Chapter 6

Agriculture and land use

6.1 This chapter examines issues related to agriculture and land use. After a short discussion of the key concept of biosequestration, the chapter comprises sections on agriculture, reforestation, deforestation, soil carbon and carbon accounting.

6.2 The committee heard from a range of stakeholders that commented on agriculture and land use issues. A number of roundtables were held throughout the hearings, which provided much useful evidence on these issues. These included roundtables on the science of climate change, green carbon and carbon accounting.

Biosequestration

6.3 Biosequestration occurs where atmospheric CO_2 is 'locked up' in soil or plant stocks, generally through natural processes such as plant growth. Biosequestration of CO_2 may occur due to the activity of natural ecosystems as well as from agricultural activities, such as the growing of trees or crops. Equally, CO_2 is released from these sources when they are destroyed or degraded, such as through burning, decomposition or consumption.

6.4 Dr Heather Keith, an academic specialist on forest ecology, provided the following definition of sources of biosequestration:

> We used the term [green carbon] to distinguish between fossil fuel carbon and carbon in biological systems. I would further separate the biological carbon into green carbon that represents natural ecosystems that are resilient and self-regenerating, so providing a very high carbon density and secure storage of carbon. I would distinguish that from industrialised plant production that includes agriculture and plantation forestry.[1]

6.5 Because biosequestration involves the removal of CO_2 from the atmosphere, it represents a form of greenhouse gas mitigation. At the roundtable on climate science, witnesses emphasised that methods of sequestering CO_2 were increasingly important given the fact that atmospheric concentrations of CO_2e have already exceeded 450 ppm.[2] This implies that in order to stabilise CO_2e at this level or lower,[3] the global effort now required a significant effort to not only abate or reduce future emissions but also to remove CO_2 from the atmosphere.

6.6 In considering the effectiveness of various forms of biosequestration, the extent of permanency is an important consideration, and one that will depend on a

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1 Dr Heather Keith, *Proof Committee Hansard*, 16 April 2009, p. 70.

2 *Proof Committee Hansard*, 15 April 2009, pp 77-78.

3 The issue of targets is discussed in Chapter 2.

number of factors. For example, in general terms carbon that is locked up in forests, or used for housing or furniture, is removed from the atmosphere for longer than is carbon stored in a food or paper product. However, paper products are capable of lasting up to 30 years in landfill.

6.7 The assessment of levels of biosequestration for the purposes of calculating additions or reductions to atmospheric carbon is referred to as 'carbon accounting'. The committee received much evidence on this critical issue, discussed in the final section of this chapter.

6.8 The importance of establishing comprehensive policies around biosequestration was a consistent theme across the hearings conducted by the committee:

> It is time to move on to the…key issues, which are tests of the credibility of the government…[These include the question:] How are we going to get the best carbon outcomes from biosequestration?[4]
>
> …there is potential with the agricultural sector and biochar, which are not covered under the early CPRS, to significantly abate emissions…[5]
>
> …we would also like to see an appropriate market signal that can work through into abatement activities, including sequestration, for our industry.[6]

Agriculture

Introduction

6.9 A common theme from all submitters and witnesses who discussed agriculture and land use issues was the historical adaptability of Australian farmers, and many called for policies that will harness and foster the independence and ingenuity of the agricultural sector. This confidence in the capacity of the agricultural sector to embrace and drive change is shared by all members of the committee.

6.10 A consistent view from agriculture-related organisations, as well as environmental and other stakeholders, was that under the current and proposed policy settings in Australia the agricultural sector could not access the opportunities offered by climate change abatement and mitigation activities, such as the new income streams that could be opened up by renewable energy, soil carbon and avoiding deforestation.

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4 Mr John Connor, Chief Executive Officer, Climate Institute, *Proof Committee Hansard*, 20 May 2009, p. 28.

5 Mr Owen Pascoe, Climate Change Campaigner, Australian Conservation Foundation, *Proof Committee Hansard*, 20 May 2009, p. 39.

6 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries *Proof Committee Hansard*, 20 May 2009, p. 75.

6.11 The potentially negative impact of climate change policies on agricultural sector production and incomes was also explored in some detail throughout the hearings.

Greenhouse gas emissions from agriculture

6.12 Agriculture emissions consist mainly of methane and nitrous oxide from livestock and cropping and make up 16 per cent of Australia's emissions.[7] However, at least in the early years, the agricultural sector will not be covered in the CPRS.[8]

6.13 The Grain Growers Association noted that current assessments of agricultural emissions did not take into account the sector's CO_2 sequestration potential.[9] Dr Christine Jones, who founded the Australian Soil Carbon Accreditation Scheme, explained:

> If you take the complete lifecycle analysis, there definitely are farmers who are sequestering more carbon than they are emitting.[10]

6.14 This issue is discussed further below.

Impact of climate change on agriculture

6.15 The National Farmers Federation (NFF) viewed climate change policy as being able to provide the agricultural sector with tools to manage on-farm risk related to 'climate variability':[11]

> …[Farmers] are at the interface of climate every day. So whether it is climate variability, climatic risk, a shift in climate, climate change or a change in climate, we are dealing with it. The variability exists and there are models that say that the variability will increase. So how are we going to deal with it on farm? The global predictions of X degree change are no doubt important and interesting, but the issue for us is what is happening on my farm and in my region and how I am going to adapt to that so that I can do more with less.[12]

6.16 The Tasmanian Farmers and Graziers Association observed:

> Obviously, with the current drought, we are seeing what could be climate change…So, when we say that climate change is real, our members,

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7 *White Paper*, p. 6-43.

8 The question of the inclusion of agriculture is discussed below, from paragraph 6.[40].

9 Mr Bryan Clark, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 88.

10 Dr Christine Jones, *Proof Committee Hansard*, 16 April 2009, pp 88-89.

11 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 5.

12 Mr Ben Fargher, Chief Executive Officer National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 4.

> especially in those areas, are fully aware of that because they are seeing every day that something is going on. A lot of the traditional ways of farming and the records they have kept, which they have relied on, will just not be of any use to them in the future…[13]

6.17 The Australian Bureau of Agricultural and Resource Economics (ABARE) drew the committee's attention to modelling it completed in 2007 which showed significant declines in Australian agricultural production if no action was taken on climate change:

> …[the] modelling…showed that by about 2030 you are looking at roughly 10 per cent declines in sugar, dairy, beef, sheep meat and wheat. By 2050 beef is down by a bit under 20 per cent; dairy, 18 per cent; sugar, 15 per cent and so on.[14]

6.18 Early work that ABARE was undertaking to assess the vulnerability of various regions was indicating:

> …the more robust a regional community is, the more diverse it is, the greater the range of agricultural pursuits in the agricultural economy and the greater the range of industries in that particular region, the less vulnerable they are to climate change.[15]

Impact of CPRS on agriculture

6.19 The committee heard from a variety of sources about the estimated impact of the CPRS on agriculture.

Modelling of impacts

6.20 As noted in Chapter 2, the Treasury have modelled impacts at a state level, and by industry, but did not believe the available data would support comprehensive modelling of the impacts of the CPRS on regional areas.

6.21 The Australian Farm Institute (AFI) referred to three studies, by ABARE, by the Centre for International Economics (which they had commissioned) and their own work, and noted:

> In summary, all three analyses projected CPRS related input cost increases in the range of one to three per cent by 2015, which would result in decreases in farm profit margins of between three and six per cent, all other things being equal. These results took into account government fuel excise and rebate commitments. Each of the three modelling exercises also

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13 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 23.

14 Mr Phillip Glyde, Executive Director, ABARE *Proof Committee Hansard*, 16 April 2009, p. 125.

15 Mr Phillip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 126.

> investigated the post-2015 direct CPRS impacts on agriculture, assuming agricultural emissions attract equivalent costs to other emissions.[16]

6.22 The committee notes that from the outset there was a lack of clarity around how modelling should treat the inclusion of agriculture in terms of EITE assistance. That is, if agriculture were classed as receiving the highest rate of EITE assistance, would it receive a 90 per cent allocation of free permits (equivalent to the nominal starting year allocation for other industries), or a 95 per cent allocation of free permits (equivalent to the starting year allocation for other industries under the revised CPRS scheme announced on 4 May 2009)? It now appears that the annual 1.3 per cent carbon productivity contribution for the years prior to agriculture's inclusion would be subtracted from the amount of free permits allocated to agriculture in its first year of inclusion in 2015.

6.23 The AFI modelling predicted an approximate 20 per cent reduction in farm profitability by 2030 for both grains and livestock, assuming that livestock production attracted 90 per cent free emissions permits under its EITE status.

6.24 Modelling by the Centre for International Economics projected that, relative to business as usual, agriculture sector outputs would reduce by up to 28 per cent for beef and wool production by 2030; with grain outputs reduced by 'somewhere in the region of two to five per cent'.[17] Mr David Pearce outlined the findings:

> Agriculture will be affected by the CPRS on commencement…through the indirect effect of the CPRS on prices within the economy. Some agricultural inputs (fertilizers, other chemicals, transport, machinery and so on) are energy intensive or contain energy intensive materials. To the extent that the CPRS raises energy costs, then the costs of agriculture will increase…[Our] analysis…suggests that even if it is not covered agriculture will experience costs…
>
> The costs experienced by agriculture, will of course, be experienced by many other sectors of the economy, so agriculture is not unique in this regard.[18]

6.25 The NFF concurred with this analysis. In addition, farmers' representatives noted that agriculture was an internationally exposed sector with an incapacity to pass on the increased costs; and that supply chain members, such as food processors, would be covered by the CPRS, which could see increased costs passed back to farmers in the form of lower prices:

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16 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 104.

17 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, pp 104-5.

