the potential to generate sustainable livelihoods in remote communities, where few other opportunities for earning an income exist. The methods are particularly applicable in the grasslands of sub-Saharan Africa and South America where revenues from carbon could be used to alleviate poverty.

# CONTACT US

For further information about this project,  
and to view all reports in the Tracking Progress series, visit

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A detailed bibliography is available in the full report for the Land-use and  
Waste sector at [www.climateworksaustralia.org/tracking-progress](http://www.climateworksaustralia.org/tracking-progress)

