



# **Durban Climate Conference and Australia's Abatement Task**

Andrew Macintosh

CCLP Working Paper Series 2011/2

**ANU Centre for Climate Law and Policy**

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## Summary

In mid-2011, the Australian Treasury released the *Strong Growth, Low Pollution* report (Treasury report), which contains the Australian Government's latest estimate of the emission reductions that will be necessary to meet its 5% 2020 target (known as the 'abatement task'). The report estimated that the abatement task in 2020 was likely to be 159 MtCO<sub>2</sub>-e, while the cumulative task for the period 2013-2020 was likely to be 737 MtCO<sub>2</sub>-e. Three issues that are the subject of negotiations at the Durban Climate Change Conference have the potential to significantly alter Australia's abatement task: (a) the treatment of deforestation emissions; (b) whether parties with surpluses from the Kyoto Protocol's first commitment period are allowed to use them to meet their commitments in the post-2012 regime; and (c) the rules for forest management accounting. This paper provides an analysis of the potential impact of these issues on the 5% abatement task. The key findings are as follows.

### *Revised abatement task due to economic circumstances*

Due to the global economic situation, particularly the threat of a prolonged recession in Europe and slowing of growth in Asia, the 5% abatement task is likely to be less than the amount projected in the Treasury report. The reference case emissions for non-LULUCF sectors are revised downward to account for this. In the revised reference case, the cumulative abatement task is 654 MtCO<sub>2</sub>-e for the period 2013-2020, down from the Treasury report's 737 MtCO<sub>2</sub>-e.

### *Deforestation emissions*

If Australia is allowed to include deforestation emissions in its base year, which seems likely, it will be able to claim credit for reductions in net deforestation emissions that are mainly attributable to regulatory changes introduced in the mid- to late-2000s. If deforestation emissions merely stabilise at 2009 levels over the period 2010 to 2020, it will reduce the cumulative 2013-2020 abatement task by 52 MtCO<sub>2</sub>-e (called the 'stabilisation scenario'). If deforestation emissions continue on the downward trajectory they have been on since 2006, and follow a linear path to 30 MtCO<sub>2</sub>-e in 2020, it will reduce the cumulative 2013-2020 abatement task by 114 MtCO<sub>2</sub>-e (optimistic scenario). When these more optimistic projections of deforestation are taken into account, the cumulative abatement task is reduced to between 540-602 MtCO<sub>2</sub>-e.

### *Australia's surplus*

Australia's surplus under the first commitment period of the Kyoto Protocol is estimated at between 101 MtCO<sub>2</sub>-e and 107 MtCO<sub>2</sub>-e. This equates to between 17-20% of the 540-602 MtCO<sub>2</sub>-e cumulative abatement task.

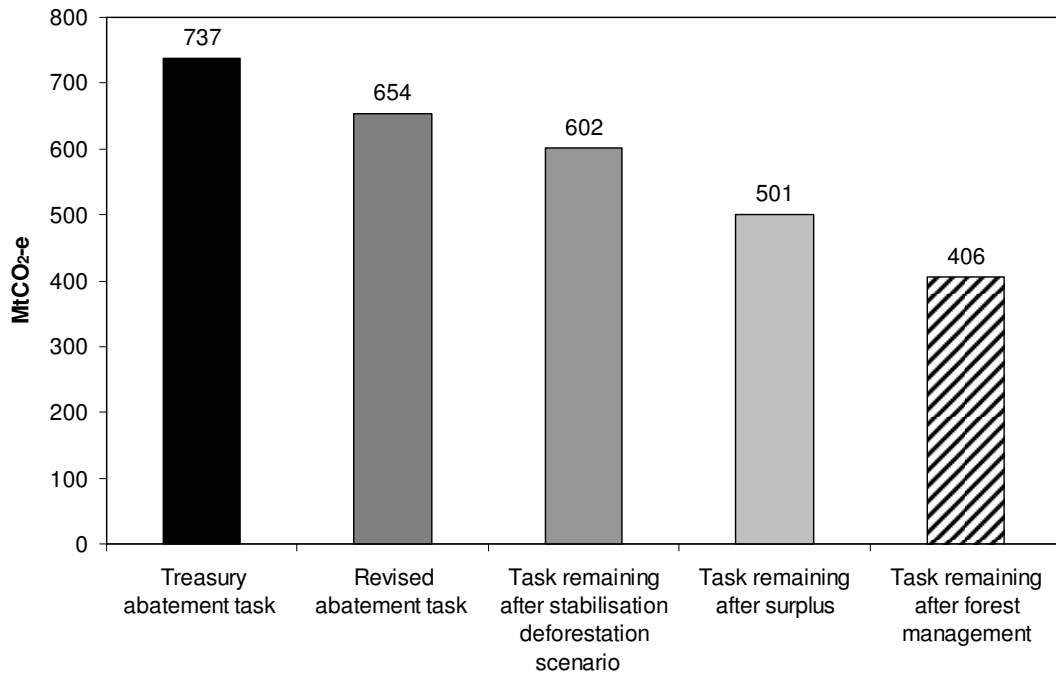
### *Forest management*

Forest management is a potential source of significant windfall or low-cost credits for Australia over the period to 2020. If the harvesting rates in native forests merely remain at 2010 levels, Australia could conservatively generate ~12 MtCO<sub>2</sub>-e yr<sup>-1</sup> of offsets, or a total of 96 MtCO<sub>2</sub>-e over the period 2013-2020. This equates to between

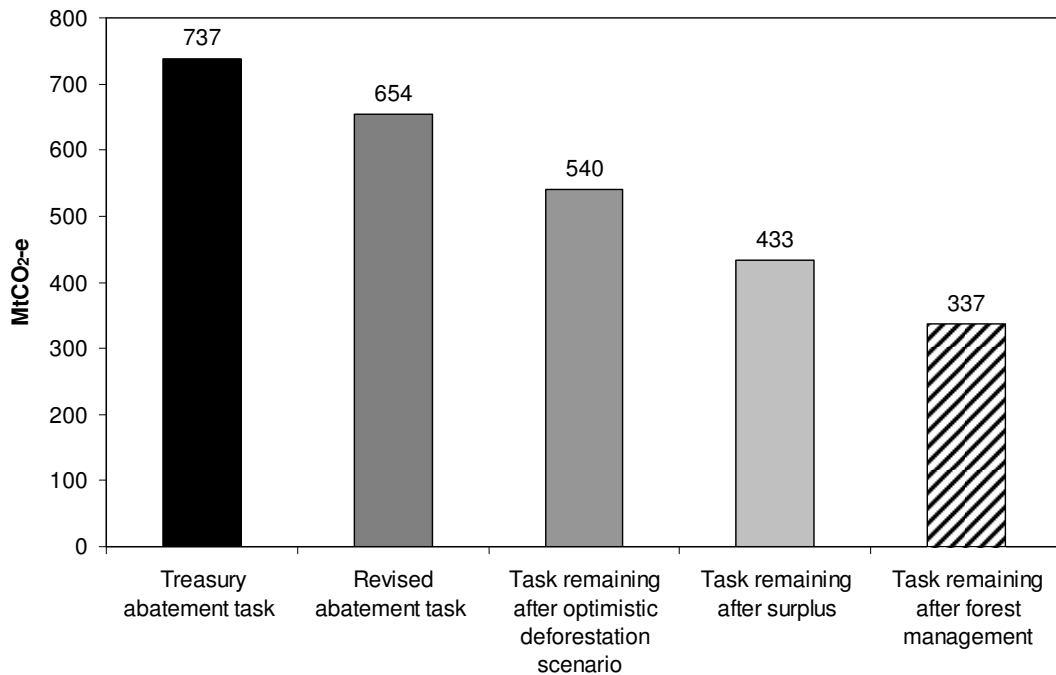
16-18% of the 540-602 MtCO<sub>2</sub>-e cumulative abatement task. This estimate is subject to several caveats. Most importantly, Australia would need to elect to account for forest management in the post-2012 period before it could access these credits. The quantity of windfall or low-cost forest management credits that Australia is able to access will also depend on the rules that are agreed for this sector.