18 Mr David Pearce, Centre for International Economics, *Answer to question on notice*, 16 April 2009.

> We also expect there to be increased costs to the processing sector, as that is being considered an industrial processor, which includes abattoirs and things like that. They will have increased costs because they also will be covered. We believe that, because the agricultural sector is a price taker and we cannot pass costs on very effectively, processing plants will offer lower prices to our farmers for their produce to offset the additional costs of those processing plants…On top of those two things…agriculture is a price taker in the world markets, and we do not really have a great opportunity to pass those costs on elsewhere.[19]

6.26 ABARE's modelling produced findings similar to the CIE's work on the initial impact of the CPRS on input costs (that is, not including potential pass-back or post farm-gate costs).[20] Based on the five per cent reduction target and a carbon price of $40 a tonne, it found that the impact on input costs of the agricultural sector would vary between 0.1 per cent and just under 0.5 per cent.[21] It was observed:

> …the projections for the indirect cost impact—in other words, the energy related cost impact that flows through in terms of the cost of farm inputs—by 2015 is actually quite similar between ABARE and other modellers. The projected increase in farm input costs is in the region of one to three per cent, which results in a decrease in farm profitability somewhere between three and six per cent. That sort of projection is quite consistent.[22]

6.27 However, ABARE concluded there would be less of an impact on agriculture due to the CPRS after 2015 (that is, once it is included in the CPRS). Recently completed work showed that the impact on meat processors by 2030 was a decline of 5.8 per cent; for other processed foods it was 0.6 per cent; and for processed milk it was minus 2.8 per cent.[23]

6.28 In terms of output, ABARE found that production in the beef and sheep sectors by 2030 would be eight per cent lower than if the CPRS had not been instituted; there would still be growth in output of 24 per cent. For grain, ABARE predicted a 5.3 per cent increase in production. Taking into account all production

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19 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20. See also Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 9.

20 Note that the work did not take into account the impacts and associated costs of climate change: Mr Philip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 113.

21 Mr Philip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 113.

22 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 106.

23 ABARE, *Proof Committee Hansard*, 16 April 2009, p. 123.

costs, the modelling showed a 20 per cent increase in cost for beef cattle and sheep meat by 2030.[24]

6.29 ABARE advised at a hearing that the conclusion to be drawn from their modelling was that 'with the current settings and the current assumptions in the model, the agriculture industry is minimally impacted by the CPRS out to 2030'.[25] (A new study by ABARE, after the hearings had concluded, comments:

> Like all sectors of the economy, agriculture will face higher input costs because of the CPRS from 2011…There may also be a CPRS related cost-price pass-through from downstream processors to farmers that lowers the prices farmers receive for their produce.)[26]

6.30 Regarding the different conclusions reached in relation to the impacts of the CPRS post-2015 and out to 2030, ABARE and the AFI explained that this was due to differences in starting point assumptions, given that both were using a similar model.[27]

6.31 Commenting on ABARE's modelling, AFI identified three assumptions that differed from their own. The most critical of these was ABARE's assumption of equivalent emissions policy impacts on agricultural sectors for developed nations from 2010; and equivalent policy impacts on agricultural sectors for developing nations from 2015:

> The differences between the ABARE results on the one hand and the other two sets of modelling highlight the potentially large economic impact that the CPRS could have on Australian agriculture in the event that competitors in international markets do not adopt equivalent emissions policies for their agricultural sectors—a situation that appears highly likely.[28]

6.32 AFI also noted that ABARE incorporated the lower emissions reduction scenario of five per cent rather than the greater reductions that would occur in the event of an international agreement. It was also relevant that ABARE had assumed there would be 3.3 million hectares of forestry development by 2030, which would contribute to emissions reduction.

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24 ABARE, *Proof Committee Hansard*, 16 April 2009, p. 120.

25 Mr Philip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 115.

26 The study gives a range of estimates of the impact on the economic value of farm production, depending on whether agriculture is included in the CPRS and what assumption is made regarding the extent of pass-through from processors to farmers; Tulloh et al, 'Effects of the Carbon Pollution Reduction Scheme on the economic value of farm production', *ABARE Issues Insights*, June 2009.

27 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 105.

28 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 105.

6.33 Commenting on the AFI's modelling, ABARE made three points. First, the AFI assumed that the response from agriculture was limited to reduction in output and that there is 'not much happening' on the technology front. Second, the AFI work did not strongly reflect the policy settings as proposed in relation to the CPRS. Third, the AFI work assumed that only Australia and New Zealand had imposed a carbon price, whereas the ABARE modelling assumed greater (phased) country coverage.[29]

6.34 Commenting on the effect of the 'real impacts of climate change' and higher input costs for farmers, the Australian Food and Grocery Council saw this as a threat to the competitiveness and profitability of Australia's food and grocery industry.[30] The Council estimated that the effect of the CPRS on increasing the costs of food production would 'undoubtedly result in higher food, beverage and grocery prices'.[31] The Council called for specific modelling of the effect of the CPRS on food prices, noting that the *White Paper* was deficient in this respect; and that households spent more on food and beverages than on energy.[32]

6.35 The committee heard some evidence on particular cost increases. The NFF advised that the additional cost of the CPRS on abattoir processing could be around $5 per cow and 80c per sheep.[33] Teys Bros estimated that the cost of permits would be around $6.30 per head of cattle, with input costs increased by about $10 a head.[34] On a worst case scenario, in which 'there is no trade-exposed status given to the livestock production and beef processing sector' it was estimated that:

> … production will be down by 14 per cent in 2030, exports down 14 per cent by 2030 and gross operating profit across the sector down 62 per cent.[35]

6.36 Teys were also concerned about the potential for carbon leakage:

> The scheme, I believe, will create carbon leakage as Australia is an emissions-efficient producer of beef. Pressures on its competitiveness will reduce our exports, which will be picked up by countries that are less efficient producers from an emissions perspective. For example, per 10

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29 Dr Helal Ahammad, Department of Agriculture, Fisheries and Forestry, *Proof Committee Hansard*, 16 April 2009, p. 117.

30 *Submission 330*, p. 4.

31 *Submission 330*, p. 9.

32 *Submission 330*, p. 9.

33 *Proof Committee Hansard*, 15 April 2009, p. 11, citing the Australian Meat Industry Council; see also Mr Mick Keogh, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 107.

34 Mr Brad Teys, Chief Executive Officer, Teys Bros Pty Limited, *Proof Committee Hansard*, 28 April 2009, p. 3.

35 Mr Brad Teys, Chief Executive Officer, Teys Bros, *Proof Committee Hansard*, 20 May 2009, p. 84.

> million head in a herd, Australia produces 71 per cent more beef than Brazil.[36]

6.37 The dairy industry, it was suggested, were estimating reduced farm incomes of about 15 per cent.[37] Bega Cheese offered some detail on potential impacts:

> We are pleased with the continued exclusion of the agricultural sector but believe that it still does not shield our dairy farmers from the impact of the flow-through effect of the CPRS. There will be approximately $6,000 to $9,000 worth of cost that will flow through the manufacturing part of the business. One of two things will happen: the cost will either flow back through to our farmers and they will have a reduced per animal cost for their milk or it will reduce our competitiveness in the international scene. We either take it out of the farmer's payment or the cost of our products that we are exporting will be more. Presently, Bega exports to about 50 different countries. We compete globally with all the other dairy manufacturers around the world. Our prices will, more than likely, step up.[38]

6.38 The committee also heard of concerns over market distortions and competitive disadvantage arising from the operation of the CPRS threshold for regulating entities:

> So, because we are selling in most places a commodity, there is very little competitive advantage except in the efficiency of the processing sector. So when, say, eight or 10 of the largest meat establishments are caught in an ETS scheme because they exceed the 25 kiloton threshold, they automatically have a disadvantage with that cost compared with their smaller competitors who are not paying that permit cost. Also, in the last 25 years there has been a huge effort to consolidate the industry and to have bigger plants slaughtering more cattle, mainly to have more efficiency—it is an efficiency driven thing. This is a kind of taxing efficiency, because it is those bigger players that are indeed caught in the threshold.[39]

6.39 Dairy Australia believed that the industry would experience a significant increase in costs, leading to concerns about its competitiveness and carbon leakage:

> From a dairy perspective, we can see some costs coming of up to $40 million to $60 million a year under the CPRS scheme, which would translate back to farms because of the trade exposure of our industry. Even though the farm sector is not covered in 2010 there will be significant costs to Australian dairy farmers from the beginning of the scheme, depending on the price of carbon, of somewhere between $6,000 and $9,000 a farm… Unfortunately, because of the situation where the majority of emissions

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36 *Proof Committee Hansard*, 20 May 2009, p. 85.

37 *Proof Committee Hansard*, 15 April 2009, p. 12.

38 Mr Elvis Amair, Technical Services Manager, Bega Cheese Ltd, *Proof Committee Hansard*, 20 May 2009, p. 89.

39 Mr Brad Teys, Teys Bros, *Proof Committee Hansard*, 28 April 2009, p. 2.

> occur at farm level but the majority of value adding occurs at the manufacturing level, we have a situation where our processing sector of the industry, the processing part of the dairy and beef value chains, is not regarded as emissions intensive trade exposed. Therefore, our processing firms are liable to full coverage from the scheme from 2010 and basically a 100 per cent cost increase under the scheme. There will be no provision for free permits.[40]

Inclusion in the CPRS

6.40 The committee notes that the question of including agriculture in the CPRS will not be settled until 2013, when it will be considered for inclusion in the scheme from 2015. The *White Paper* provides the following reasons for the exclusion of agriculture:

> Estimating agriculture emissions is complex. These emissions are highly variable in response to management practices and climatic conditions…
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> The sector also includes more than 100 000 entities, many of which emit only small amounts of greenhouse gases each year. Only a small number of farm businesses emit more than 25 000 tonnes of CO_2e a year, which is the general Scheme threshold. If Scheme obligations were applied to farm businesses above this threshold only, most agriculture emissions would not be covered by the Scheme. Significant competitive distortions would then arise between closely competing farm businesses on either side of the Scheme threshold. On the other hand, a lower participation threshold would impose compliance costs on farm businesses that would be disproportionately higher than for other businesses within the Scheme.[41]

6.41 The CO2 Group discussed the difficulties of regulating such a large number of entities:

> There are transaction costs as well. This is the great conundrum about agriculture. There is no doubt that agriculture, as a sector, is a substantial emitter, but the practical reality of being able to regulate thousands and thousands of small farmers and bring them effectively into a scheme…is the reason it has not been included. All scheme design around the world is focussed on the logic of going upstream, concentrating on large emitters because they are practical units of regulation.[42]

6.42 The NFF agreed with the decision that agriculture be presently excluded from the CPRS, pointing to some additional problems in this respect:

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40 Mr Chris Phillips, General Manager, Trade and Strategy, Dairy Australia, *Proof Committee Hansard*, 30 April 2009, pp 199-201.

