



# Cook the Books

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Climate Cheats III: When the going gets tough, change the rules

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# Table of contents

Executive summary .....	1
Chapter 1. Background: Forestry the temporary fix .....	5
Chapter 2. Accounting rules: What counts? .....	8
Gross vs net emissions.....	8
UNFCCC accounting .....	8
Kyoto accounting .....	9
Gross-net emissions targets .....	9
The New Zealand story.....	10
How carbon in post-1989 forests is currently accounted .....	11
Ch-ch-ch-ch-changes: The averaging approach .....	12
Chapter 3. Problems with forest carbon accounting.....	15
Using forests to offset fossil fuel emissions .....	15
Measurement uncertainties .....	16
Negotiation dynamics .....	17
Issues with Harvested Wood Products accounting.....	17
Issues for the averaging approach .....	18
Conclusions .....	20
Chapter 4. Top Secret.....	21
Keep 'em in the dark .....	22
BYO rules .....	22
Democracy? Yeah, nah .....	23
Getting answers the hard way .....	23
Chapter 5. Results from our forestry emissions model .....	25
Model overview .....	25
Emissions projections .....	25
Honing in on the key numbers .....	28
Chapter 6. Implications.....	31
Wiping the credit card debt .....	31
Retrospectively violating Kyoto .....	31
Regressing on Paris .....	32
Global repercussions .....	33
Short-term gain, long-term pain .....	34
Chapter 7. Conclusion.....	35
Recommendations.....	35
Appendix 1. The mystery of the missing 16 million tonnes .....	38
Appendix 2. Official justification for withholding forestry emissions projections .....	40
References .....	41

# List of figures and tables

Figure 1: Illustrative model of carbon stored by a hectare of pine plantation forestry .....	1
Figure 2: Illustrative model of the impact of the change to averaging approach on NZ's forestry emissions. ....	3
Figure 3: New Zealand's total projected emissions/credits 2008-2020 .....	5
Figure 4: New Zealand's official emissions projections as at December 2015 .....	10
Figure 5: Carbon dioxide stored in a hectare of plantation forest over time .....	12
Figure 6: Carbon stored by a hectare of forest under existing rules and the averaging approach .....	13
Figure 7: Projected area of New Zealand's post-1989 forest by age class in 2020 .....	14
Figure 8: Average carbon stock under different timeframes and HWP assumptions .....	19
Figure 9: Net forestry emissions projections using different harvest models and accounting rules (midpoint scenario) .....	27
Figure 10: Net forestry emissions by commitment period using different harvest models and accounting rules (midpoint scenario) .....	28
Figure 11: Model calibration to Government projections .....	29
Figure 12: Forestry credits earned and repaid, up to and above the long-term average carbon stock (midpoint scenario) .....	30
Table 1: Projected forestry credits claimed above long-term average carbon stock to 2020	30

# Executive summary

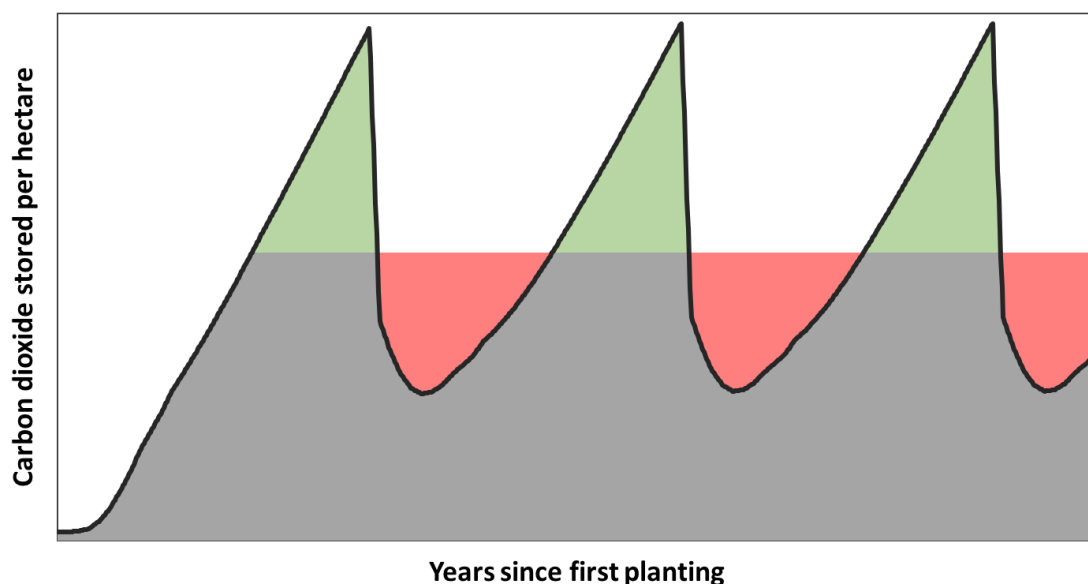
New Zealand has so far managed to meet its international climate change commitments despite national greenhouse gas emissions rising significantly since 1990. In our previous report, *Climate Cheats*, we showed that one part of New Zealand's strategy involves huge quantities of carbon credits from Ukraine and Russia which were essentially fraudulent.

The biggest contributor towards New Zealand meeting its targets is, in fact, forestry. Specifically, the huge swathe of pine plantations established in the 1990s. As these pine forests have grown, current rules have allowed New Zealand to gain credits for all the carbon stored, covering most of the gap between our emissions and our targets. However, when those forests begin to be harvested from around 2020, New Zealand will have to pay many of those credits back.

This report exposes a covert Government plan to change the rules and avoid paying those credits back. To understand the plan requires some understanding of forest carbon accounting.

A newly planted forest soaks up carbon as it grows. If and when it is harvested, some of that carbon is returned to the atmosphere. As long as that forest is replanted, the land carbon stock never goes back to zero; there is some carbon that remains stored, fluctuating around a long-term average. As you can see in Figure 1 below, once the long-term average is reached (shaded grey), this cycle operates like a credit card with periods of carbon credit (green) and carbon debit (red).<sup>i</sup>

**Figure 1: Illustrative model of carbon stored by a hectare of pine plantation forestry**



<sup>i</sup> The inclusion of harvested wood products complicates the picture somewhat, as the carbon stock grows over successive rotations, but this does not change the essential picture.

The existing rules track the cycle of carbon stored in the forest; a country receives credits as a new forest grows, but has to pay some of those back upon harvest. The pine forests planted in the 1990s will start reaching harvest age from around 2020. At that point, the forestry 'credit card' will be maxed out and would need to be repaid when harvesting takes off in the 2020s. This is illustrated below in Figure 2(a).

Now, the Government is proposing a new method of accounting for planted forests in our first commitment under the Paris Agreement. Under this new approach, New Zealand would only receive credits for carbon stored in a new forest up until it reaches the long term average carbon stock (the grey area in Figure 1). For a pine plantation that would be after around 20 years. If we applied this rule now, New Zealand would receive far fewer credits during the period up until 2020, but also wouldn't have to pay any back on harvesting. This is illustrated in Figure 2(b).

The existing rules bought New Zealand time to get our greenhouse gas emissions down, but Government inaction has squandered that time. Our emissions have continued to climb in excess of our targets and it will now take a huge effort to turn things around.

The challenge for the next decade is compounded by the fact that we have to pay back some of the credits received for forests that will be harvested after 2020. What is the Government's answer? Change the rules halfway through the game. By changing the rules in 2020, New Zealand can keep all the credits received up until then, but doesn't have to pay any back – see Figure 2(c).

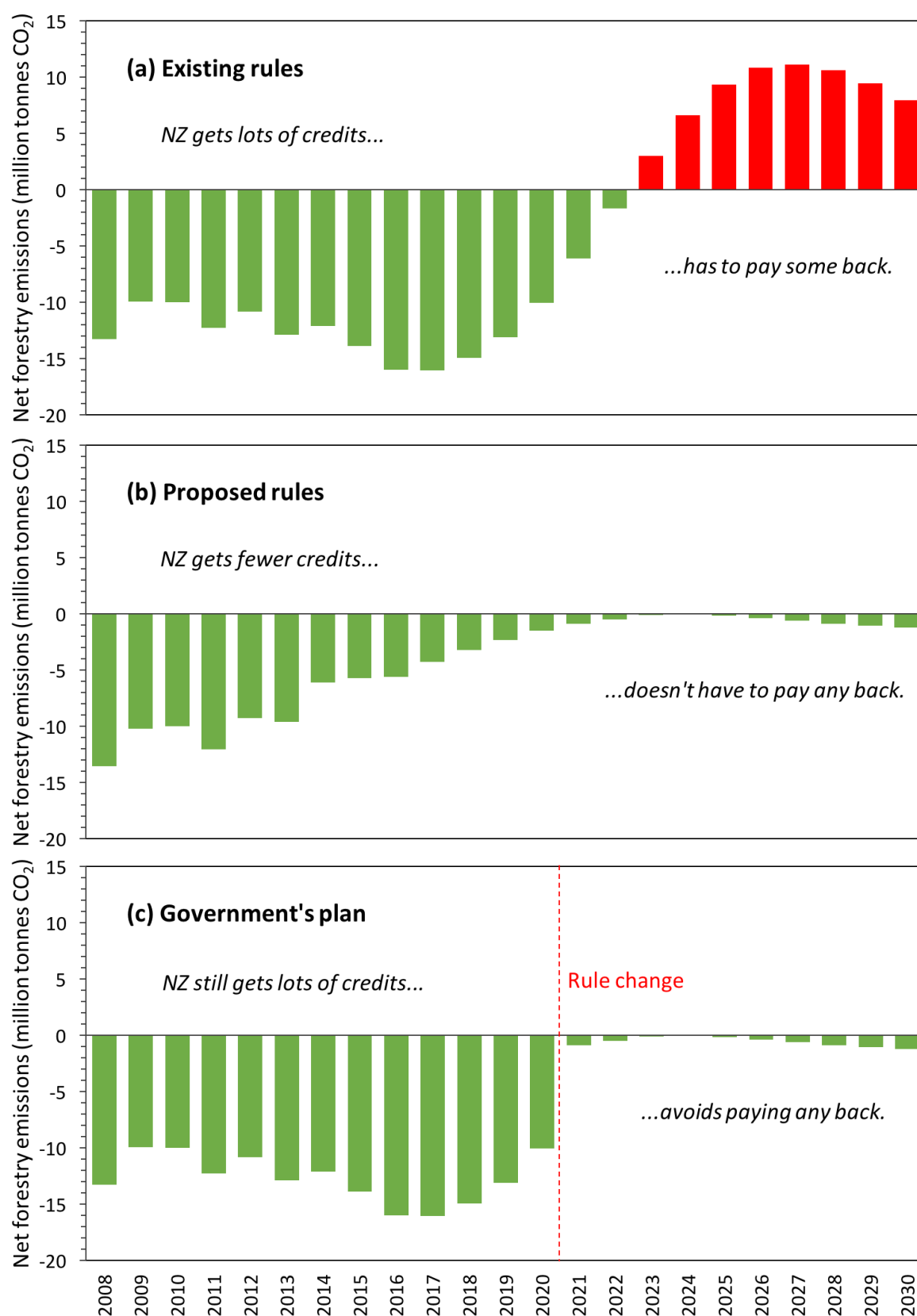
In principle, there is nothing wrong with the Government's proposed 'averaging approach'. The problem is the timing of the change: right when, under existing rules, New Zealand's forestry credit card is maxed out.

Our investigation into this began with an Official Information Act request to find out the impact the proposed rule change on New Zealand's projected emissions. The Government has refused to release this information, arguing that it would disadvantage New Zealand in the ongoing Paris Agreement negotiations. In our view, this secretive and undemocratic approach risks genuine damage to New Zealand and to the prospects of the Paris Agreement.

Given the Government's refusal to release the information, we developed our own forestry emissions model to quantify the potential impact of the proposed rule change. Using official methodology and data inputs sourced from documents obtained through our OIA request, we are confident in the validity of our results.

Our key finding is that, up to 2020, New Zealand will claim **79 million credits** (with a range of 65 to 90 million) from forests that are above their long-term average carbon stock. The harvesting or deforestation liability attached to those credits will be wiped by the rule change. The excess emissions this allows equate to nearly one year's worth of New Zealand's gross emissions.

**Figure 2: Illustrative model of the impact of the change to averaging approach on NZ's forestry emissions.**



Source: MF model (midpoint scenario results presented in Chapter 5).

This approach will violate not only the forest accounting rules agreed under the Kyoto Protocol, but also the Paris Agreement's key principle of progression. Based on our model results, New Zealand's 2030 target is not in fact a progression on our 2020 target under a consistent accounting approach. We estimate the target, under the proposed change in rules, translates to a **7% increase on 1990 levels** under existing accounting rules.

If we were to also add in the 86 million surplus credits the Government seems intent on carrying over post-2020 (which it only holds due to the use of fraudulent credits bought from Ukraine and Russia), then New Zealand's target would effectively be a **27% increase on 1990 levels**.

Perhaps most damaging of all is that, to secure its preferred rules, the Government is pushing for the most flexible and non-prescriptive approach to forest accounting possible in the Paris Agreement. This negotiating stance combined with the precedent New Zealand is setting by opportunistically changing the rules could do huge damage to global efforts to reduce greenhouse gas emissions. It risks opening the door for other, larger countries to similarly hide their emissions through arcane accounting tricks. And without consistent and transparent accounting, there is little hope for credible international emissions trading.

The key conclusion is that, while there appears to be some merit in the rule change the Government is proposing, integrity requires a corresponding increase in New Zealand's 2030 target.

Firstly, the Government should front up with the information to enable the New Zealand public and the international community to engage in an honest and well-informed debate on the proposed rule change.

Secondly, the Government should increase the 2030 target by a level that would compensate for the impact of the rule change. Our analysis indicates this would require a target of at least 25-30% below 1990 levels.

