28 March 2021

Climate Change Commission
PO Box 24448
Wellington 6142

Attn: Submissions analysis team

Subject: Response to the Climate Change Commission draft advice on the first three emissions budgets and on policy direction for the Government's first emissions reduction plan.

This submission is from the Bioenergy Association.

The Bioenergy Association represents a significant portion of owners of facilities using biomass and residual waste to produce energy, including WWTP and heat plant; solid, gaseous and liquid biofuel producers and suppliers; bioenergy and waste-to-biogas consultants; researchers and equipment/appliance suppliers across New Zealand. Its members have an interest in policies relating to the utilisation of biomass and residual organic waste for the production of energy and coproducts; reduction of emissions to air in communities from both residential and commercial/industrial scale heating applications and from decomposition of waste; and wise use of our renewable natural biomass resources for the betterment of communities. Residual organic waste[1] is considered to be a renewable resource.

The Association has Interest Groups whose members manage the Association's specific technical matters relating to the production of energy from solid biofuels via combustion, production of gaseous biofuels via anaerobic digestion, and transport biofuel production and use, specifically with regard to standards and best practice. The Interest Groups host workshops and dissemination of information to those interested in the respective sectors, or considering investment. Information is published and available from the association websites (www.usewoodfuel.org.nz www.biogas.org.nz and www.liquidbiofuels.org.nz) and from the Bioenergy Knowledge Centre https://www.bioenergy.org.nz/bioenergy-knowledge-centre .

Overview

The Bioenergy Association supports support the ambition for New Zealand to meet a 1.5 deg C pathway with an equitable / inclusive transition, and believes that a growing bioeconomy can be an enabler in delivering that.

In New Zealand the bioenergy and biofuels sector is based on the downstream use of residues from forest harvesting and processing, agriculture production, food processing and municipal organic wastes that cant be otherwise recycled or reused. The products are primarily bioenergy, biochemicals and biofuels but the coproducts also provide significant financial revenues. The success of bioenergy and biofuels downstream processing will depend on the availability of residues from very successful upstream production and processing. Bioenergy and biofuels are integrated into the upstream sectors as the bioenergy and biofuels sector is dependent on them wanting to gain revenue from their residues.

[1] Residual organic waste is the organic residues of manufacturing, food production and municipalities which has not been able to be recycled or reused and would otherwise be disposed of to landfill.

While there is a growing competition for residual biomass and organic waste our analysis shows that, provided we all take managed proactive long term actions with regard sourcing biomass from land and waste use, that there will be adequate biomass available from forestry and agriculture working together to maximise land use opportunities, and no organic waste should go to landfills post 2030.

While the energy products produced from residual biomass and organic waste will have increasing value to communities as New Zealand transitions to a post petroleum economy, the maximization of value derived from the coproducts such as biofertilizer, char, lignin and biochemicals will also be important as they substitute for current petroleum sourced products.

To achieve sustainability and be a low emissions economy New Zealand needs to move to become a bioeconomy and adopt circular economy principals. Bioenergy and biofuels are the foundation for this to occur.

This submission from the Bioenergy Association incorporates a number of points raised by members but where a submission from a member provides greater detail the information is supported but not repeated in this submission. This submission should be read as being complementary to the individual submissions from members.

This submission is structured similar to the Commission's draft Advice and focuses only on the main points of relevance to the Association.

Heat, Industry, and Power (HIP)

1. Currents HIP emissions at around 18.8 mt CO2/a, to keep us on track they have to fall to 10.4 mt CO2/a by 2035 (44.6%)

   Supported. To achieve this level of reduction the recent decisions by Government with regard to reducing use of fossil fuels in government owned heat facilities should be extended to include all crown and local government facilities, and private owned facilities supported by public funding. A focus by Government on its own assets will provide evidence and demonstration to the private sector to do the same. (It is already having that effect).
   To achieve this level of reduction there is a need to extend training of technical personnel investigating, developing and operating new low emission equipment. There is a lack of experienced personnel.

2. CCC supports an energy strategy, including the shift away from a 100% renewable electricity target and instead to set a renewable energy target (60% renewable by 2035, 90% by 2050). Setting a broader, system-wide target for renewable energy would signal the scale of emissions reductions required across the whole energy system and encourage investment without locking in a prescribed pathway. *(*P110)

   Develop a long-term national energy strategy that provides clear objectives and a predictable pathway away from fossil fuels and towards low emissions fuels, and the infrastructure to support delivery. (Action 3 P113)

   Supported. The move from energy policy focused on electricity to encompass all energy forms is long overdue as there are often options beyond electricity. For example the current low emissions transport programme administered by EECA is only for electricity solutions, yet gaseous or liquid biofuels solutions may be equally relevant.
   However adopting an energy strategy rather than solely an electricity strategy as at present will require greater involvement of central and local government as some renewable energy sectors, such as the bioenergy sector, do not have involvement of a lot of large companies and the value chain is split amongst many SME players. As a result there are market failures

/structures which need collective action. A continued focus on market driven solutions alone will result in emissions reduction taking longer than need be.
The renewable energy sectors tend to operate through their respective associations to provide economies of scale and collective action. However all the renewable energy associations are small and under-funded with an inability to employ full time staff, and have no funding to undertake research, information dissemination, advocacy or prepare best practice guidelines. Professional support for the renewable energy sectors can be provided from these associations but requires funding. In general the current sector development for the collective good of all New Zealanders is being funded by the association members who are often small business, which results in a free rider inequity situation.
An energy rather than an electricity focus would recognise that technologies alternative to electricity are often available as solutions and each should be considered on its merits.