41 *White Paper*, p. 6-44. The committee notes that even if agriculture is included in the scheme from 2015 soil carbon (which is not included under the Kyoto Protocol) will not be part of agricultural emissions: see Dr Judith Ajani, *Submission 340*, p. 1.

42 Mr Andrew Grant, Chief Executive Officer, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 91.

> …an ETS is not currently appropriate for agriculture due to a range of reasons. [These]…include the measuring, monitoring and verification issues, as well as the complex issues of post-Kyoto rules, how land use is taken into account in terms of those rules and how natural emissions and man-made emissions get lumped together. They just, quite frankly, do not work for us.[43]

6.43 A number of witnesses felt that agriculture should not ultimately be included in the CPRS in 2015. The NFF observed that it 'may never be appropriate' to include agriculture in the CPRS.[44]

6.44 The CO2 group felt that complementary measures were better suited than the CPRS to addressing agricultural emissions.[45] Dr Judith Ajani concurred:

> I do not think that we should be looking at putting the agricultural sector into the ETS just to capture some pricing benefits that are highly uncertain at this stage, but rather we should be looking at a whole-of-agricultural policy…There is more to the agricultural issues than just carbon. There are water issues, biodiversity issues and across-the-board sustainability issues in transport. I would encourage looking at agriculture as a whole issue, not just a single issue.[46]

6.45 The Grain Growers Association advised that it did not consider agriculture suitable to be included under the CPRS. It was concerned at the delay in formulating a national policy approach towards agriculture.[47] The Association called for the establishment of a voluntary scheme for agriculture based on the Kyoto Protocol Clean Development Mechanism (CDM), which is in essence a baseline and credit scheme where tradeable credits can be earned from abatement and mitigation activities. This could provide a domestic source of carbon credits for regulated entities under the CPRS as well as income generating opportunities for the agricultural sector.[48]

6.46 The Tasmanian farmers' representative also commented on the delay in addressing agriculture, noting that it had led to a lack of incentives for farmers to

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43 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 3.

44 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 3.

45 Mr Andrew Grant, Chief Executive Officer, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 91.

46 Dr Judith Ajani, Economist, Fenner School of Environment and Society, Australian National University, *Proof Committee Hansard*, 16 April 2009, p. 81.

47 Mr Bryan Clark, Industry Development Manager, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 82.

48 Mr Bryan Clark, Industry Development Manager, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 92.

adopt practices that could make substantial contributions to both reducing greenhouse gas emissions and to providing productivity and income opportunities for farmers:

> …at the moment, there is little incentive for farmers to adapt to emission reduction techniques and things like soil carbon sequestration, because they are just not on the immediate agenda. Also…the current regime will exclude opportunities for offsetting from agriculture to other sectors until a decision has been made as to whether agriculture is in or out. So that really takes out another whole raft of opportunities for our farmers. In addition, the CPRS really does not provide any real incentives for best management practices or renewable energy production on farm, which we believe could have great potential for our farmers.[49]

6.47 The Australian Farm Institute also commented on the current lack of incentives for agriculture in the CPRS:

> …the way…[the CPRS] is proposed at the moment, which would just be a price on emissions with no incentives for abatement other than forestry, it is very difficult to see what progress can be made in relation to agricultural emissions.[50]

6.48 The Grains Council called for the rapid development of complementary measures outside the framework of the CPRS:

> What we are saying is that it is not a one-size-fits-all approach. We need to look outside the square of the ETS and the CPRS and see what complementary measures can we start tomorrow in the agricultural industry so we can be part of the solution.[51]

6.49 The NFF noted the ongoing process of the sector better understanding the 'potential ramifications' of bringing agriculture inside the proposed CPRS:

> It is an education process that we feel is very important for us, bearing in mind that it is only Australia and New Zealand who are entertaining the idea of covering agriculture within their emissions trading schemes.[52]

6.50 In international terms, the committee received evidence that few countries are considering the inclusion of agriculture in their emissions trading schemes. The committee notes that it appears unlikely that many, if any, countries will include the sector in their emissions trading schemes.

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49 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20.

50 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 113.

51 Ms Tara Taubenschlag, Grains Council of Australia, *Proof Committee Hansard*, 16 April 2009, p. 88.

52 Mr Charles McElhone, NFF, *Proof Committee Hansard*, 15 April 2009, p. 16.

Need to develop complementary policy measures outside the CPRS

6.51 Given agriculture's significant contribution to greenhouse gas emissions; its exclusion from the CPRS until 2015, and potentially beyond; and the lack of incentives for farmers in the CPRS as it is currently proposed, a range of stakeholders argued that separate and additional or complementary policy measures were needed to address the agricultural sector.

6.52 Witnesses and submitters consistently pointed to the fact that agriculture had very significant potential for greenhouse gas mitigation, which could also contribute to enhancing the productive capacity and income potential of agricultural land, and to addressing persistent environmental problems such as salinity and loss of biodiversity.

6.53 For example, Dr Ajani stated:

> …Australia should bring the land use sector into a wider climate policy, with food security, water and ecological sustainability prime considerations…[53]

6.54 Similarly, the Grains Council of Australia noted:

> Food security, increased productivity and climate change should be considered synergistically and not as separate parts. We look forward to an industry partnership approach…and to a new low-carbon farming future which will seek to place Australian agriculture as a world leader in the solution to the management of CO_2 concentrations at sustainable levels.[54]

6.55 The CO2 Group observed that 'anything we can do that is complementary and synergistic should be explored'.[55]

6.56 The Tasmanian Farmers and Graziers Association stated:

> We would like to see incentives and rewards being provided for both the adaptation and innovation that our farmers will need to undertake and also for emission reduction.[56]

Need for additional research on adaptation and mitigation

6.57 The committee heard numerous calls for further research on adaptation and mitigation. The NFF noted:

> I hope to talk about some of the issues around adaptation not just mitigation, because for us that ongoing adaptation is important and we do

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53 *Submission 340*, p. 1.

54 Ms Tara Taubenschlag, Communications Adviser, Grains Council of Australia, *Proof Committee Hansard*, 16 April 2009, p. 70.

55 Mr Andrew Grant, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 92.

56 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20.

> need the information, the research and development and the tools to be able to give those options to farmers so they can make those management decisions on farm and continue to produce food and fibre.[57]

6.58 The Western Australian Farmers Federation's president noted that they had 'lobbied for increased research funding for agriculture's role in greenhouse gas mitigation and abatement'.[58] Commenting on the limited ability of the sector to fund research into agriculture and climate change related issues, their climate change spokesperson called for increased government expenditure to enable solutions to be identified which would allow farmers to pursue activities that promote both farm productivity and CO_2 abatement and/or mitigation.[59]

Committee comment

6.59 The committee notes that, in the context of climate change and a carbon constrained world, the agriculture and land use sector is a significant contributor to Australia's CO_2 emissions. The committee accepts the reasons for the decision to exclude agriculture from the initial phase of the proposed CPRS, but notes that there is a significant possibility that agriculture would not be found suitable for inclusion from 2015. The committee notes also that on 4 May 2009 the Government announced that it would put back the start of the CPRS for 12 months, which would allow for a refocusing of resources on examining the inclusion of agriculture.

6.60 The committee heard a range of evidence from scientists, academics, farmers and environmental groups that Australia and its agricultural sector are particularly vulnerable to the impacts of climate change. Farm groups also emphasised that Australian farmers were accustomed to dealing with climate variability and extremes. Noting the need for information and skills to assist farmers to adapt to climate change, the committee considers it imperative that the government fund research into regional impacts of climate change to assist on-farm planning and adaptation.

6.61 The committee devoted considerable time to investigating the question of the impact of the CPRS on the agriculture sector. It found that there was agreement amongst submitters and witnesses that the sector would experience increased input costs following the inception of the scheme, in particular due to the increased price of energy. The committee notes that, under current and proposed policy settings, the increase was estimated to be somewhere in the range of 0.1 per cent to three per cent, and that similar increases would affect all sectors of the economy as intended by the scheme.

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57 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 3.

58 Mr Mike Norton, President, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 95.

59 Mr Dale Park, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 105

6.62 Evidence was also heard about the potential for market distortion and competitive disadvantages within industry sectors arising from the CPRS emissions threshold for regulating entities. A notable example was the concern expressed by beef processors that the emissions threshold of 25 000 tonnes of CO_2e for inclusion under the CPRS would penalise larger, more efficient operations by requiring them to purchase permits for emissions; smaller operations that came under the threshold and hence were not required to purchase permits would enjoy a competitive advantage. Any such market distortion would effectively act as a tax on efficiency and could see other perverse outcomes such as companies foregoing expansion opportunities, or restructuring or downsizing, to remain or come under the scheme threshold. Clearly, international trade competitiveness could also be damaged in such circumstances.

6.63 A second notable example was the effect of the proposed CPRS on the dairy sector. The committee heard that dairy farming was an emissions intensive trade exposed sector that, being classed as agriculture, would not be included under the CPRS. However, the processing side of the sector was not considered to be emissions intensive or trade exposed and would therefore pay 100 per cent of the price of its emissions under the CPRS. The significant cost increases to the processing side of the industry could clearly affect the sector's international trade competitiveness.

Recommendation 7

6.64 The committee recommends the Government review the impact of the CPRS to avoid the EITE provisions generating perverse outcomes for the agriculture sector and the food processing and manufacturing sector such as scaling down and splitting operations.