Thirdly, New Zealand needs a real plan to deliver on this target and beyond. For reasons highlighted in this report, that plan should set separate gross emissions and/or sectoral targets. Storing more carbon in forests is an important part of our contribution to global climate change efforts, but it is no substitute for reducing gross emissions. To live up to the Paris Agreement, New Zealand needs a plan to get our carbon dioxide emissions down to zero in a time frame consistent with keeping global warming to well below two degrees.

Finally, the Government is yet to follow the key recommendation in *Climate Cheats*, to 'dump the junk' – commit to cancelling any surplus credits remaining as at 2020. It is especially galling for the Government to want to change to new forestry accounting rules, at the same time as attempting to carry over the proceeds of junk credits from the Kyoto Protocol's first commitment period.



# Chapter 1. Background: Forestry the temporary fix

Climate Change Minister Paula Bennett asserts that New Zealand has met its greenhouse gas emissions reduction targets through:<sup>1</sup>

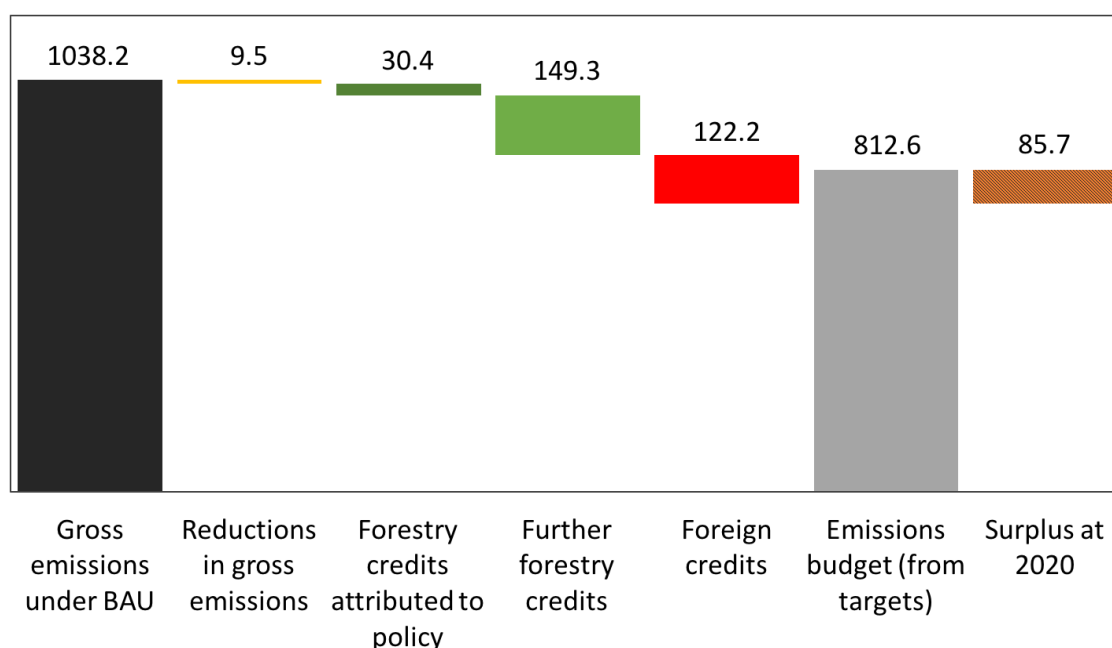
*“...[A] combination of emissions reductions, the capture of carbon through forestry, and international trading.”*

In Figure 3 below, we compiled official projections to show how much these three components are actually expected to contribute towards meeting our emissions targets for the whole period from 2008 to 2020.

In absolute terms, New Zealand has not reduced emissions – they have risen significantly since 1990. In fact, in 2015 net emissions were at a record high.<sup>2</sup> Overall, from 2008-2020, gross emissions are tracking around 27% above our targets.

As Figure 3 shows, Government policies are projected to reduce gross emissions by 9.5 Mt below business-as-usual over 2008-2020 – just 4% of the gap. The Ministry for the Environment’s own evaluation of the Emissions Trading Scheme – which the Government touts as New Zealand’s main climate change instrument – stated that it has not significantly influenced domestic emissions.<sup>3</sup> The biggest contribution to gross emissions reductions, in fact, is from the 2004 regulations requiring methane capture at landfills.<sup>6</sup>

**Figure 3: New Zealand’s total projected emissions/credits 2008-2020**  
(millions of tonnes)



Source: Own calculations based on official Government data and projections.<sup>4,5,6</sup>



That leaves us with forestry and foreign credits, which have done the heavy lifting towards meeting our climate commitments. Between 2008 and 2020, carbon removals from forestry will get us most of the way towards meeting our targets, covering around 80% of the gap. Importantly, most of this was not the result of climate policy – it is the credits claimed from the huge swathe of pine forests planted in the 1990s.<sup>i</sup>

New Zealand will only need about 36 million worth of foreign credits to cover the remaining 16% of the gap. However, the Government allowed companies to buy in around four times this many foreign credits through the Emissions Trading Scheme. This is the reason for the substantial surplus of 85.7 million credits projected for 2020. As we found in our previous report, *Climate Cheats*,<sup>7</sup> the vast majority (97 million) of these foreign units were Emission Reduction Units from Ukraine and Russia, which were largely fraudulent.

So, forestry is the primary method by which New Zealand will meet our climate change commitments to 2020, and it is the subject of this report.

This reliance on forestry has always been a double edged sword. Crucially, the forests in question are not permanent; they are commercial pine plantations. Between 1990 and 2005, over 500,000 hectares of new pine forests were planted, increasing New Zealand's plantation estate by nearly half. This was nothing to do with government environmental policy; instead it was related to changes in taxation treatment, a drop in agricultural land prices and a spike in log prices.<sup>8</sup>

This happy coincidence provided New Zealand with a way to soak up a huge amount of carbon, albeit temporarily. In a recent speech, former Environment Minister Simon Upton candidly reflected on the boom in plantation forestry as being mana from heaven for our politicians at the time:<sup>9</sup>

*“...I don't mind admitting that the sheer scale of forest sinks at the time... made biological sinks loom particularly large in our thinking.”*

Of course, for New Zealand to reap the benefits, this required forest carbon sinks to be recognised in the Kyoto Protocol. Accordingly, our Government and negotiators pushed hard for this, and were successful. We will go into the detail of the accounting rules in the next chapter, but the key concept to grasp is that plantation forests are a bit like a carbon credit card. They do deliver some ongoing carbon storage as long as the land continues to be replanted, but some of the carbon absorbed through the growth phase is released following harvesting; these credits need to be paid back (see Figure 1 in the Executive Summary).

Ministers and policymakers knew all along that forestry was only a temporary fix. All the way back in 1994, Simon Upton gave an address in which we stated:<sup>9</sup>

*No-one is arguing that sinks are the whole answer. Sinks won't last indefinitely – our credit is likely to run out by around 2020.*

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<sup>i</sup> The 30.4 million forestry credits attributed to policy gives a somewhat inflated picture, as some of this reduction is only from slightly delayed harvesting of pine forests until after 2020.

Despite full awareness, this has failed to translate into action. Instead of using the time that our Kyoto forests bought us to get New Zealand's emissions on a downward path, successive governments have allowed them to continue growing.

Many saw this coming – there were plenty of dissenters who argued that forestry shouldn't be included in emissions target accounting at all. Organisations like Greenpeace, as well as other countries negotiating the Kyoto Protocol were sceptical whether New Zealand would simply use the happy coincidence of large scale plantation forests to delay taking action. Simon Upton recounts John Gummer, then the UK's Environment Minister, saying:<sup>9</sup>

*But you're just dodging the problem. You'll cover every square inch of the country in pine trees, there'll be no pressure to do anything about emissions and then you'll hit a brick wall!*

The concern was so great that guidelines were even put in place to warn against this outcome. The Marrakech Accords – the set of principles governing forestry and land use accounting in the Kyoto Protocol – included the following principle: *"That accounting for land use, land-use change and forestry does not imply a transfer of commitments to a future commitment period."*<sup>10</sup> In other words, forestry shouldn't be used as a credit card to delay action.

History has borne out these concerns. New Zealand is now approaching the brick wall (or "wall of wood", as it became known) that John Gummer alluded to around 2020, just as Simon Upton predicted. Not only will the supply of free forestry credits run dry, we face paying back the credit card debt New Zealand has relied so heavily on to meet emissions targets to date. This means that even the modest emissions reduction target the Government has put forward for 2030 (an 11% reduction on 1990 levels) will be very challenging under the current accounting rules – due entirely to our past inaction.

Again, this looming problem was well understood by decision makers, and warned about for years – particularly by the Sustainability Council of New Zealand in an ongoing series of publications including the 2010 book, *The Carbon Challenge*.<sup>11,12</sup>

So what is the Government's response? Time to change the rules. Not content with having cheated through the use of copious quantities of fraudulent carbon credits, the Government has come up with a covert plan to cook the books. New Zealand's 2030 target is conditional not only on unlimited access to international markets, but also conditional on the change to a new forestry accounting approach. As we will show through this report, the effect would be to have the large credit card debt New Zealand has accumulated written off.

It is like we have entered a 200m race, doing nothing after the starting gun, and are now complaining how hard our challenge is when the other runners are 100m ahead. The Government's response is to ask for the race to be shortened. We are trying to change the rules, halfway through the game.

Wealthier countries like New Zealand are supposed to be doing their bit. We have failed to so far, indeed our emissions have risen, and the Government's plan suggests it wants to keep it that way.

## Chapter 2. Accounting rules: What counts?

The forestry accounting rules that have applied in international climate change agreements to date are far from simple. In this chapter we explain these rules, and the changes on which the Government has made New Zealand's post-2020 commitments conditional.

### Gross vs net emissions

As set out in Chapter 1, a country's greenhouse gas emissions are generally reported using two key quantities:

- *Gross emissions* are the total emissions from all sectors except the land sector - i.e. energy (including transport and heat), industrial processes, agriculture and waste.
- *Net emissions* are the total emissions from all sectors, including emissions and CO<sub>2</sub> removals from the land sector.<sup>i</sup>

In other words, the difference between gross emissions and net emissions is the land sector - known in UN-speak as Land Use, Land Use Change & Forestry (LULUCF). If a country has more emissions than removals from LULUCF, its net emissions will be higher than its gross emissions. Conversely, if a country has more removals than emissions (like most developed countries at present), its net emissions will be lower than its gross emissions.

A source of continual confusion, however, is that there is more than one accounting method for LULUCF, and therefore more than one measure of a country's net emissions.

### UNFCCC accounting

Over time, the United Nations has developed an extensive and detailed methodology for countries to report on their greenhouse gas emissions, including those from LULUCF. Developed countries are required to produce annual greenhouse gas inventories, calculating and reporting on their emissions from 1990 up to the present.

The inventory reporting on LULUCF emissions and removals (usually referred to as 'UNFCCC accounting') is the simplest to understand, because it basically attempts to include everything. Changes in carbon stocks from all types of land use (e.g. forests, grassland, cropland) and all carbon 'pools' (e.g. living biomass, soils, litter) are calculated and accounted for. In theory, this gives the truest representation of the actual carbon emissions and removals from the land sector. However, uncertainties in some areas are large and the numbers have been revised significantly in recent years with the addition of previously excluded sinks and sources.<sup>ii</sup>

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<sup>i</sup> Both measures of emissions are reported as tonnes of carbon dioxide equivalents, whereby non-CO<sub>2</sub> greenhouse gases (such as methane and nitrous oxide) are weighted relative to CO<sub>2</sub>.

<sup>ii</sup> For example, New Zealand's reported net emissions in 2011 changed from -15.0 MtCO<sub>2</sub>e in its first Biennial Report (2013) to -29.9 MtCO<sub>2</sub>e in its second Biennial report (2015), due to the addition of harvested wood products into the accounting and many data improvements.

## Kyoto accounting

Under the Kyoto Protocol, countries use a different set of rules to account for LULUCF emissions towards compliance with their targets. In a nutshell, the Kyoto accounting rules focus on forestry land-use changes since 1990, the chosen base year for the agreement. Countries are liable for all emissions from *deforestation* - when existing forest land is cleared and converted to another land use - but are credited for CO<sub>2</sub> removals from *afforestation/reforestation* - when land is converted (back) to plantation or permanent forest.<sup>iii</sup>

This gives rise to the distinction between *pre-1990 forest land* (established before the start of 1990) and *post-1989 forest land* (converted to forest since the start of 1990). Pre-1990 forest only incurs a liability if it is deforested - the normal growth and harvest cycle does not gain credits or incur liabilities. Post-1989 forest gains credits during growth but also faces liability for harvest and for deforestation (this is explained further below).

The rationale behind the Kyoto accounting rules is to isolate the changes directly resulting from human activities since 1990. This goes hand-in-hand with the way Kyoto Protocol targets work.

## Gross-net emissions targets

Under Kyoto, most countries' targets are expressed relative to their gross emissions in the base year, 1990.<sup>iv</sup> The targets themselves, though, apply to net emissions under the Kyoto accounting method described above.

