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SUBMISSION – TOWARDS A LOW-EMISSIONS ECONOMY

8 June 2018

To: Low-emissions economy
New Zealand Productivity Commission
PO Box 8036, The Terrace
WELLINGTON 6143 By email: - info@productivity.govt.nz

Please find enclosed my submission on steps towards a low-emissions economy. In my submission I have focussed on forestry and trees on farms as my areas of expertise to address the key question of the opportunities for the New Zealand economy to maximise the benefits and minimise the cost of a transition to a lower net-emissions economy, while continuing to grow incomes and wellbeing.

The key conclusions from my submission are given below. The background and reasoning for these conclusions is outlined in the following pages.

Plantation Forestry in the Emissions Trading Scheme

1. The ETS has not been successful in encouraging new planting of plantation forests, especially for small woodlot owners and on farms. This is largely due to harvest liabilities requiring the return of most or all NZUs earned, with ongoing administrative obligations, and the complexity of the scheme for those not well versed in forestry.
2. A simplified variation to work in parallel with the current ETS is proposed which enables investors to keep the majority of NZUs earned in the first 10 years to help meet investment costs, and then be able to deregister from the ETS provided they commit to the replanting of the forest post-harvest. This would be an effective non-cash mechanism for the Government to employ to encourage new planting of post-89 forests.

Towards Sustainable Farming

3. The planting of trees on farms not only provides an opportunity for significant carbon sequestration, but also helps deliver a number of Ecosystem services (e.g. water filtration, nutrient cycling, soil formation).
4. The ETS does not recognise the majority of planting on farms, with shelterbelts and small areas of planting excluded. With agriculture entering the ETS in the near future, farmers should be able to account for the carbon sequestered in these trees to offset their on-farm emissions.

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5. Allowing farm shelterbelts, riparian planting and other small areas into a farm-specific variation of the ETS for the purpose of managing on-farm emissions would act as a catalyst for increasing on-farm planting (Question 10.2).
6. Mechanisms to encourage soil conservation and hence soil-based carbon storage should also be considered, which would have flow-on benefits for the environment.
7. For agriculture in the ETS to be effective, the point of obligation must be at the farm level (Question 10.1), although there may be some potential for catchment level trading of farm credits. Nevertheless, large corporates like Fonterra will have to off-set their impact on-farm, potentially through helping fund farm-based or catchment schemes, and through the use of conservation credits (e.g. ETS, water, habitat, soil).

Plantation Forestry Environmental Management

8. Plantation forestry needs to address riparian management in the wake of recent storm and flood events in Nelson and Tolaga Bay. This may include the planting of riparian zones in permanent species, which will increase NZ's sequestration.
9. Consideration also needs to be given to appropriate forest management models on steep land, which includes continuous cover forests. Continuous cover forests with longer-rotation species will increase sequestration and will limit the amount of NZU liabilities at harvest.

Please feel free to contact me should you have any queries.

Yours sincerely

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1. Plantation Forestry in the Emissions Trading Scheme

1.1 Background

Government seeks to encourage afforestation as a key component of its climate change policies.

A range of initiatives are being considered under the Billion Trees Programme, some which include grant payments to encourage planting. Naturally there will be a limit to the amount of grant funding available.

