

**Low-emissions economy inquiry**  
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**Submission by Hitachi Zosen Inova Australia (HZIA)  
Consultation: Low emissions economy inquiry**

Hitachi Zosen Inova Australia Pty Ltd (HZIA) is a fully owned subsidiary of Hitachi Zosen Inova AG, Zurich, Switzerland (HZI). HZI is the world leader in the supply of biological and thermal Energy from Waste (EfW) solutions:

- Biogas, compost and fertilizer from organics (food & green waste) with HZI Kompogas® Dry Anaerobic Digestion (AD) with more than 80 plants delivered worldwide
- Process steam, electricity, district heating & cooling, aggregates and metals with HZI grate based combustion technology with more than 500 references worldwide
- Underlying proprietary technology resulting in safe, reliable, and energy-efficient solutions
- World-leading turn-key EPC provider of EfW plants inclusive operations & maintenance

The following comments are based on our experience worldwide and reflect our commitment to provide sustainable waste recovery solutions.

**Overview and recommendations**

Waste contributes 5% of New Zealand's greenhouse gas emissions. Using the waste instead of landfilling it contributes in multiple ways to greenhouse gas reductions not only in the waste, but also the energy sector:

- Banning of all untreated waste going to landfill reducing greenhouse gas emissions to zero
- Driving this by introducing a significant levy in the range of \$150/t (\$5/t for soil like materials)
- Encourages increased source separation and recycling as well as composting and anaerobic digestion of organic waste (food and green)
- Use of anaerobic digestion to produce energy (electricity, biomethane, compressed natural gas)
- Combustion of residual waste to produce steam, electricity, district heating & cooling, and recycle aggregates and metals

Please note that contrary to public opinion and most waste industry voices in NZ, the above proposal will increase composting and recycling and is not an environmental threat.

We encourage you to consider Best Available Technology by:

- Fulfil our societal obligations under the Paris Agreement to move towards a sustainable society
- Ban all untreated waste going to landfill in line with European Community and replace the NSW EfW Police with the European EfW standard (WID/IED)
- Ramp the landfill levy to the same level as in the UK and a lower rate for ash material (also applicable for ash from coal and biomass power stations unless recycled).
- Hypothecate all levies raised back to industry (composting, recycling, Energy from Waste, landfill remediation) to make (nearly) zero waste to landfill happening
- Introduction of Standard Rules SR2012 No13 from England and Wales as a proven standard for millions of tons of bottom ash recycling every year (attached)
- Best practise study tour to Europe (UK EPA, AD and EfW plants)

The last point being the most important point, we would be happy to facilitate a program to visit some EfW plants and facilitate discussions with respective local and state regulators, politicians and community groups. We suggest visiting and meeting with:

- Ferrybridge FM1 (in operation) and FM2 (in construction), near Leeds UK
- Severnside near Bristol UK
- Riverside in London UK
- UK EPA

Please find attached further answers to the questions and a presentation outlining the high-level impact on the greenhouse gas emissions (minus 4.2 mio t/y) which will turn from net contribution to abatement (estimated at 0.6 mio t per year).

If requested, I would be pleased to provide further evidence or information to the inquiry.

Kind regards

Hitachi Zosen Inova Australia Pty Ltd



Dr. Marc Stammbach

Managing Director

Attachments:

- Brochures HZI Company, Kompogas, Ferrybridge, Riverside, Severnside
- Presentation "An inconvenient truth: How NZ can take off to Paris with Energy from Waste"

## Response to specific questions

### **Q1: How can the Commission add the most value in this inquiry?**

Banning of all untreated waste going to landfill will drive recycling, composting and treatment of residual waste.

### **Q2. Chapter 3 of this issues paper mostly looks at ways to reduce emissions directly at their source. What other approaches would help identify opportunities to effectively reduce emissions?**

While the reduction of emissions at source puts a clear focus on an action which has clear linkage to GHG emissions and is not only identifiable but is measurable, there is often a disconnect between the investor and the beneficiaries of climate change action.

The ETS is a slow, inefficient and indirect mechanism for encouraging transition from use of fossil fuels. If we want it to occur by 2030 then we need a more direct mechanism. This could include a tax with recycling of the revenue to assist faster transition, or even more direct public investment to lower the risk for participants. This could involve lifting public investment in the traditional area of public good pre-commercial R&D.

Another mechanism could be for Government (on behalf of the community) to purchase units of emission reduction. The purchase of emission reduction units would be directly linked to the outcome of specific projects. This could be similar to the previous New Zealand Government **Projects to Reduce Emissions Programme** which assisted get many emission reduction projects implemented.