The combined impact of the revisions in non-LULUCF and deforestation reference case emissions, the projected surplus, and forest management on the cumulative 5% abatement task are shown in Figures S1 (using the stabilisation deforestation scenario) and S2 (using the optimistic deforestation scenario).

**Figure S1 Impacts on Australia's 5% cumulative abatement task, 2013-2020, under the stabilisation deforestation scenario**



**Figure S2 Impacts on Australia's 5% cumulative abatement task, 2013-2020, under the optimistic deforestation scenario**



## 1. Introduction

On Monday, 28 November 2011, the 17th Conference of the Parties (COP17) to the United Nations Framework Convention on Climate Change (UNFCCC) and the 7th Session of the Conference of the Parties serving as the Meeting of the Parties (CMP7) to the Kyoto Protocol commenced in Durban, South Africa. Much of the focus of the Conference is on whether there will be a second commitment period of the Kyoto Protocol, whether a mandate is devised to commence negotiations on a new legally binding agreement based on the work of the Ad-hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), and what bridging arrangements should be put in place if there is a gap between the end of the first commitment period of the Kyoto Protocol and the formal commencement of the replacement regime. Many countries are also seeking to reach an agreement within the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP) on the technical accounting rules that will apply in the post-2012 regime.

All aspects of the negotiations will have implications for Australia but there are four issues being negotiated within the AWG-KP that are of particular importance to those interested in the size of Australia's abatement task (the amount by which it has to reduce its emissions) for the period 2013-2020:

- the 2020 targets (called 'quantified emission limitation and reduction objectives' (QELROs)) for developed countries (Annex I parties);
- how deforestation emissions should be treated in Australia's base year for the purposes of determining its target (or assigned amount);
- whether, or to what extent, developed countries that have surpluses from the Kyoto Protocol's first commitment period should be allowed to carry them over into the post-2012 regime, and use them to meet their targets; and
- the rules for forest management accounting.

The purpose of this paper is to analyse how the above issues could affect the size of Australia's abatement task. Section 2 provides details of Australia's quantified economy-wide emission reduction target range and discusses the Australian Treasury's estimates of the abatement task to 2020. Section 3 provides an update on the likely growth in emissions (excluding land use, land-use change and forestry (LULUCF)) in the absence of additional policy measures (the reference case). Section 4 reviews the implications of the negotiations surrounding the deforestation rules. Section 5 looks at the question of surpluses. Section 6 discusses forest management and section 7 analyses the combined impact of these issues on the abatement task.

## 2. Australia's 2020 target and the associated abatement task

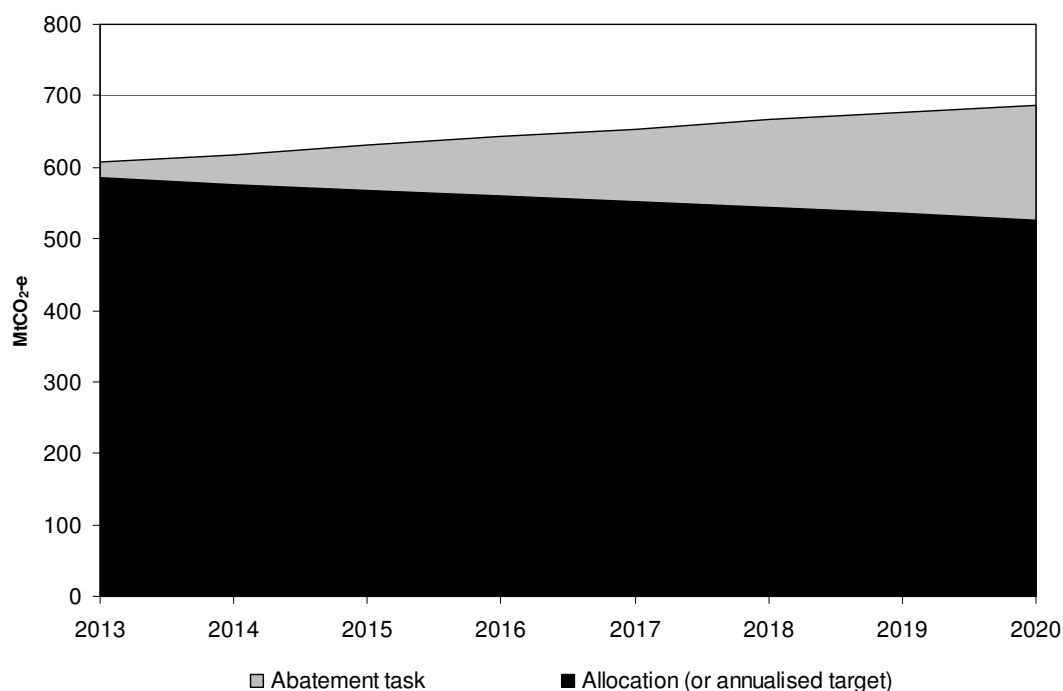
The quantified economy-wide emission reduction target that Australia has submitted as part of the negotiations is a range of between 5% and 25% below 2000 levels by 2020. Its formal submission is in the following terms.

Australia will reduce its greenhouse gas (GHG) emissions by 25 per cent compared with 2000 levels by 2020 if the world agrees to an ambitious global deal capable of stabilizing levels of GHGs in the atmosphere at 450 ppm carbon dioxide equivalent (CO<sub>2</sub> eq) or lower. Australia will unconditionally reduce its emissions by 5 per cent compared with 2000 levels by 2020 and by up to 15 per cent by 2020 if there is a global agreement which falls short of securing atmospheric stabilization at 450 ppm CO<sub>2</sub> eq under which major developing economies commit to substantially restraining their emissions and advanced economies take on commitments comparable to Australia's (SBSTA, 2011: 4).

Given the state of the negotiations, the lack of ambition expressed by other developed countries, and statements made by the Australian Government, most analysts have assumed that Australia will pursue its unconditional 5% target for 2020.

In mid-2011, the Australian Treasury released the *Strong Growth, Low Pollution* report (Treasury report), which contains the Australian Government's latest estimate of the emission reductions that will be necessary to meet the 5% target (known as the 'abatement task') (Treasury, 2011). The report estimates that Australia's 5% target translates to 527 million tonnes (Mt) of carbon dioxide equivalents (CO<sub>2</sub>-e) in 2020 and that, without additional policy measures, its emissions (Kyoto accounting) will rise from 578 MtCO<sub>2</sub>-e in 2010 to 680 MtCO<sub>2</sub>-e in 2020 in the 'medium global action scenario'. This leaves an abatement task of 152 MtCO<sub>2</sub>-e in 2020, and a cumulative task of 681 MtCO<sub>2</sub>-e over the period 2013 to 2020. Treasury contends that the abatement associated with the Carbon Farming Initiative (CFI) must be added to these estimates (on the assumption all eligible offset credits will be exported). After this adjustment, the Treasury report's final estimates of the 2020 and 2013-2020 abatement tasks under the medium global action scenario are 159 MtCO<sub>2</sub>-e and 737 MtCO<sub>2</sub>-e respectively (Figure 1).

**Figure 1 Australia 5% abatement task, assuming eligible CFI offsets are exported**



Source: Treasury (2011).

