

Submission on NZ Productivity Commission report on Low Emission Economy

From Denis Hocking, Farm Forester, jdhocking@xtra.co.nz R.D. 1, BULLS 4894 ph 06 322 1254

I would like to congratulate the Productivity Commission on a very thorough, well researched and considered report. I cannot claim to have read the report thoroughly, but have focused on the area of most interest to me namely land use and forestry and would like to raise a number of issues that illustrate your arguments or which I believe are not adequately covered, or emphasized in the report.

1. I run a long established farm forestry operation on coastal sand country just southwest of Bulls. The property has been in family ownership since 1955 with forestry as a major part of the operation. Today it covers 247 ha with 110 ha of Foxton phase sand dunes in plantations and the inter-dune flats grazed in a sheep and beef cattle breeding operation of about 1,800 stock units. Note that Foxton phase sand dunes are the larger, higher dunes, as seen south of the Manawatu river. The sand country is well suited to farm forestry with good access and dunes that grow radiata pine and some top timber eucalypts very well, but are fragile and low productivity pastoral land. Since clear-fell harvesting started in 1990 net returns per hectare from the “poor” land in forestry have almost always exceeded returns per hectare from the “better” land in pastoral farming. As I have moved to sustainable harvest, forestry has regularly provided more than half the gross returns for the whole operation. Meanwhile simple calculations suggest the carbon stored in this commercial forest (35,000 to 40,000 tonnes CO₂e) represents about 100 years of total agricultural emissions for the property. I cannot use most of this because it is pre-1990 forest, but I feel it illustrates the potential on some of the more favorable land. Forestry can be a very profitable way of off-setting emissions.
2. Farm forestry can also get leverage from other virtues of afforestation in particular reduced nutrient losses into waterways. The pressures on farming to improve water quality mean farm forestry could be a useful tool.
3. Another, probably relatively minor, virtue of forestry, which I don't think you mentioned, is the much greater activity of methanotrophic, (methane removing), bacteria in forest soils, both indigenous and exotic, than in pasture soils. The late Kevin Tate, from LandCare Research, was the expert in this area.
4. I feel that you do not emphasise that utilizing forests can give greater reductions in GHG emissions than simply growing, sequestering and leaving. I have been assured by life cycle assessment researchers that using wood for structural, furniture, packaging, biofuel, etc. while the forest is regrown results is a much more effective

way of reducing emissions. I acknowledge that not all forests can be safely harvested as demonstrated in recent debris flow events.

5. Further to the above point of debris flows, we need to recognize that forestry may be struggling to maintain its social license to operate if there are more such events. Solutions are needed even if it means abandoning some forests.
6. Wider use of wood in the New Zealand economy/culture would, I believe, be a good development, but would probably need a wider range of timbers for different uses. Amongst the farm foresters there is a lot of activity on alternative species and I have been very impressed by the high quality eucalypts I am successfully growing on sand dunes, contrary to the accepted wisdom of 30 years ago.
7. Looking for more “wood intensive cultures” we probably have much to learn from the Scandinavian countries. Engineered wood products is another area New Zealand needs to emphasise.
8. The point of obligation for farming emissions is a real problem for which I have no solution but I do believe there needs to be greater promotion of trees/forestry on farms, emphasizing the advantages. However “optimal” afforestation will vary widely between properties and assisted joint ventures might be a possibility.
9. I believe that the Government does have a major role in research and extension services in the area. Some of the key research is probably just getting out and finding what is already working on properties.
10. One common claim that you repeat, but don't appear to reference fully, is that New Zealand's GHG efficiency when producing animal products is significantly better than the world average, i.e. our emissions are lower per unit of production. Since methane dominates these emissions, and since I have been led to believe that pasture diets result in higher methane emissions than ruminant diets high in grain, I would like to see this claim substantiated. I certainly believe that we are more energy efficient and thus CO₂ efficient.
11. Another claim that I would question is whether afforestation is a major factor in rural depopulation. It would seem that long commutes have already become commonplace in rural areas with employees living in towns. I employ a shearer when he isn't shearing and am always amazed at the length of his commutes for shearing. My experience suggests there is more labour required per hectare in an intensively managed plantation than on sheep and beef properties, but silvicultural input can vary widely.
12. You mention carbon fertilization with the apparent assumption that higher atmospheric CO₂ will stimulate all plant growth. Reality seems to be more complicated. I understand that pasture trials done by AgResearch at Flock House in the early 2000s showed growth rates at elevated CO₂ ranged from 40% ahead of controls to 10% behind, the latter figure for the 2003 drought year when extra

growth would have been so valuable. A meta-analysis of responses to elevated CO₂ in temperate forests published in *Science* (*Science* 353, p72, 1/7/2016, sorry no authors) showed wide variations in response and tracked this down to mainly the mycorrhizal associations. Species with ecto-mycorrhizal associations showed sustained increases in growth rate, those with arbuscular mycorrhizal showed temporary or no response. Underlying these results seemed to be the availability of other nutrients, with ecto-mycorrhizal associations being more effective at utilizing low nutrient levels, especially nitrogen. The message seems to be that to profit from CO₂ fertilization farmers will need to spend more money on other fertilizers. Pasture species and also the majority of indigenous forest species use arbuscular mycorrhiza while pines and eucalypts use ecto-mycorrhiza.

I hope that my criticisms and comments will not be seen as detracting from what I firmly believe is a very impressive report. Congratulations

Denis Hocking