The purchase of emission reduction units recognizes that the community should pay for externalities/public goods such as greenhouse gas emission reductions.

Adoption of a carbon tax which can be directly applied to fossil fuel users would also produce revenue which can be recycled back into assisting business transition to a low carbon economy. This has already been done in a way by the waste levy which is recycled into waste minimization projects and recently into waste –to-energy projects eg tyres.

Many of the benefits of transition from fossil fuel to biomass fuels accrue to the community but currently there is no explicit payment to the investor for these benefits. This is a market failure. A direct carbon tax approach similar to the Road tax would be direct, simple to administer and allow recycling of the tax revenue back into greenhouse gas emission reduction opportunities.

Liquid and solid organic waste along with proven conversion technologies can provide biofuel resources which can replace fossil fuels. The current central and local government

waste policy focus has been on waste minimization and limits utilization. Being able to use waste as a tool for greenhouse gas emission reduction will require legislative changes and a refocusing of current waste management practices.

The current approach to greenhouse gas emission reduction tends to look at opportunities each in isolation when a total value chain approach would unleash a wider range of opportunities. Consideration of the whole value chain also opens up the potential to meet the same needs in completely new ways. It is recommended that the Commission look at the wider benefits, identifying and quantifying some of the different value chain activities, and develop targeted measures.

### **Q3**

**To what extent is it technically and economically feasible to reliably measure biological emissions at a farm level?**

### **Q4**

**What are the main opportunities and barriers to reducing emissions in agriculture?**

The focus of policy work to date in the agricultural sector has been biological emissions and other emission reduction opportunities in agriculture have been ignored. These emission reduction opportunities available to farmers to offset their biological emissions will be significant and should be considered, but need to be addressed across the total value chain. For example farmers are able to source biomass which can be used by food processors as a replacement fuel for coal, which indicates that the parties need to work together. There needs to be mechanisms to facilitate addressing the current gaps across the food production and processing sector.

The wide range of opportunities for assisting reduce emissions on farms can include:

- Collection and processing of animal excrement into biogas and fertilizer to avoid runoff into waterways.
- Use of biogas produced on-farm as biomethane fuel for vehicles, heat and on-site electricity use.
- Use of land not in efficient farm production (gullies, steep slopes, shelterbelts etc) for the growing of trees. The trees can provide additional revenue streams to landowners from export, processing into lumber and processing into wood fuel.
- Collection of forest harvest residues from farm forestry for use as wood fuel.
- Use of break crops and crop production residues eg corn stover, straw etc as a supplementary feedstock for anaerobic digestion of organic matter and production of biogas and fertilizer.
- Use of break crops such as rape as a feedstock for the production of liquid biofuels.

- Pelletising of herbaceous matter eg straw, miscanthus etc for use as a fuel in industrial heat plant.

The opportunities to reduce emissions in agriculture are complementary to traditional farming and are not instead of. In the New Zealand context the bioenergy opportunities are based on the use of crop production or food processing residues so are fully sustainable. At present there appears little economic justification for the growing of energy crops.

In order for farmers to minimize the externality risk they face from farm emissions there needs to be mechanism for offsets to be recognized so that net farm emissions (including offsets) are considered.

## **Q5**

### **What are the issues for government to consider in encouraging alternative low-emissions land uses?**

While land use is largely in the hands of land owners the long lead time for many greenhouse gas reduction or mitigation opportunities eg forestry, results in opportunities being forgone. Purchase of emission reduction units by the Government from landowners can move the focus of investments from short term to long term thus assisting adoption of low –emission/mitigation land uses.

The bioenergy sector value chains involve many different participants from land owner, forest owner, biomass residue collection, processing of residue into fuel, and delivery by biomass fuel suppliers. This is unlike the other renewable energy sources such as hydro, solar, wind and geothermal where the energy resource is homogenous and involves few parties. The bioenergy market is thus more complex and this in itself is a significant market barrier which necessitates development of a number of tools, information dissemination, best practice training and facilitation.

## **Q6**

### **What are the main barriers to sequestering carbon in forests in New Zealand?**

The lack of a supportive forestry and wood processing sector strategy is a significant barrier. As a result forest owners act only in their own short term commercial interest whereas a long term strategy would encourage long term benefits such as for climate change . This is a market failure. Purchase by the Government of emission reduction units from additional forest planting would be a payment for these community benefits. They can also be linked to the community benefits of added value processing of the wood occurring within New Zealand instead of export.

Biomass from wood processing is the best source of wood fuel so the stronger and bigger the wood processing that is undertaken within New Zealand the more fossil fuel substitution can occur.