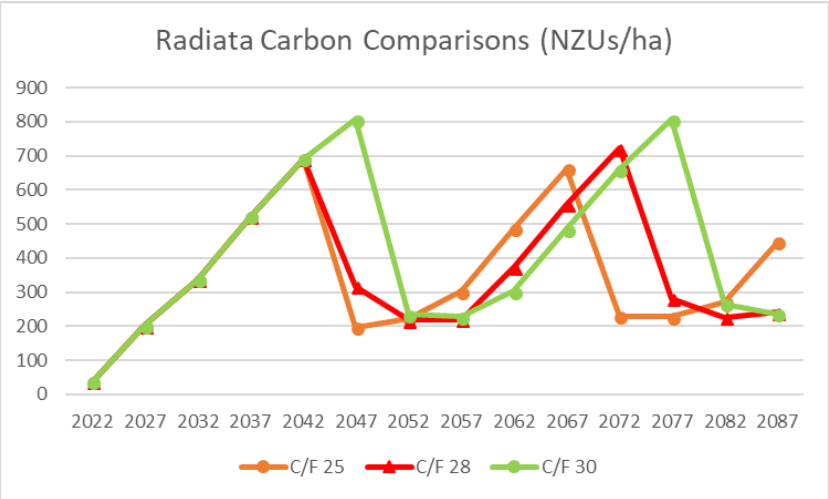
The Emissions Trading Scheme (ETS) is intended in part to encourage new planting, although it has enjoyed limited success in this respect. In particular, it offers little benefit to smaller landowners wishing to establish forests, especially single or limited age class, largely due to harvest liabilities requiring the return of most or all NZUs earned, with ongoing administrative obligations and the complexity of the scheme for those not well versed in forestry. Nevertheless, with some simplification the ETS is a useful scheme for larger forest owners and investors in carbon forestry.

For forests established after the commencement of the ETS in 2008, planted within the Commitment Period (CP) the forest is registered and replanted following harvesting, then not all NZUs earned need to be returned following harvesting. This is sometimes referred to as “free” or “low-risk” carbon.

However, if these “low risk” NZUs are sold, then the participant has no ability to earn additional saleable NZUs from the registered area. This is unless they have a wide range of age classes and/or are prepared to game the market (buy/sell NZUs) and/or use NZUs to spread income over the rotation on the assumption that they will be able to cover their liabilities out of harvest income (which in itself carries NZU price risk). This results in ongoing obligations and costs for limited or no additional benefit to the participant and could be seen as a disincentive to registering forests in the ETS.

The following graph shows the NZU balance of a single age class of radiata pine plantation forest for two rotations (and the beginning of a third), which highlights the limits of “low-risk” NZUs available to ETS participants.

- Radiata pine, Gisborne region, generic MPI Lookup tables.
- Planted 2019.
- Five-yearly CP closing balances.
- Harvest at age 25, 28 and 30 years.
- Replant 1 year after harvest.



The graph highlights: -

- Residual/replant NZU balance for radiata pine after harvesting at age 28/30 reaches its lowest level at or slightly above the NZU balance at age 10 years.
- Residual/replant NZU balance after harvesting at age 25 reaches its lowest level at or just below the NZU balance at age 10 years.
- (Gisborne age 9 NZU balance 201 NZU/ha, age 10 balance 219 NZU/ha).
- Following replanting the NZU balance increases during the second rotation but returns to similar levels post-harvest as for the first rotation.
- The only NZUs able to be sold without participating in market and price risk are those earned in the first 9-10 years. This is considered to be a significant disincentive to ETS participation for smaller forest owners.

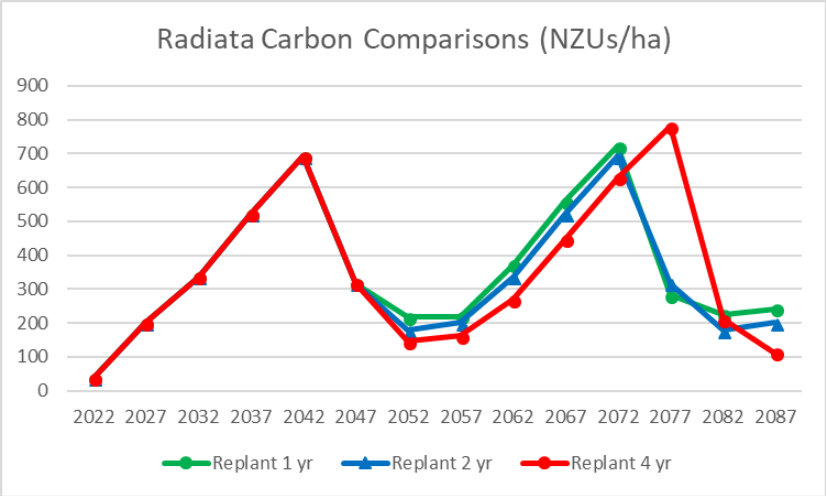
1.2 Potential Solution

A simplified variation to the ETS could be used to encourage new planting of production forests, specifically smaller blocks and single age class forests which are disadvantaged by the current ETS, and this could be run as a separate scheme in parallel with the current ETS. This variation would provide an incentive to establish new forests without the need for Government grant payments, would limit forest owners' and the Government's ETS liability, and result in additional post-89 forest to meet international obligations. The key elements are outlined below.