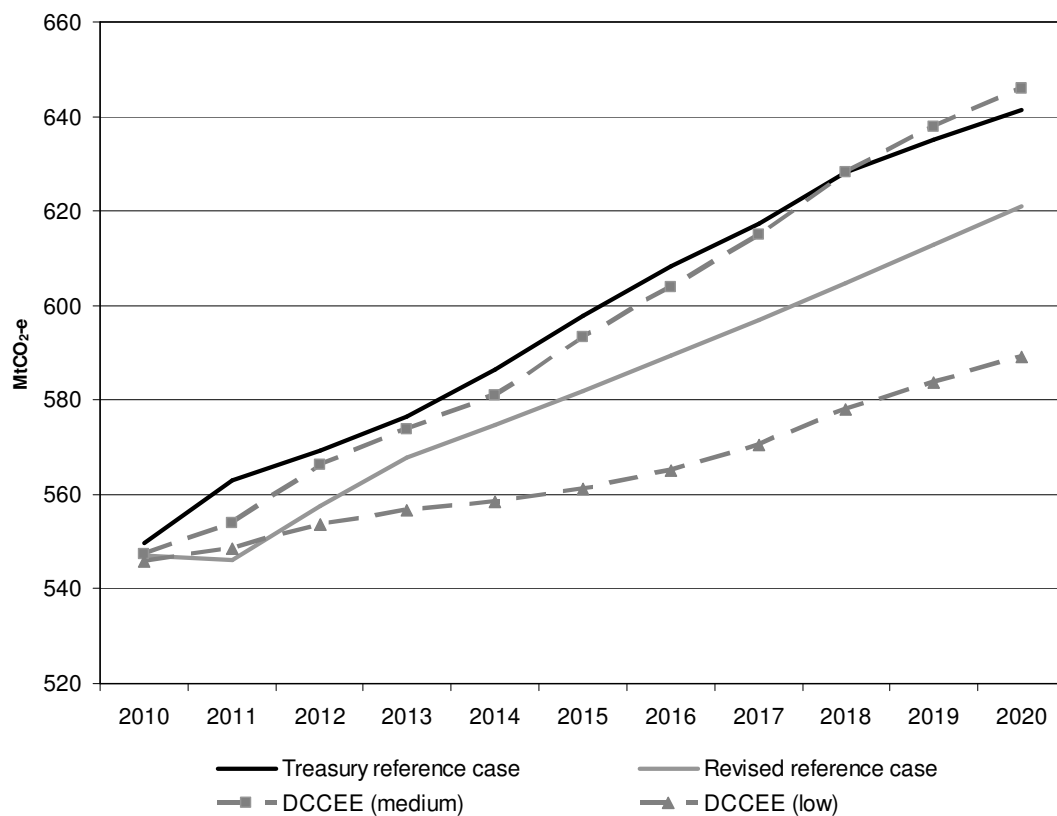
### 3. Updating the non-LULUCF reference case

In November 2011, after the Treasury report had been published, the Department of Climate Change and Energy Efficiency (DCCEE) released its National Greenhouse Gas Inventory update for the last quarter of 2010-11 (DCCEE, 2011a). The update contains preliminary data on emissions from all sectors other than LULUCF to the end of the 2011 reporting year. These data show a significant drop in electricity and fugitive emissions between 2010 and 2011, a large proportion of which is attributable to the weather conditions brought by the 2010-11 La Niña event. The increase in rainfall since mid-2010 has facilitated a rebound in hydroelectric generation to levels approaching those seen prior to the drought, which has displaced more carbon-intensive forms of generation. The 2010-11 summer floods and wet autumn also caused significant disruptions to mining activities, lowering fugitive emissions. In addition to these climatic factors, the economic slowdown (which is partly attributable to the floods), improvements in energy efficiency and an increase in embedded generation have all help to put downward pressure on emissions from non-LULUCF sectors since the late 2000s. As a result of these interrelated factors, electricity emissions have fallen from a high of 207 MtCO<sub>2</sub>-e in 2009 to 194 MtCO<sub>2</sub>-e in 2011 and total emissions (excluding LULUCF) in 2011 are estimated to be 546 MtCO<sub>2</sub>-e, 17 MtCO<sub>2</sub>-e lower than the level projected by Treasury.

Looking forward, the global economic situation, particularly the threat of a prolonged recession in Europe and slowing of growth in Asia, has the potential to cause a significant downward revision in Australia's reference case emissions for the period 2013 to 2020. To account for this, a simplified revised reference case was devised.

Under this scenario, it was conservatively assumed that in 2012, emissions in all non-LULUCF sectors (excluding fugitive emissions) grow at the trend rates seen between 1990 and 2007, before the onset of the global financial crisis. Fugitive emissions were projected to rebound from the effects of the floods and rain, rising from 42 MtCO<sub>2</sub>-e in 2011 to 44.5 MtCO<sub>2</sub>-e in 2012. Between 2013 and 2020, emissions in all non-LULUCF sectors, except for agriculture and waste, were assumed to grow at rates between <0.1% and 0.4% below those projected in the Treasury report. The emissions growth rates for agriculture and waste emissions were assumed to be the same as those contained in the Treasury report. The results are shown in Figure 2, and sectoral data on the revised reference case are presented in Appendix A. Included in Figure 2 for comparison is the medium and low reference case scenarios from DCCEE's *Australia's Emissions Projections 2010* report (DCCEE, 2010).

**Figure 2 Revised reference case (excluding LULUCF emissions)**



Sources: Treasury (2011), DCCEE (2010), DCCEE (2011a; 2011b), author estimates.

#### 4. Deforestation emissions and the abatement task

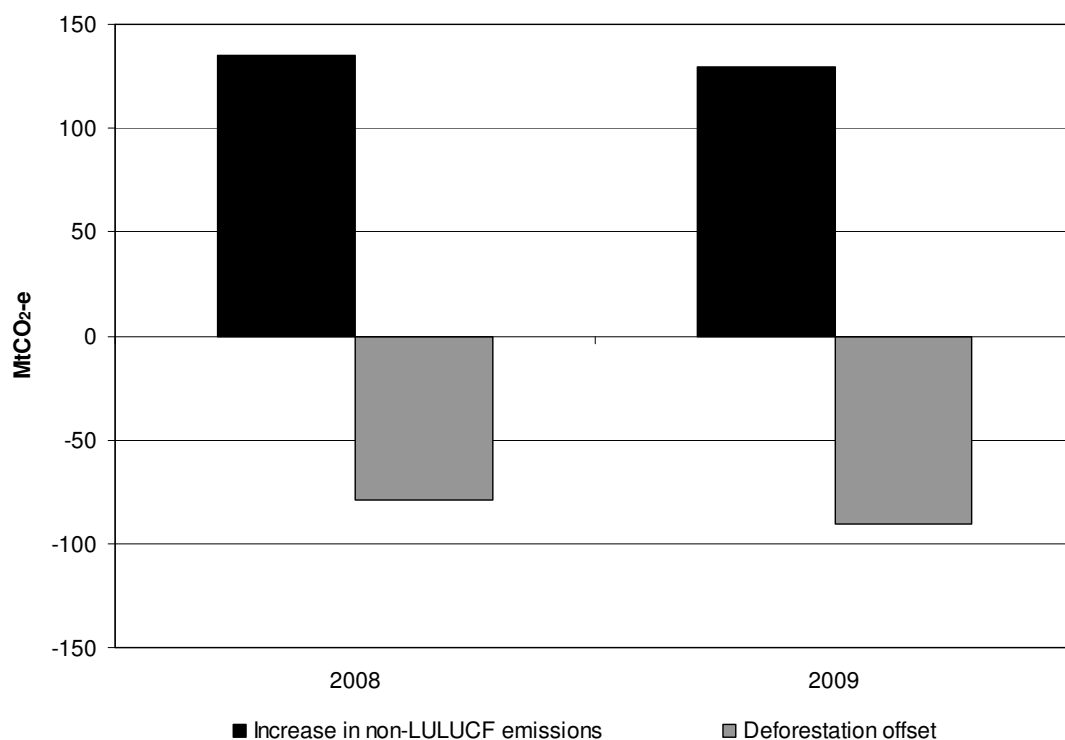
There are three issues associated with deforestation that will have a significant impact on the size of Australia's abatement task to 2020:

- whether Australia is allowed to include deforestation emissions in its base year for the purpose of calculating its target;
- if it is, which estimate of deforestation emissions is included in the base year; and

- in the absence of additional policy measures, what trajectory are deforestation emissions likely to follow over the period 2013-2020.