#### **Q10**

##### **In addition to encouraging the use of electric vehicles, what are the main opportunities and barriers to reducing emissions in transport?**

Electric vehicles have positive attributes for short cycle use but long cycle and heavy load use will probably be a challenge for a number of years. This is where liquid and gaseous biofuels will have a decided advantage over electric as liquid and gaseous biofuels require minimal modification of vehicles, and infrastructure additions for heavy road transport can be modest.

Heavy grade liquid biofuels for marine and rail applications are technically available today but market demand is necessary to get them to the stage of commercialization. With other policy drivers, such as a requirement to move to low sulphur fuels in marine applications, a transition to low carbon transport could occur within a short period of time.

While the users of vehicle fuel are principally influenced by price there is no payment to biofuel sellers for the community environmental benefits such as clean air and reduced sulphur emissions. Again a market failure.

However it is quite possible that a market that is willing to pay the premium for biofuels will emerge for transport in sensitive industries (e.g. food, tourism). Underpinning work on this potential willingness-to-pay and positioning NZ to meet the market is required to reduce the risks and potentially realise a significant opportunity.

#### **Q11**

##### **What are the main opportunities and barriers to reducing emissions from the use of fossil fuels to generate energy in manufacturing?**

Biomass can be used as a replacement for fossil fuels in a wide range of applications around the supply of heat, and onsite electricity used in manufacturing.

There is enough recoverable woody biomass available throughout New Zealand that 60% of current coal use in heat plant could be replaced by biomass fuel. Bioenergy Association has identified that 4PJ pa of existing coal fueled heat plant could convert to wood fuel by 2030 and 11PJ pa by 2040. By 2040 this would require an additional 2 million tonnes of wood fuel per annum and produce emission savings of 1000kt CO<sub>2</sub>-e per annum.

Because of the emerging nature of the wood fuel supply market the timeline is out to 2040 as under current policies the growth in fuel supply has to evolve in an orderly manner through incremental growth. To achieve these emission reduction levels would require the New Zealand Energy Efficiency and Conservation Strategy (NZECS) to be fully implemented by 2022. (Without a plan for implementation as at present this is unlikely to occur). The 2040 level of substitution opportunities could be achieved by 2030 if more progressive low carbon economy policies than are currently in the NZECS were adopted.

The main barrier to the use of wood fuel to reduce greenhouse gas emissions is that unlike other renewable energy sources biomass is generally non homogenous, comes from many variable sources and involves many different parties throughout the value chain. Minimisation of the risk of biomass fuel supply requires aggregators of the fuel, and good fuel recovery and preparation, so that a consistent and reliable fuel is available to heat plant owners and operators. If the wood fuel supply market continues to be treated as a simple commodity market such as coal and gas then its growth will be slow. If however assistance to development of the biomass fuel supply market is provided so that it is efficient and encouraged to grow, then the growth in replacement of coal will be greater than currently assumed.

Adoption of waste-to-energy programmes around use of solid and liquid municipal waste and food processing waste could result in emission reductions of 90kt CO<sub>2</sub>-e per annum by 2030 and 150kt CO<sub>2</sub>-e per annum by 2040. Many of the waste-to-energy opportunities are financially attractive today with around 4-6 year financial payback periods but because waste-to-energy is not currently recognized by Government as an greenhouse gas reduction opportunity the sector will take some time to get momentum. The way in which waste is often collected results in it either not being available or is contaminated and unusable except for disposal in landfill.

Waste-to-energy greenhouse gas emission reduction opportunities are often potentially very attractive as waste is currently often a cost to communities and has an existing waste levy to encourage use instead of disposal. Methane is also 23 times more significant as a greenhouse gas than CO<sub>2</sub>.

The current Government targets of 1% reduction is related to GNP productivity is not applicable to assessing individual manufacturing opportunities so has no relevance to the market other than as measure for Government. Targets that are relevant to specific sectors and applications need to be developed so that they can relate to specific programmes or interventions. These could and should be regional and include both CO<sub>2</sub> and methane emissions.

The ETS is premised on the believe that it will affect the market cost of using fossil fuels. As a micro economic tool for decision makers it provides little assistance in the short term as it is too indirect and at the whim of other parties actions. A more direct market intervention such as a carbon tax would be relevant to individual business decision making. A carbon tax

would also result in funding which could be recycled to assist greenhouse gas emission reduction opportunities.