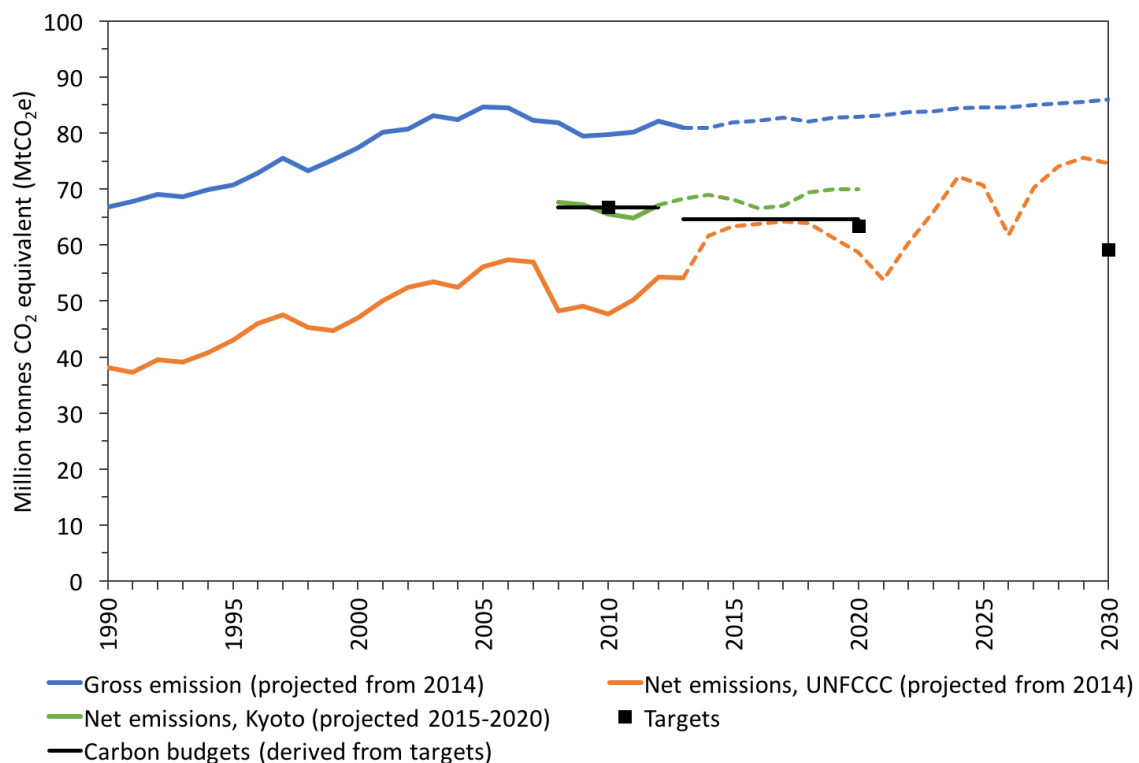
This can have some misleading and confusing results. For example, New Zealand's target for the first commitment period (CP1, 2008-12) was to cap emissions at 1990 gross levels. Under the Kyoto accounting rules, we achieved this. However, as Figure 4 below shows, our gross emissions (the blue line) were around 21% higher than they were in 1990 over CP1. Our net emissions under the full UNFCCC accounting rules (the orange line) have also risen to a level 31% higher than they were in 1990. New Zealand's overall land carbon sink has actually declined slightly since 1990. However, under Kyoto rules we (reasonably) do not face any liabilities from the natural decline in forest carbon sinks that existed before then.

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<sup>iii</sup> From the start of the second commitment period (2013-2020), countries must also account for *Forest Management* - carbon stock changes in land which was already in natural or planted forest pre-1990. The accounting for this category is more complex; essentially, countries are only credited or debited based on deviations from what would be expected under standard forest management practices (the 'reference level'). It is unlikely this will contribute much to New Zealand's emissions accounts.

<sup>iv</sup> Countries with net emissions higher than gross emissions in 1990 are an exception to this, notably Australia.

**Figure 4: New Zealand's official emissions projections as at December 2015**



*Notes: Net forestry removals under Kyoto accounting for CP1 (2008-12) have since been revised downwards by about 16 Mt, as shown in Appendix 1.*

*Sources: Ministry for the Environment<sup>5,6</sup>; NZ Greenhouse Gas Inventory 1990-2012.*

## The New Zealand story

From the outset, New Zealand has been a key figure in the negotiations of LULUCF accounting rules. In fact, it was New Zealand that first proposed bringing forestry sinks into the Kyoto Protocol using the gross-net target approach.<sup>13</sup> As we saw in Chapter 1, our Government recognised early on the opportunity for short-term benefit from the planting boom of the early 1990s. This put us in a quite unique situation; New Zealand has been assessed as the country most advantaged by the Kyoto rules.<sup>14</sup>

New Zealand continued to focus its efforts heavily on this area of the negotiations while the finer details were ironed out, and as the rules were revised for the Kyoto Protocol's second commitment period.<sup>v</sup> By and large, our negotiators have got what they wanted. The problem - which politicians did their best to ignore - is that New Zealand was building up a carbon debt it would need to repay when those forests begin to be harvested around 2020.

In response to this problem, the Government is planning a significant change to how New Zealand will account for carbon in post-1989 forests under the Paris Agreement. Once again, the proposed change will work heavily in New Zealand's favour. In the following sections we explain how.

<sup>v</sup> While the NZ Government eventually decided to withdraw from the second commitment period, it is applying the agreed rules to our voluntary 2020 target.

## How carbon in post-1989 forests is currently accounted

The current approach to forest carbon accounting essentially tries to follow the real-time carbon flows as closely as possible. Countries get credited for every tonne of CO<sub>2</sub> removed by the planted forest as it grows, up until the time of harvest. If and when a forest is harvested, a percentage of the standing wood volume is assumed to be removed from the site as roundwood. The harvest residues that remain - including the roots and other deadwood and litter - are assumed to decay over time, eventually releasing the stored CO<sub>2</sub> back to the atmosphere.<sup>vi</sup> If the forest is replanted, then the cycle starts over again.

A key rule change agreed for the second commitment period was the inclusion of *Harvested Wood Products accounting*. Previously, all of the carbon in the harvested roundwood was assumed to be released instantaneously upon harvest. This is clearly physically unrealistic, as some of that carbon will stay locked up in wood products for decades or longer - particularly if used in buildings.<sup>vii</sup>

New Zealand again led the charge in the negotiations for harvested wood products (HWPs) to be included under Kyoto accounting.<sup>15</sup> Under the rules that were agreed, HWPs are treated with a decay curve so that CO<sub>2</sub> emissions upon harvest are delayed, rather than instantaneous. HWPs resulting from deforestation (i.e. if the land is not replanted) are still treated as instantaneous, however, maintaining a stronger disincentive.

However, countries can only include HWPs if there is sufficient transparent and verifiable data on how much of the wood is ending up in different types of products.<sup>viii</sup> At present, New Zealand is only able to account for domestically manufactured HWPs. There is insufficient data on the fate of the 50% or so of New Zealand's wood harvest currently exported as raw logs, so this is still treated as an instant emission. The Government has a work programme underway to obtain data that would enable it to include exported logs in HWP accounting, and hopes to be able to do so before 2020.<sup>16,17</sup>

Figure 5 below is an indicative example for a hectare of post-1989 forest. This assumes a rotation (harvest age) of 30 years and the fixed HWP parameters described in detail in the technical guide to our model (available at [www.morganfoundation.org.nz/cook-the-books](http://www.morganfoundation.org.nz/cook-the-books)). Note that there is high uncertainty around these parameters and how they may change with time - we discuss this further in Chapter 3.

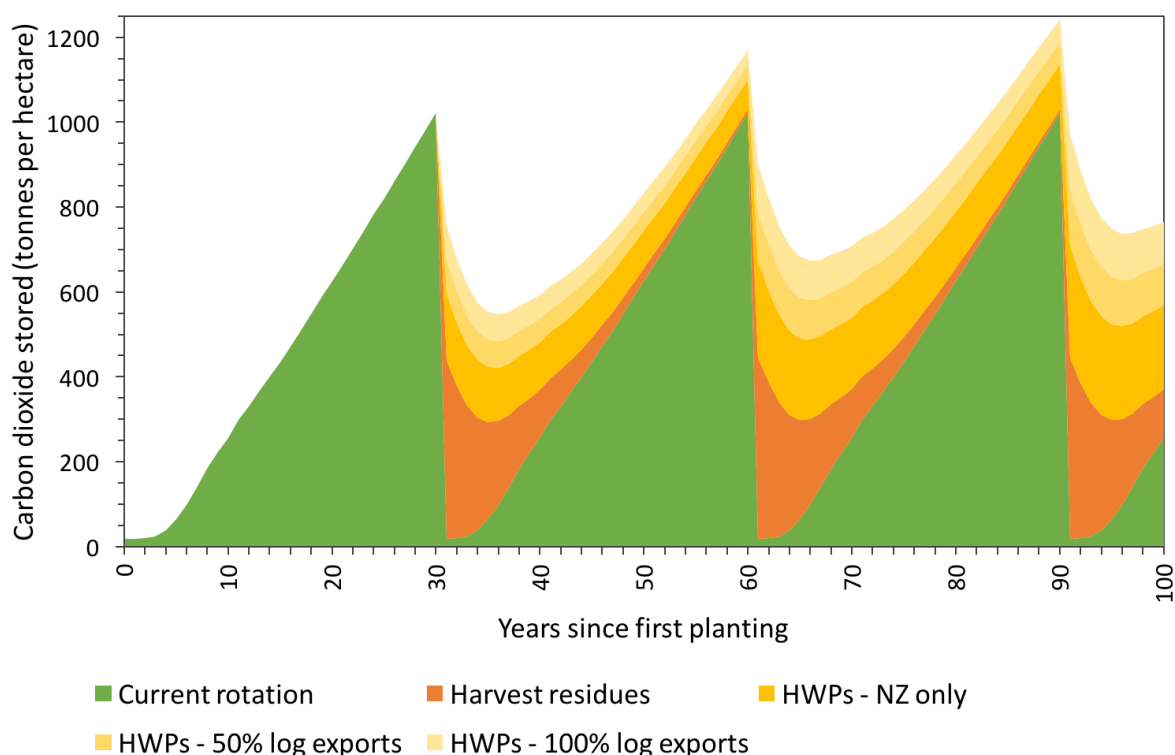
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<sup>vi</sup> For technical details, such as how the actual carbon uptake of forest is estimated, see New Zealand's Greenhouse Gas Inventory 1990-2014.

<sup>vii</sup> The instantaneous emissions approach would make sense if the total global carbon stock in HWPs were constant, but this is now acknowledged to be increasing.

<sup>viii</sup> HWPs are grouped into three categories - sawnwood, panels and paper - which are all assigned specific decay half-lives.

**Figure 5: Carbon dioxide stored in a hectare of plantation forest over time**



Source: MF model.

### Ch-ch-ch-changes: The averaging approach

On 7 July 2015, the Government submitted New Zealand's Intended Nationally Determined Contribution to the UN.<sup>18</sup> This set out New Zealand's proposed 2030 target (a reduction of 11% below 1990 levels by 2030), conditional on New Zealand's preferred approach to land sector accounting and to unrestricted access to global carbon markets. The details of the intended land sector accounting approach were not provided, because the Government was actually yet to decide on its preferred option.<sup>ix</sup> On 25 November 2015, the Government submitted an addendum, "to provide further clarity, transparency and understanding about its intended approach to accounting for emissions and removals from forestry and other land use in achieving our 2030 target."<sup>19</sup>

The key change the Government is seeking from existing Kyoto rules is described as follows:

*"Forests established after the base year will continue to be accounted for as they would under the Kyoto Protocol, but once they attain their long-term average carbon stock, taking into account all carbon pools and activities, the forest will transfer to the Forest management/Forest remaining forest category, where it will be accounted for under a business-as-usual reference level. New Zealand will continue to account for all deforestation emissions."*

<sup>ix</sup> We now know from documents obtained under the OIA that options were still being discussed until 13 November (see Chapter 4).

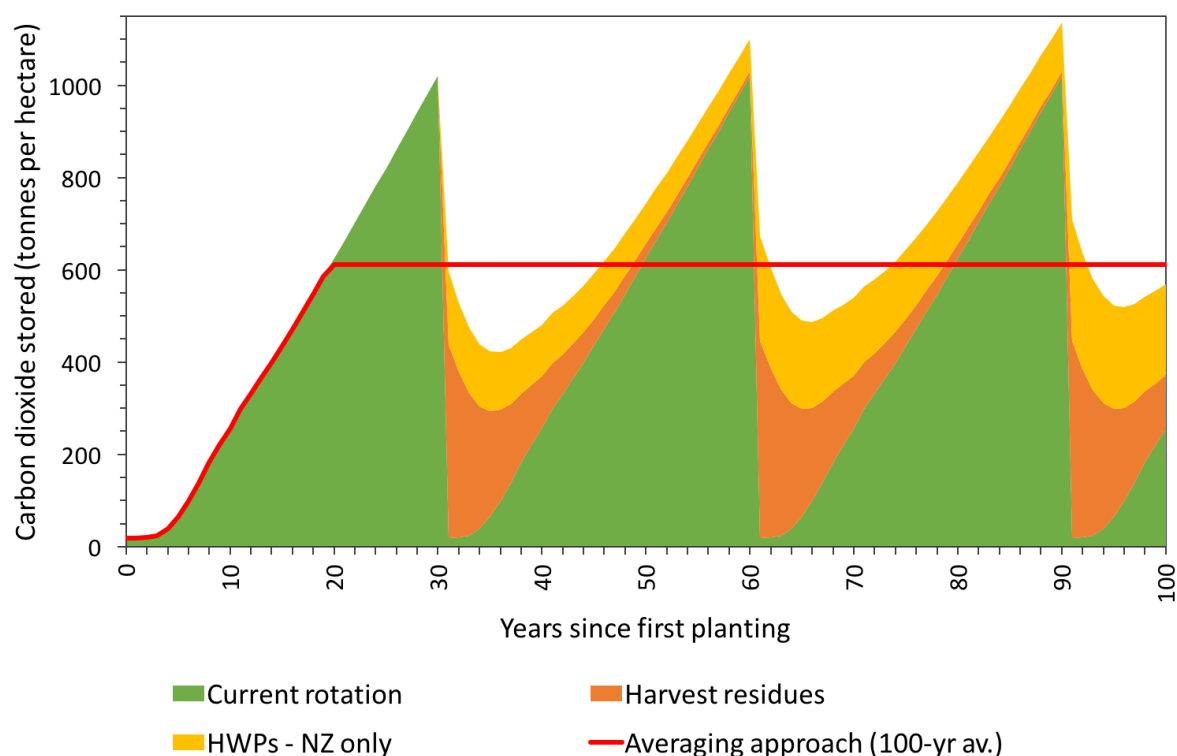


In short, this means that an area of newly established forest will only be credited for carbon removals up to the year that it reaches the “long-term average carbon stock”. From then on, the sawtooth-like harvest cycle is effectively removed. The land would only face a liability (equal to the credit gained) if deforested. “...[T]aking into account all carbon pools and activities” means that the Government is intending to include HWPs in the calculation of the long-term average carbon stock.

