Your submission to Zero Carbon Bill

Marcus (J N M) Williams

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Submitter Type: Individual

Clause
1. What process should the Government use to set a new emissions reduction target in legislation?
Position
The Government sets a 2050 target in legislation now
Notes
According to 'accepted science' zero carbon is not negotiable. The questions are when, and how to get global commitment? Any failure will lead to inevitable global catastrophe.

Clause
2. If the Government sets a 2050 target now, which is the best target for New Zealand?
Position
Net Zero Emissions - Net zero emissions across all greenhouse gases by 2050
Notes

Clause
3. How should New Zealand meet its targets?
Position
Domestic emissions reductions only (including from new forest planting)
Notes
By adopting new energy efficiencies and recognising (counting) all carbon sequestration - especially in the soil and in every tree planted and growing in the country. This is critical - please see expanded notes at end:

Clause
4. Should the Zero Carbon Bill allow the 2050 target to be revised if circumstances change?
Position
Yes
Notes
The Government needs flexibility to deal with changing circumstances and respond to changing global priorities.

Clause
5. The Government proposes that three emissions budgets of five years each (i.e. covering the next 15 years) be in place at any given time. Do you agree with this proposal?
Position
Yes
Notes
As an instrument of evaluating progress.

Clause
6. Should the Government be able to alter the last emissions budget (i.e. furthest into the future)?
Position
Yes - the third emissions budget should be able to be changed but only when the subsequent budget is set
Notes
see previous notes

Clause
7. Should the Government have the ability to review and adjust the second emissions budget within a specific range under exceptional circumstances? See p36 Our Climate Your Say
Position
Yes
Notes

Clause
9. Should the Zero Carbon Bill require Governments to set out plans within a certain timeframe to achieve the emissions budgets?
Position
Yes
Notes

Clause
10. What are the most important issues for the Government to consider in setting plans to meet budgets? For example, who do we need to work with, what else needs to be considered?
Notes
This is a global issue. All governments need to work together to the same end.

Clause
12. What role do you think the Climate Change Commission should have in relation to the New Zealand Emissions Trading Scheme (NZ ETS)?
Position
Advising the Government on policy settings in the NZ ETS
Notes
The ETS has serious shortcomings which must be addressed. As stated elsewhere- all emissions must be accounted for, not just the conveniently countable ones.

Clause
14. Do you think the Zero Carbon Bill should cover adapting to climate change?
Position
Yes
Notes
Zero carbon is about climate change.