<u>Participants register in short-term ETS</u>

- Participation registered on land title consistent with current ETS;
- Participation requires commitment to replanting land post-harvest, or surrendering NZUs if the land use is changed;
- Participant claims NZUs (or a portion thereof) for the first 10 years;

- Registration cancelled after 10 years (or transferred to the Crown), with the registration remaining on the land title. The participant retains the first 10 years' NZUs and the forest status and commitment to replant is recorded and linked to the land title/LIM;
- The Crown can continue to use the deregistered forests as it does currently to meet reporting obligations;
- The participant or their successor replants the registered land post-harvest, which means the carbon balance doesn't go below what was earned in the first 10 years.
- The following graph shows the impact of the timing of replanting post-harvest, using the current ETS methodology for post-89 forests.



The graph highlights: -

- Planting 1-2 years after harvest, which is standard forestry practice, results in a minimum post-harvest NZU balance of 80-100% of year 10 NZU balance. It is suggested that 75% of year 10 total NZUs would be a suitable amount for participants to earn, provided they commit to replant within two years of harvest. Note that many local authority rules require replanting within 18-24 months of harvest for erosion and sediment control reasons.
- Delaying replanting by 4 years post-harvest reduces minimum NZUs to 66% then 51% of year 10 balance following the first and second rotations respectively. If the forest is not replanted 4 years from the date of harvest then the forest would be considered to be deforested, consistent with pre-90 forest replant/deforestation rules.

Participant Benefits

- Value of NZUs helps meet land, establishment and tending costs, lowering the cost of entry into forestry;
- Cancelling or transferring participation to the Crown removes the need for forest owners to continue managing ETS participation, thereby reducing ongoing costs, simplifying participation and encouraging new forest investment.

Government Benefits

- Provides an incentive to establish new forests without the need for grant payments, potentially limiting the amount of grant payments required for commercial forests;
- Increased new forest planting improves the Crown carbon account;
- Requirement to replant forest post-harvest means the post-harvest liabilities will not use NZUs claimed and sold by establishing participant, limiting Crown liability.

Considerations

- The amount of "low-risk" carbon depends on species, location, rotation length and the delay between harvesting and replanting. Therefore, the amount of NZUs available to participants in this variation to the ETS might vary between species.
- Simple rules around the amount of NZUs able to be claimed and sold are needed to make it straightforward for participants and reduce Crown risk. For example: -
    - Use generic regional tables for Emissions Returns, with no requirement to enter the Field Measurement Approach (FMA) for registrations over 100 ha. The FMA process to date should have resulted in enough information to enable accurate regional Lookup tables to be produced for the main commercial species;
    - Participants claim a portion of the NZUs earned in the first 10 years, with a commitment to replant within 2 years of harvest (e.g. 75% for radiata pine);
    - If replanting is delayed more than two years post-harvest, then the portion of NZUs claimed between two years post-harvest and the date of planting must be returned;
    - If the forest is not replanted four years after harvest, then it is considered deforested and treated the same as deforested pre-90 forests (i.e. the full amount of NZUs returned);
- Participants can still elect to register in the full ETS should they wish.

2. TOWARDS SUSTAINABLE FARMING

2.1 Background

New Zealand's comparative advantage in farming is rainfall, soil fertility and sunshine hours, allowing it to grow high quality pasture-based "free range" meat products. Much is also made of New Zealand's "clean, green" image, although this is under increasing scrutiny.

Traditional pasture-based farming in New Zealand is under pressure from a variety of sources; economic, environmental, animal welfare, consumer health/nutrition/ethics, and farm worker availability.