6.65 However, there was some disagreement in the evidence about the effect of the CPRS on agriculture out to 2030 in the event that agriculture is included in the scheme. Some members of the committee were also concerned about the compounding effect of the RET scheme on agricultural productivity and profitability. The committee notes that limited modelling of these issues has been undertaken; and that modelling outcomes are highly dependent on starting assumptions, which can legitimately differ based on assessments of relevant policy and external factors. Given this, the committee agreed that more extensive and detailed modelling of impacts of climate policy choices on agriculture is desirable. A more comprehensive and detailed understanding of the impacts of the CPRS on agriculture is needed before a decision can be properly made on the inclusion of agriculture in the proposed CPRS.

6.66 The committee notes there was a considerable convergence of views across a range of stakeholders in relation to the suitability of agriculture for inclusion in the CPRS. Submitters and witnesses pointed to the complexity of monitoring and verification of agricultural emissions, and of regulating the large number of entities in the sector. Further, many questioned whether an emissions trading scheme could provide adequate incentives to pursue the significant opportunities for greenhouse gas abatement and mitigation that exist in the agricultural sector, particularly in light of the carbon accounting rules in their present form. In addition, the committee heard extensive claims that many strategies to reduce greenhouse gases could not only

secure significant reductions but also deliver a range of impressive environmental and productivity benefits for Australia's farmers and land managers.

6.67 Given this, there were consistent calls to begin immediately to develop and put in place complementary measures for greenhouse gas abatement and mitigation in the agricultural sector, with a particular focus on developing new income streams to create ongoing incentives for farmers to undertake greenhouse gas abatement and mitigation activities.

Recommendation 8

6.68 The committee recommends that, as a priority, the Government develop complementary policy measures for greenhouse gas abatement and mitigation in the agricultural sector; and that such policy measures be underpinned by substantially greater research and development in this area.

Recommendation 9

6.69 The committee recommends that the Government establish an agriculture and land use policy taskforce to accelerate the development of complementary climate change policy measures for the land use sector; and to promote full carbon accounting in land use, agriculture and forestry sectors in international climate change fora.

Reforestation

Potential for biosequestration

6.70 For the purposes of this section, reforestation should be understood as both commercial and environmental. Mr Peter Cosier, an environmental policy specialist, highlighted a significant difference between commercial reforestation, such as plantations, and environmental plantings. He described these approaches as distinct in terms of carbon sequestration:

> There is the forest industry, the forest product sector, and what they call environmental plantings. It is the environmental plantings with the higher carbon prices where you get your massive carbon sequestration because that carbon stays in that landscape and hence that is where most of the investment will go.[60]

6.71 Mr Cosier described the significant potential for biosequestration through reforestation to contribute to the reduction of atmospheric CO_2:

> According to a McKinsey study done last year, we believe that terrestrial carbon, that is, tree planting and increasing soil carbon, can contribute

60 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 16 April 2009, pp 68-69.

> between 25 per cent and 30 per cent of the solution to climate change mitigation.[61]

6.72 The CO2 Group called for reforestation to be pursued as a ready and practical measure for carbon sequestration:

> …[Reforestation] is robust. Most critically it is proven. It is here and now, so it is not something that we need a lot of research and development to implement. It brings a range of other benefits, and Australia leads the world in terms of the technical and scientific underpinnings of reforestation from a credibility point of view and also from a commercial aspect.[62]

6.73 The committee notes, however, that biosequestration involves many policy variables that can affect the outcome in terms of CO_2 sequestration. Mr Cosier observed that the Garnaut report had identified 12 potential biosequestration options. For example, environmental plantings could be cycled to provide a source of biofuel to offset fossil fuel emissions; however, this would lower the net carbon stored. Mr Cosier observed that there were 'quite complex resource economics involved' in this issue.[63]

6.74 It was also acknowledged that there had been no dynamic equilibrium modelling done to assess the impacts of the terrestrial carbon market on such critical areas as food and fibre production.[64] The committee considers this to be of critical importance, given the importance of food and fibre production to Australia in terms of food security and as an income stream for Australian farmers. On this issue, Mr Cosier cited work done by ABARE which illustrated both the practical opportunities and constraints of any significant effort to pursue biosequestration as a mitigation option:

> ABARE's analysis…suggested that we could open up the opportunity of about five to six million hectares of tree planting in both commercial plantations and environmental plantings. To give you some idea of scale, that is equivalent to about 20 per cent of the Murray-Darling Basin. The argument against that is that we need to use our agricultural lands to grow food and fibre, which is an obvious answer, given that the world population is growing and demand for food and fibre is growing.[65]

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61 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 78.

62 Mr Andrew Grant, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 68-69.

63 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 99.

64 *Proof Committee Hansard*, 16 April 2009, p. 74.

65 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 78.

Reforestation under the CPRS

6.75 Under the Kyoto Protocol, parties must count emissions and removals of greenhouse gases from forests established after January 1 1990 on previously cleared land. Australia's definition of 'reforestation' for Kyoto Protocol purposes is:

- a forest of trees with a potential height of at least two metres and crown cover of at least 20 per cent; and
- in patches greater than 0.2 hectares.

6.76 Under the CPRS, the government proposes that all eligible reforestation may be included on a voluntary basis. This will allow credits to be generated for the biosequestration of carbon. This is the only land use that is proposed to be covered by the CPRS.[66] In reference to the delayed starting date for the CPRS, the National Association of Forestry Industries (NAFI), commented:

> NAFI supports the changes to the CPRS announced by the government on 4 May, noting it will provide more time for the industry to adjust while at the same time allowing reforestation to voluntarily generate permits for carbon stored from July 2010.[67]

6.77 Beyond this however, NAFI identified a number of concerns with the present design of the CPRS in relation to the forestry industry:

> The narrow rule set adopted by the government has created issues with the inclusion of forestry and more work is required to get the draft scheme right so that the forest industry has the confidence to opt in on a voluntary basis. The design issues include cascading, liability issues for forest maintenance requirements, uncertainty over carbon estimation methods, trading restrictions on exports of units compared to unlimited imports of international units and an inflexibility in the carbon credit approach for forest projects.[68]

6.78 NAFI also expressed concern over:

> …the inequity and exclusion of forestry under the CPRS fuel credit scheme, which will apply to agricultural and fisheries small businesses to help offset the impact of fuel price rises. The question that we have been asking the government and not given a straight or logical answer on is: why has forestry been excluded from the scheme when agricultural and fishing activities have been included?[69]

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66 At least until the possible inclusion of agriculture in 2015: see below.

67 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries, *Proof Committee Hansard*, 20 May 2009, p. 63.

68 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries *Proof Committee Hansard*, 20 May 2009, p. 63.

69 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries, *Proof Committee Hansard*, 20 May 2009, p. 63.

6.79 They explained that the effect on the forestry sector of exclusion from the fuel credit scheme would be significant:

> …the exclusion of forestry from the CPRS fuel scheme will impact directly on the small business harvesters. These small businesses are largely run on very tight margins. They do not own trees. They will not get any benefit from the CPRS as such in relation to being able to create credits or anything like that. These businesses purely harvest the trees for the companies or the tree owners, and this is where the impact of exclusion from the CPRS fuel credit scheme will impact. We have done some work with some of these harvesters on what the impact will be; it is likely to be around about $12,000 a year extra. Because we are in very difficult financial times at the moment and, as I said, these small businesses run on tight margins normally, this sort of additional cost or tax on them will have devastating effects. These harvesters and contractors are spread right through rural and regional Australia, so the impact is going to be quite significant right across Australia.[70]

6.80 The AFI observed that the inclusion of reforestation under the CPRS was an effectively limited option:

> At this stage the only options there are forestry, so in carbon sink forestry development, the definition is 0.2 hectares, more than 20 per cent groundcover and capable of growing more than two metres in height. So that gets down to quite small-scale areas of forestry, bearing in mind the transaction costs are likely to make it uneconomic at that sort of [scale]…[71]

Plantations

6.81 Dr Ajani noted that the policy settings proposed in the CPRS led to the perverse outcome that plantations—which were best suited for wood production—were targeted for carbon storage, which was actually best achieved through maintenance and development of self-regenerating forests:

> What we have is a policy frame that…tags plantations to do the job of carbon storage, the job it does worst, and it tags native forest and other self-regenerating systems to do the job of production, when it should be doing the job of carbon storage. It is the wrong way around.[72]

6.82 Dr Ajani classified this as a 'negative incentive' insofar as only one land-use activity out of the whole land-use sector was being encouraged.[73] The Tasmanian Farmers and Graziers Association were also concerned about potential distortions:

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70 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries, *Proof Committee Hansard*, 20 May 2009, p. 81.

71 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 112.

72 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, p. 71.

73 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, pp 90-91.

> We are a bit concerned about the opt-in forestry provisions in the CPRS, mainly not because of forestry per se but because, effectively, forestry now will be the only avenue by which farmers and landowners under this scheme will be able to gain any benefit from the CPRS. Anything else is not allowed, has been excluded or is not in Kyoto, so forestry or timber is the only one left. While many of our members will take advantage of that factor, it has the potential of distorting land use decisions. Therefore, we are a bit concerned about that as well.[74]

6.83 Accordingly, Dr Ajani called for plantations to be excluded from the CPRS on the grounds that they were the least ecologically sound forest land-use activity through which to pursue reforestation and carbon mitigation.

6.84 Greenpeace (Australia) also argued for the removal of plantations from the CPRS due to their impermanence:

> …terrestrial carbon is very impermanent, it is very risky to offset industrial and fossil fuel emissions on it because you are likely to send that carbon stored in terrestrial ecosystems into the atmosphere again. So you would end up increasing emissions and it would become a very expensive way to increase emissions—as opposed to using cost abatement mechanisms.[75]

6.85 This concern was shared by Environment Victoria:

> Tree plantations can help reduce emissions but given their vulnerability to fire and drought they are no substitute for emissions reductions in energy and transport.[76]

6.86 Greenpeace called for plantations to instead be supported through a fund based model:

> The idea of having a fund is that the criteria could be set at such a level to deliver that funding and reduce emissions in a way that did not, for example, impact on extreme biodiversity and water users—which some of the plantation establishment processes may eventuate in. But also the fund based mechanism does not offset emissions.[77]

6.87 In contrast to Dr Ajani and Greenpeace, the CO2 Group argued:

> One of the things about this discussion is that many of the things that we are talking about are not either/or. You can have a CPRS with reforestation in it and still work on some of the opportunities that are probably not best met in the current frame of the CPRS. We are strongly of the view that the CPRS is necessary, and it is necessary to have reforestation in it, because

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74 Mr Nick Flittner, Manager, Drought and Climate Change, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20.