Due to Article 3.7(2) of the Kyoto Protocol (known as ‘the Australia clause’), Australia is allowed to include deforestation emissions in its base year for the purpose of calculating its assigned amount for the first commitment period (2008-12). This accounting provision is an exception to the general rule that, because emissions from LULUCF are treated as offsets, they are not included in the base year emissions estimate. Australia insisted on the inclusion of Article 3.7(2) because its deforestation emissions had fallen by ~50% over the period 1990 to 1997 due to factors unrelated to climate change policy. By including deforestation emissions in its base year, the Australian Government knew it could receive credit for the reductions that had already occurred and use these to offset emission increases in other sectors. This is what has occurred. Between 1990 and 2009, non-LULUCF emissions increased by approximately 130 MtCO<sub>2</sub>-e yr<sup>-1</sup> and these increases are being offset by credits from deforestation worth ~80-90 MtCO<sub>2</sub>-e yr<sup>-1</sup> (Figure 3).

**Figure 3 Increase in non-LULUCF emissions vs. decrease in deforestation relative to 1990, 2008 and 2009**



Source: DCCEE (2011a; 2011b).

*Will Australia include deforestation emissions in its base year?*

There have been discussions within the negotiations about whether Article 3.7(2) should be altered to prevent Australia from claiming credit for reductions in deforestation emissions over the period 2013-2020. Under this proposal, parties would be unable to include deforestation emissions in their base year but would remain liable for net deforestation emissions in the accounting period (i.e. standard gross-net

accounting). At this point, it appears unlikely that this proposal will be accepted and, in all likelihood, Australia will continue to include deforestation emissions in its base year.

*What deforestation emission estimate should be used?*

If Australia is allowed to include deforestation emissions in its base year, a question arises as to which estimate of these emissions should be used for the purposes of calculating the 2020 target (or the assigned amount for the second commitment period). DCCEE produces two estimates of deforestation emissions: one for the purposes of the National Inventory Report that is submitted under the UNFCCC, and another for the purposes of reporting under the Kyoto Protocol. The National Inventory Report accounting system tracks deforestation trends (forest conversion, reclearing and other post-conversion changes in carbon stocks) from 1972. The emissions that are reported for these purposes cover those associated with forest conversion (i.e. human-induced conversion of forest land to a non-forest use) and all subsequent changes in carbon stocks (reclearing, fires, drought affects etc.). The Kyoto Protocol deforestation emission estimate is a subcomponent of that which is reported in Australia's National Inventory Report. It is confined to the net emissions associated with human-induced conversion of land that was forest in December 1989 to a non-forest land use and all changes in carbon stocks on the affected land units after the initial conversion event.

Given the context in which targets are set, there is a logic to using the Kyoto estimate of deforestation emissions when calculating Australia's 2020 target. However, because Australia's target is calculated from a 2000 base year, there is a problem – technically there is no estimate of deforestation emissions (or LULUCF emissions more generally) under the Kyoto Protocol in the year 2000. With the exception of Article 3.7(2), debits and credits from LULUCF are only accounted for in the commitment period.

In the Treasury report, the National Inventory Report estimate of deforestation emissions was used (69.5 MtCO<sub>2</sub>-e in 2000), which resulted in the 5% target converting to 527 MtCO<sub>2</sub>-e in 2020. If the Kyoto Protocol rules were applied, the estimate of deforestation emissions is likely to be ~10% lower, or ~62 MtCO<sub>2</sub>-e. The use of this estimate results in the 5% target converting to 520 MtCO<sub>2</sub>-e in 2020.

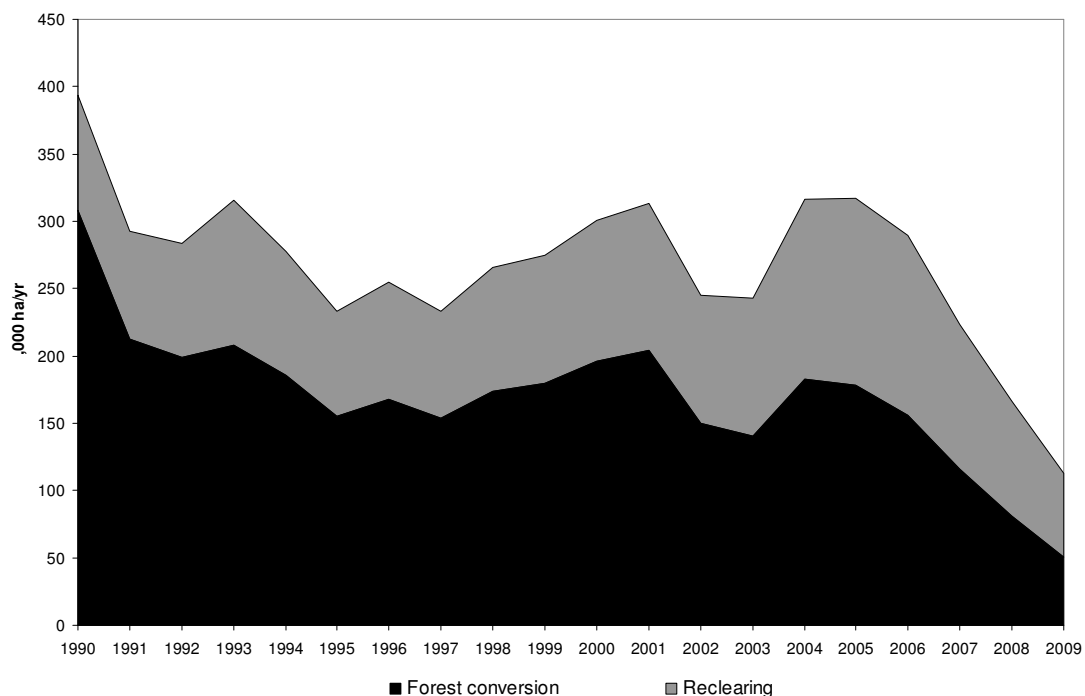
*What trajectory are deforestation emissions likely to follow over the period 2013-2020?*

Similar to elsewhere, the underlying drivers of deforestation trends in Australia can be traced to factors related to agriculture (most deforestation in Australia is for grazing and cropping), including commodity prices, agricultural input costs, the exchange rate, rainfall, government policies and the availability of uncleared productive agricultural land. Due to the complex nature of the interaction between these factors, projections of deforestation emissions are subject to a large degree of uncertainty. In recent times, the task of forecasting deforestation emissions has been complicated by changes in vegetation management laws in Queensland and New South Wales. The regulatory structures in these jurisdictions are still in their relative infancy and it is likely to be several years before their full effects are realised.

The starting point for the deforestation emission projections in the Treasury report was the equivalent projections published by DCCEE in 2010, which estimated that, in the absence of new policy measures, land use change (deforestation) emissions would be stable at just under 50 MtCO<sub>2</sub>-e yr<sup>-1</sup> over the period 2010 to 2030. From this projection was deducted the projected deforestation abatement from the CFI, estimated at 4 MtCO<sub>2</sub>-e yr<sup>-1</sup>.

There are reasons to believe the Treasury report’s deforestation projections are too conservative. The regulatory changes in Queensland have triggered a sharp decline in forest conversion since 2006 (Figure 4). This downward trend has been aided by other contributory factors – the millennium drought, flood events in 2009, declining agricultural terms of trade, diminishing supply of uncleared productive land – but the regulatory changes appear to be the primary driver. Given the time lag associated with the introduction of broad regulatory structures of this nature, and the fact that the last round of regulatory changes only came into effect in late 2009, there is a reasonable likelihood that deforestation rates will continue to fall for several years regardless of whether additional policy measures are introduced.