3. Phase out of coal and limit gas use. No more installation of coal-fired boilers for industrial and building heat, and for existing coal use in buildings to be eliminated by 2030. New gas connections for homes and businesses would halt by 2025. But emissions from electricity generation and process heat must be phased in a way that would enable assets and infrastructure to be replaced on "as natural a cycle as possible" to maintain growth while minimising costs from stranded or written-down assets.

   Supported in principle but some specific proposals are not supported. Phasing out coal and limiting gas use is supported but needs to be done in a managed way and taking account of existing uses and the introduction of replacement fuels.
   A ban on new uses of coal and gas by industry by 2030 is supported.
   Care also needs to be taken with the transition from fossil fuels so that "boom- bust" situations do not occur. A sudden influx of new inexperienced players could make things worse rather than better. There are already many people who are taking on transition work for which they have no experience and the result is failures of the new replacement plant. An orderly transition is critical to the long term success of the transition. There is an adequate foundation of personnel and experience from which to grow but skills and experience development needs to be included in transition plans.
   Partnering bioenergy with fossil fuels is an important transition method. For example co-firing coal and biomass, or using biogas as a supplementary fuel in coal boilers, can not only allow continued operation of existing long life equipment but it can provide a good learning environment for facility operators who are often a significant barrier to adoption of new equipment or practices.
   Natural gas is an ideal partner for gaseous, liquid and solid biofuels and much of the infrastructure and personnel can continue to be used. Rather than having a drop dead date for natural gas it would be preferable to assist the natural gas and LPG sector to transition existing activities to accommodate biofuels, or to introduce replacement renewable gaseous fuels.
   Some alternatives such as renewable LPG are not yet commercially available so assistance to bring new technologies on stream as quickly as possible needs to occur.
   LPG is extensively used throughout the South Island, in applications away from natural gas networks and by applications such as hospitality where replacement with electricity would be prohibitively expensive. Replacement of LPG by renewable LPG is critical for these applications and should be a high priority for research.
   Natural gas can be replaced by biogas from biomass and residual organic waste but development of that market will require significant assistance and management of the gas specification to ensure safety. It is recommended that blending of biogas into the natural gas market be investigated.

Currently the transition from coal and natural gas to low emission fuels is being undertaken in an ad hoc piecemeal manner with no linkage between government and the private sector. A partnership between government agencies and the private sector needs to be established and a joint Action Plan developed. This should be done quickly and have a joint steering body. Currently issues are not being addressed and opportunities missed resulting in a lack of focus and slow reduction in emission levels. Such an Action Plan should be adequately funded.

4. Urgently introduce regulation to ensure no new coal boilers are installed. (Action 7 P115)
   Supported. Will provide teeth to current decisions.

5. To establish a bioeconomy, greater government coherence and coordination is needed. Developing a plan for the bioeconomy alongside the new national energy strategy, across transport, buildings, energy, waste, land use and industry. (Action 6 P114).

   Supported. Bioenergy and biofuels are a subset of the full range of products that can be produced from biomass within a bioeconomy. As the bioeconomy expands (it is already large in NZ but not recognised as a sector) there will be increased competition for biomass. A healthy market for biomass already exists (export logs, lumber, manufactured wood products, bioenergy and extracted biochemicals). The supply of biomass is capable of expansion as the market expands. As is currently occurring, demand will stimulate and drive supply.
   The Ministry of Forestry is already developing a sector transformation plan and includes bioenergy and other bioeconomy products as down-stream products. The Ministry must continue to include all forestry and liaise with other entities including agriculture and horticulture from where biomass is sourced.
   In New Zealand the bioenergy and biofuels sector is based on the downstream use of residues from forest harvesting and processing, agriculture production, food processing and municipal organic wastes that cant be otherwise recycled or reused. The products are primarily bioenergy, biochemicals and biofuels but the coproducts also provide significant financial revenues. The success of bioenergy and biofuels downstream processing will depend on the availability of residues from very successful upstream production and processing. Bioenergy and biofuels are integrated into the upstream sectors as the bioenergy and biofuels sector is dependent on them wanting to gain revenue from their residues. Bioenergy and biofuels are also an integral driver for regional economic development, employment, and farming. The multifaceted reach of the bioeconomy requires improved coordination across sectors, between government and the private sector, and between research and application. The current ad hoc manner in which transition to a bioeconomy and to a low emissions future is resulting in missed opportunities for reducing emissions quickly.
   The feedstocks for a bioeconomy may come from wood, non-woody plants and residual organic wastes. The bioeconomy programmes must cover all feedstock sources as there are attributes of each which can assist production of specific bio-based products.

6. The Government needs to provide direction on the priority uses of bioenergy, to signal the optimal scale of a system, help overcome barriers, and to provide investment and procurement support.

   Partly supported. There is no need for Government to "provide direction on the priority uses of bioenergy" or "to signal the optimal scale of a system" as the interface between demand and supply is different throughout New Zealand and bioenergy is distributed energy with specific locational demand and supply requirements. What is required is a general support for transitioning from use of fossil fuels and support for those wishing to make the move.

Mandating transition from fossil fuels for all Crown entities (including local Government) would provide demonstration and lead by example.
Support to help the bioenergy and biofuels sector to promulgate best practice and provide independent advice would assist new areas of investment for bioenergy and biofuels. The current laissez faire approach to the market development means that opportunities are currently being missed because the parties are either not aware, or the transaction costs are too high.
An aspect about bioenergy facilities is that they often do not require large economies of scale and small to medium facilities may be optimal, and be an ideal size for managing risk. In general because bioenergy is distributed energy the size of plant is optimised for the specific application.
Large scale facilities for either bioenergy or production of biofuels could be built but these would need secure supply of large quantities of biomass. This could be achieved by establishment of long term contracts with agriculture and forestry land users.