75 Mr Paul Winn, Forest Climate Policy Expert, *Proof Committee Hansard*, 21 April 2009, p. 62.

76 *Submission 409*, Attachment 1, p. 3.

77 Mr Paul Winn, Forest Climate Policy Expert, *Proof Committee Hansard*, 21 April 2009, p. 62.

> without that we see the disappearance of a massive investment signal immediately and we go back to where agriculture fundamentally is. We have done a massive amount of research and development. We have made that initial investment and now is the time for Australia to get some of that return on its investment. It is really important not to throw the baby out with the bath water.[78]

6.88 Forestry Tasmania also saw a benefit in the recognition of plantations under the proposed CPRS:

> Another avenue for improving carbon capture is through the establishment of plantations on existing cleared land. We have established a program…where we will partner with private land owners to control noxious weeds such as gorse through the establishment of plantations on their land with the sharing of profits on harvest. Such programs have the opportunity to improve agricultural productivity, diversify farmer incomes, increase forest production, store carbon and enhance rural biodiversity and soil stability. By targeting weedy areas we will not have conflicts with agricultural productivity, and indeed the project could involve extended shelter belt plantings with positive production benefits. Such programs have the opportunity to opt in to the proposed CPRS and we support that position provided the rules of engagement are operationally practical for farm and forest owners.[79]

6.89 On balance, the committee believe that the current forestry settings should remain within the CPRS as they provide one avenue for the rural sector to participate to advantage in the scheme. Evidence provided during the hearings from Private Forests Tasmania indicated that there were real gains to be made for farmers who used whole of farm management planning to manage their properties in a sustainable manner.

Environmental plantings and land management practices

Potential benefits to agriculture

6.90 The committee heard evidence that, in addition to biosequestration of CO_2, reforestation in the form of environmental planting could in its own right deliver significant benefits to agriculture, for example through the restoration of landscapes and the reversal of salinity. The CO2 Group explained:

> You need to separate out the role that plantation forestry plays from carbon sink because one is a tiny subset of a bigger opportunity…[If] you look at the grain belt region of Western Australia, its viability irrespective of climate change and carbon sink depends upon reintroducing trees into the landscape because the area of viable agricultural land is shrinking each year

78 Dr Chris Mitchell, Executive Director, CO2 Group, *Proof Committee Hansard*, 16 April 2009, pp 84-85.

79 Dr Hans Drielsma, Forestry Tasmania, *Proof Committee Hansard*, 23 April 2009, p. 70.

> due to dry land salinity. It is a 20-year research program funded by state and federal governments where over billions of dollars have been spent. It is not a status quo. One of the learnings of Australia is that we have over cleared our landscapes, so there is considerable upside in investment in carbon sinks generally, putting aside plantation forestry.[80]

6.91 Environmental plantings could also deliver benefits for Australia's stressed and damaged river systems, which could assist farmers in adapting to climate change:

> With strategic plantings of environmental plantings it can help to repair degraded river systems by restoring and riparian vegetation along river systems and also reconnecting the fragmented landscape that we have done in Australia over the past 200 years, in particular, in southern Australia.[81]

6.92 Mr Cosier emphasised that, unlike plantations—which some feared could compete with prime food-producing agricultural land under current arrangements—environmental plantings could be undertaken in such a way as not to compete with agricultural land and water resources:

> The advantages of carbon sequestration through environmental plantings is that it can go into areas that do not require large scale forestry soil types or rainfall patterns and it can be on a much smaller scale. In degraded landscapes, such as in the Murray-Darling Basin, every farmer, for example, could probably revegetate 10 per cent of their property with almost no economic loss, but massive environmental gain as well as a carbon sink gain. If you look at it from a forest industry plantation perspective, yes, there are serious finite physical limits on where you can have forestry plantations. But in terms of environmental plantings in degraded landscapes in southern Australia, I think it is an open book, and I think the opportunity is there in the work I am aware of and that will be released soon that is quite staggering and, to be honest, very exciting.[82]

6.93 Finally, Mr Cosier emphasised the opportunities that biosequestration offered for farmers in terms of new income streams, given the right policy settings:

> The overall message is that a range of options is available to a range of people, but the bottom line is the profoundly large income stream into rural Australia that does not currently exist and profound opportunities for multiple environmental benefits. One physical example is that if in 1788 we knew what we now know, we would not have cleared the vegetation on our river systems. We would have left corridors of native vegetation along the river systems. A carbon price gives us the opportunity to put back those corridors of native vegetation.

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80 Mr Andrew Grant, Chief Executive Officer, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 77.

81 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 78.

82 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 98.

> Most farmers that I know of would be delighted for someone to pay them just to plant a strip of vegetation along their rivers to improve the water quality in the river system. The impact on production would be quite minimal, but the overall land scale benefits for the Murray-Darling Basin are quite profound.[83]

6.94 Greenpeace emphasised improved land management to keep terrestrial carbon locked up as a priority issue for Australia's climate policy.[84]

Case studies

6.95 The committee received evidence of environmental planting projects that provided practical examples of how policy settings which allowed credits to be generated for reforestation activities could lead to productivity and environmental benefits on agricultural land, and new income streams for farmers.

6.96 Mr Rob de Fégely noted that 'environmental credits had an enormously valuable and potentially very powerful role to play in addressing these [land use] problems that we have in Australia'.[85] These land use issues were ultimately related to the ongoing health and viability of Australia's rural and regional communities. He explained:

> By putting a price on the environment—and carbon is the most obvious one, but there are other values out there that you can potentially value—you can provide income to repair these problems. It was government policy, in many cases, for landowners to clear land when we were developing the agricultural industry. We need a government policy to assist in that repair process. We can concentrate production on the most productive land. We do get a chance to look at land-use planning. We can reward good management and sound stewardship both pre and post 1990. That is important because, in my view, people who did some pretty good things back in the 1950s and 1960s should not be disadvantaged by the introduction of an emissions trading scheme. You can create the incentive for people who own land throughout regional Australia to develop and improve sustainable land management.[86]

6.97 Mr de Fégely provided a specific example to the committee which demonstrated the synergies that existed between reforestation or native bush regeneration activities and CO_2 mitigation. The project involved a wheat-cropping farm in Western Australia suffering salinity problems. The areas of salinity were planted out with trees and native vegetation, representing an area of around 18 to 20 per cent of the property, in an effort to control the rise of the watertable (the cause

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83 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 99.

84 Mr John Hepburn, *Proof Committee Hansard*, 21 April 2009, p. 58.

85 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 30.

86 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 31.

of salinity). The plantings also offered protection from wind erosion, as well as biodiversity benefits.[87] The project had already received praise as a:

> …large scale, tangible demonstration of how rural Australia can maintain its agricultural production while also sequestering large amounts of carbon and protecting the environmental and cultural values of their properties.[88]

6.98 A second example was a project in Northern Australia involving savanna fire management. Mr de Fégely noted that wildfires in this region of Australia were common and contributed to around three per cent of Australia's greenhouse gas emissions. The program involved the 'substantial' reduction of emissions from wildfires through early season controlled burning and management. Were such CO_2 savings able to be accounted for in the CPRS, the income derived from the carbon credits this generated in turn could support the employment of traditional landowners to manage the fire regime. Related benefits could include the control of pest plant and animal species and surveillance of remote regions; the lower intensity of the fires also could avoid some of the impacts on biodiversity of uncontrolled wildfires.[89]

6.99 Mr de Fégely noted that approaches that sought to retain agricultural production while addressing environmental and ultimately climate problems required assistance to farmers to provide the skills and financial ability to learn and undertake such projects.

6.100 In terms of biodiversity, Mr de Fégely noted that there was a need to consider biodiversity credits, which, properly designed, could provide an income stream to farmers for both past and future preservation of forests and woodlands:

> …[Farmers can be given incentives by being given] the option to be able to ensure that they can get credits for existing vegetation. For instance, if you have got a standing red gum woodland or a standing yate woodland, depending on where you are, and you fence that off and part of the processes is that you can claim the credits for the existing trees which are already there, which gives you income to ensure that you can then create the additional biodiversity in that environment, then you are changing and improving the biodiversity in a particular region.[90]

Reforestation and job creation

6.101 The CO2 Group emphasised the potential for all forms of reforestation to provide broader social benefits, such as job creation, based on its potential income streams and positive agricultural and environmental benefits:

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87 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, pp 31-32.

88 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 33.

89 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 32-33.

90 *Proof Committee Hansard*, 21 April 2009, p. 40.

> In terms of job creation it is quite significant. The areas that our business operates are in the very marginal of farmland regions in Australia that are dying naturally and slowly through ageing rural communities, marginal viable land practices and increasing difficulty with climate change in itself. To diversify those landscapes is good policy and you are injecting economic investment in very marginal parts of Australia that have not had it for a long time. It is not a one-off investment. If you establish your dedicated carbon sink you get ongoing labour through management and protecting the asset. You get job creation through the measurement of the carbon, the scheme compliance and the commerce that underpins it. You are creating new economic activity that is ongoing for a 50-, 60- or 80-year period and it is quite substantial.[91]

6.102 The CO2 Group advised:

> So far we have at least a 1.5 multiplier in our company, so that for every job that we create directly there is at least 1½ full-time equivalents out there. There are jobs in developing the nurseries and propagation. There are jobs in land preparation, land acquisition and negotiation. There are jobs through carbon accounting itself. There are additional investments in research and development and, on the financial side, doing the permit creation and so on.[92]

Committee comment

6.103 The committee notes that reforestation has a great potential to contribute to Australia's greenhouse gas reduction targets, particularly given its recognition under the Kyoto protocol as a form of greenhouse gas mitigation. However, the committee heard much evidence that questioned whether reforestation activities should be included under the CPRS, given possible distortions to land use decisions that could affect such things as food security, and which could see plantation-based reforestation preferred over possibly more effective abatement options through the preservation of native forest carbon stores.