Clause
Do you have any other comments you'd like to make?
Notes
The concept outline below suggests constructive ideas as to how and why carbon is far more important than just climate change - and ways to achieve that. ShelterForest: - A solution for some of the most critical challenges facing mankind in the 21st century: Significant elements: - Climate change, costs, consequences, and carbon implications; ShelterForest outlined; Global topsoil degeneration and implications; Opportunities from trees and shelter; Ramial chipped wood - an answer to sequestration and soil degeneration; Hydraulic redistribution – a previously unrecognised quality of many trees; The imperative to include shelter in carbon calculations; Introduction: Our planet is in the process of exceeding its capacity to support the rampantly expanding human population and the demands from increasing consumerism. Major challenges include climate change, loss of topsoil, and, increasingly challenged water resources, - factors all addressed by ShelterForest. Climate change currently has a significant political profile. Calculations suggest the current annual global cost of climate change at US$140 billion although, given global climatic events during Aug/Sept 2017, this figure might be dramatically understated. Financial, economic and loss of life costs can be expected to increase exponentially in line with recent trends. The most immediate response to global warming is to reduce levels of atmospheric CO2. The pragmatic way of achieving this is by the planting of trees. Unfortunately, planting forests also conflicts with increasing demands for food – or do they? ShelterForest (SF) accommodates this conflict by proposing planting large numbers of trees in ways which increase land productivity, reduce the impact of climate change, and provide additional opportunities and benefits. The concept: ShelterForest proposes planting of 20% of all land in trees in the form of shelter belts of some 20 metre or so width. Shelter belts thus become belts of forest rather than single lines of trees by growing several rows (say 3) of harvestable lumber trees inter-planted with understory plants, all chosen for multiple purposes and functions, including rotational harvest. The shelter value of the plantings alone will more than compensate for the land taken out of production in most, if not all, situations. These benefits will be even more significant with the advent of increasingly extreme weather predicted by global warming. While a primary objective of ShelterForest is to combat the causes and consequences of climate change, the most immediate benefit will be in the economic value of shelter will begin within months of being planted and grow rapidly thereafter. Growing trees sequester carbon, both through their own biomass and into the surrounding soils, thus contributing to soil regeneration. In addition, there are other benefit opportunities with profound implications including environmental, economic and sustainability. ShelterForest design process: SF is achieved through a design process considering a complex range of factors, possibilities, and outputs. All farmland should be included, especially productive flats and ‘easy’ land. The starting point for each site would be an in-depth analysis of relevant factors including geology, geography, prevailing winds, sun orientation, climate, existing structures including established trees, waterways etc. Plant selection would consider plant functions, characteristics, their relationship with each other and the environment as well as resource, harvest, and other considerations. Such might include the use of deciduous trees to enable sun penetration during winter and early spring months whilst retaining significant shelter function. Understory shrubs would provide livestock protection against adverse weather during winter. The Value of Shelter: The economic benefits of shelter are all too often little recognised. A passage was noted in an American journal a number of years ago which suggested: - If you plant 20% of your land in trees, productivity on the remaining 80% will increase by 80%. This was more recently reinforced by the reported experience at Windwhistle – a name inspired by environmental circumstances - in Canterbury, NZ - where it was observed that when shelter was planted “productivity increased by more than 60%”. These observations suggest that the productivity value of shelter alone in most situations will provide gains well in excess of any perceived loss of production from the area planted in trees. Shelter is an essential part of many permanent crops. It