Figure 6 below illustrates the rule change using the same indicative example as Figure 5 above, with only NZ-manufactured HWPs included. The top of the solid areas is the accounted carbon stock under the existing Kyoto rules. The red line is the accounted carbon stock under the averaging approach, assuming the long-term average is calculated as the value over a hundred years (we discuss the issues around this in Chapter 3, ‘Issues for the averaging approach’). The forest reaches this carbon stock value around the age of 20 years.

Without needing further detail, this tells us enough to predict the general impact of the proposed rule change. For post-1989 forests yet to reach the long-term average carbon stock at the time of the rule change, it will make no difference. However, for forests that are *above* the long-term average carbon stock New Zealand will have already received additional credits under the existing rules compared to what we would have received under the averaging approach. Thanks to the rule change, New Zealand wouldn’t have to pay these credits back, as we do now. **In other words under the rule change, the harvest or deforestation liability for all credits received above the average level would be removed.**

**Figure 6: Carbon stored by a hectare of forest under existing rules and the averaging approach**



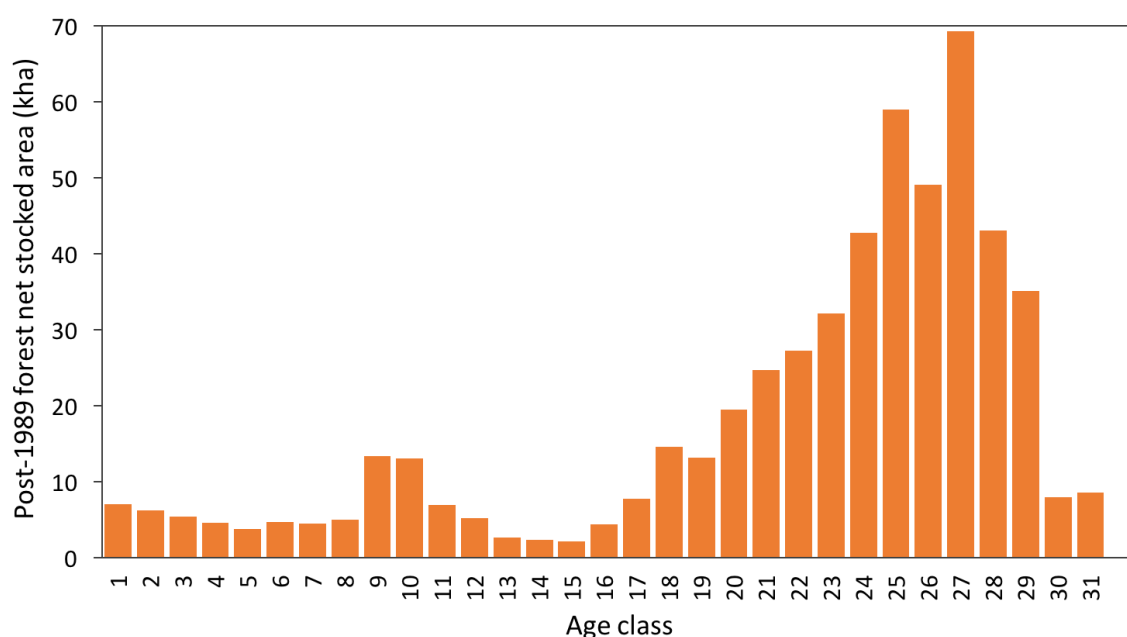
Source: MF model.

The scale of the impact becomes clear when we consider the age class of New Zealand's post-1989 forest estate. Figure 7 shows the projected area by age class in 2020, assuming no harvesting from 2015-2020. The huge area planted in the early- to mid-1990s will all be aged over 20 years by this point. Over the second commitment period (2013-2020), New Zealand will gain a large number of credits from these forests above their long-term average level. If the rules are then changed to the averaging approach in 2021, the harvest or deforestation liability for all those credits will be wiped.

**By relying on forestry to meet existing targets, we have run up a carbon credit card debt. This rule change would have the effect of writing that debt off.**

The rule change will clearly advantage New Zealand, by wiping carbon liabilities accumulated up to 2020; the only question is how much. Before we address that question, in the next chapter we discuss some of the problems with existing forest carbon accounting methods and some issues with the averaging approach.

**Figure 7: Projected area of New Zealand's post-1989 forest by age class in 2020**



Source: MF model.

## Chapter 3. Problems with forest carbon accounting

This report focuses on the New Zealand Government's intended changes to how it accounts for carbon in planted forests, and the impacts these changes would have. Before proceeding to look at those impacts, there are several problematic issues with the existing approach that need clear understanding and consideration. We discuss some of the issues in this chapter, with emphasis that this is not an exhaustive analysis. We begin with the more fundamental problems.

### Using forests to offset fossil fuel emissions

One of the underlying features of the Kyoto Protocol rules is that they allow carbon stored in forests to fully 'offset' emissions from fossil fuels and other industrial processes. For compliance in any given period, a tonne is a tonne, regardless of the nature of the source or sink. New Zealand has fully embraced this philosophy by completely integrating forestry into the Emissions Trading Scheme - the only carbon market to operate this way.

The problems with this approach and accompanying mindset are articulated well in the recent speech by OECD Environment Director Simon Upton mentioned in Chapter 1.<sup>9</sup> Mr Upton championed this very approach internationally as New Zealand's Environment Minister from 1993-1999. Three issues he raises can be summarised as follows.

#### Long-term carbon stocks

CO<sub>2</sub> and most other greenhouse gases (except methane) stay in the atmosphere for a very long time; they accumulate. It is therefore the cumulative emissions, rather than the rate, that ultimately matters. The remaining cumulative emissions 'budget' for a reasonable chance of staying under 2°C (let alone 1.5°C) is small and rapidly diminishing - at current rates the world is set to blow it in around 20 years.<sup>20</sup>

In the long run, forests can only offer a relatively small buffer of increased land carbon stocks, which will be needed *in addition to* rapid reductions in gross emissions. If forest offsets are used to further delay the necessary transformation of the energy system, they risk being counterproductive.<sup>21</sup> As Mr Upton put it:

*"If there was ever a short-term case to offset a permanent increase in atmospheric carbon with forest sinks (whose permanence cannot be guaranteed) it has long since vanished. Trading forest sinks against fossil fuels sends the wrong signal in a world that needs to reduce fossil fuel emissions to net zero."*

#### Permanence

The preceding quote also raises the issue of permanence. While digging up and burning fossil fuels is essentially an irreversible process on human timescales, planting a forest is not. Whether through later policy changes, uncontrollable events such as wildfires, or

persistent climate change feedbacks such as the spread of pine beetle, there can be no guarantee that the carbon in a forest will stay locked up for good.

### Albedo/reflectivity

Finally, in Mr Upton's own words:

*"Forest sinks aren't quite as positive from a climate point of view as they appear. Because they're darker, they reduce the reflectivity of the earth's surface so less radiation is bounced back into space. In New Zealand's case, reduced albedo from forest cover is worth a discount of about 20% of the carbon stored."*

To summarise these three issues: a tonne of carbon absorbed by a tree is not as urgent, not as safe, and not as effective at reducing global warming as a tonne of fossil carbon kept in the ground. The two should therefore not be treated as perfect substitutes.

### **Measurement uncertainties**

A further problem that Mr Upton did not touch on is that the uncertainties in the estimates of carbon removals and emissions from forestry and other land use are large - much larger than the uncertainties in gross emissions. This point is perhaps best demonstrated by an illuminating example we uncovered during the research for this report. Further information on this is provided in Appendix 1.

In New Zealand's 2014 Greenhouse Gas Inventory (covering the period 1990-2012), forestry was estimated to have contributed net removals of 71.6 million tonnes of CO<sub>2</sub> over the first commitment period (CP1, 2008-2012) under Kyoto accounting rules. That year's inventory was used in the Kyoto 'true-up' process, so New Zealand was officially credited with that quantity of forestry credits to use towards meeting our target.

In the 2016 Greenhouse Gas Inventory (covering up to 2014), the estimate for the same quantity - net removals over CP1 - had been revised downward by 23% to just 55.4 million tonnes.

While this is an alarmingly large change, we do not believe there was anything dodgy going on. Government scientists and analysts do their best to ensure the numbers are as accurate as possible, and the systems established to monitor and estimate forest carbon are impressive. The annual reports also undergo international review. Our finding simply highlights the inevitable uncertainties when trying to estimate the forest carbon sink at close-to-real-time. The numbers are constantly being refined and revised as better data becomes available.

The upshot is that we now know New Zealand claimed around 15 million forestry credits in CP1 for CO<sub>2</sub> removals that did not actually occur. These credits were used to offset 15 million tonnes of emissions that really did occur. However, there is no requirement under the Kyoto process to pay those credits back in a future period in light of the updated data.

This finding demonstrates yet another reason why forestry should not be treated as a perfect emissions offset. It also provides a further reason the Government should cancel surplus credits left over from CP1; a surplus which was already built on the use of environmentally worthless foreign carbon credits.<sup>7</sup>

## **Negotiation dynamics**

Allowing countries to trade off reductions in gross emissions against carbon removed by forest sinks creates a natural incentive to push for rules that enable them to maximise the apparent sinks (and minimise sources).<sup>22</sup>

Under Kyoto, the requirement for prescriptive rules created winners and losers. Under the Paris Agreement, with its emphasis on “nationally determined” approaches, the risk is that every country ‘wins’ if allowed to apply their most favourable rules - and therefore we all lose through global action being undermined. According to researchers at Climate Analytics who have analysed countries’ Intended Nationally Determined Contributions, most countries where the LULUCF sector is relevant intend to use it to their advantage.<sup>23</sup>

A related problem is that the uncertainties in accounting and projecting LULUCF emissions/removals spill over to affect the level of mitigation ambition in other sectors. Furthermore, if business-as-usual projections and other necessary information are not provided, it is difficult or impossible for anyone to actually determine how ambitious a country’s target is. This is exactly the case for New Zealand due to our Government’s refusal to release information.

This point in turn poses challenges and risks for international trade in emissions reductions, which New Zealand says is vital to achieve our 2030 target. Previous experience with emissions trading suggests that we should only trade with countries that have both a credible accounting system and challenging targets, so that the credits they sell represent true reductions in emissions. Allowing all countries to set their own forestry rules will complicate matters.

## **Issues with Harvested Wood Products accounting**

As discussed in Chapter 2, accounting for Harvested Wood Products (HWPs) was introduced in the second commitment period of the Kyoto Protocol. There are strong reasons for including HWPs: incentivising greater use of sustainable wood products, especially where these substitute for carbon-intensive materials such as concrete and steel, could deliver significant climate benefits. However, there are a number of practical difficulties and potential pitfalls.

Firstly, under full UNFCCC accounting, countries currently have flexibility in the choice of accounting approach for HWPs. In simple terms, some approaches account based on the country of harvest, while others account based on the country of use. Kyoto Protocol rules (i.e. the rules applied to meeting targets) prescribe one uniform approach (the production approach). However rules that will apply in the Paris Agreement are yet to be decided, and consensus may be difficult given that different approaches favour different countries. If the

agreement allows flexibility in approach, there is risk of inconsistencies such as carbon storage in HWP being double-counted.

Secondly, there are concerns that without adequate safeguards (and depending on accounting approach), including HWP accounting in emissions targets could reduce the disincentive for deforestation, particularly in developing countries. More trees might end up being cut down as a result.

Thirdly, the current Kyoto accounting method likely overestimates the actual increase in HWP carbon stocks by not accounting for losses from products produced earlier. While the global HWP carbon stock is found to be increasing, HWPs produced today will to some extent replace older products. That is, some will replenish existing stored carbon, not increase the net amount of carbon stored. However, accounting for products produced from a country's past wood harvest would be extremely difficult in practice.

Finally, inclusion of HWPs hugely exacerbates the uncertainty problems discussed in the previous section. Tracking and accurately estimating carbon stored in wood products is very challenging - even for a country with relatively well-established monitoring systems like New Zealand. New Zealand's 2016 Greenhouse Gas Inventory assigns an uncertainty of  $\pm 51.3\%$  to the estimated emissions from HWPs.<sup>i</sup> For comparison, the uncertainty in biomass carbon stocks of post-1989 forest is  $\pm 8.6\%$ . Furthermore, this uncertainty will likely be even larger if and when HWPs produced from exported logs are included in New Zealand's accounts (see Chapter 2). While HWPs are currently a very small contributor to the carbon balance of post-1989 forest (because very little has been harvested yet), their contribution will soon grow to be large. This will up the risk of large errors like the one discussed in the previous section and Appendix 1 occurring again in the future.

In summary, the inclusion of HWPs adds significant complexity to an already complicated forest carbon accounting system. This creates much greater scope for errors, perverse outcomes, and even deliberate manipulation. Treating carbon stored in wood products as equivalent to gross emissions is therefore even more dubious and risky than carbon stored in living forests.

## Issues for the averaging approach

The averaging approach will add another layer of complexity to all that we have described above. The lack of information about how this would be implemented poses several questions.

The first is how the "long-term average carbon stock" would be determined - in particular, what timeframe would be used. A challenge for our later analysis is that the Government has refused to release information on how it intends to do this. Some information hints at a 100-year average,<sup>ii</sup> but we remain uncertain about the Government's plans and what method might ultimately be agreed or allowed. This is clearly a very important factor.

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<sup>i</sup> Table 11.4.1 in the report.