6.104 In terms of environmental plantings and land management, the committee was impressed by the potential for positive financial and environmental outcomes for Australia's agriculture and land use sector, if there were suitable incentives for farmers and land managers in place. The committee heard impressive examples of programmes for environmental plantings and land management that could also lead to substantial carbon abatement and mitigation, as well as environmental and farm productivity, outcomes. The committee agreed that Australia would receive significant benefit from focusing more of its efforts and resources on research and scheme development in the area of environmental planting and land management activities.

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91 Mr Andrew Grant, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 77.

92 Dr Christopher Mitchell, Executive Director, Corporate Development, CO2 Group, *Proof Committee Hansard*, 16 April 2009, pp 84-85.

Recommendation 10

6.105 The committee recommends that the Government promote the testing, development and roll-out of environmental restoration and land stewardship schemes, giving priority to schemes that can make a significant contribution to emissions reductions, agricultural productivity and biodiversity conservation.

Deforestation

Deforestation under the Kyoto Protocol and the CPRS

6.106 Under the Kyoto Protocol rules, Australia is liable for emissions from deforestation or land clearing. However, the government's proposed CPRS will not include deforestation. The *White Paper* stated that this was because the potential number of liable entities and monitoring, reporting and compliance complexities meant it was impractical to do so.[93]

Emissions from deforestation

6.107 The committee heard that deforestation is a very significant contributor to global CO_2 emissions. For example, tropical rainforest clearing is contributing to total global emissions in the order of eight to 20 per cent.[94] Dr Michael Raupach observed that in Australia:

> We are still logging native vegetation at a rate, from memory, of something like 60 million tonnes of carbon a year…[95]

6.108 Professor Will Steffen noted the superior carbon storage characteristics of native natural ecosystems:

> …natural ecosystems, as a general rule of thumb, maximise carbon storage compared to any human planted system…So by removing an old growth forest, you have removed a very rich carbon store. Even by replanting with trees, you will not get back the carbon you had in the original ecosystem. That is true in savannahs and it is true in grasslands as well, although they put the carbon in different parts of the ecosystem. A very good rule of thumb is that natural ecosystems have maximised storage for that particular type of climate and soil.[96]

6.109 Dr Heather Keith explained the significance of existing terrestrial carbon stores in terms of potential release of CO_2:

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93 *White Paper*, p. 6-61.

94 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 79.

95 Dr Michael Raupach, *Proof Committee Hansard*, 15 April 2009, pp 100-101.

96 Professor Will Steffen, *Proof Committee Hansard*, 15 April 2009, p. 101.

> One [role of the terrestrial biosphere] is the existing stock of carbon in the biosphere, in the vegetation in the soils. This is a very large amount of carbon. For example, in the native forests of South-East Australia it is seven gigatonnes of carbon. A gigatonne is 10 to the power of nine. You compare that with the annual emissions of greenhouse gases in Australia, which are approximately 152 megatonnes of carbon per year. A megatonne is 10 to the power of six. It is very important that this stock of carbon be protected to avoid any future emissions.[97]

6.110 A number of other submitters and witnesses also emphasised the importance of preserving existing carbon stores via avoided deforestation. On this issue Dr Raupach observed:

> …the requirement in our whole terrestrial carbon sector…is to become a net sink for carbon. Clearly reduction in rates of deforestation is an important contribution to that.[98]

6.111 The Australian Conservation Foundation believe 'there is a big potential to reduce our emissions if we protect the standing native forests'.[99]

6.112 Dr Keith noted that current areas of forest that have been harvested hold carbon stores well below their carrying capacity. Such areas needed to be prioritised as carbon sequestration sites and to be free from disturbance by human activity, which would maximise their performance as carbon sinks. Such an approach would also have the benefit of ensuring these forests did not require any inputs of energy.[100]

6.113 Given the carbon storage characteristics of native natural ecosystems, and their resilience and self-regenerative capacity under Australian conditions, Dr Ajani argued that climate policy in relation to mitigation and adaptation through the forest land use sector should reflect the following principles:

> a. Avoid emissions from deforestation and forest degradation by protecting existing carbon stocks in primary forests and woodlands, i.e. do not clear or log these ecosystems.
>
> b. Maintain, or where necessary, re-establish the restorative capacity of deforested and degraded natural ecosystems to ensure maximum carbon sequestration as they return to their full carbon carrying capacity.
>
> c. For natural forests and woodlands devoid of restorative capacity, reforest using mixed native species to enhance resilience and therefore long-term

97 Dr Heather Keith, *Proof Committee Hansard*, 16 April 2009, p. 70.

98 Dr Michael Raupach, *Proof Committee Hansard*, 16 April 2009, pp 100-101.

99 Owen Pascoe, Australian Conservation Foundation, *Proof Committee Hansard*, 20 May 2009, p. 39.

100 *Proof Committee Hansard*, 16 April 2009, p. 84.

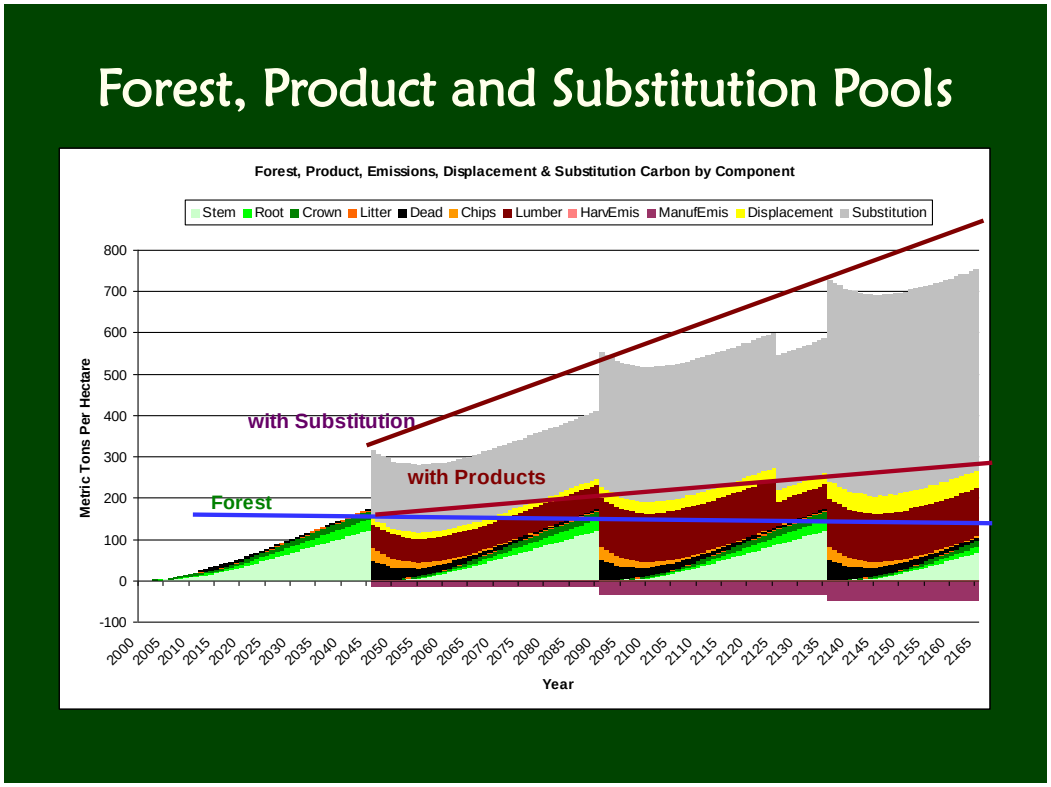
carbon storage capacity. Reforestation should make use of remnant natural forests and woodlands.[101]

6.114 In contrast to the views outlined above, Forestry Tasmania advised the committee that managed forests 'lead to increased wood storage and emissions over time'.[102] They explained:

> This is as a result of three interrelated factors—the storage of carbon in the forest themselves, the storage of carbon in harvested wood products—whether in use or disposal—and, finally, the avoided emissions or substitution that arises from the use of wood products, including wood based energy production, instead of more energy intensive products or fossil fuel based energy sources.[103]

6.115 Forestry Tasmania provided the committee with Chart 6.1, which illustrates the capacity of managed forests to lead to increased wood storage and reduced emissions over time.

Chart 6.1



Source: College of Forest Resources, University of Washington.

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101 *Submission 340*, pp 1-2.

102 Dr Hans Drielsma, Executive General Manager, Forestry Tasmania, *Proof Committee Hansard*, 23 April 2009, p. 68.

103 Dr Hans Drielsma, Executive General Manager, Forestry Tasmania *Proof Committee Hansard*, 23 April 2009, p. 68.

6.116 Given the capacity for wood products to persist, Forestry Tasmania called for the explicit recognition of wood products as a form of biosequestration in emissions trading frameworks.[104] This view was supported by NAFI:

> …in a post-Kyoto agreement we are looking for the recognition of carbon stored in our wood products.[105]

6.117 The National Association of Forest Industries called for the broad inclusion of the forestry industry under the CPRS:

> NAFI advocates the full inclusion of forestry activities in the proposed Carbon Pollution Reduction Scheme given its significant potential for providing low-cost emissions abatement.[106]

International deforestation

6.118 The Government has acknowledged the importance of deforestation:

> If we are going to curb global emissions we need to deal with deforestation…Deforestation accounts for approximately 18 per cent of global greenhouse emissions, with around 13 million hectares of the world's forests being cleared each year.[107]

6.119 Greenpeace noted that the government recently announced a policy on reducing emissions from deforestation and forest degradation in developing countries (REDD). This would involve the generation of credits from reductions in deforestation from an agreed level.