7. Predicts 1000 job losses in the Oil & Gas sector by 2035. (P111) whether the skills of those who work in the oil and gas sector should be actively retained in Aotearoa for new low emissions industries.
   An opportunity supported. The potentially large number of people currently working in the oil and gas sector coming available is an opportunity for New Zealand to transition to a bioeconomy. These people have the skills and experience that will be critical for a bioeconomy and their capabilities are the foundation for transitioning to a bioeconomy where an immense range of new products based on biochemicals will eventually replace products currently produced from petroleum based chemicals.
   The skills and experience of these people are also critical for the production of biogas and biofertilizer from organic wastes, and the development and operation of biorefineries for the production of transport biofuels.
   This should be a flagship opportunity arising from the emissions reduction programme and not presented as a cost. However transitioning to a bioeconomy will require initial assistance from government for research and start-up funding. Governments such as Queensland[2] and the Netherlands[3] have recognised the opportunities and made bioeconomy a platform for new business growth.

8. The CCC is also calling for the creation of a strategic plan to decarbonise industries such as steel making, cement and petrochemicals, and greater efforts to develop low-emission fuels, such as biofuels and hydrogen.

   Supported. Except for some CRI the current public good bioenergy research sector is near non existent and there is a lack of research objectives and programmes. Research tends to be ad hoc and reactive rather than structured with objectives and programmes. Not only do we need to better build our research capabilities but we need to better recognise what our existing research entities are already capable of. Bridging the gap between laboratory and commercial application is a critical task worthy of government support, via initiatives such as demonstration and beacon projects.

9. There may be constraints on biomass supply in some regions where there is not significant forestry. Achieving this uptake will require the development of supply chains for gathering and processing biomass along with the establishment of local markets. (P64)

[2] https://www.statedevelopment.qld.gov.au/industry/priority-industries/biofutures
[3] https://bioeconomy.easteco.org/wp-content/uploads/2020/06/netherlandspositionbiobasedeconomy_fbrbiomassresearch_2016.pdf

Supported. A future shortage of biomass in any region will be a consequence of doing nothing. If biomass supply is approached as a collective managed activity there will be adequate amounts of biomass available for all uses. The biomass fuel supply chain has a sound foundation and it is currently growing as demand requires. There are no barriers to entry of new players and accreditation systems are in place to ensure that quality biomass is supplied to customers. Plantation forestry companies are already part of the supply chain and have the capability and incentives to make more biomass available to meet demand.
However the agricultural sector does not yet recognise the opportunity that providing biomass as a product of their land use can become a value revenue stream for their business. Biomass can be supplied from the approximately 6% of hill country sheep and beef farms that the Biological Emissions Reference Group has estimated could be afforested without negatively affecting production. Including the biomass that can be sourced from managed shelterbelts, and managed riparian planting would result in around 9% of farm land being able to be a source of biomass. The drivers for farmers to use such land is strong and initiatives for farms to have Environmental Management Plans is already underway. However the scope of such Plans must be widened so as to include all environmental aspects, including vegetation and tree management as a source of biomass, and not just focus on nitrogen management. An integrated Farm Management Plan that included agriculture and forestry would assist provide the very significant amounts of biomass that will be necessary if the objective of replacing fossil fuels is to be achieved at all, let alone within the timelines of the respective emission reduction budgets. Farmers can progress from being producers of food and fibre to being producers of food, fibre and fuel.
Failure to encourage use of forestry and farm residual biomass means that the opportunities are missed for landowners to source additional revenue from their forestry, agriculture and horticulture production residues. Instead the valuable biomass residues are wasted.
Currently farm forestry is often treated as if only by hobbyists yet it has significant potential and needs to be better recognised as being a serious contributor to emissions reduction and part of an integrated land use, contributing to farm business resilience and a source of biomass for commercial applications.

10. Biomass would expand at a faster rate than expected under current policy settings to meet the country's energy needs and replace coal and natural gas (P90)
Supported. However there will be a need for improved communication and planning between government agencies and the bioenergy sector. (Refer 5 above) Currently because of policy development sensitivities there is a lack of partnership between government and the sector.

11. Introducing measures to help reduce process heat emissions from boilers by 1.4 Mt CO2e over 2018 levels by 2030 and by 2 Mt CO2e by 2035. (Action 7 P115)

Supported. Having a planned bioenergy and biofuels programme would assist transition the sector faster. Currently programmes and activities are ad hoc and reactive rather than to a transformation plan. Different parties are doing their own thing as there is no coordinated planning and effort.

Unlike the coal and gas sectors which publish independent information on the future availability of natural gas or coal for different recovery confidence levels there is no such fuel projects available to the market for biofuels. MPI provide forecasts of future wood production but this is not a good indicator of the availability of wood residues which can be processed into being fuel. Scion undertook analysis of potential wood residues availability for the Bioenergy Association in 2017[4] but significant new plantings have occurred since then and

[4] https://www.usewoodfuel.org.nz/resource/residual-biomass-fuel-projections-for-nz

harvest practices are continually improving. Such analysis should be undertaken at least every 2 years.
While there is a current focus on transitioning from coal and natural gas fuels for process heat there are also many manufacturers who use diesel and LPG as boiler fuel. These should be included in any emissions reduction analysis as in many situations the facilities are small and it may be easier to replace diesel use in these boilers with a drop-in renewable diesel if it is available. Renewable LPG could also replace petroleum based LPG.
LPG is extensively used across the South Island and in off-network gas supply locations. The availability of renewable LPG would allow the continued use of existing LPG fuelled heat equipment thus avoiding unnecessary capital expenditure by facility owners.