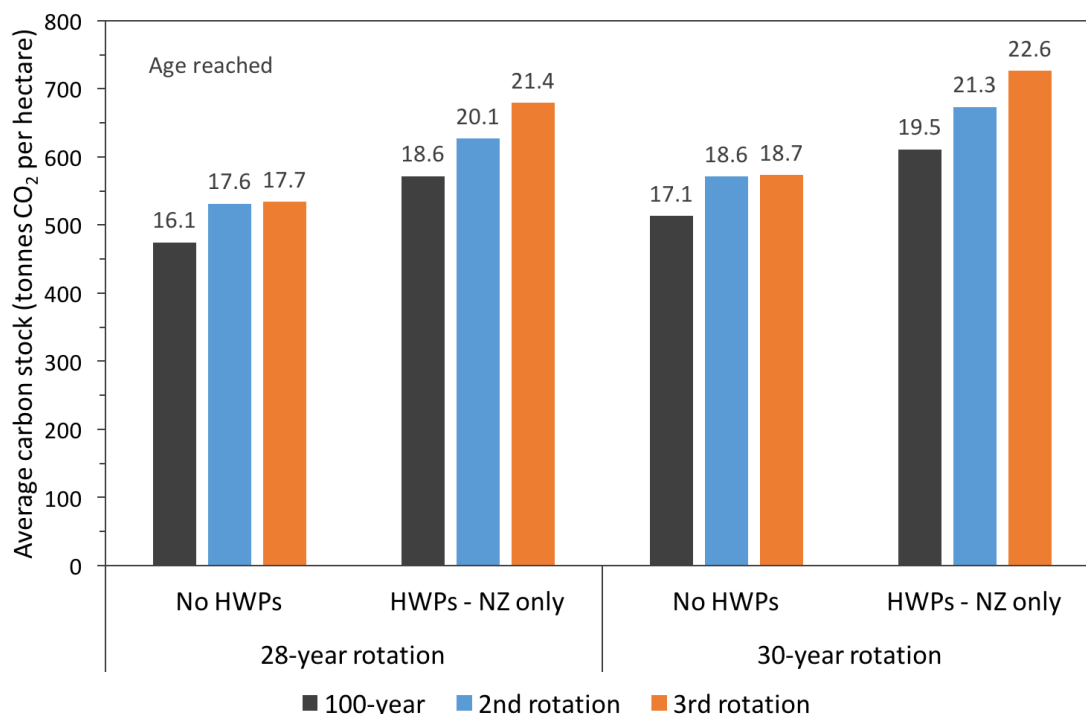
<sup>ii</sup> Documents we obtained through the Official Information Act reveal scenarios were modelled where the average carbon stock was assumed to be reached at 20 years or at 28 years. Twenty years is

However it is determined, the long-term average carbon stock is affected by rotation age and, especially, HWP parameters. As shown in Figure 5, when HWPs are included, the average carbon stock grows over successive rotations (eventually converging to a constant value). Figure 8 below shows the average over different timeframes and under four different sets of assumptions, for a typical New Zealand pine plantation. Note that the results are sensitive to assumed HWP parameters - i.e. the proportion of harvest converted into different product types and the average decay rates - which are highly uncertain.

This demonstrates one implementation problem for the averaging approach: it requires making assumptions about rotation age and HWPs in the future, when we cannot even estimate the latter accurately today. We do know that allocation of the annual harvest to different product types and to different markets has changed significantly over the last two decades, and presumably will continue to change.<sup>16,17</sup> Similarly, changes in pruning regime and genetic improvements will also affect the average carbon stock.

The upshot is that the long-term average is a moving target, and it will need to be continually revised based on up-to-date measurements of what has actually happened.<sup>24</sup> This could mean massive retrospective changes to our forestry accounts, even greater than we saw in the example above. The Government is yet to release any explanation of how it envisages this working - particularly if and how credits allocated in earlier periods would be retrospectively adjusted.

**Figure 8: Average carbon stock under different timeframes and HWP assumptions**



Source: MF model.

consistent with the result in the Parliamentary Commissioner for the Environment's latest report for the average amount of carbon stored over 100 years, assuming a 28-year rotation and apparently including all HWPs (including those produced from exported logs). We have no idea what assumptions would lead to the 28 year value - this seems far too large.



## Conclusions

The main message is that forest carbon sinks are very different to carbon emissions reductions and shouldn't be treated as a substitute. A fundamental problem with the existing Kyoto approach is that it has allowed countries like New Zealand to do so.

At minimum, we have seen how important it is to apply highly conservative assumptions in forest carbon accounting to avoid overestimates that allow more carbon to be pumped into the air. This will be a key area to watch both in New Zealand and internationally as countries try to bring more carbon pools such as HWPs into their accounting.

Most importantly, this highlights the need for a clear plan to cut emissions. A credible plan would set separate targets for reducing gross emissions and increasing land carbon sinks – China's Nationally Determined Contribution is an interesting example with its commitment to "increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level". Separate targets would provide clarity about the actual ambition of New Zealand's commitments and what it will take to deliver them, minimise loopholes and creative accounting, and prevent the large uncertainties in the land sector from stalling action in other areas.

## Chapter 4. Top Secret

This investigation began with an Official Information Act request to the Ministry for the Environment way back on 17 May 2016. We wanted to know what impact forestry would have on New Zealand's proposed 2030 emissions target - something neglected in all analysis the Government had released to date. We asked for projections of the emissions and removals from the land sector under all possible accounting methodologies that might apply to New Zealand's post-2020 commitments.

Sadly, we were to be disappointed. After several delays, we finally received the first response to our request on 4 August.<sup>i</sup> This excluded one large document, *Post-2020 Forestry and Land Use Options for New Zealand's 2015 Contribution*, which we were told was still being worked through. On 27 September we were told this document would be provided to us shortly. At the time of writing this in mid-October, more than five months after our request was lodged, we have still not received it.

As for the documents we did receive on 4 August, the key information we had requested - the forestry emissions projections - was withheld. Apart from the limited set of projections already in the public domain, which do not tell us anything useful with respect to the 2030 target,<sup>ii</sup> all data, graphs and cost figures were redacted. Key information about the long-term average carbon stock value to be used in the proposed averaging approach was also redacted.

The upshot is that New Zealand's forestry emissions projections are a state secret - a continuation of similar behaviour dating back to the negotiations on the second commitment period of the Kyoto Protocol.<sup>25</sup>

### **“Prejudicing” New Zealand?**

Officials justified the information being withheld under the OIA provision of section 9(2)(j):  
*“...[T]o enable a Minister of the Crown or any department or organisation holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations)”*

This is revealing in itself, that officials believe that if other countries could see the impact different accounting rules would have on New Zealand this would “disadvantage” us in the negotiations.

The Act requires that, when invoking this provision, the ministry must be able to explain precisely how the prejudice would occur, assess the likelihood of that occurring, and also weigh this against public interest considerations in favour of releasing the information.<sup>26</sup> On

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<sup>i</sup> The full response can be viewed at [www.morganfoundation.org.nz/cook-the-books](http://www.morganfoundation.org.nz/cook-the-books)

<sup>ii</sup> Projections under full UNFCCC accounting out to 2030 were published in New Zealand's Second Biennial Report in 2015, but projections under current Kyoto accounting rules are only available to 2020.

10 August, we asked the Ministry for the Environment to provide further justification along these lines. The full response, received on 27 September, is provided in Appendix 2. Here we unpack and respond to key parts of it.

## **Keep ‘em in the dark**

For starters, the response indicates that it is the Ministry for Primary Industries (MPI), the lead agency on land use accounting, that is blocking the release of the information. It also confirms, as we expected, that:

*“There are major economic and fiscal differences for New Zealand between different accounting methodologies.”*

In other words, the changes the Government is seeking will have a large impact on what the 2030 target means in practice.

In describing how the prejudice would occur, the crux of their argument is that:

*“If the national impact of different options were publicly available, it would prejudice the Government’s ability to negotiate on objective grounds such as environmental and scientific legitimacy if the approach also financially benefitted New Zealand. This disadvantage would manifest as impacts on New Zealand’s perceived integrity and negotiating credibility...”*

In our view, this argument is exactly wrong. If the Government wanted to undermine New Zealand’s integrity - along with perceptions of the integrity of forestry as a mitigation option more generally - it is going about it the right way. What message does it send to other countries if our Government refuses to reveal the national impact of accounting rule options when asked? Surely, they will assume a hidden agenda to minimise the emissions reductions required to meet our target (which the documents we have obtained reveal as accurate). The Government’s secrecy will feed (justified) mistrust and when the truth is revealed, the consequences could be genuinely damaging to New Zealand’s standing.

Rather than hiding information to protect “perceived integrity”, perhaps the better approach is to act with genuine integrity.

## **BYO rules**

The following is a key sentence from the section explaining the likelihood of prejudice:

*“The Government therefore has strong reasons to expect that the release of the withheld information will result in confused or negative portrayals of New Zealand’s approach internationally, resulting in a loss of trust in New Zealand’s and other Parties’ ability to nationally determine their own approaches.”*

This and the rest of the section point to a clear national negotiating position that countries should be given maximum flexibility to set their own rules under the Paris Agreement. As discussed in Chapter 3, in our view this is a recipe for disaster. It may, in fact, be the most

damaging aspect of what the Government is doing. While New Zealand's emissions are small in the global picture, the Government's actions are opening the door for far larger countries to play accounting games and choose whatever rules will minimise the action they need to take.

Again, we are perplexed by how the Government apparently sees secrecy as a way to build trust. If this is to be New Zealand's *modus operandi*, we will be powerless to stop other countries from following suit and withholding key information that would enable us to determine the real substance of their commitments. The non-binding Paris Agreement relies entirely on mutual accountability for it to work. This is impossible without transparency.

Similarly, our Government has insisted that our target is contingent on participation in international trade of emission units. As discussed above, any trading system needs transparency and consistent rules to have any credibility at all.

## **Democracy? Yeah, nah**

Finally, the response acknowledges reasons why releasing the information is in the public interest - including "enabling effective public participation in New Zealand's laws and policies" - before explaining why MPI believes these are outweighed. If we understand the argument correctly, it is essentially that the effects of possible rules are unclear because there are several "unknown and undecided variables", and the information will only be "useful" to the public *after* negotiations on these variables have concluded.

The argument is in equal parts convoluted and patronising. It is a slap in the face to the notion that the New Zealand public should have a say in the rules our Government is negotiating for our national climate change commitments - rules which the Government readily admits will have a major effect on what our commitments actually mean.

Sadly, this attitude is not surprising considering the approach taken to public consultation in setting the nominal 2030 target last year. Of the 10,600 submissions that advised a specific target, 99.6% called for a stronger commitment than what the Government made.<sup>27</sup> Not only were those submitters seemingly ignored, the Government continues to withhold information New Zealanders require for informed debate about the actual level of New Zealand's ambition.

## **Getting answers the hard way**

Despite the key information being withheld (and the one large document still pending), the documents obtained through our OIA request have nonetheless been useful. They provide a simple explanation of the averaging approach. They confirm that the change to this would wipe significant emission liabilities off New Zealand's books compared with existing rules ("reduce costs" in the Government lingo), and clearly show this was the driving factor behind the decision.

The documents reveal that MPI modelled four different accounting options for comparison:

1. *Existing Kyoto rules*;

2. *“Modified Kyoto”*<sup>iii</sup> - existing Kyoto rules with the change to the averaging approach for post-1989 forest;
3. *Full gross-net* - net emissions under UNFCCC accounting, with the target set relative to 1990/2005 gross emissions;
4. *Full net-net* - net emissions under UNFCCC accounting, with the target set relative to 1990/2005 net emissions.

The Modified Kyoto option was eventually recommended to ministers on 13 November, on the grounds that it would provide the most certain reduction in costs with relatively low political risk.

Most usefully of all, the documents provided a mostly unredacted list of the assumptions used in the modelling of the four accounting options. Given the Government’s refusal to release the data we asked for, we decided to build a model to get some answers ourselves. This is presented in the following chapter.

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<sup>iii</sup> This is also referred to as ‘Hybrid Kyoto’ in the earlier documents.

## Chapter 5. Results from our forestry emissions model

Following the Government's refusal to release its forestry emissions projections, we proceeded to develop our own forestry emissions model to create projections and analyse the impact of the proposed accounting rule changes. This chapter presents a brief overview of our model and the key results.

### Model overview

The full model, along with a technical guide, can be downloaded and used at [www.morganfoundation.org.nz/cook-the-books](http://www.morganfoundation.org.nz/cook-the-books). The technical guide contains a full explanation of how the model works and the assumptions we have used.

As much as possible, we have followed the methodology and assumptions used in official emissions reporting and projections, in order to replicate these as best we can. We have relied mostly on New Zealand's Greenhouse Gas Inventory 1990-2014 for methodology and historic data, and documents we obtained through our Official Information Act request for future scenario assumptions. We thank the Ministry for the Environment for assisting us with some technical questions and providing additional unpublished data.

Our model produces close agreement with the forestry emissions and removals reported in the national inventory. Net forestry emissions in the model agree with the inventory result to within 1% for all years from 2008-2014,<sup>i</sup> and within 0.5% for the total period.

### Emissions projections

The documents we obtained through the Official Information Act show that the Government developed three future forestry scenarios and modelled all of these under different accounting rule options. The scenarios have the self-explanatory names 'Low emissions', 'High emissions' and 'Midpoint'.<sup>ii</sup> Most of the input assumptions for these scenarios are shown in the documents.

Two areas where we do not have sufficient information to be fully confident in our assumptions are Harvested Wood Products (HWPs) and future harvest projections.

On HWPs, the Government's three scenarios all assume default product half-lives specified by IPCC guidance,<sup>iii</sup> and the same mix of products as in the most recent year for which data

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<sup>i</sup> Forestry emissions under Kyoto accounting rules are only provided from 2008 onward.

<sup>ii</sup> Note that the midpoint scenario assumptions are generally not exactly halfway between the low and high values.