6.120 Greenpeace expressed concern over the potential for the use of a market based mechanism such as REDD to reduce emissions from deforestation. In particular, they pointed to resistance to such an approach from the EU and Brazil. Further, they noted 'significant risks' related to the permanence of forest offsets, given their vulnerability to 'fire, pest and disease and weather events'. Losses to such forces could see developing countries lose credits in addition to having foregone, for example, agricultural development.[108] There was also a question over the ability of developing countries to administer effective systems of measuring, reporting and verifying emission reductions; concerns about deforestation leakage to countries not

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104 Dr Hans Drielsma, Executive General Manager, Forestry Tasmania *proof Committee Hansard*, 23 April 2009, p. 69.

105 Mr Allan Hansard, Chief Executive Officer, *Proof Committee Hansard*, 20 May 2009, p. 63.

106 Mr Allan Hansard, Chief Executive Officer, *Proof Committee Hansard*, 20 May 2009, p. 63.

107 'Australia's contribution to a global agreement on climate change', Speech to the Lowy Institute for International Policy, by the Minister for Climate Change, Senator the Hon. Penny Wong, 20 April 2009, p. 8.

108 Mr Paul Winn, Forest Climate Policy Expert, Greenpeace Australia, *Proof Committee Hansard*, 21 April 2009, p. 60.

participating in the REDD program; and the potential for the REDD mechanism to drive down the price of carbon credits and to lock-in 'dirty technology.[109]

6.121 Dr Keith, however, noted that developed nations are not currently part of the REDD scheme; and suggested that Australia should pursue the inclusion of developed nations in this scheme in future international negotiations, including at Copenhagen.[110]

6.122 On this issue, Mr Cosier offered the following policy options:

> …there are three ways we can do it in Australia, and these would be Kyoto compliant things to do. Whilst they are not in the CPRS, they would assist Australia's targets. One is that you could regulate to further reduce land clearing. For example, in New South Wales and Queensland there is effectively no regulation on urban clearing, so that would be one method—urban development. The second is to require land clearing to buy an emissions permit, in the same way you require a fossil fuel emitter to buy an emissions permit. The third is to provide incentive mechanisms such as buying back regrowth clearing rights in Queensland.[111]

Committee comment

6.123 The committee notes that the issue of deforestation, both nationally and internationally, must be a central concern of climate policy if there is to be a successful effort to reduce and stabilise atmospheric concentrations of CO_2 within the range recommended by the current science. In particular, the committee notes that existing forests represent a massive store of carbon that has to be effectively managed in order to ensure that Australia can reduce its emissions into the future.

6.124 The committee notes that deforestation is not proposed to be included in the CPRS; and that, in relation to international deforestation, there are conflicting views on current proposals to reduce deforestation in developing countries. Given the potential significance of deforestation to global emissions and reductions of CO_2, the committee felt there is considerable scope for Australia to develop a more comprehensive policy approach in this area. The committee urges the government to establish a policy development that brings together all stakeholders to establish a comprehensive set of policy settings process on national and international deforestation.

Soil carbon

6.125 As noted above, a number of submitters and witnesses felt that storage of carbon in soil could provide a significant source of greenhouse gas mitigation.

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109 Mr Paul Winn, Forest Climate Policy Expert, Greenpeace Australia, *Proof Committee Hansard*, 21 April 2009, p. 61.

110 Dr Heather Keith, *Proof Committee Hansard*, 16 April 2009, p. 84.

111 Mr Peter Cosier, Wentworth Group of Concerned Scientists,, *Proof Committee Hansard*, 16 April 2009, p. 82.

Mr Cosier, discussing the importance of pursuing strategies that contribute to the removal of carbon from the atmosphere, observed:

> …the only way we can possibly achieve a 450 target, given the fact that we have already exceeded it, is to reduce emissions from the atmosphere. One of the great opportunities that we see, both globally and in Australia, is the opportunity of using terrestrial carbon, that is, trees and soil carbon, to contribute to a greenhouse gas emission level reduction in the atmosphere.[112]

6.126 However, the NFF observed:

> Obviously there is a lot of debate about the extent of the opportunities through soil carbon and the different practices that can generate positive soil carbon outcomes.[113]

Biochar

6.127 A number of submissions and witnesses raised the issue of biochar with the committee. Biochar is a form of charcoal that is created through pyrolysis of biomass such as food scraps and agricultural waste. In simple terms, pyrolysis is the heating of a substance in the absence of oxygen.

6.128 Biochar, as a form of charcoal, is both stable and high in carbon content. As such it is proposed as a form of carbon capture and storage to help mitigate greenhouse gases. As an additional benefit, when it is added to soil biochar raises the soil's carbon content and therefore its quality and productivity. The submission of Professor Syd Shea, Director of Science, Rainbow Bee Eater Pty Ltd, referred to crop yield increases of more than 100 per cent, and expected permanent reductions in the use of fertilisers.[114]

6.129 However, Dr Jones expressed concerns over the viability of biochar, particularly in relation to the economics of transporting the biomass and subsequent biochar:

> …biochar is…a hugely expensive extravagance. It costs an absolute fortune to get biomass to the place where you undertake the pyrolysis and then you have to transport it again out to farms…It would improve the soil, but it is an engineering solution to a biological problem.[115]

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112 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, pp 77-78.

113 Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 16.

114 Professor Syd Shea, Director of Science, Rainbow Bee Eater Pty Ltd, *Submission 765*, p. 3.

115 *Proof Committee Hansard*, 16 April 2009, p. 15.

6.130 In contrast, Mr Frank Strie, of BEST Energies Australia, advised the committee that he believed biochar could be cost-effective and profitable.[116] This would involve the generation of power from the pyrolysis of biomass, producing biochar, which created two income streams from its production. The submission of Professor Shea noted that 'modern pyrolysis technologies…recover significant amounts of oil and gas as a by-product of the biochar production process'.[117]

6.131 Further, Mr Strie advised that there were abundant and cheap sources of biomass as raw material for the production of biochar. This included a wide range of otherwise waste material, such as agricultural waste and the large amounts of household garden and food waste generated by cities.[118]

6.132 Professor Shea proposed an integrated business model for the viable production and use of biochar on a large scale. This would involve multiple regional nodes for the production of biochar and by-product fuels, thereby reducing the transport costs referred to above. In the case of the demonstration project outlined in his submission, biomass would be sourced from harvested mallee, wheat straw and other local sources, which could be a potential source of reforestation if systematically grown and harvested. The by-product fuels from pyrolysis could be used to make renewable electricity or possibly as feed stock for higher value uses such as liquid fuels.[119]

6.133 Professor Shea estimated that biochar technology could potentially mitigate 100 million tonnes of carbon per annum for under $20 per tonne.[120]

Australian Soil Carbon Accreditation Scheme

6.134 Dr Jones, the founder of the Australian Soil Carbon Accreditation Scheme, advised the committee of her system of raising soil carbon, which she believed had significant potential to mitigate CO_2 and so contribute to Australia's greenhouse gas reduction targets

6.135 Dr Jones emphasised the importance of soil carbon as a potential means of sequestering atmospheric CO_2 and, more generally, as a key driver for soil health or quality. Dr Jones advised the committee on a proposed stewardship scheme which had the potential to provide a 'financial incentive for biosequestration of atmospheric carbon in agricultural soils,[121] also improving the productive capacity of farm soils.

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116 Mr Frank Strie, BEST Energies Australia,

117 *Submission 765*, p. 3.

118 Mr Frank Strie, BEST Energies Australia, *Proof Committee Hansard*, 23 April 2009, p. 87.

119 *Submission 765*, pp 4-5.

120 *Proof Committee Hansard*, 30 April 2009, p. 130.

121 *Proof Committee Hansard*, 16 April 2009, p. 73. See also *Submission 765*.

6.136 Dr Jones explained the principles of the scheme:

> In farming, we have pastures or crops with green leaves and they sequester that carbon. They turn the gas into a liquid in the leaves in the form of soluble glucose through the process of photosynthesis. It is using a natural process of photosynthesis to sequester that and then that goes out into the soil through the roots. It is as a liquid. It is dissolved carbon and it is humified in the soil. What we are talking about is using land management methods that ensure that there is living ground cover there year around. The 22 million hectares of crops [in Australia] that you talked about at the moment have plants living there in winter when the wheat and barley is growing, but then over summer they are bare, so that the carbon goes back to the atmosphere from that soil. We have developed methods of planting those crops into perennial ground cover so that in summer it is still alive, living and still sequestering carbon.[122]

Committee comment

6.137 The committee acknowledges the potential for soil carbon to contribute to Australia's reduction of emissions and adaptation to climate change, and was impressed by the potential of some of the various techniques and technologies that were considered in the course of the inquiry.

6.138 The committee notes that there is no silver bullet solution to climate change, and that a successful effort to reduce Australia's emissions, particularly in relation to agriculture and land use, will necessarily rely on an array of complementary approaches. With this in mind the committee believes that the role of government is to provide an environment where innovation is encouraged and supported to provide effective solutions that can prove themselves and compete in national and international spheres.

Recommendation 11

6.139 The committee recommends that the Government promote the testing, development and roll-out of soil carbon technologies and schemes, giving priority to schemes that can make a significant contribution to emissions reductions and soil health.

Carbon accounting

6.140 Carbon accounting refers to the method by which levels of carbon emissions and reductions are measured, such as for assessing compliance for Kyoto Protocol purposes or under the proposed CPRS.

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122 *Proof Committee Hansard*, 16 April 2009, p. 74-75.

6.141 As is clear from the discussion below the particular rules of carbon accounting—to the extent that they do not recognise particular sources of emissions or emission reductions—act as a powerful incentive or disincentive for particular strategies for greenhouse gas mitigation and abatement.

Carbon accounting under the Kyoto Protocol and the CPRS

6.142 The Department of Climate Change advised the committee on the development of Australia National Carbon Accounting System (NCAS):

> …has been driven by the treatment of these emissions under the Kyoto protocol and the significance of land-based emissions to Australia's overall greenhouse emissions profile. In that context Australia over the last decade has built up a world leading and scientifically robust capability in carbon measurement and accounting in land systems.[123]

6.143 The initial priorities for developing the system were on 'meeting the compulsory Kyoto protocol reporting requirements for deforestation and establishment of new forests, including commercial and environmental plantings'.[124]

Need for changes to accounting rules

6.144 The committee found there was a high degree of consensus across submitters and witnesses, representing a broad range of interests, in relation to shortcomings in both the international system of carbon accounting and Australia's carbon accounting system.