12. Increasing support for identifying and reporting on emissions reduction opportunities in industry, including energy efficiency, process optimisation, and fuel switching. (Action 7 P115)

    Supported. Bioenergy and biofuels opportunities are generally regionally specific according to the availability of biomass and residual organic waste. A national approach can provide a very useful framework but regional action ensures a supply demand balance of biomass supply necessary to optimise opportunity success. Regional information on the opportunities for transition would assist collective regional action to reduce transaction costs and to provide economies of scale for fuel supply. Regional Councils should be required to provide annual reports on the sources of emissions within their region so that there is publicly available information on which action can be taken.

13. The CCC analysis includes solid biofuels from forestry and wood processing but ignores contributions from biogas from organic waste for heating.

    In the industrial heating section there is no reference to the effects of transition from fossil fuels by those food processors who are adopting circular economy practices to produce their own embedded energy (heat, transport and electricity) from residual organic matter arising from their manufacturing operations. Analysis shows that 4.6PJ of energy in food manufacturing (1.8Mt CO_2-e) could transition from fossil fuels by use of biogas produced from the site's own organic residues. This could be even more significant in the second and third budget periods.
    The use of organic waste is an opportunity ignored throughout the CCC document yet it is a problem requiring solution and while small in quantity is often easy to utilise. It is also already subsidized by avoidance of the waste disposal levy.
    The utilisation of wastewater biomass is a particularly example with double benefits. Currently most NZ municipal and industrial wastewater treatment plants use aerobic treatment, e.g. expend electrical energy to oxidize wastewater biomass to CO_2. Instead anaerobic treatment (biogas technology) could recover a large fraction of this biomass in the form of methane, while simultaneous lowering the electrical energy consumption of wastewater treatment. The Bioenergy Association therefore recommends that any new build or upgrade of large municipal or industrial wastewater treatment plants (capacity >3,000 kg COD/day) requires either an anaerobic primary treatment step (full stream) or anaerobic treatment of sludge and selected high strength wastewater fractions, with biogas recovery and utilization, as a mandated consent condition.
    Source segregation of the waste streams can maximise the value of the outputs from subsequent waste processing. Digestate from anaerobic digestion can be treated to be a high grate fertilizer but work needs to be done to ensure that all such fertilizer is sold.

14. The CCC analysis assumes a reduction in biomass supply over time because the supply has been linked primarily to existing forest harvest rotation times.

    Not supported. This assumption does not recognise how the biomass supply market operates. There is a difference between potential biomass availability and fuel supply. At any time supply of biomass as fuel is increasing to meet demand. Accredited solid biofuel suppliers source biomass from forestry and agriculture sources under often long term relationships. The plantation forestry owners are making more and more production residues available as demand requires. There is only a time related economic boundary as to the amount of biomass that can be made available from the forestry sector. As the demand for biomass increases for a growing range of bioeconomy products (including export) more hill country land can be used for forestry. (refer Scion Biofuels Roadmap analysis). In addition, if biomass supply is properly managed and sources from agriculture then, within the limits of sustainable land use, the supply of biomass should be able to always match demand. Availability will be affected by price and the alternative costs of energy applying at that time but in principle there is no technical reason why biomass supply, to meet all current predicted bioproduct manufacture, should not match demand.

15. Helping people to access capital to reduce barriers to the uptake of technology or infrastructure upgrades such as boiler conversions, energy efficiency technologies, and electricity network upgrades. (Action 7 P115)

    Supported. Access to capital is always a barrier and any financial assistance will have an impact on the speed of transition. However there are also other financial instruments such as accelerated depreciation which may be easier and cheaper to apply.

16. Commercial and public buildings can quickly transition away from coal to alternatives such as biomass which could use existing boilers. Our path assumes that by 2030 coal use in commercial and public buildings has been eliminated. The Government announcement in 2020 that all coal boilers in public sector buildings will be phased out is a step towards this. (P60)

    Supported. Wood pellets are used for heating in commercial scale buildings as a controlled heat source because their quality is homogenous and modern equipment can be automatically controlled. The level of transition is generally affected by the level of market and technical information available to building owners. A specific programme providing building owners with relevant information is required to transition heating in buildings from use of fossil fuels and this could be undertaken in partnership with government and the sector.
    Current Government programmes tend to focus on electricity solutions yet wood pellets can also be an appropriate solution in many situations. Focusing on electricity as the only solution supported, along with other demands for electricity, will put pressure on future electricity supply and cost. A total energy rather than an electricity focus for the energy sector will allow all the renewable energy sources to be optimised.

Transport

17. Commission suggests that we can cut out almost all emissions in Transport by 2050
    Current transport emissions are around 16.6 Mt CO2-e, to keep us on track they have to fall need to 8.8 Mt CO2-e (almost 50% by 2035).