#### **Q12**

**What changes will be required to New Zealand's regulatory, institutional and infrastructural arrangements for the electricity market, to facilitate greater reliance on renewable sources of energy across the economy?**

The wood energy market is focused only on heat and onsite electricity supply because of the relative economics of electricity from other renewable energy sources. However the waste-to-energy market can produce biogas which is storable for use at periods of peak electricity demand when electricity prices are higher. The value of biogas as a controllable electricity source and biomass to substitute for electric thermal loads would be enhanced with greater adoption of time of day electricity pricing in the retail electricity market.

#### **Q13**

**What evidence is there on the possible physical effects of future climate change on sources of renewable energy in New Zealand, such as wind, solar and hydro power?**

The rate of growth of biomass will be affected by changes in ambient temperature and CO<sub>2</sub> concentrations but on the other hand more extreme climates resulting in high winds and catastrophic fires can destroy forest sources. We would note that NIWA in a report for MfE has suggested the impacts of climate change this century are unlikely to statistically significant.

#### **Q14**

**Apart from the regulation and operation of the electricity market, what are the main opportunities and barriers to reducing emissions in electricity generation?**

As noted earlier, getting clean electricity will require reducing the level of fossil fuels generation, predominantly for peak loads and dry years. Storage (including EVs) and demand side management will help manage some of this, but biofuels both centralized, district and by end users will have an important part to play.

#### **Q15**

**What are the main opportunities and barriers to reducing emissions in**



**industrial processes (such as the production of steel, aluminium and cement) and in product use (such as the use of hydrofluorocarbons in refrigeration and air conditioning equipment)?**

There is some experimentation with the use of biomass to replace coking coal (Carbonscape), but that is currently small scale.

#### **Q16**

**What policies and initiatives would best promote the design and use of buildings that produce low greenhouse gas emissions?**

A greater use of timber in buildings would result in more wood processing which produces the best biomass fuel.

The use of wood pellet fuel in residential heating not only reduces the use of fossil fuel but because it is a controlled combustion to produce heat and clean air contributes significantly to the improvement of air quality in urban areas.

#### **Q17**

**What are the main opportunities and barriers to reducing emissions in waste?**

Disposal of any organic waste to landfill will result in methane emissions which are 23 times more significant than CO<sub>2</sub> as a greenhouse gas. Landfills are an inefficient method of processing waste as only around 60% of methane is captured at the best designed and managed landfills. All organic waste can be processed into energy by use of proven technologies. The barrier to this occurring is not economic but by the waste management practices occurring throughout New Zealand. Best practice waste management could result in near all organic waste being used productively as a source of energy. This has been recognized by territorial authorities adopting *zero organic waste to landfill* policies but they need assistance on how this can be achieved.

Liquid trade waste currently processed in sewage treatment facilities or disposal to landfill can all be utilized to produce energy.

Modern waste-to-energy practices and technologies could result in near 100% of methane produced from waste being removed as an emitted greenhouse gas.

Waste-to-energy plant based on anaerobic digestion can be located in urban areas and efficiently process all food waste. By choice of location close to the food waste source waste transportation emissions can be reduced significantly. Internationally anaerobic digestion

facilities are located in urban areas without consenting problems. Combustion of waste can also be undertaken in urban areas when the plant is designed to meet appropriate consent conditions.

The biggest barrier to the reduction of emissions from waste is attitudinal and a lack of will by territorial councils to want this to occur. Guidance from Government would assist address this barrier.

## Q18

**Policies to lower emissions from particular sources, technologies and processes can have interactions with emission sources in other parts of the economy. What are the most important interactions to consider for a transition to a low emission economy?**

With regard to bioenergy opportunities there are three important policy cross linkages.

1. Implementation of the NZ Energy Strategy (NZES) and NZEECS. The Key Focus Areas of the NZES related to *Developing our Energy Potential* and the NZEECS relating to *Unlocking our energy productivity and renewable potential* set out tasks and actions which would significantly achieve the stated objective of *Reduce energy-related greenhouse gas emissions*. Implementing these cross sector strategies would make a significant reduction in greenhouse gas emissions yet there is currently little effort across central and local government to develop plans for their implementation. Serious pursuit of these strategies by Government would assist transition to a low emission economy.
2. Since the demise of a united public service with the adoption of the State Sector Act 1988 there has been a failure in the machinery of government for government agencies to effectively work on cross government policies that affect multiple policies and programmes such as occurs with climate change. Mechanisms need to be developed so that the climate change policy development and implementation of programmes are more integrated across government.
3. This inquiry by the Productivity Commission is the first serious attempt by Government to involve the sectors in developing a plan on how to achieve the Paris climate change targets. It is recommended that because the transition to a low emission economy is far reaching across all Government policies that an on-going reference group or similar (such as the Land and Water Forum) be established.
4. Specific government programmes that affect the ability of bioenergy solutions to contribute to reducing greenhouse gas emissions are the forestry and wood processing strategies and the waste strategies. Interactions with both these programmes is critical to the level of greenhouse gas emissions that can occur.