<sup>iii</sup> These are: 35 years for sawnwood products; 25 years for wood-based panels; and two years for paper. Note that the published studies to date have found far shorter half-lives than this from New Zealand's log exports (Scion 2014, Manley et al 2016).

was available (2013). As discussed in Chapter 2, New Zealand can currently only account for domestically manufactured HWPs under Kyoto rules, but there is a work programme underway to source sufficient data on the fate of exported logs. The three scenarios differ by the percentage of log exports assumed to be included in the HWP accounting: 100%/50%/0% in the low/midpoint/high emissions scenarios respectively.

The current mix of products produced from harvested wood is not directly reported in the national inventory. Instead, we have set our assumptions based on data for 2011 from a MPI technical paper on the subject.<sup>iv</sup> We do not know how closely this matches the assumptions the Government has used, but we note that there are large uncertainties around the HWP parameters anyway (see Chapter 3, 'Issues with Harvested Wood Products accounting').

Future harvesting will have a huge impact on accounted emissions under the existing rules, but zero impact under the averaging approach. The timing of harvest is therefore a critical factor in how much difference the rule change will make over a given time period.

The challenge is that it is very difficult for us to replicate the Government's assumptions on harvesting. We are only told the target rotation age (32/30/28 in the low/midpoint/high emissions scenarios), but this does not mean all forests are harvested at this age. The actual annual harvest projections used by the Government were provided from a fairly complicated national forest harvest model. While MPI publishes national wood harvest forecasts based on similar modelling, these do not distinguish pre-1990 forest (harvesting of which does not affect emissions under Kyoto accounting) from the post-1989 forest we are interested in. There is little for us to go on.

Given this, we tried several different harvest modelling methods to provide a range. Figure 9 below shows net forestry emissions under three different methods (the blue lines) when all our assumptions are aligned to the Government's midpoint scenario. These three methods can be summarised as follows:

1. Fixed harvest age: all forests are harvested at a fixed age, in this case set to 30 years.
2. Fixed harvest profile: each year, a fixed percentage of forest at each age class (e.g. 15% of forests aged 28) is harvested. The percentage profile is sourced from a Motu working paper and is based on historical data.<sup>28</sup>
3. Small-scale forest harvest projection: a specified annual wood volume is harvested, starting from the oldest forests first. The wood volumes used here are adapted from the national harvest forecast from small-scale owned forests (assuming a target rotation age of 30).<sup>v</sup>

The methods give a wide range, and we believe the middle projection (fixed harvest profile) is the most realistic of the three. While the shape is different, it gives the best overall agreement with the official projection to 2020 (the black circles).<sup>vi</sup> It is clearly unrealistic to assume all forests will be harvested at a fixed age, although it is a useful indicator of

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<sup>iv</sup> See p. 36 of Scion (2014).

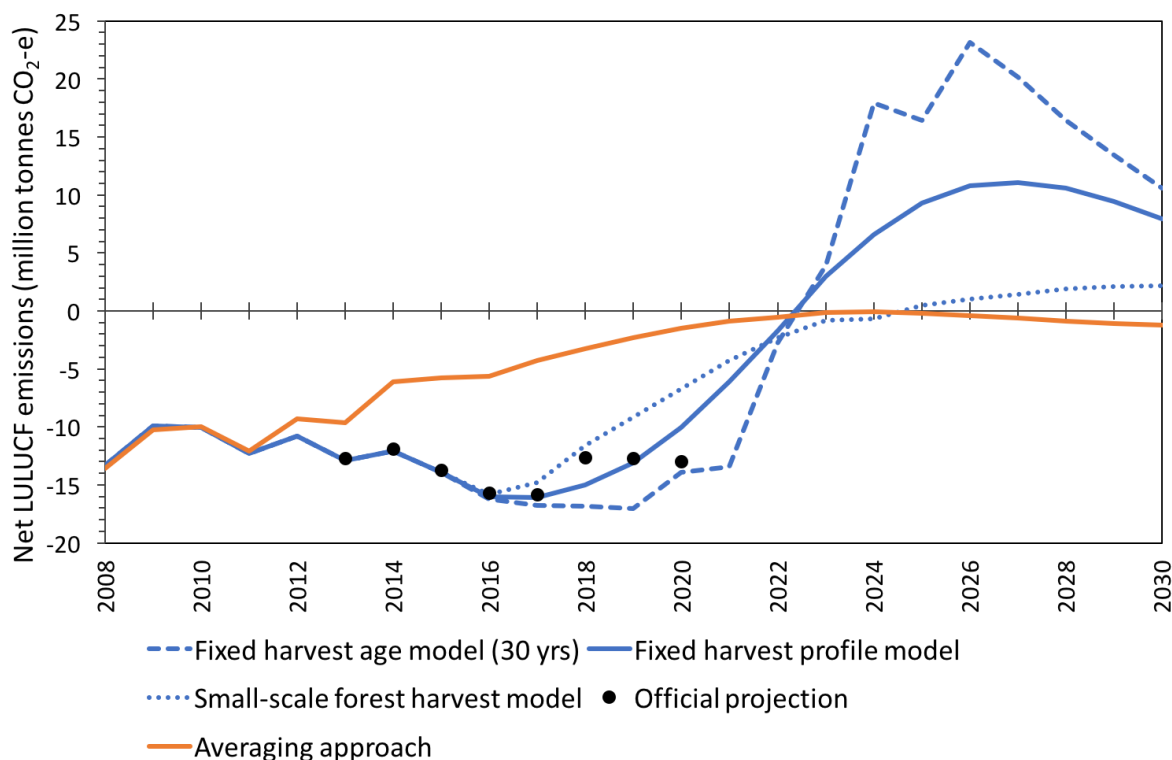
<sup>v</sup> For more detail see the technical guide at [www.morganfoundation.org.nz/cook-the-books](http://www.morganfoundation.org.nz/cook-the-books).

<sup>vi</sup> It also broadly aligns with forestry emissions in a graph published in the Ministry for the Environment's 2014 Briefing to Incoming Ministers. The two are not directly comparable as this was based on different assumptions and data which is now out of date.



potential extremes. It is also unrealistic to assume all post-1989 forest is small-scale forest as the third method does.<sup>vii</sup> In the wood availability forecasts, this small-scale forest harvest gets heavily smoothed through both early and late harvesting. In our model using this method, nearly 30% of the forest aged 30 and over is still yet to be harvested after 2030. We believe these methods therefore provide reasonable upper and lower bounds.

**Figure 9: Net forestry emissions projections using different harvest models and accounting rules (midpoint scenario)**



*Note: Blue lines show emissions under existing Kyoto rules; orange line shows emissions under the averaging approach.*

*Sources: MF model; official projections from Ministry for the Environment (2016).<sup>5</sup>*

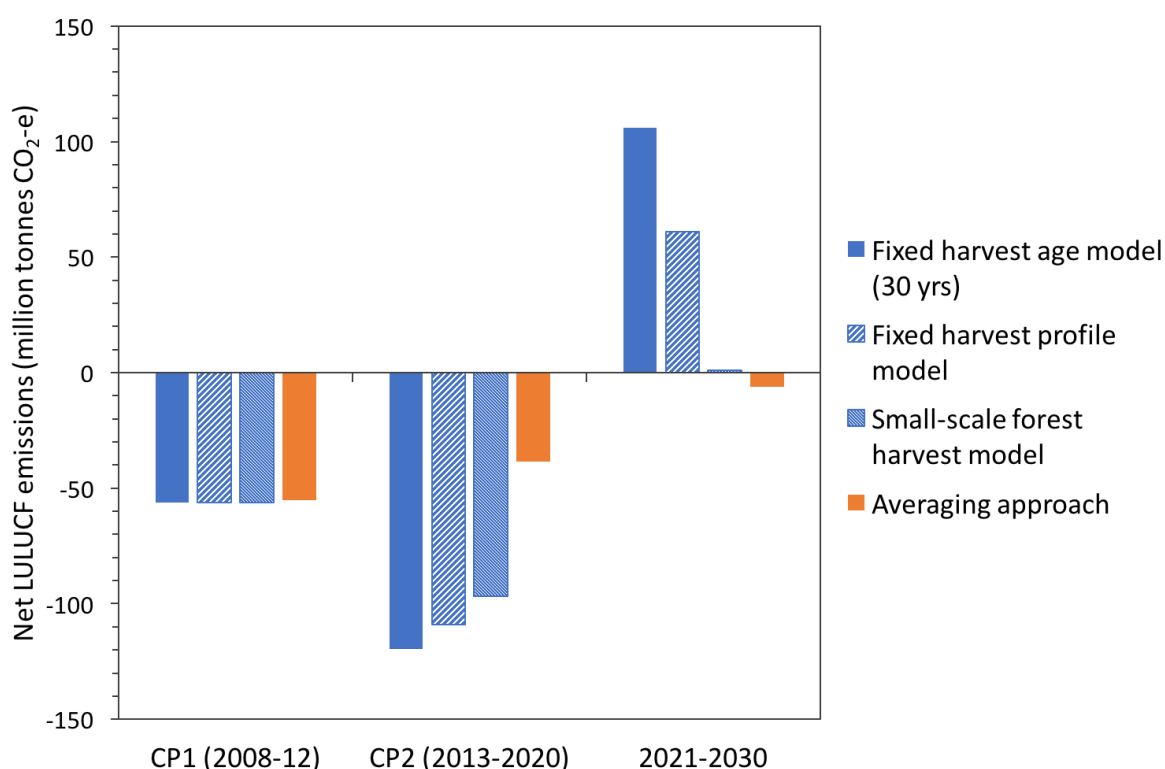
The thing we are most interested in here is the difference between the net emissions under current Kyoto rules, and under the averaging approach (the orange line - remember this is not affected by harvest timing). We have assumed here, in line with the little information the Government has released, that the long-term average carbon stock is reached at age 20. The lines therefore start to diverge from 2011 when the first post-1989 forests exceed this age. Up to around 2022, removals are substantially higher under existing rules than they would be under the averaging approach - how much higher depends on how much early harvesting takes place. After 2022, once the harvesting really kicks in, forestry becomes a net source of emissions under existing rules, while under averaging it remains a small net sink.

<sup>vii</sup> While the total land areas of small-scale forest and post-1989 forest are very similar, they do not comprise the same forests. More than 50% of the post-1989 forests registered in the ETS are larger than 1,000 hectares.

In other words New Zealand has benefited hugely from having the existing rules, up until now. If these rules continued, New Zealand would have to pay back many of the carbon credits we received up to 2020, but the change in rules would avoid this.

Figure 10 below shows the total net emissions over the commitment periods for these same projections. The different rules make very little difference in CP1 as most of the forests are yet to reach the long-term average carbon stock. CP2 is when the existing rules are most advantageous to New Zealand: for the three harvest modelling methods used here, net *removals*<sup>viii</sup> are likely to be 71 million tonnes (within a range of 58 to 81 million tonnes) greater under existing rules than under the averaging approach. Finally, for the first period of the Paris Agreement (2021-2030), the tables are turned and net *emissions* are 67 million tonnes (within a range of 7 to 112 million tonnes) greater under existing rules than under the averaging approach.

**Figure 10: Net forestry emissions by commitment period using different harvest models and accounting rules (midpoint scenario)**



Source: MF model.

## Honing in on the key numbers

So far we have only shown our results emulating one of three Government scenarios - the midpoint scenario - and found that within this there is considerable uncertainty due to unknown harvest timing. However, there is a way we can hone in on the numbers most salient to the rule change the Government is seeking.

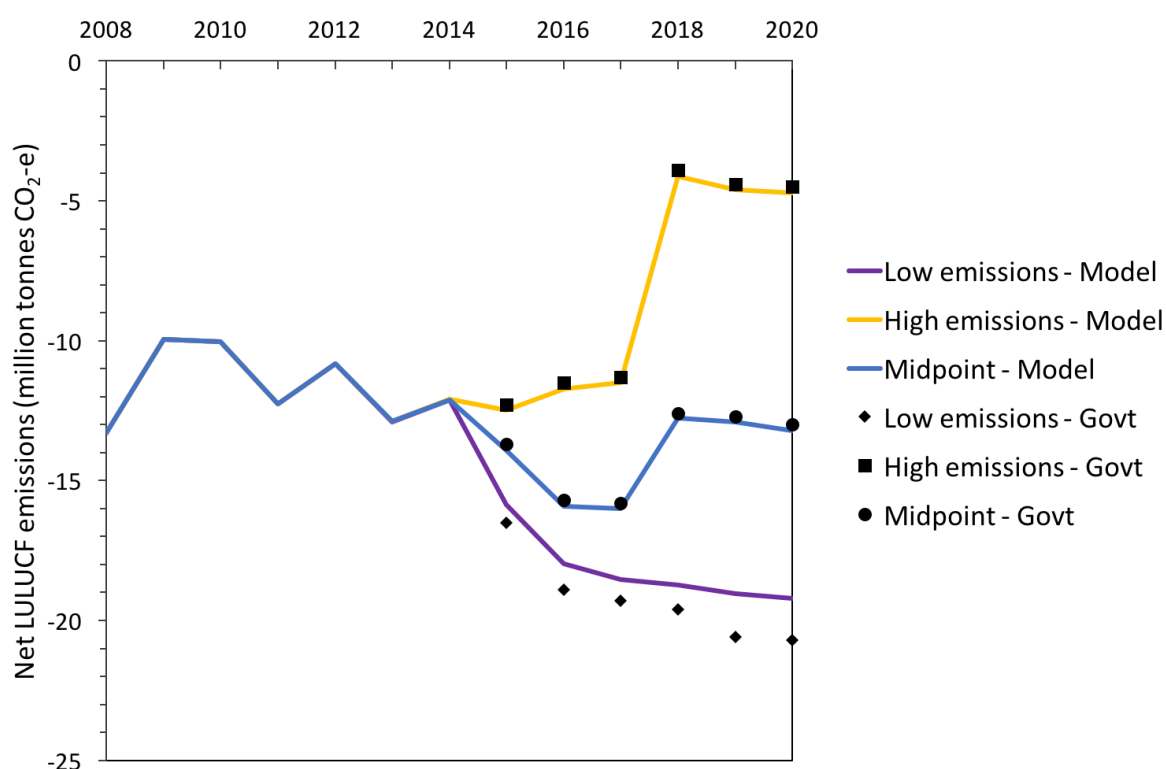
<sup>viii</sup> We sometimes use the term net removals (a positive number) when the net emissions are negative.