    Aotearoa should take action to scale up the manufacture of low emissions fuels like biofuels or hydrogen-derived synthetic fuels in the first three emissions budget periods

That 6% of liquid fuels for domestic use are low carbon fuels by 2035

Supported. However to achieve these targets we have to lift our game very considerably from what is happening now (near nothing). We have biocrude technologies (Licella and Solray) already in NZ that are proven and ready to advance to full commercial scale but both require support. The level of research being undertaken into hydrogen and the Lake Onslow pumped storage electricity project shows what is possible when support is provided.
Government leadership and assistance similar to that which has been provided for electric vehicles, process heat, hydrogen and peak electricity would result in transport emissions starting to reduce immediately. The current hands off leave-it-to-the-market approach to transport will continue us down the current pathway which would result in little being achieved before 2050.
A transition pathway where immediate availability of gaseous and sustainably produced liquid drop-in biofuels can be from importing such fuels. This would result in emissions reductions occurring within months and not years. Use of imported transport biofuels would allow experience of use of such fuels in engines to be gained by operators and maintenance staff so that when domestic manufactured fuels come available vehicle owners will have already addressed any concerns of using fuels they are not used to.
The use of imported sustainable drop-in transport biofuels allow the continued use of existing engines thus avoiding capital expenditure. It would also provide a stimulus to invest in domestic fuel production.
Domestic production of low emission fuels can be accelerated if the feedstock initially comes from residual waste, including plastics, as this is already subsidised by the avoided waste levy. Turning waste into a crude oil is classified as a waste recovery operation. Many of the renewable/low emission fuel technologies coming available can process a wide range of feedstocks, including both residual waste and biomass, to produce a renewable low emissions crude oil which can be refined into a transport fuel. Over time, as the market for low emission fuels increases and the availability of residual waste reduces, then a greater proportion of the feedstock could come from biomass.

18. The commission suggests that no more light ICEs should come into the country from 2035

    Not supported. This ignores the use of drop-in biofuels in existing ICE's which can be done at near zero cost to the vehicle owner. The capital cost of replacing vehicle engines can be avoided if drop-in biofuels are made available. Reduction of emissions from transport can be achieved within months, rather than years if sustainable transport biofuels are imported. Existing infrastructure can continue to be used. The immediate use of imported biofuels would then provide incentive for domestic production of similar drop-in biofuels as a market would already exist.

19. no new public transport buses with internal combustion engines from around 2030-2035. (EV P 17)
    Not Supported. This policy ignores the opportunity for drop-in biofuels to be used for buses and long haul transport. If gaseous or liquid biofuels was imported then buses could become low emission transport within months. Imported fuels would require a subsidy but from a national perspective that cost would be offset by the avoided capital expenditure which is required by use of other low emission fuel options.

20. The CCC makes no reference to gaseous biofuels for transport

    Gaseous biofuels have been used previously in New Zealand (Christchurch WWTP, BTC demonstrator at Redvale landfill) as a transport fuel and there is no reason why WWTP

operators who produce biogas couldn't institute such a fuel use for on-site vehicles. In northern Europe gaseous biofuels are more common that liquid biofuels (Scania).

21. CCC recommend that, in the first budget period the Government take the following steps to support the use of low carbon fuels for heavy vehicles such as trucks, planes, ships, and off-road vehicles to meet emissions budgets: (Action 4 P 110)

    - Set a target and introduce polices so that at least 140 million litres of low carbon liquid fuels are sold in Aotearoa by 31 December 2035.
    - Introduce low carbon fuel standards or mandates to increase demand for low carbon fuels, with specific consideration given to aviation.
    - Introduce incentives to establish low emissions fuel plants, such as biofuel sustainable aviation fuel, and make those fuels more competitive with traditional fossil fuels.
    - Place further emphasis on decarbonising the rail system, and establish an investment strategy and clear targets to increase the share of rail and coastal shipping.

    Supported. The CCC report discusses electrification of rail but fails to include that liquid or gaseous biofuels can be used in the existing diesel engines thus avoiding unnecessary capital expenditure on new engines and extensive infrastructure.
    Beyond completing the electrification of the Auckland -Wellington rail line there is limited value in building and using sparsely used electrification infrastructure, particularly in the South Island when drop-in liquid biofuels are available. Immediately importing liquid drop-in biofuels could result in 100% of the rail network becoming low emissions within months rather than decades.
    Coastal shipping has generally been ignored, yet because limited infrastructure would be required, this is a sector where emission reductions could be achieved quickly by use of imported sustainably produced liquid biofuels.
    Heavy duty land transport could be reducing emissions already by use of drop-in liquid biofuels in existing engines. The major barrier has been a lack of focus on promoting development of the gaseous and liquid biofuels markets. The development of the electric vehicle and production of hydrogen have shown what can be achieved when there is a priority on achieving progress quickly.
    Replacement of diesel in off-road machinery and vehicles would be difficult for electricity but drop-in liquid biofuels could be used without any capital expenditure and as soon as the fuel is available.

22. No further internal combustion engine light vehicles imported after 2032.

    Not supported. Such a policy would limit the ability of use of drop-in liquid biofuels in existing ICE and lock in the performance and cost risk of electric vehicles. Electric vehicles are often not appropriate for many rural vehicle owners who have to travel long distances in a short period of time, or operate tractors and earthmoving equipment etc off-road.

23. Electrify medium and heavy trucks (Table 3.1 P55)

    Electric vehicles for heavy long haul freight are only just emerging and so it is too early to be mandating electric heavy vehicles. There is also the very significant cost of unnecessary vehicle replacement when drop-in liquid biofuels can be used in the existing vehicles today. The solution of importing sustainably produced liquid biofuels is not addressed by the CCC advice yet it could be one of the quickest and cheapest emission reductions available for heavy vehicles and rail.