seems likely that for most, if not all other farming activities, the economic value of shelter is little understood and/or has not been fully evaluated. The mechanics of shelter: The immediate value of shelter is reduced wind. Within the zone immediately behind shelter, wind speed is reduced by about 80%. At a distance 10 times the vertical height of the shelter, wind speed will be reduced in the order of 30% to 50%. Thus, shelter of height 30m will have significant downwind benefits for more than 300m, coincidentally also benefiting the next ShelterForest belt. Reduced wind means reduced stress on both animals and plants and reduced loss of water from evaporation. Wind-chill increases the energy (food) requirement of livestock and can have particularly devastating, even fatal consequences, particularly when accompanied by cold rain. Heat can also be a source of stress which can be accentuated by direct sun and by high temperature winds (the other end of the wind-chill factor). Skin temperatures on dark animals have been measured upwards of 50oC. Trees beyond shelter: Trees have been critical to the development of life on planet Earth. They have been integral to the development of man since he began using fire and making tools. Today they are still essential for many building structures and industries and provide a huge biomass resource which is also a natural alternative to many fossil resource requirements, Many trees have extraordinary value as livestock fodder - nutrition and health from leaves, twigs, bark, and fruits, - food for bees (an increasingly threatened element of reliable food supply), food and environmental support for wildlife and natural predators etc. They are essential for erosion control on steep hills and along river banks. A significant aspect of SF is that, through the design process, mature trees can be harvested on a rotational basis with minimal impact on the functional integrity of the shelter. Slash from harvested trees can be an energy or alternative biomass resource, and/or, chipped as a resource for regenerating topsoil (see RCW below). Many leaves, and even the bark from some trees are highly nutritious and naturally sought after by livestock. The harvest and by-products from SF will provide new economic and sustainability opportunities for the land and its owners as well as increased opportunities for meaningful employment. Carbon sequestration: Estimates suggest that about 30% of the current excess carbon in the atmosphere originated from degrading soils. Trees naturally sequester carbon. Climate change is a serious challenge and but soil degeneration may be an even more critical. We need to return carbon to the soil for the regeneration of organic biomass and soil fertility. As soon as trees begin to grow they accumulate carbon from the atmosphere, both below and above ground. It has now been shown that carbon levels in the ground increase as you get closer to trees, likely through natural leaf and twig litter and other biological processes. Most of the world’s fertile topsoils were formed by natural forest litter. Satellite technology can now measure every significant tree canopy on the planet. It is particularly important that these are all recognised as every ton of C is relevant, especially if we (the tax payer) are paying for carbon credit deficits. Every tree contributes to carbon sequestration and long-term sustainability. The soil resource (or deficit): The soils of the world are being degraded at an alarming rate with loss of soil biomass (carbon) a major factor. University of Sydney Professor John Crawford says that current projections of topsoil degradation suggest that within the next 50 years our planet will produce 30% less food with a population demanding 50% more. This equates to a projected food deficit in the order of 50%. Trees, particularly in the form of ShelterForest, provide an extraordinary answer to this dilemma, in part through the potential of Ramial Chipped Wood: Ramial Chipped Wood (RCW): < http://forestgeomat.for.ulaval.ca/brf > Research began at Laval University, Quebec, in the late 1970s as a result of large piles of slash left after logging operations. Over 20 years of research produced positive, if not astounding, results with two in particular illustrating the potential; strawberries in Quebec and tomatoes in Senegal producing yield increases of 300% and 1000% respectively. Fertile topsoil is a critical ingredient for high yielding crops. Throughout evolution plants and trees have been essential to the formation of topsoil. We now have the understanding and the technology to dramatically enhance this natural process and begin to repair the damage done by global deforestation and modern farming practices. Perhaps the greatest opportunity from RCW is to sequester carbon into soil in a process which could have profound implications for the lives of billions of people within the next generation or so. Mobile technology is already available which can chip trees at up to 90 tons/hr - the limiting factor being access to raw tree material. This equates to 180,000 tonnes every year for each chipping unit. With SF, such material would be grown and processed on site eliminating most transportation and further processing costs. Another opportunity arising from this concept is that lower grade RCW+, (RCW is defined as having a diameter less than 7cm) could be chipped by the same equipment, either as a bulk resource (such as energy) or as an expanded resource of woodchip for sequestration. RCW offers a process which enables recovery from the massive global deforestation over recent history and subsequent soil degeneration by providing organic material to regenerate topsoils and enhance land productivity. Composting is long considered a fundamental of good gardening. (It is the natural process of forest litter.) RCW expands that concept to a new level of practicable possibility. The place for trees today is as an integral part of all conventional farming rather than, or as well as, conventional forestry. Water: In addition to reduced evaporation resulting from shelter, increased biomass in soils will further benefit water challenges by increasing the water absorption and retention. This should be of special interest in the light of anticipated increasing weather extremes from global warming. Organic soil matter can hold 20 times its own weight in water. Hydraulic Redistribution: This is an extraordinary quality recognised in a report from UC Berkeley in 2005. Upwards of 60 tree species were recognised as ‘dumping’ water at the bottom of their roots at wet times and releasing it back into surface soils during dry times. This has the benefit of alleviating stress on the plants during both flood and drought. Back to the future: Mention the concept of planted forests and the immediate thought is of large areas of single specie trees. This continues the modern experiment of mono-culture which clearly challenges our planet’s natural evolutionary biology. SF invites a revisit of the concept of ‘forest’ and consideration towards more natural integrated biological systems. These will prove to be more productive, much more sustainable and less risky than the intensive monocultural farming methods which currently prevail. ShelterForest will, at planting, begin the many and complex contributions to a more viable and sustainable future, contributions which will grow year by year. Marcus Williams