The central issue, as we outlined in Chapter 2, is how many credits will be claimed from forests above the long-term average carbon stock value up to 2020. New Zealand would not receive these if the averaging approach were applied earlier, and once the rules are changed these credits would never be 'paid back'. The answer to this question depends only on harvesting up to 2020 - it is unaffected by uncertainty around harvest projections in the next decade.

Fortunately, we do have the Government's projections up to 2020 under Kyoto rules, and can use these to calibrate our harvest assumptions.

We prescribed wood harvest volumes such that our modelled net emissions match the official projections for the low, midpoint and high emissions scenarios, as shown in Figure 11. There is a problem matching the low emissions scenario - even when we set harvesting to zero (as shown in the graph), our net removals are still too small. We can match the Government projection if we also set all deforestation to zero, but this is not the assumption detailed in the OIA documents. We remain unsure about the reason for this disagreement.

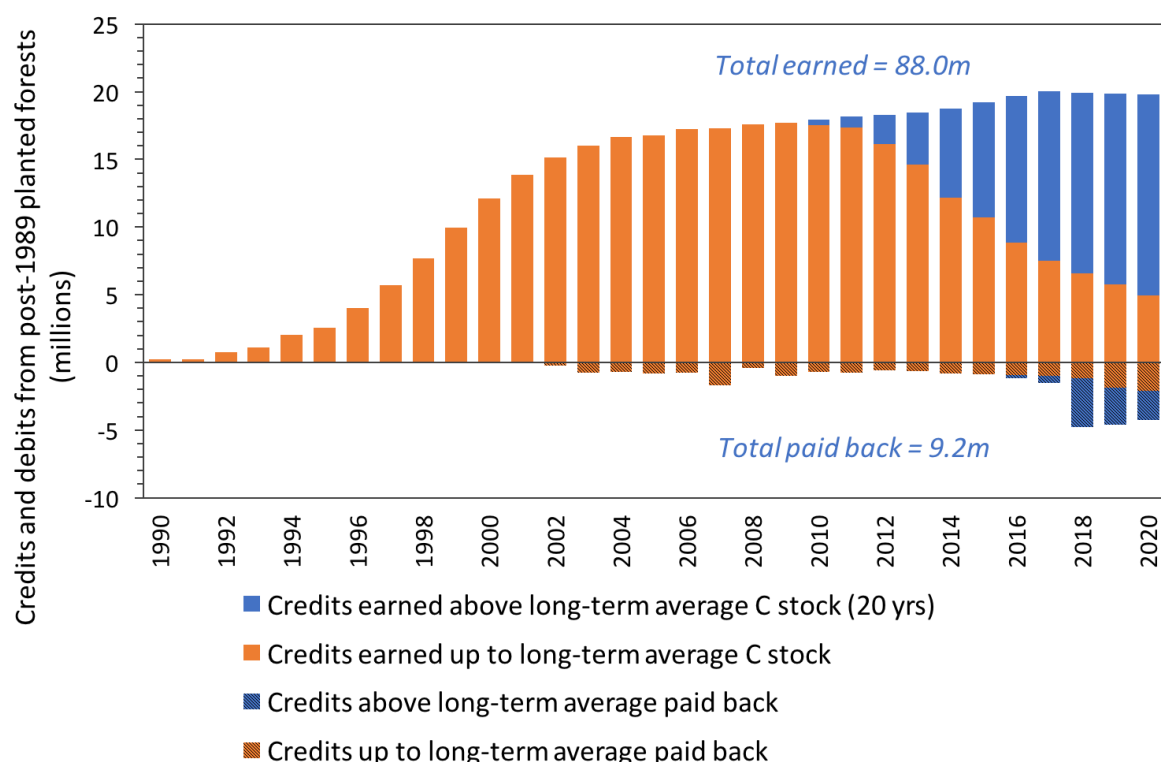
**Figure 11: Model calibration to Government projections**



Sources: MF model; Government projections from Ministry for the Environment (2015).<sup>29</sup>

With our harvest projections calibrated as described, we then calculate the total credits that would be accrued up to 2020 from forests above their long-term average carbon stock (again assuming this is reached at 20 years). Figure 12 below illustrates this with the annual forest removals for midpoint scenario, distinguishing between credits earned up to the long-term average (the orange bars), and above the long-term average (the blue bars).

**Figure 12: Forestry credits earned and repaid, up to and above the long-term average carbon stock (midpoint scenario)**



Source: MF model.

The totals from 2008-2020 (i.e. summing up all the blue bars in the Figure 12) are shown in Table 1 for all three scenarios. This gives a range of 65 to 90 million credits, with a central estimate of 79 million. For perspective, this equates to almost a year's worth of New Zealand's gross emissions (currently around 81 million tonnes of CO<sub>2</sub>e annually).

**Table 1: Projected forestry credits claimed above long-term average carbon stock to 2020**

	Low emissions scenario	Midpoint scenario	High emissions scenario
<b>Net credits from forests above long-term average carbon stock, 2008-2020</b>	90 million	79 million	65 million

Source: MF model.

We discuss the implications of these findings in the following chapter.

## Chapter 6. Implications

The obvious impact of the Government's proposed rule change is to make it significantly easier for New Zealand to meet the 2030 target. That in itself doesn't necessarily make it wrong. However, as we explain in this chapter, the Government's plan has some deeply problematic implications.

### Wiping the credit card debt

Our modelling results in Chapter 5 culminated in one key set of numbers: up to 2020, New Zealand will claim an estimated 79 million (65 to 90 million) forestry credits from forests that are above their long-term average carbon stock. As shown in Chapter 1, these will be used to cover our gross emissions which are tracking around 27% above our targets to 2020.

We cannot say with accuracy what difference the rule change will make over the 2021-2030 period, because this depends on how much forest gets harvested, and when. This difference could be lower than 65 million, if there is both a lot of early harvesting before 2020 and a lot of forests not harvested until after 2030. It could also be well in excess of 90 million if most harvesting does occur within the 2020s. This is because under the existing rules the carbon stock drops below the long-term average following harvest, before rebuilding as the next forest rotation grows (see Figure 5).

This uncertainty matters if we are only looking at the impact to 2030, but not if we look longer term. Again, the ultimate impact of the rule change is that by 2020 we will claim some 79 million credits from forests above their long-term average carbon stock - i.e. carbon that is *only temporarily stored*. Regardless of harvest timing, New Zealand will avoid ever paying those temporary credits back by changing to the averaging approach.

In other words, after maxing out the forestry credit card in order to meet New Zealand's targets to 2020, the Government intends to covertly wipe the debt. This act would clearly be in violation of existing international agreements, and opens the door for other countries to rort those agreements also.

### Retrospectively violating Kyoto

Changing the rules to wipe the liability for those temporary forestry credits is more than just dodgy - it is also in clear violation of the Kyoto Protocol's governing principles on forestry accounting. In particular:<sup>10</sup>

- *"That consistent methodologies be used over time for the estimation and reporting of [land use, land-use change and forestry] activities;"*
- *"That reversal of any removal due to land use, land-use change and forestry activities be accounted for at the appropriate point in time."*

The Government chose to exit Kyoto at the end of 2012 and instead take on a voluntary 2020 target, but committed to continue applying Kyoto rules to meet this. Some may argue

that we are now entering a new agreement and the old rules no longer apply. However, this is inconsistent with the Government's plan to carry forward 85.7m credits from the current period into the 2021-30 period.

New Zealand can honour the principles of the Kyoto Protocol if we compensate for the reversal of temporary forestry credits we have used thus far (above the long-term average), when this occurs post-2020. If New Zealand does not do this, then we will retrospectively destroy the environmental integrity of those credits we claimed.

## **Regressing on Paris**

The Government's actions also violate one of the key tenets of the Paris Agreement, the progression principle: "The efforts of all Parties will represent a progression over time." As stated in the 2015 Cabinet paper on New Zealand's intended contribution to the agreement:<sup>30</sup>

*"Developed countries are expected to show progression on their current targets... New Zealand currently has a target to reduce emissions to 5% below 1990 levels by 2020 across the whole economy. Our post-2020 target will need to improve on this to show progression."*

At face value, New Zealand's chosen 2030 emissions target of 11% below 1990 levels is a progression on our 2020 target. But what these targets actually mean is defined by the accounting rules - and the Government has made the 2030 target conditional on changing these. What would New Zealand's 2030 commitment translate to under the continuation of existing rules?

Firstly, we will assume for the below analysis that the impact of the forestry accounting rules change over the 2021-2030 period equates to 79 million credits. As discussed above, it could work out to be less or more depending on harvesting times but over the longer term (i.e. beyond 2030) this would average out.

The -11% target provides New Zealand with a 'carbon budget' (or emissions allowance) for the 2021-2030 period of 611 million tonnes of CO<sub>2</sub>e (Mt).<sup>31</sup> The official projection for gross emissions under business-as-usual is 846 Mt. This leaves a deficit of 235 Mt to be made up through mitigation action over the decade (emissions reductions, forestry removals, or purchase of foreign credits if viable).

Based on our modelling, under the rules the Government is seeking with averaging, forestry will be a net sink of around 6 Mt over the period under BAU. This would reduce the mitigation requirement very slightly to 229 Mt.

Let's assume that - by whatever means - New Zealand meets the 611 Mt carbon budget under the changed forestry accounting rules. Measured under the existing rules, our emissions over the period would be 79 Mt above that. In other words, the *effective carbon budget under existing rules* would be 690 Mt.

Finally, we can translate this back into an *effective 2030 target*. The answer is approximately a 7% increase on 1990 levels.

**To summarise: we estimate that the nominal 2030 target of 11% below 1990 levels, under the Government's proposed rule change, translates to 7% above 1990 levels under a continuation of the current accounting rules. Under a consistent accounting approach, New Zealand's commitment is a regression on our 2020 target.**

What target would New Zealand need to take on under the rule change in order to demonstrate genuine progression on our 2020 target?

Under the same assumption as above, a target of -5% under existing rules translates to around -23% under the proposed rules (a carbon budget of 559 Mt). That would just be holding the line on New Zealand's 2020 commitment. A target of -11% under existing rules translates to around -29% under proposed rules (a carbon budget of 532 Mt).

Finally, what if, in addition to changing the forestry accounting rules, New Zealand also manages to carry over the 85.7 million surplus credits we are projected to hold after meeting the 2020 target? Remember that we only possess this surplus due to past use of foreign credits that were largely fraudulent; it therefore has little, if any, environmental integrity. Factoring this into the equation, **New Zealand's effective 2030 target would be a 27% increase above 1990 levels.**

## Global repercussions

As the Government likes to point out, New Zealand's emissions are small on the global scale. The excess emissions allowed by the Government's proposed rule change would amount to around 0.01% of the remaining global carbon budget for a likely chance of staying under 2°C.<sup>i</sup> This is in no way a justification. However, perhaps the most harmful impact of New Zealand's actions is the potential to undermine the Paris Agreement and global action to reduce emissions.

In order to get its way on the proposed rule change, the Government's negotiating stance is to push for the most flexible, non-prescriptive approach to land carbon accounting in the Paris Agreement (see Chapter 4, 'BYO Rules'). As discussed earlier, this is a recipe for disaster - enabling other countries to play the same accounting games we are playing and choose rules that allow them to hide their emissions and minimise the action they need to take.

Furthermore, New Zealand may establish a precedent for changing the rules to suit a country's circumstances in any particular time period. We would have no grounds to stop other countries building up forest credits in one period and then wiping their liability in a future period. To avoid this harmful precedent, New Zealand needs to be upfront about the effects of the proposed rule change, and compensate for them.

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<sup>i</sup> According to the IPCC, this remaining budget is approximately 800 GtCO<sub>2</sub> as at 2016 (<http://bit.ly/2cGdrRI>).



## **Short-term gain, long-term pain**

Ultimately, the Government's strategy of trying to keep the effects of the rule change secret and avoid taking responsibility may in fact be shooting New Zealand in the foot. When countries do eventually cotton on, this sort of accounting trickery risks confirming the worst fears and turning the world against forestry as a genuine mitigation option. The risk is a backlash that could, ironically, lead to highly restrictive rules on how forest sinks can contribute to countries' commitments, and a generally dim view of their role in addressing climate change. Expanding and enhancing New Zealand's forests do have an important role to play in our global contribution, which the Government's strategy risks undermining.

## Chapter 7. Conclusion

In this report, we have investigated the impact of the intended changes to forest carbon accounting in New Zealand's commitment under the Paris Agreement. The Government has refused to reveal information about the impact, but our analysis confirms it is very significant.

Our key finding is that, up to 2020, New Zealand will claim 79 million credits (with a range of 65 to 90 million) from forests that are above their long-term average carbon stock. The proposed change to the averaging approach, which averages out the harvest cycle, will remove the harvest or deforestation liability attached to those temporary credits. The excess emissions this rule change will allow, compared to a consistent accounting approach, equate to up to a year's worth of New Zealand's current gross emissions.

There is nothing wrong with the averaging approach in principle. While there are unresolved questions around how it would be implemented in practice, it does stack up scientifically. The issue is the timing of the change: right when, under existing rules, New Zealand's forestry 'credit card' is maxed out.

The Kyoto accounting rules have been extremely favourable to New Zealand so far. The 1990s boom in pine planting bought us time to get our emissions trending down, or establish new forest to compensate for the looming harvest. Due to Government inaction, we have done neither, and we are now facing the consequences.

The fact is that policymakers understood this all along. As discussed in Chapter 1, many observers argued that the inclusion of forestry would merely result in New Zealand delaying genuine action to reduce emissions. This concern has proven to be correct. Worse, the Government has filled the remaining gap between emissions and targets with dodgy foreign carbon credits, delaying action even further.