**Figure 4 Queensland deforestation rate, forest conversion and reclearing, 1990 to 2009**



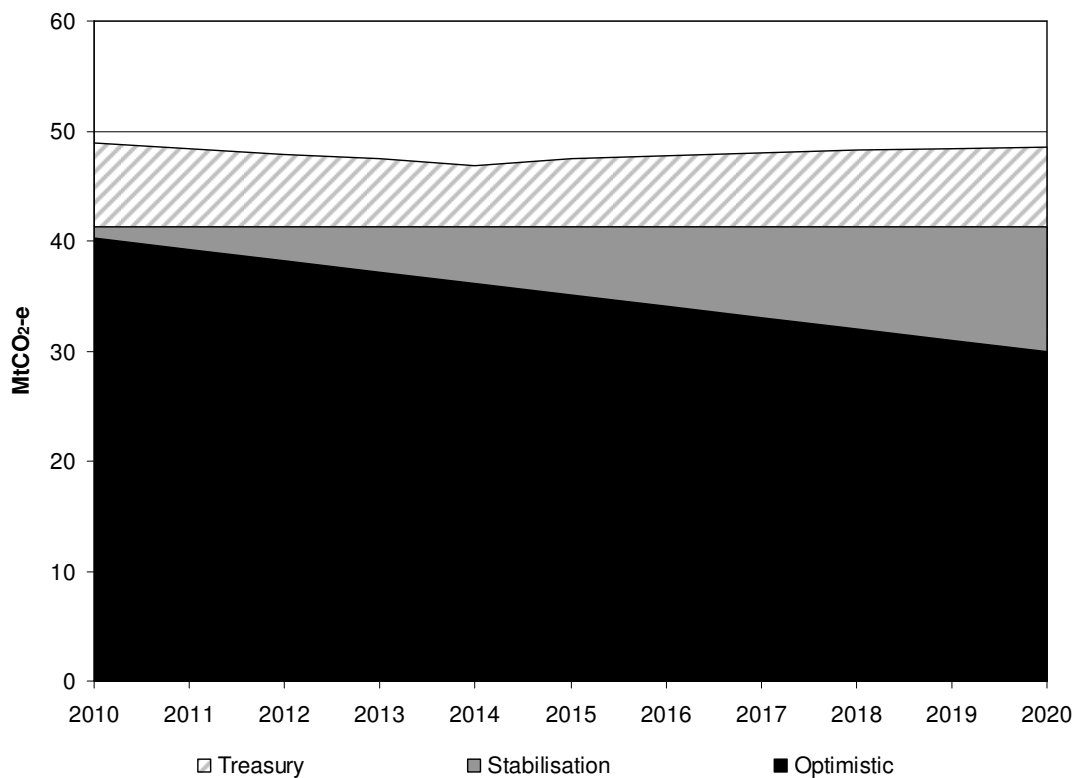
Source: DCCEE (2011b).

The significance of the decline in deforestation emissions is evident in the start year of Treasury’s projections. In 2010, the Treasury report predicts that deforestation emissions will be 49 MtCO<sub>2</sub>-e, whereas in 2009, they were already 7.6 MtCO<sub>2</sub>-e lower at 41 MtCO<sub>2</sub>-e.

To account for the potential for deforestation emissions to be lower than projected, two simple revised deforestation reference case scenarios were developed (both

exclude the impact of the CFI, i.e. the CFI abatement is treated as additional). In the first (stabilisation scenario), deforestation emissions are assumed to remain at 41 MtCO<sub>2</sub>-e over the period 2010-2020. In the second (optimistic scenario), they decline linearly from 41 MtCO<sub>2</sub>-e in 2009 to 30 MtCO<sub>2</sub>-e in 2020. The impact of these lower projections on Australia's abatement task is shown in Figure 5. On a cumulative basis, the lower deforestation emissions reduce Australia's abatement task by between 52 MtCO<sub>2</sub>-e and 114 MtCO<sub>2</sub>-e over the period 2013-2020.

**Figure 5 Stabilisation and optimistic deforestation reference case emission scenarios vs. Treasury projection**



Sources: Treasury (2011), DCCEE (2011a; 2011b), author estimates.

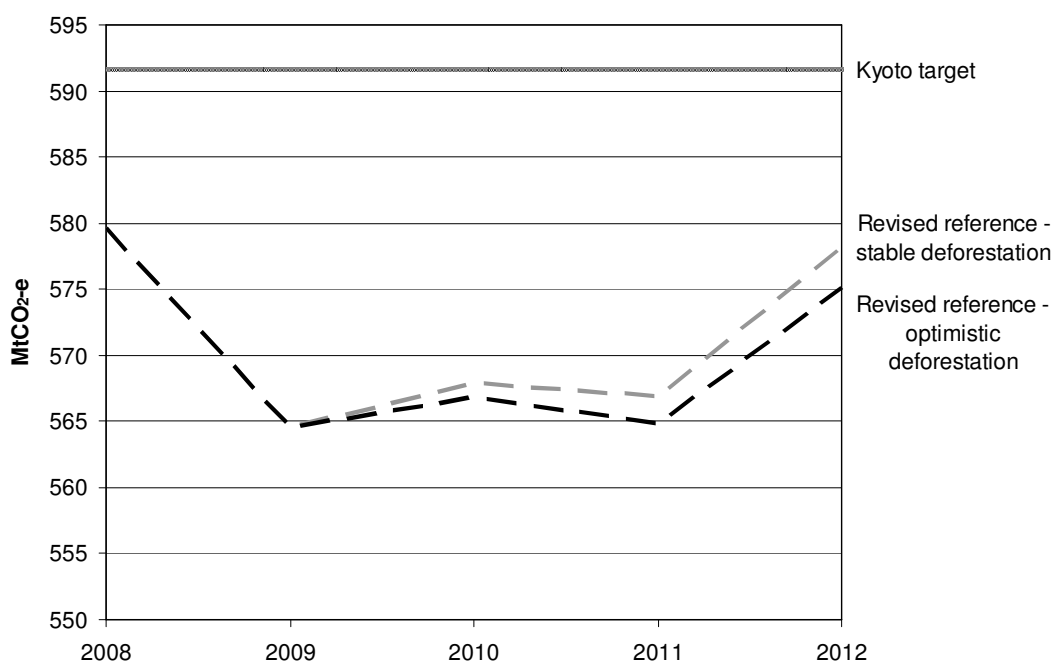
## 5. Australia's Kyoto surplus

One of the most contentious issues in the international negotiations concerns the carry-over of surplus assigned amount units from the first commitment period (i.e. whether Annex B parties that meet their targets under the Kyoto Protocol should be allowed to use any surplus units to meet their obligations in the post-2012 regime). Most of the attention surrounding this issue has been focused on Russia and Ukraine, who are likely to have billions of surplus units that could be carried-over into the 2013-2020 period. While not of the same magnitude, Australia is also likely to have a significant surplus that could be used to reduce its abatement task.

The size of Australia's surplus will largely be a function of the growth rate of energy emissions between 2011 and 2012, and the trajectory of deforestation emissions over the period 2010 to 2012. If it is assumed that non-LULUCF emissions follow the

revised reference case discussed in section 2, reforestation emissions remain unchanged from the Treasury report, and deforestation emissions follow either the stabilisation or optimistic scenarios from section 4, the cumulative surplus over the commitment period will be between 101 MtCO<sub>2</sub>-e and 107 MtCO<sub>2</sub>-e (Figure 6).

**Figure 6 Australia's Kyoto target vs. projected emissions**



Sources: Treasury (2011), DCCEE (2011a; 2011b), Australian Government (2008), author estimates.