Pasture-based or free-range meat production is at a cost disadvantage to intensive meat production systems (e.g. feed lots, caged chicken/pork). This will explain in part the rapid decline in red meat consumption in New Zealand (and most likely globally) at the expense of chicken, pork and feedlot meat.

The emergence of lab-grown meat and vertical farms will place further pressure on traditional farming systems, not only in terms of cost but also from a perceived welfare/ethics perspective.

Markets are increasingly demanding that suppliers can prove sustainability from farm to plate, and these can be used as non-tariff barriers to trade (e.g. the Food Miles campaign in the UK).

This means that pasture-based farming needs to address a number of factors to ensure that it is positioned at the premium end of the market.

Government is developing policies to improve water quality through reduced sediment and nutrient runoff. Initiatives include the fencing and planting of riparian zones and using trees to stabilise erodible slopes.

Furthermore, soil accounts for a large proportion of the world's carbon storage. New Zealand has some of the most eroded and compacted soils in the world (50% of sheep and beef, 80% of dairy land), and mechanisms to encourage soil conservation and hence carbon storage should be considered.

Agriculture will enter the Emissions Trading Scheme in the near future. The next section outlines how it can be used as a tool to encourage on-farm planting to help achieve demonstrable sustainable free-range pasture-based farming.

2.2 Trees on Farms

Trees on farms are necessary to help achieve a number of the desired sustainability, productivity and welfare outcomes outlined above. Specifically: -

- Paddock shelter improves pasture and crop growth through reduced wind flow and hence transpiration. This translates to increased animal productivity through improved feed.
- Paddock shade and shelter improves animal welfare by reducing heat and cold stress (depending on the season).

- Paddock shade and shelter also improve animal productivity as the energy no longer required for heating/cooling can go into growth.
- Land stabilisation planting (e.g. willow/poplar poles) helps improve water quality through reduced runoff and sedimentation and helps protect topsoil, which has its own carbon storage benefits.
- Riparian planting improves water quality and reduces sedimentation through streamside stability and the filtering of water runoff.
- Farm planting, including shelterbelts, riparian and woodlots improves biodiversity, plant and wildlife habitat, and the ability to connect isolated habitats.
- With the rapid expansion of the honey sector, there is significant pressure for spring-build-up and over-wintering sites for bee hives. Incorporating bee forage species as part of normal on-farm planting enables farmers to offer apiary sites to beekeepers to help ease this pressure (www.treesforbeesnz.org). Use of native plants in on-farm planting will assist native pollinators.
- Tree and shrub species sequester carbon to offset farm emissions.
- The ETS can be seen as a first step in marketable ecosystem services from trees on farms. For example, Conservation credits (soil, water, air, habitat, etc.) as are currently being trialled in the UK.

If regulatory mechanisms are to be used to increase the planting of trees on farms, these need to be simple and easy for farmers to use. Incentives are the best way to bring about desired change, rather than threatened "consequences". Examples of incentives include:

- Enable market participation (e.g. ETS).
- Funding schemes (e.g. AGS, ECFP, Hill Country Erosion Scheme, Regional Council fencing schemes).
- Rates rebates. For example, discount on district/regional rates if landowner undertakes priority environmental work identified by council (e.g. fencing waterways).

2.3 Farming in the Emissions Trading Scheme

As it currently stands, the ETS does little to encourage on-farm planting, and in fact actively discourages it. Individual woodlots offer little incentive as most NZUs earned need to be returned at harvest as outlined in section 1. Shelterbelts and planting less than 5m in height, 1 hectare in area and 30m in width are excluded, which means the majority of planting on farms is likely excluded from the current ETS.

The ability for farmers to account for sequestration from the trees they establish or allow to regenerate on their farms to offset their on-farm emissions can be used as a driver of change for on-farm planting and land management. This would not only address climate change but also the outcomes outlined above in terms of water and soil quality, biodiversity, animal welfare and productivity, and will help deliver demonstrable sustainable farming.