All this has left New Zealand between a rock and a hard place, playing catch up. It is as if we have entered a 200m race, done nothing after the starting gun, and we now face the challenge of catching up when all our opponents only have 100m to go. Our Government's response isn't to get moving and try to catch up - to take responsibility for our position. Instead, it is trying to change the rules halfway through the race, asking for our remaining distance to be shortened.

### Recommendations

#### 1. Be upfront

If the Government wants to change the rules, the consequences of doing so should be a matter for national discussion - not a secret to everyone but Ministers and negotiators. In our view, contrary to what the Ministry for Primary Industries thinks, this secretive approach will undermine trust in the Paris Agreement negotiations and risk damaging New Zealand's reputation in the long run. Instead, the Government should be honest and upfront with New

Zealanders and the international community by releasing its analysis of the national impact of different forestry accounting rules.

## 2. Up the target

If the Government proceeds with its intended rule change, this will amount to a retrospective violation of forest accounting principles agreed under the Kyoto Protocol. It also violates the Paris Agreement's principle of progression before that Agreement has even begun. We estimate that New Zealand's 2030 target, with the conditional rule change, would amount to a 7% increase on 1990 levels under existing rules. Under a consistent accounting approach, the commitment is therefore a regression on New Zealand's 2020 target (-5% on 1990 levels).

If the Government does not compensate for the rule change by increasing its target, and continues to hold out for maximum flexibility in accounting methods, New Zealand risks undermining the Paris Agreement. Global action to reduce emissions will thus be compromised. The Government's approach risks establishing a precedent for countries to apply whatever rules will minimise their accounted emissions in a given period, and to change their rules when it suits them.

The obvious way for New Zealand to compensate for the effects of the rule change is to factor this into our 2030 target. Doing this, based on our analysis, would require increasing the target to a reduction of 25-30% on 1990 levels. This would ensure a genuine progression on New Zealand's 2020 target, and establish a good global precedent.

## 3. Develop a real plan to live up to the Paris Agreement

This whole tale highlights the need to actually get on with the job of decarbonising our economy, particularly our energy system. The real essence of the Paris Agreement is that countries need to get on a pathway to zero net emissions in the second half of the century. New Zealand needs a plan to do this.

For reasons highlighted in this report, that plan should set gross emissions and/or sectoral targets. Storing more carbon in forests is an important part of our contribution to global climate change efforts, but as we discussed in Chapter 3, it is no substitute for reducing gross emissions (especially of long-lived gases which accumulate in the atmosphere, like carbon dioxide and nitrous oxide). Setting separate targets for gross emissions and for carbon removals (in forests) will make the substance of our commitments clear and certain.

## 4. Dump the junk

Finally, as we recommended in our previous report, *Climate Cheats*, carbon trading also needs to be supplementary to strong domestic action, and it must ensure environmental integrity. The Government should commit to cancelling the surplus credits remaining as at 2020, given that this surplus built on the past use of fraudulent foreign credits. In fact now there are two reasons to dump the junk; seeking to carry over credits post-2020 implies continuity and consistency. This would be contradictory with the Government's intention to change the forestry rules between the two periods.



# Appendix 1. The mystery of the missing 16 million tonnes

In the process of our investigation into the proposed forestry accounting rule changes, we made another interesting discovery. Using data from New Zealand's 2016 national greenhouse gas inventory, the net forestry emissions under Kyoto accounting rules for the first commitment period (CP1, 2008-12) came to -55.4 million tonnes CO<sub>2</sub>e. However, in the CP1 'true-up process', which took place in 2015, New Zealand received 71.6 million Removal Units to represent net removals from forestry over the period. Why was there a difference of 16.2 million tonnes?

The answer is revisions in the national estimates since 2014 (the year from which the Kyoto true-up used data), as shown in Table A1.

**Table A1: Net LULUCF emissions under Kyoto accounting rules from successive national inventories**

Year	2016 inventory	2015 inventory	2014 inventory
2008	-13.1	-13.4	-14.2
2009	-9.7	-10.0	-12.3
2010	-9.8	-11.4	-14.4
2011	-12.1	-12.6	-15.5
2012	-10.6	-12.0	-15.1
<b>TOTAL</b>	<b>-55.4</b>	<b>-59.4</b>	<b>-71.6</b>
<b>Difference c.f. 2014</b>	<b>16.2</b>	<b>12.2</b>	

*Note: 2014 inventory includes ARDC rule, excluded in 2015 and 2016.*

*Source: Common reporting format (CRF) tables published with New Zealand's national greenhouse gas inventories.*

Why such a significant change to the estimates? Ministry for the Environment officials explained that the numbers will change each year due to updated input data (such as the area of deforestation or harvesting) and also due to ongoing improvements to methodology.

In this case there is firstly a small effect of a minor rule change. The 2014 inventory figures include the afforestation reforestation debit-credit (ARDC) rule, which applied in CP1 but was removed from the accounting rules for CP2 (2013-20). This rule means that when a forest is harvested (but not deforested), the country only needs to pay back credits earned by that forest after 2007 – i.e. only the credits that a country has actually benefited from the use of. This rule is not included in the 2015 and 2016 inventory reporting, and accounts for a small part of the difference.

In the 2014 inventory, the ARDC rule reduced net emissions (i.e. increased net removals) by 0.9 Mt.<sup>i</sup> Assuming this scales with area of harvesting reported (which was about one third higher in the 2016 inventory), it would therefore account for 1.2 Mt of the difference in net emissions between the 2014 and 2016 inventories. Including the effects of the ARDC rule in the 2016 inventory figures, the actual difference due to data revisions since 2014 is **15 million tonnes**.

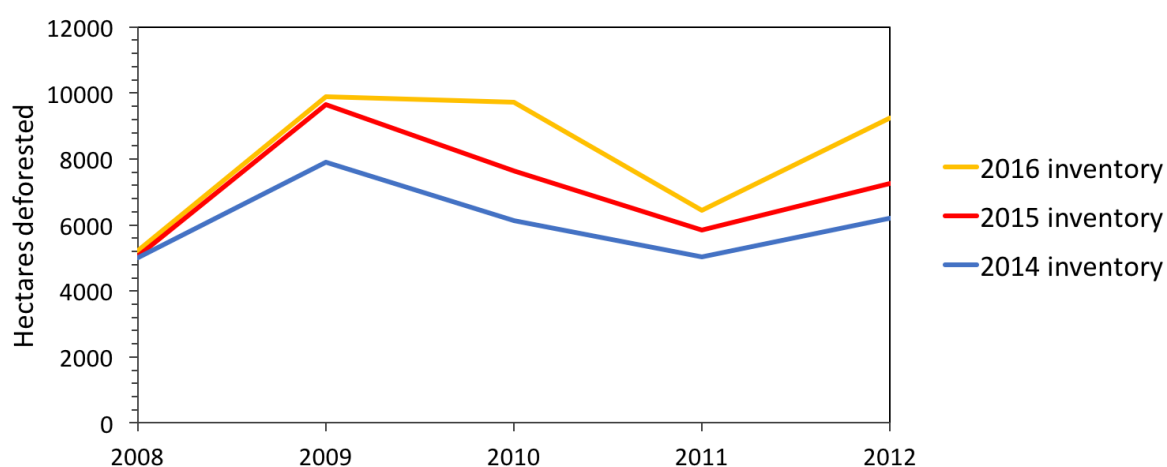
Higher levels of reported deforestation account for over half of that difference. Figure A1 below shows the annual areas of deforestation of pre-1990 forest as reported in each year's inventory. We estimate that the additional deforestation reported (including post-1989 forest land) accounts for 8.6 MtCO<sub>2</sub>e of the difference between 2014 and 2016 inventories. It also accounts for almost all of the difference between the 2015 and 2016 inventories.

The remainder of the difference (6.4 Mt if our deforestation analysis is accurate) is due to other data and methodology updates. For example, we understand that the national carbon yield tables were updated based on new field measurements.

In conclusion, we now know that New Zealand received around 15 million forestry credits in Kyoto CP1 which it should not have received. The majority is due to an estimated 8.6 million tonnes of emissions from deforestation that was not detected in the 2014 inventory report. If the 2016 inventory figures were used, New Zealand's net emissions would in fact have exceeded the CP1 target, requiring the use of foreign credits.

This finding highlights the risks in accounting for forest sinks towards emission reduction targets, due to the difficulties of accurately monitoring land-use and estimating CO<sub>2</sub> removals. It will be important for the Paris Agreement to learn from this: for example by requiring the use of conservative assumptions, and for retrospective improvements to forestry emissions estimates to be compensated for in later periods. More importantly, it strengthens the case for having separate targets for gross emissions and forestry removals.

**Figure A1: Reported area of pre-1990 forest deforested in successive national inventories**



Source: New Zealand's greenhouse gas inventory reports

<sup>i</sup> Calculated from the CRF tables.

## Appendix 2. Official justification for withholding forestry emissions projections



Paul Young  
Morgan Foundation

Dear Mr Young

Further to your OIA request of 17 May 2016, you have requested, in your email dated 10 August 2016, the reasons for withholding certain information from the documents under section 9(2)(j) of the Official Information Act 1982 (OIA).

Section 9(2)(j) of the OIA permits withholding official information “necessary to ... enable a Minister of the Crown or any Department or organisation holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations)”. This is subject to being outweighed by other considerations which render it desirable, in the public interest, to make that information available” (Section 9(1) of the OIA).

The Ministry for the Environment acknowledges that the Ministry for Primary Industries is the lead agency on land-use accounting. The information below, provided by Ministry for Primary Industries outlines the rationale for withholding LULUCF projections under proposed accounting rules in your OIA request:

“Negotiations in question

*The Government is currently negotiating under the United Nations Framework Convention on Climate Change (UNFCCC) on the detailed rules that will apply to the Paris Agreement once it enters into force. This includes negotiations on the greenhouse gas accounting rules that will apply to New Zealand’s future international climate change commitments and emissions reduction targets. The eventual outcomes of these negotiations can have a significant impact on the cost to New Zealand of delivering on its successive NDCs, and it is in these negotiations where the New Zealand Government would suffer prejudice or damage if the withheld material were released.*

Prejudice or disadvantage identified

*There are major economic and fiscal differences for New Zealand between different accounting methodologies. The release of the withheld information would enable negotiating partners to identify the financial importance to New Zealand of different negotiated outcomes on accounting methodologies. If the national impact of different options were publicly available, it would prejudice the Government’s ability to negotiate on objective grounds such as environmental and scientific legitimacy if the approach also financially benefitted New Zealand.*

*This disadvantage would manifest as impacts on New Zealand’s perceived integrity and negotiating credibility, and therefore the likelihood that other Parties would either accept the scientific basis for New Zealand’s proposed approach, or have the goodwill to provide for New Zealand’s interests. Any perceived high economic value for New Zealand could also require greater negotiating concessions to secure preferred approaches under future accounting guidance.*



### Likelihood of prejudice

*The ability for New Zealand to secure its preferred approach to forestry accounting rules will depend on the level of granularity and prescription of the guidance, as well as the Government's ability to negotiate for its preferred approaches. These two factors will be determined by the level of trust and confidence placed by other Parties in the environmental integrity of others' chosen accounting approaches, amongst other variables.*

*In negotiations on forestry accounting alone, the UNFCCC negotiations have provided multiple past examples where the complex nature of forestry accounting has resulted in misunderstandings; concerns at the environmental integrity of different methodologies; divergent views on the appropriate contribution of forests in meeting emissions reductions targets; and resulting demand for highly prescriptive forestry and land use accounting rules.*

*The Government therefore has strong reasons to expect that the release of the withheld information will result in confused or negative portrayals of New Zealand's approach internationally, resulting in a loss of trust in New Zealand's and other Parties' ability to nationally determine their own approaches. This would very likely lead to calls for greater prescription in the accounting rules and compromise New Zealand's chances to include its preferred approaches.*

### Considerations of public interest

*We recognise the public interest in the release of the withheld information, including understanding the projected contribution of forestry to the cost and ambition of New Zealand's 2021-2030 target and enabling effective public participation in making New Zealand laws and policies.*

*However, we note that the release of the withheld information may not necessarily promote these considerations. In particular, these projections vary significantly with each regular update and recalculation, and are reliant on a large number of both unknown and undecided variables. The information in question would therefore not provide a clear picture which could enable the public to predict the impacts of New Zealand's decisions under the Paris Agreement, or its influence at a granular level on domestic policy such as the New Zealand Emissions Trading Scheme. This picture will not become clear until more of these factors are determined, primarily in international negotiations. The negotiations that will determine the usefulness of this information and its ability to fulfil that public interest are ongoing, and remain at a critical point.*

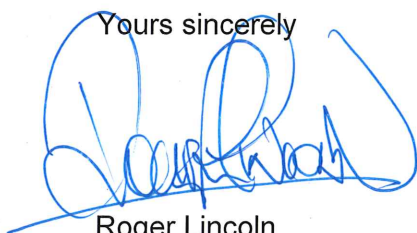
*We have considered whether the public interest considerations in this case outweigh the prejudice and disadvantage of releasing the information. Given the current and reasonably contemplated negotiations, and the financial and economic significance of the different accounting methodologies on New Zealand, in these particular circumstances we consider that the prejudice and disadvantage outweighs the public interest in making this information available at this time.*

*Should circumstances change in future, for example once the negotiations have progressed further, New Zealand's position in the negotiations may no longer be so prejudiced or disadvantaged by the release of this information, and this may enable public interest considerations to outweigh these risks. We would look to reconsider this information for release, at that time."*

As discussed with you in your phone call on Tuesday 20, the outstanding paper in your OIA request (Post-2020 Forestry and land Use Options for New Zealand's 2015 Contribution) will be provided to you shortly.

I trust this answers your enquiry.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Roger Lincoln', written over a horizontal line.

Roger Lincoln  
**Climate Change Director**

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