24. Biofuel blending (Table 3.1 P55)

    The current technical availability of drop in biofuels means that unlike hydrogen or EV new infrastructure does not need to be installed. The flexibility provided by liquid biofuel arises because it can be used where available but otherwise the vehicle can use mineral fuel until biofuel can again be sourced. Blending biofuels such as biodiesel can be a good transition provision.

25. Start electrification of ferries and coastal shipping

    The use of liquid biofuels in the existing ferries and coastal shipping can occur immediately with the additional benefit that NZ would them comply to the international MARPOL requirement to stop using high sulphur fuels. Use of drop-in biofuels would allowance of existing engines.

Agriculture

26. Farm businesses will need to adopt practice changes and take up new technology as it becomes available. Action could result in improved international market access. However, it may be challenging for the food and fibre sector to pass on any costs. (P88)

    Supported. However encouraging and assisting farms to be total integrated business following circular economy principles can result in improved business resilience and increased revenue from sale of energy products such a biomass for fuel. Adopting practice changes shouldn't be thought of as a cost but as possible additional revenue sources.
    If farms look to use their residues from crops and animal husbandry (stover, dairy effluent), horticultural mulches (dairy stand-off pads) wood fuel (woodlot thinnings, end of life erosion control plantings) and plant managed (3 row) shelter belts, to produce biogas and for sale as solid biofuel, then additional revenue streams will be achieved leading to improved business resilience.

27. CCC heard throughout their engagement about the concern that whole farms could be planted in exotic forests, either for production forestry or permanent carbon forestry. This could have impacts on rural communities and the wider food and fibre sector. (P98)

    Less productive land could be afforested with little impact on farming productivity or employment. (P99)

    The Biological Emissions Reference Group estimated that approximately 6% of hill country sheep and beef farms could be afforested without negatively affecting production. This equates to approximately 250,000 hectares. (P100).

    Agriculture, horticulture and forestry should be encouraged as part of integrated farm management. Production forestry and traditional farming can coexist as they can be complementary land uses. Often 6-9% of a farm is not productively used and these areas can be used for production forestry to produce farm revenue.

    As New Zealand transitions to a bioeconomy there will be a lot more rural based industry re-establishing where previous communities have disappeared. For example the extraction of resins and essences from biomass are often done close to source so as to avoid high biomass transport costs.
    A reimagining of farming as multi production and based on circular economy, bioeconomy and sustainable land use can improve farm profitability. Farming should be for food, fibre and fuel.

28. The number of jobs generated across the value chain by production forestry, permanent carbon forestry, and sheep and beef farming. (P99 Table 5.1)

    A bioeconomy will create more rural employment and so encouraging rural communities to attract these new business opportunities to locate nearby should be occurring.

29. Capacity building and extension services for landowners focused on integrating trees or forestry onto farms rather than wholesale land use change could limit the impacts of afforestation. This could be facilitated by developing carbon monitoring systems that allow for tracking and rewarding sequestration from smaller or dispersed areas of trees. (P99)

    The He Waka Eke Noa Partnership to develop a farm level pricing system. The partnership is also developing the information and support needed to manage farms in a low emissions way, including training, extension, and farm and forestry advisory services. (P118)

    Supported. A complete widening of the thinking about what is agriculture needs to come from the development of wide national thinking. This is already occurring with regenerative land use and the work of the He Waka Eke Noa Partnership. However the profile of existing changes needs to be extended so that people become attracted to this transition.
    Economies of scale will be assisted if farmers work collectively with neighbours to be able to provide long term biomass supply contracts. Farming has a long history of collective cooperation and that will manage risk of new ventures.
    Setting a goal of farms becoming net zero emission emitters would encourage land users to adopt mitigation practices that would not otherwise occur.

30. However, native afforestation could be suitable for areas of less productive land where exotic afforestation is inappropriate. (P99)

    Many sheep and beef farms have areas of land that are steep and susceptible to erosion. These areas could be particularly suitable for permanent forests. (P99)

    Not supported. From a climate change perspective the locking up of land in native forestry should only be encouraged where the ability to harvest tress sustainably is extremely difficult. Production forestry is essential for providing the volumes of biomass which would be required if all applications from its use (bioenergy, transport biofuels, engineered wood products, biochemicals, animal bedding) are to be met. Sustainable forestry and harvest practices are already being developed and implemented which will address concerns about some current plantation forestry practices. Continuous rotation exotic plantation forestry is the equivalent of permanent forests, but with additional economic and emission reduction benefits.

31. The CCC draft refers to agriculture tree planting but does not refer to the opportunities that cropping can provide to reduce emissions from farms.

    Where farms integrate energy crops with their normal activities the farm business residence can be improved and emissions reduced:

    - *Farmed non-woody biomass can be grown as a break crop to improve soil fertility and as an additional source of revenue. Previous experience in the Canterbury region with the growing of rape to produce high oil seed for manufacturing into biodiesel showed how rape could be an attractive break crop for cereal crops.*
    - *Liquid biofuels, particularly drop-in renewable diesel, can be scaled up quickly using non-woody biomass (preferably giant Miscanthus), including in regions/districts without forests. This will assure that total biomass supply will respond to demand as production ramps up.*