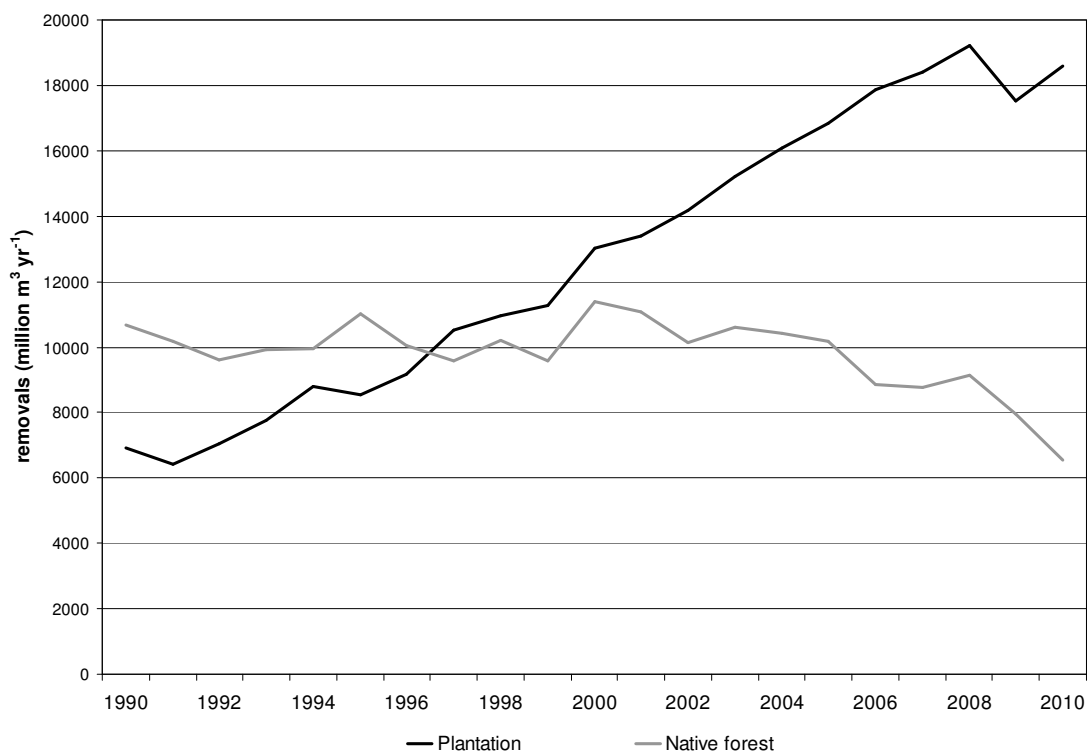
## 6. Forest management

In the first commitment period, forest management is accounted for on a gross-net basis, meaning the amounts recorded for forest management in each year are equal to the net emissions from forest management lands. The use of this approach is problematic because it assumes the net emissions are a product of additional human-induced actions when, in fact, they could be attributable to past management activities (e.g. recovery from harvesting before 1990) or natural factors (fires, pest attacks, droughts etc). This gives rise to risks of undeserved credits (windfall credits) and debits.

At Durban, the parties will be discussing whether to amend the rules concerning forest management to shift the accounting framework from a gross-net to a baseline-and-credit system. Under the baseline-and-credit system, forest management reference levels will be set for all relevant developed countries for the period 2013 to 2020 (or the length of the second commitment period, if different). These reference levels are supposed to represent net emissions from forest management assuming no policy change from December 2009. Once the reference level has been determined, the credits and debits that are recorded for each party will be calculated by subtracting the reference level from actual net emissions: parties whose net emissions are below the reference level will receive credits; those whose net emissions are above the reference level will receive debits.

In accordance with the Cancun Agreements, Australia has submitted a forest management reference level based on a projection that assumes no change in policy from December 2009. For the multiple use public native forest component of the projection, the Australian Government assumed that the harvest rate of these forests between 2013 and 2020 would be equal to the average rate over the period 2002 to 2009. While defensible, this assumption downplays the structural changes that have been occurring in the Australian forestry industry since the early 2000s, which have seen the plantation and native forest sectors moving in opposite directions. Between 2001 and 2010, plantation roundwood removals rose by 39%, increasing from 13.4 million m<sup>3</sup> yr<sup>-1</sup> to 18.6 million m<sup>3</sup> yr<sup>-1</sup>. Over the same period, native forest roundwood removals fell by 41%, from 11.1 million m<sup>3</sup> yr<sup>-1</sup> to 6.5 million m<sup>3</sup> yr<sup>-1</sup> (Figure 7).

**Figure 7 Plantation and native forest roundwood removals (m<sup>3</sup> yr<sup>-1</sup>), 1990 to 2010**



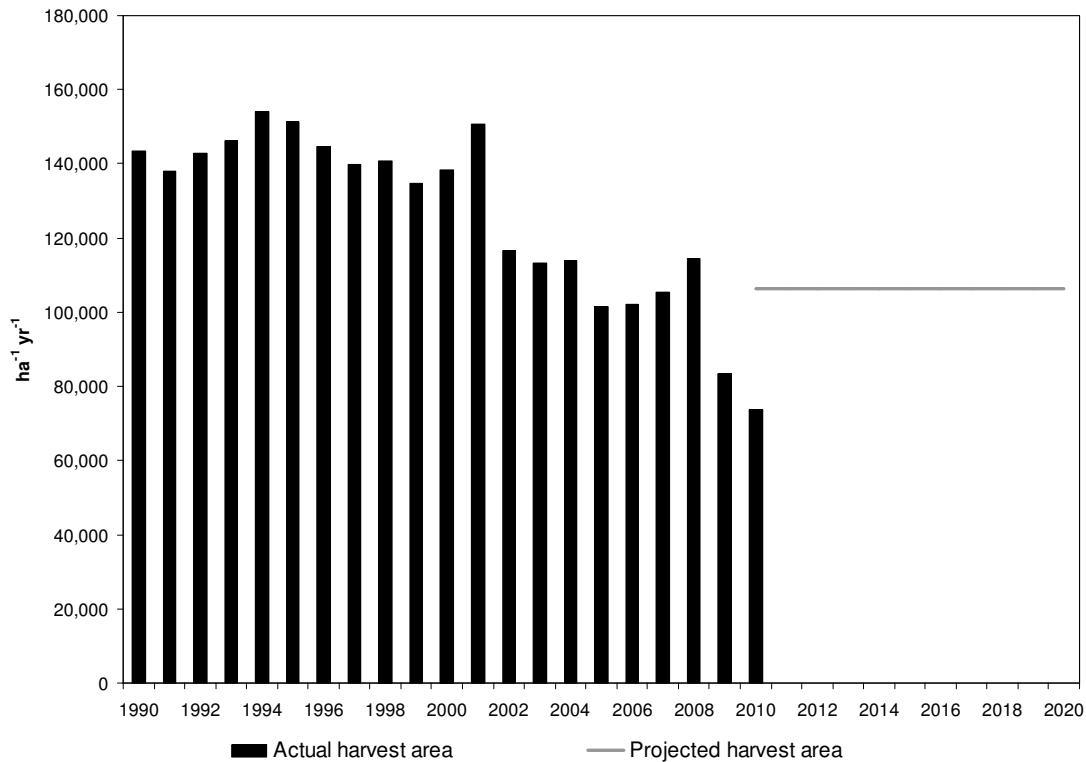
Sources: ABARES (2011a; 2011b), Queensland Department of Environment and Resource Management (2011), Forests NSW (2011).

The downward trajectory of the native forest sector is a product of several factors, the main ones being pre-2009 policy changes, rising competition from the plantation sector and shrinking demand in key export markets (Japan particularly). In the short- to medium-term, the pressure on the native forest sector is likely to continue, even in the absence of policy changes. The plantation sector is experiencing strong growth and the prospects of a speedy recovery in the Japanese native forest woodchip market are low. Rapid growth is being experienced in the Chinese roundwood and woodchip export market but most of the logs are being sourced from plantations.

Due to the domestic and international conditions, there is likely to be a sustained period of below average harvesting in native forests. The trajectory of the industry is apparent from the harvesting statistics. In 2001, an estimated 150,591 ha<sup>-1</sup> yr<sup>-1</sup> of

native forest was subject to harvesting. By 2010, this had fallen to 73,679 ha<sup>-1</sup> yr<sup>-1</sup>, 51% below the level in 2001 and 31% below the level projected for the period 2013-2020 (i.e. the 2002-2009 average) (Figure 8).