6.145 The Department of Climate Change, while noting that Australia followed the international accounting rules, advised that there were a number of 'simplifications and constructions' that were not the preferred approach and which Australia had been seeking to change:

> Those assumptions are things like a presumption that biomass fuels are treated as zero emissions. Harvesting of trees are treated under the Kyoto protocol as an immediate emission when clearly this table here is not an emission; it is a carbon stock and there is a decision to be made at the end of the useful life of this table as to what happens with that carbon stock.[125]

6.146 The West Australian Farmers' Federation noted that in order to change Australia's accounting rules the international rules would need to changed:

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123 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 2.

124 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 2.

125 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 6.

> …the Australian CPRS has to be in agreement with the Kyoto rules or the international accounting rules. That is why I say to you that what we need this government to do is change those international accounting rules...[126]

6.147 Dr Raupach discussed the importance of a globally comprehensive and consistent method of carbon accounting:

> We need a full carbon account. It is very important in constructing that full carbon account, which has to be global because the carbon is globally shared, it is very important to distinguish the processes and the exchanges of carbon between the earth's surface and the atmosphere, which we are managing, as humans, and those which we are not. The reason for that is that if we do not make that distinction, then there is an enormous temptation to, as it were, socialise some of the losses and to count processes which are occurring or would have occurred anyway as mitigation.[127]

6.148 Dr Ajani noted that 'a coherent climate change policy requires comprehensive greenhouse gas accounting systems'.[128] She believed that both the international and Australia's systems of carbon accounting were seriously flawed to the extent that they did not properly recognise the land use sector. This meant that significant opportunities for mitigation were being overlooked:

> Australia uses the Kyoto accounting system to report its greenhouse gas emissions and, whilst its treatment of fossil fuels is good, its treatment…of the land use sector is seriously flawed. As a result, we have significant climate change mitigation actions that make ecological and economic sense that simply do not hit the political radar.[129]

6.149 The Australian Farm Institute emphasised the importance of seeking to change the current carbon accounting rules in light of present shortcomings:

> For Australian agriculture that is more important than any target—a more comprehensive accounting system that recognises both sequestration and emissions from agriculture as opposed to current systems, which only recognise gross emissions…The three rules that are critical are the net-net accounting requirement, the lack of separation of natural and man-made changes in emissions and the 'one in, all in' rule—in other words, you could not put just a paddock or a few areas of agriculture in; you had to put in the whole lot.[130]

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126 Mr Dale Park, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 103.

127 Dr Michael Raupach, *Proof Committee Hansard*, 15 April 2009, p. 102.

128 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, p. 90.

129 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, p. 90.

130 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, pp 112-4.

6.150 The NFF also stressed the need for international rules to account for sequestration of carbon in relation to agricultural land use. He commented:

> So there are some additional elements there [needing recognition]. In terms of the natural disturbance issue, which is really at the heart of the problems with recognising soil carbon and other means of sequestration, our understanding is that there is a lot of traction there because it makes sense. This is about stopping the things that we can control, not the things that we cannot. Clearly, bush fires and drought have emissions profiles, and farmers should not be penalised for those emissions sources.[131]

6.151 The CO2 Group raised an issue in relation to problems with accounting for the effects of fire:

> When people are talking about full carbon accounting it is all true, but there is a nasty part Australia and that is that it is a fire-prone continent. If we are going to go to full carbon accounting we have got to manage the understanding of the emissions associated with fire, and the science of that is pretty thin. We know the accounting rules at the moment are wrong. They assume that when a fire goes through you lose all of the carbon. Anyone who has just inspected what has happened in Victoria knows that is not true, but how much carbon you lose with what sort of fire, over what time frame, and when it goes back is actually not documented in a robust, scientific accounting way.[132]

Current efforts

6.152 The NFF had been seeking to have the international accounting rules changed so that farmers could get credit for carbon sequestration:[133]

> Anthropogenic and non-anthropogenic [emissions] and differentiating those impacts to distinguish between things that farmers can contribute [to] and things they have no bearing on is the essence of the issue.[134]

6.153 Mr Cosier noted that Australia was being proactive in trying to secure changes to international carbon accounting methods:

> …there is a lot of activity at the official level pushing for a whole carbon accounting mechanism in the Copenhagen process. At the international level there is great discussion about what is called REDD and whether or not REDD is simply to incentivise the reduction in clearing of developing

131 Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 20 May 2009, p. 81.

132 Dr Chris Mitchell, Executive Director, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 85.

133 Mr Ben Fargher, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 15.

134 Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 16.

> country forests or, again, to go to a whole carbon accounting process for tropical forests.[135]

6.154 The Department of Climate Change advised on Australia's position on carbon accounting for the purposes of international negotiations:

> In the negotiations, we have been strongly advocating for and giving considerable priority to the argument that we should have comprehensive accounting of the land systems that reflects the proposition that we measure, report and account the actual emissions that are occurring at the time and place at which they occur. In other words, we do not have spatial and temporal dislocation with things like assumptions about wood products—for instance, harvesting being an immediate emission when clearly in both space and time it is not an immediate emission. In the energy and industrial sectors, we follow a principle of emissions being reported at the time and place at which they occur, and that is the proposition which we think should underpin the accounting for the land systems.[136]

6.155 Dr Graeme Pearman felt that although it was unlikely that methods of biosequestration would be included in the CPRS in the short term, it was nevertheless important to begin to establish more comprehensive forms of carbon accounting as part of Australia's policy response to climate change:

> …in the short term, and that is the term of the CPRS, we are not going to have those capabilities of including those systems immediately. That is why I think the concept of still supporting them in some way within the framework of the overall policy response of government is important so that we can build the capabilities of that sector that eventually should be incorporated into the total trading system when it is ready.[137]

6.156 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, also noted that it could take 'quite a long time' to achieve full carbon accounting. He therefore urged immediate action on including deforestation in the CPRS, given it was already covered under the present accounting rules:

> Under the existing rules, we have 60 to 70 million tonnes worth of CO_2 and, where that is emitted from deforestation, it is the equivalent of 400,000 hectares a year. We can move on that very quickly and get very cheap abatement in that sector.[138]

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135 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 16 April 2009, p. 82.

136 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 6.

137 *Proof Committee Hansard*, 15 April 2009, p. 100.

138 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, *Proof Committee Hansard*, 15 April 2009, p. 101.

6.157 Mr Cosier expanded on the potential economics of Mr Macintosh's suggestion:

> I will just pick up the point that if we are still emitting 60 million tonnes a year from deforestation of Australia, at a $40 carbon price, if my maths is right, that is around [$2.4] billion to the Australian economy. We might find that if you brought avoided deforestation into the CPRS or into some other government policy framework, immediately you would fundamentally change those economics.[139]

6.158 Witnesses also noted that the question of accounting for the efficiency of plantation and native forests as carbon stores was dependent on the use to which harvested plantation trees were put, such as furniture, paper products and building materials.[140]

6.159 Mr Macintosh pointed to an important distinction between deforestation and forestry management. In the case of the former, most of which occurred for agricultural purposes, there was an immediate release of carbon followed by the fairly rapid release of the remainder through burning or degradation. In relation to forestry, however, it was necessary to consider the use the product was put to in order to properly account for its contribution to atmospheric CO_2.[141] Dr Raupach also addressed this issue:

> I am not familiar with the particular study that you cited on the 30 per cent figure. This just gives me one opportunity to state for the record that I am appearing in a personal capacity for this inquiry, not as a CSIRO scientist. But the implication of that figure is that we are going to be increasing our stock of the various stores of carbon, including timber, paper and whatever else is being produced from the forest into the future…So a good assessment of the residence times of these carbon pools before the inevitable and eventual release of this carbon back to the atmosphere occurs is a critical part of this process.[142]

6.160 Mr Cosier noted that the timber industry stood to benefit:

> Even though the current rules do not provide a credit, if you like, for storing that carbon in, say, houses or furniture, timber products are going to be major, major winners in any carbon price scenario simply because they displace energy intensive products, such as aluminium, steel and brick manufacture and cement, which are all high greenhouse-emitting products. Even with the current Kyoto rules, the forest product sector, or the timber

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139 *Proof Committee Hansard*, 15 April 2009, p. 101.

140 *Proof Committee Hansard*, 15 April 2009, p. 103.

141 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, *Proof Committee Hansard*, 15 April 2009, p. 103.

142 *Proof Committee Hansard*, 15 April 2009, p. 104.

> plantation sector, would be a major beneficiary from the high price of carbon.[143]

6.161 Professor Steffen offered a cautionary perspective on the importance of full carbon accounting:

> We need to take care not to isolate the climate change carbon issue from other values that forests provide for society and for nature. There is a lot of concern, for example, in the biodiversity conservation community that ill-conceived carbon schemes that involve forests and indeed other ecosystems could give you disbenefits for biodiversity. There is clear feeling that we need to think broadly and carefully with a whole systems approach, not just full carbon accounting…We need to look at the other benefits that natural ecosystems provide.[144]

Committee comment

6.162 The committee notes there was a very significant level of agreement among stakeholders about the need to reform national and international accounting rules to accurately and comprehensively reflect carbon fluxes, emissions and reductions across natural system and all facets of human activity.

6.163 The committee also acknowledges that this task is likely to take a significant period of time to achieve in international negotiations; and the commitments and efforts that Australia has made to date to achieving reform of carbon accounting rules.

Recommendation 12

6.164 The committee recommends that the Government takes steps to ensure that Australia encourages reform of international carbon accounting rules.

Recommendation 13

6.165 The Committee recommends that the Government provide greater funding so that recommendations 8, 9, 10, 11 and 12 can be implemented in a timely manner.

Senator the Hon Richard Colbeck

Chair

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143 *Proof Committee Hansard,* 15 April 2009, p. 104.

144 *Proof Committee Hansard,* 15 April 2009, p. 104.