In order for this to be achieved, the ETS rules need to be amended to allow for typical on-farm planting and reversion. This won't be accommodated by the current ETS, but requires a separate

scheme running in parallel to specifically manage on-farm emissions. Such a scheme would have more flexibility in the planting that qualifies, and simplified Lookup tables and accounting rules. Any carbon credits generated in this scheme couldn't be sold, although perhaps any surplus could be exchanged for NZUs at an agreed ratio (e.g. 1 NZU:2 farm credits). Farmers could of course register woodlots over 1 ha in area in the full ETS should they wish.

International rules for forestry and climate change allow areas less than 1 hectare, forest species less than 5m in height, and per hectare canopy density of as low as 10%. Areas over 0.1 ha should be allowed, with a minimum width of 3-5m for shelterbelts, and a minimum tree height of 3m. Lookup tables would need to be developed for the various planting types, with a baseline assessment of annual sequestration set at the start of a Commitment Period and reviewed every 5 years to align with Commitment Periods. Depending on the reporting period required, the farmer would need to notify any changes, e.g. shelterbelts removed, new planting. Use could be made of a variation of the offsetting rules to balance any on-farm removal of trees with new planting (the offsetting rules are too restrictive in their current format).

Taking this approach, it is imperative that participation in the ETS is at the farm level, as this is the unit managed by the farmer and around which decision-making is based. Having participation at the processor level removes decision-making from the farmer and reduces relevance and farmer buy-in. Nevertheless, large corporates like Fonterra will have to off-set their impact on-farm, potentially through helping fund farm-based or catchment schemes, and through the use of conservation credits. There is also an argument for farmers (and processors) to be able to co-operate at the catchment level, in terms of trading farm credits (e.g. as with nitrogen in some areas), but this would need to be balanced with other desired outcomes (e.g. fencing of waterways).

3. Plantation Forestry Environmental Management

Recent storm and flood events in Nelson and Tolaga Bay have brought home the susceptibility of large-scale clear-cut forestry to severe weather events, and the downstream consequences. From anecdotal evidence it appears that these events are becoming more localised and increasing in their intensity, and land management practices need to reflect these changes as they become the new norm. Much of New Zealand's steep land tree planting was promoted as a more profitable and environmentally sustainable alternative to pastoral farming. Therefore, it is imperative that the industry be able to survive employing environmentally sustainable practices, which might include different types of forest management than today and a greater role for carbon forestry and other conservation credits.

Plantation forestry clearly has to take riparian management seriously, and this doesn't just mean riparian setbacks as per the National Environmental Standard for Plantation Forestry. Currently, riparian setbacks don't have to be planted and in fact some councils exclude planting within the riparian zone in plantation forests. Farmers are starting to have to fence and plant riparian zones for water quality in terms of sediment and nutrient runoff. It is therefore not unreasonable for forest owners to plant riparian zones to manage harvest slash and sediment runoff. Options here include native species or long rotation exotics such as redwood. Because this riparian planting is for forestry

there would be no need for fencing. The implication here is that the riparian zone would now be in some form of permanent forest cover, which should result in increased long-term carbon sequestration through these areas not being harvested. The ETS rules need to be able to accommodate such planting, which would help offset any potential financial loss to forest owners.

In situations where existing plantation forests extend to the water course or there is simply an unplanted setback, then forest owners will need to manage harvesting operations to minimise risk. This might include limits on full slope harvesting, and for settings adjacent to the water course leaving high stumps and tree heads across the slope to act as a sediment/slash trap for example. Councils will need to look at catchment limits on harvesting operations – what Tolaga Bay likely shows us is that you can't have hundreds of hectares in a catchment harvested from ridge top to valley bottom in a short timeframe – the slash and sediment risks and loads are too great.

Ultimately where this leads to in areas like the East Coast steep lands is continuous cover forestry, where trees are only harvested individually or in small groups (if at all) so that the tree canopy is largely maintained. This may necessitate a shift in tree species in some situations to those better suited to individual or small group harvesting (in terms of growth characteristics, longevity and timber value), but if the value of NZUs increases then these forests may become more valuable for carbon or other conservation credits. The use of mānuka as a colonising species with an interim honey yield as a nurse crop for long-rotation native species is one such concept.