**Figure 8 Estimated total area of native forest harvested (multiple use public native forests and private native forests) (ha<sup>-1</sup> yr<sup>-1</sup>), actual and projected, 1990 to 2020**



Sources: Australian Government (2011a; 2011b; 2011c); ABARES (2011a; 2011b); Forest Practices Authority Tasmanian (2011), Queensland Department of Environment and Resource Management (2011), Forests NSW (2011), author estimates.

By using the 2002-2009 average harvest rate as the basis for determining the forest management reference level, the Australian Government has created an opportunity for it to access windfall, or at the very least, cheap offset credits. If the harvesting rate in native forests remains at 2010 levels, Australia could conservatively generate ~12 MtCO<sub>2</sub>-e yr<sup>-1</sup> of offsets over the period 2013-2020. Reducing native forest harvesting to 50% of the 2002-2009 average, or around 53,200 ha<sup>-1</sup> yr<sup>-1</sup>, could generate ~19 MtCO<sub>2</sub>-e yr<sup>-1</sup> of offsets over the same period (Macintosh, 2011a; 2011b).

While forest management could potentially significantly reduce Australia’s abatement task, there are several hurdles that need to be cleared before the associated offsets can be claimed. Differences of opinion in the negotiations surrounding ‘safety measures’ and the treatment of major natural disturbances need to be resolved, and the final form of the rules needs to be agreed. Australia would then have to opt to account for forest management – it declined to account for forest management in the first commitment period because of concerns about the potential for wildfires to expose it to large liabilities (debits). After Durban, there should be greater clarity about whether

Australia will account for forest management in the post-2012 regime and the implications if it does so.

## **7. The combined impact on Australia's abatement task**

The outcomes from Durban have the potential to significantly reduce the abatement task associated with meeting Australia's 5% 2020 target. Under the revised reference case (using the Treasury report's projections of deforestation emissions), the cumulative abatement task is 654 MtCO<sub>2</sub>-e for the period 2013-2020,<sup>1</sup> down from the Treasury report's 737 MtCO<sub>2</sub>-e.

### *Deforestation*

If Australia is allowed to include deforestation emissions in its base year, which seems likely, it will be able to continue to claim credit for the reductions in the deforestation rate, and for regrowth on deforested land units. The fact that the regulatory regimes in Queensland and New South Wales are still in a relatively infant state, and that deforestation rates in Queensland have yet to stabilise, suggest that Australia's deforestation emissions are likely to continue to fall from the 2009 level of 41 MtCO<sub>2</sub>-e, or at least not increase significantly, over the period 2010-2020. As stated, declining deforestation emissions could reduce the abatement task by between 52 MtCO<sub>2</sub>-e (stabilisation scenario) and 114 MtCO<sub>2</sub>-e (optimistic scenario) over the period 2013-2020 (i.e. between an 8% and 17% reduction in the revised abatement task). When these more optimistic projections of deforestation are taken into account, the cumulative abatement task is reduced to between 540-602 MtCO<sub>2</sub>-e.

### *Australia's surplus*

In section 5, Australia's surplus was estimated at between 101 MtCO<sub>2</sub>-e and 107 MtCO<sub>2</sub>-e. This equates to between 17-20% of the 540-602 MtCO<sub>2</sub>-e abatement task.

### *Forest management*

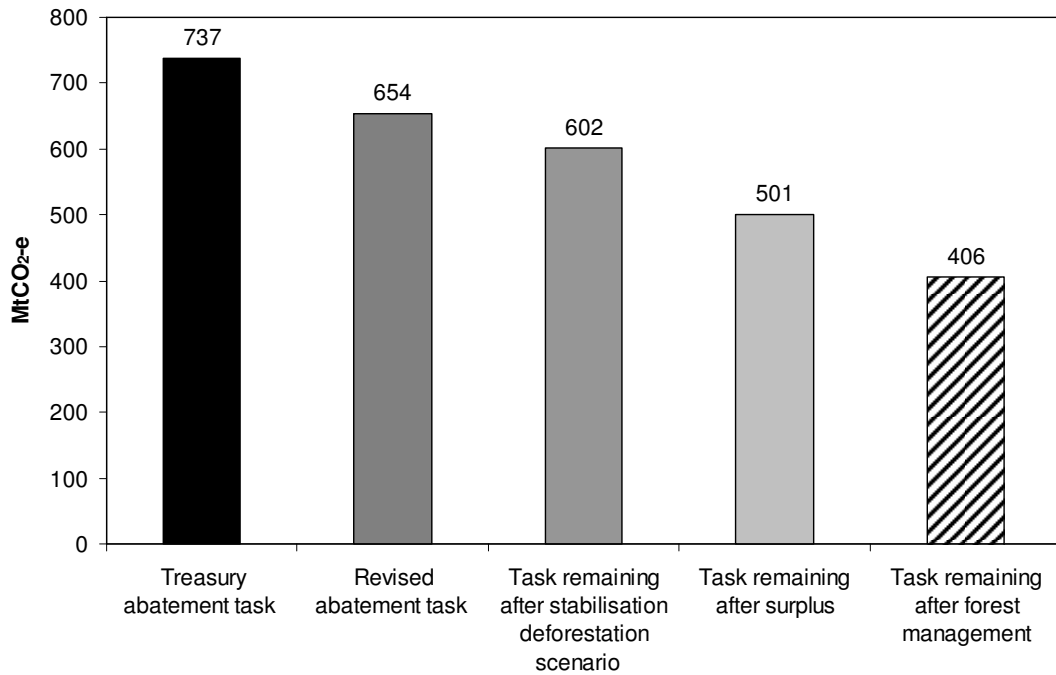
Forest management is a potential source of significant windfall or low-cost credits for Australia over the period to 2020. If the harvesting rates in native forests merely remain at 2010 levels, Australia could conservatively generate ~12 MtCO<sub>2</sub>-e yr<sup>-1</sup> of offsets, or a total of 96 MtCO<sub>2</sub>-e over the period 2013-2020. This equates to between 16-18% of the 540-602 MtCO<sub>2</sub>-e abatement task. Again, this estimate is subject to several caveats, including that the new rules concerning forest management are resolved, no restrictions are placed on the use of forest management credits, and that Australia opts to account for forest management in the post-2012 period.

The combined impact of the revisions in non-LULUCF and deforestation reference case emissions, the projected surplus, and forest management on the 5% abatement task are shown in Figures 9-12. Figures 9 and 11 show the impacts on the cumulative abatement task for the period 2013-2020, while Figures 10 and 12 show the impacts on the single year abatement task in 2020.

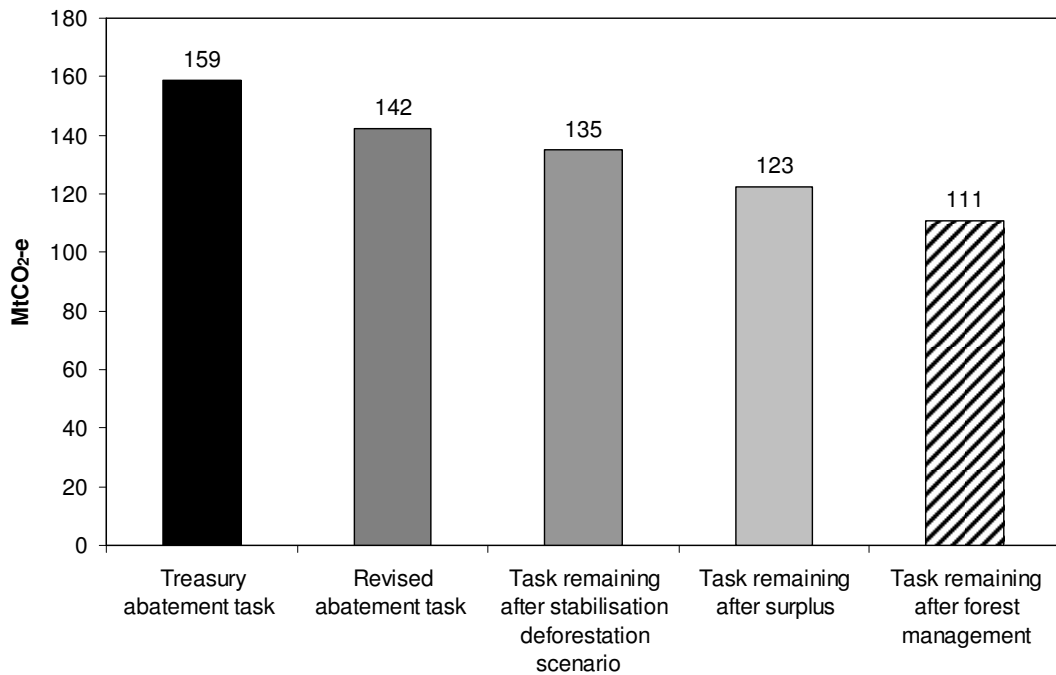
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<sup>1</sup> In keeping with the Treasury report, it has been assumed for these purposes that all eligible CFI credits are exported in the absence of a carbon price.