- *Non-woody biomass use for production of drop-in renewable diesel will give much higher mitigation of emissions than forest biomass since (if farmers opt to grow it on current pastoral land) it will result in some reduction in livestock numbers.*
- *Along with the production of liquid biofuels from non-woody biomass crops there is also good potential to scale up biogas production by AD by using the crop as a supplementary feedstock. There are multiple use options in rural areas.*
- *Most good pastoral sites for forestry conversion are in sheep/beef farms, while the proposed land for arable biomass crops (the less productive class of arable land that is too drought prone for valuable feed crops) would be as likely to be on dairy farms.*
- *Plant & Food Research findings have indicated that all annual fossil fuel use by agriculture, fishing and forestry could be replaced with crop biofuels using less than 5% of a less productive arable land category called 'summer dry.' This is a small part of total dairy land used for grazing and feed crops.*
- *New published research by NZ scientist Louis Schipper and a US collaborator indicates that forest photosynthesis may be halved by 2040 due to the warmer climate, setting off a tipping point. The species that will not be affected by warming (with C4 type photosynthesis) are tropical grasses—like Miscanthus.*

Forestry

32. CCC sees pinus radiata playing an important but declining role. Estimates from recent studies suggest there is on the order of 1,150,000 to 1,400,000 hectares of marginal land that could be planted in forestry. As much of this land is steep and prone to erosion, we consider that it would be more suitable for permanent forests, particularly native forests. (P67)

    Not supported. The ability of pinus radiata to grow fast in New Zealand and on difficult slopes from where it can be harvested is extremely valuable as a source of biomass to replace fossil fuels. Without it being so readily available it will make it extremely difficult to meet the replacement of fossil fuel targets recommended by the CCC. The wealth possibilities from transition to a bioeconomy will depend of having adequate quantities of biomass such as pinus radiata which can be commercially harvested.
    The immense availability of biomass from hill country forestry needs to be recognised as the foundation for development of a bioeconomy. It is a source of our future wealth and because of the experience of our forest harvesting capability it is our "gold mine" for wealth creation – but we have to change our thinking about it.

33. Bioenergy offers a low cost route for decarbonising some sectors, including process heat. Overall, there appears to be a large potential biomass supply from collecting and using waste from forestry and wood processing. However, the availability is likely to vary across the country due to regional mismatches in supply and demand of biomass, and the cost of transporting biomass. While the supply of biomass residues may appear to be abundant in some regions, trade-offs may also need to be made when deciding what parts of the economy to decarbonise using biomass first. (P68)

    Not supported. Biomass can be grown nearly anywhere in New Zealand so if over time some regions have some difficulty sourcing solid biofuels then there will be incentive for farmers to look at extending their on-farm plantings.
    Solid biofuel supplied inter-region is often not costly and there are minimal additional emissions as backloading on empty returning trucks often occurs.

In a number of regions the limited availability of residues for bioenergy are because of overly restrictive regional rules prohibiting forestry. The regional rules for forestry are limiting the ability of landowners in that region from growing trees as part of their land management. The rules are overly restrictive and applied to areas where they may not be necessary. Rather than have forestry not permitted there should be a greater use of discretionary rules specific to each parcel of land. Adopting farm land management plans covering all land uses, including tree planting, would allow specific land to be managed sustainably without overly restrictive regional rules..

34. Ramp down planting new exotic plantation forests for carbon storage

    Not supported. New forest plantings should not be just for carbon storage. The plantings should be multipurpose with carbon storage being a bonus. The primary reason for planting plantation forests should be for the full range of products such as land management, export, lumber, bioenergy, biofuels and engineered wood products. Such an approach can reduce the costs to society of emissions reduction.

35. Implementing measures to incentivise establishing and maintaining at least 16,000 hectares of new permanent native forests per year by 2025, increasing to at least 25,000 hectares per year by 2030 and continued until at least 2050. (Action5 P123)

    Native forests remove carbon at slower rates than exotic planted forests, but permanent native forests continue to remove carbon for hundreds of years. Native forests also offer other benefits, such as long-term erosion control, improved biodiversity and recreational benefits. There is an estimated 1.15 to 1.4 million hectares of erosion prone land, much of which would not be suitable for production forestry but could be suitable for converting to permanent forest. Manaaki Whenua estimate around 740,000 hectares of marginal land not suitable for commercial forests could naturally regenerate (i.e. without planting) if pests are managed. Some of this land is government owned. (P121)

    Not supported. This is selective thinking as each of the points listed can also apply to exotic plantation forestry.

36. Requiring an appropriate forest management plan for all forests over 50 hectares defined as permanent to monitor the forest's permanence and limit exposure to risks such as climate change impacts, governance failure, and community impacts. (Action5 P123)

    Supported with modification. The forest management plan should be included within the overall land (or farm) management plan. Forestry is only be one land use and where appropriate should be integrated with farm land use.
    The 50 ha requirement should be dropped as it excludes much of farm forestry such as managed shelterbelts and woodlots which can be an easily harvested source of biomass.
    The definitions of what plants should be included within carbon accounts needs to be rethought as every plant absorbs CO_2. Farmers are currently disadvantaged by the NZ ETS rules as they receive limited credits for the absorption from planting on all their land. Land use should be treated on a net emissions accounting basis so that credits are provided for absorption or sale of say solid biofuel from the land and debits recorded for biological emissions etc. A policy of farms being zero net emitters by 2035 would incentivise farmers to think about their options and to pursue them. The current often conflicting policies regarding land use is administratively clumbersome and does not provide good incentives for land owners to make good decisions. Credits for native or production forestry would recognise how most farms can do both with a resulting net emissions reduction.

37. Designing a package of policies that must include amendments to the NZ ETS and land use planning rules, to deliver the amount and type of afforestation needed over time to align with our advice on the proportion of emissions reductions and removals and addressing intergenerational equity. (Action5 P123)

    Supported. Many of the current NZ ETS criteria prohibit the recognition of the positive contribution of net emissions reduction farm forestry (limits on shelterbelt width, exclusion of biomass energy crops such as miscanthus because of height limits). Farmers are currently disadvantaged because of the rules around the NZ ETS.