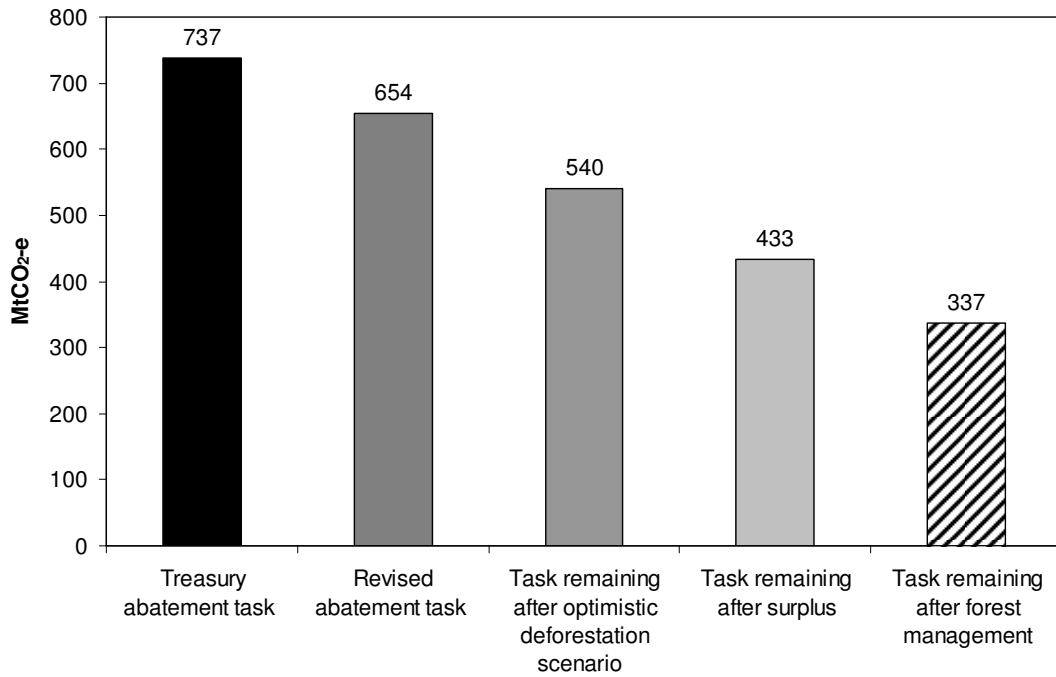
**Figure 9 Impacts on Australia's 5% cumulative abatement task, 2013-2020, under the stabilisation deforestation scenario**



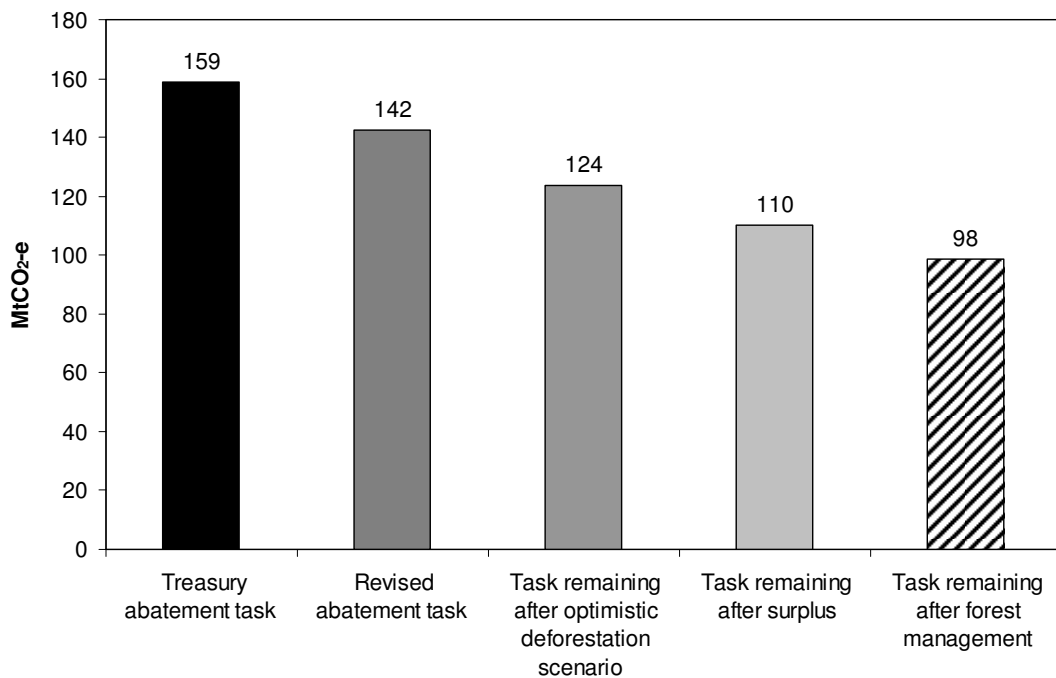
**Figure 10 Impacts on Australia's 5% abatement task in 2020 under the stabilisation deforestation scenario**



**Figure 11 Impacts on Australia’s 5% cumulative abatement task, 2013-2020, under the optimistic deforestation scenario**



**Figure 12 Impacts on Australia’s 5% abatement task in 2020 under the optimistic deforestation scenario**



Sources: Treasury (2011), DCCEE (2011a; 2011b), author estimates.

## Appendix A Reference case data tables

**Table A1 Treasury report reference case (medium global action scenario), excluding LULUCF, 2010-2020**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Electricity</b>	201	202	201	204	205	206	207	207	207	208	209
<b>Other stationary energy</b>	94	98	98	103	106	110	115	119	122	125	127
<b>Transport</b>	81	85	88	90	91	91	92	93	94	96	97
<b>Fugitives</b>	42	44	48	50	52	55	58	60	65	66	67
<b>Agriculture</b>	86	87	87	86	87	88	89	89	90	91	92
<b>Industrial processes</b>	31	32	33	34	35	35	35	36	36	37	37
<b>Waste</b>	15	15	14	11	12	12	12	13	13	13	14
<b>Total</b>	550	563	569	577	586	598	608	617	628	635	641

**Table A2 Revised reference case, excluding LULUCF, 2010-2020**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Electricity</b>	201	194	199	200	200	201	202	202	203	204	205
<b>Other stationary energy</b>	90	94	95	98	100	103	106	108	111	114	117
<b>Transport</b>	84	86	87	88	89	90	91	92	93	94	95
<b>Fugitives</b>	44	42	45	46	48	50	53	55	57	60	62
<b>Agriculture</b>	83	83	84	85	85	86	87	87	88	89	90
<b>Industrial processes</b>	31	33	33	34	34	34	35	35	35	36	36
<b>Waste</b>	14	14	14	14	14	14	14	14	14	14	14
<b>Total</b>	547	546	557	564	571	579	586	594	602	610	618

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