38. Do you support our approach to focus on growing new native forests to create a long-lived source of carbon removals? Is there anything we should change, and why? (Q11 P49)

    Strongly not supported. It is a policy which ignores the other economic and social benefits which other forestry can provide. Native forests sequester C very slowly compared to our most productive exotics, and areas of native forest required to have the necessary impact on our C accounts by 2050 are simply too large and expensive for us to contemplate.

Waste

39. From 0.14 (today) to 0.12 Mt CH4 by 2035

    Not supported. A much greater amount of emissions reductions could be achieved if government established a circular economy programme of activities similar to what has been done for electric vehicles.
    Adoption of a policy of zero organic waste to landfill by 2030 would provide a strong driver for using organic residues rather than disposing of them to landfill where uncaptured methane is produced.
    The bioenergy contribution from the wastewater sector could also be much larger if priority would be given to anaerobic treatment with biogas recovery rather than traditional, energy intensive aerobic treatment.
    Currently the lack of encouragement and funding for use of residual waste activities means that a slow pathway to emissions reduction is occurring. Bioenergy Association has the structure and foundations for providing leadership but funding is required.

40. Pushing for a circular approach to waste. Reusing and recovering waste materials is a key part of a circular economy. The CC path would see a reduction in the amount of waste generated and a focus on reducing the amount of organic waste, such as food, wood and paper, that go into landfills.

    Supported. Many food processors are looking to convert organic residues into energy, biofertiliser and clean water for use on-site. Embedded energy from processing the site's residual waste could be the least cost energy for a manufacturer but there are currently a lack of demonstration sites and experienced advisers to assist. Internationally food processors are adopting circular economy processes. Bioenergy Association could expand its current activities in this area but funding similar to that which has been provided for expansion of the electric vehicle market or the replacement of fossil fuels for process heat would be required.

41. The New Zealand Waste Strategy 2010 is due to be replaced, providing an opportunity to set ambitious waste reduction targets and supporting policy. Suggested approach: reduce waste where possible, covert waste, capture leftover waste (P124)

    Supported. The current focus on minimisation of waste is at the cost of a more sustainable policy of minimise <u>and</u> use (recycle) residual waste so that zero waste goes to landfill. The

production of energy from waste is a form of recycling. The Waste Strategy needs to be revised so that use is seen as an important part of the package.
The pathway for achieving maximum emission reductions from waste must be through a Waste Strategy which enables and encourages a vision of zero organic waste to landfill by 2035.
The waste strategy must work at all levels of the waste hierarchy with minimisation and recycling as the highest priority and a focus on source separation of municipal and commercial residuals will assist minimisation and recycling. Source separation of residuals will also enhance the use of the material that hasn't been able to minimised or recycled in other ways. Separated residual organic waste can be composted or processed in an anaerobic digester to make valuable fertiliser and energy. Any remaining unseparated mixed residuals can be treated to produce energy with the result of there being no organics remaining that has to go to landfill.
The revised Waste Strategy needs to take a holistic approach to waste at all levels of the hierarchy and go beyond minimisation.

42. A lack of collection and processing infrastructure means that opportunities to divert and recover waste are currently inconsistent and limited. (P124)

    Supported. Because the focus of the waste policies is on minimisation that has been little attention to separation and collection of wastes. Source separation of organic wastes reduces the costs of later handling activities and also allows for processing into higher value products such as certified biofertiliser, compost or energy.

43. The CC path assumes minor improvements in landfill gas capture through increasing site coverage and efficiency to reduce total methane emissions from waste by an additional 4% by 2030.

    Supported. Assistance to improve capture at existing landfills would encourage it to occur. Currently the economics to improve capture is not strong enough so assistance is required. If a policy of zero organic waste to landfill by 2030 is implemented then the economics are reduced further and greater assistance is needed.

44. Setting ambitious targets in the New Zealand Waste Strategy for waste reduction, resource recovery and landfill gas capture to reduce waste emissions in Aotearoa by at least 15% by 2035. (Action 13 P125)

    Supported with modification. The targets should be on a regional basis so that local authorities are incentivised to lead with local solutions. A national target means that no one is incentivised.
    Regions should be required to produce annually a report on all emissions from within each region. That would provide information on where action should and can be taken. In other words a regional inventory which would be site specific.

45. Investing the waste levy revenue in reducing waste emissions through resource recovery, promotion of reuse and recycling, and research and development on waste reduction. (Action 13 P125)

    Supported. The criteria should be wide enough that sector development such as can be done by organisations such as the Bioenergy Association can be funded.

46. Action 13 P125 Measuring and increasing the circularity of the economy by 2025.

    Supported with modification. The targets should be on a regional basis so that neighbouring business are encouraged to work collectively for local solutions.

The Bioenergy Association is encouraged at the extent of the analysis, research and consultation which the Commission has undertaken and recommends that the commission continue this level of activity rather than just have it done when required to provide period budget advice to Government. The process the Commission has followed has provided data and facilitated discussion across many groups working to provide feedback. In order to achieve the emissions reduction targets this level of research and discussion must continue. The Commission has proven it has the ability to provide the appropriate leadership. However the Bioenergy Association is concerned that there is a lack of similar leadership across government entities regarding funding and facilitation to ensure implementation of initiatives.

The Bioenergy Association would like to meet with Commission staff to discuss the feedback provided and will participate in any working groups/meetings established.

Regards

Brian Cox
Executive Officer
Bioenergy Association