## Q19

**What type of direct regulation would best help New Zealand transition to a**

### **low-emissions economy?**

Mandatory reporting of greenhouse gas emissions on business and government entities would provide information not currently available and encourage a focus on where effort on emissions should be addressed.

Currently there is no regular monitoring by MBIE of the use of biomass for energy yet biomass contributes 14% of energy used. Monitoring and reporting of the use of biomass from wood and waste would provide sound data on which policies can be developed.

There is no regular monitoring of heat use throughout the economy. A database does exist of what heat plants exist but this is not maintained and is very inaccurate. Considering the importance of heat energy to the economy it is critical that heat use is measured and monitored otherwise any programmes and policies will always be simply guesswork.

### **Q20**

**Acknowledging the current review, what changes to the New Zealand Emissions Trading Scheme are needed if it is to play an important part of New Zealand's transition to a low-emissions future?**

### **Q21**

**What type of market-based instruments would best help New Zealand transition to a low-emissions economy?**

A carbon tax would provide more guidance to investors considering new facilities which have the potential to reduce greenhouse gas emissions. The ETS is an indirect tool that depends on the whims of the market whereas a carbon tax is direct and controllable. It directly affects decision makers when considering fuel choice and leaves no uncertainty.

The lack of payment for the externality benefits from bioenergy facilities, which is often the principal benefit, mean that in the main transition from fossil fuels to biomass fuels are difficult for investors to justify.

The increased development of information relating to the potential bioenergy solutions, and its dissemination, would improve development of the bioenergy market. Because of the diversity of participants it is inefficient for individual parties to source their required information.

Cost reflective pricing of other fuels would assist. Fuels substitute for one another. Some are highly competitive with good margins in one application allowing them to prevent other fuels from competing in others. Peak electricity pricing has been mentioned.

**Q22****What type of support for innovation and technology would best help New Zealand transition to a low-emissions economy?**

With regard to the bioenergy sector many of the technologies are well proven rather it is because of its complexity with multiple fuel supply parties that assistance with market information, technical best practice, and facilitation of parties would assist. At present the perception on the availability of biomass fuel is a major barrier and addressing this perception requires attention. The inability of individual fuel suppliers to fund the develop the market tools eg standards, accreditation etc creates a market failure where collective action is necessary. The sector is in its infancy and most parties are small so do not have the financial ability to fund the necessary market tools.

On the longer-term opportunities and risks beyond the reach of individual companies NERI (a member of BANC) is about to publish a more general energy research strategy for NZ that has a significant bioenergy component. We understand NERI is separately in discussion with the Commission and we support their proposed strategy.

**Q23****How can New Zealand harness the power of financial institutions to support a low-emissions transition?**

Access to capital is a significant barrier for renewable energy based solutions because renewable energy facilities tend to have high capital costs and low operating costs compared to fossil fuels. Some international jurisdictions have allowed accelerated depreciation as a fiscally neutral support mechanism. This makes recognition that the benefits of renewable energy solutions are in the main for future generations. It also recognizes that many of the benefits of greenhouse gas reduction are public good benefits for the community at large and not for the investor.

In the end the financial institutions will need to prudently have regard to the risk and returns. They therefore have an interest in good analysis of the opportunities and risk emerging in the sector and should be encouraged to invest in this kind of analysis focused on the NZ situation.

**Q24****What type of alternative approaches (such as voluntary agreements or support for green infrastructure) would best help New Zealand transition to a low-emissions economy?**

A carbon tax would encourage those emitters able to reduce emissions to look for solutions.

Payment for community benefits from renewable energy opportunities would assist the transition.

#### **Q25**

**In addition to “core” climate policies and institutions, what other changes to policy settings or institutional frameworks are required to effectively transition New Zealand to a low-emissions economy?**

Because the community benefits from bioenergy solutions relate to regional economic growth, employment and achievement of environmental outcomes the climate policies need to integrate with the full range of government policies.

#### **Q26**

**What are the main uncertainties affecting New Zealand businesses and households in considering investments relevant to a low-emissions future?  
What policies and institutions would provide greater confidence for investors?**

The NZTS provides significant uncertainty as no one can identify what, if any, effect on future fossil fuel prices it might have. The NZTS is also a mechanism not controllable by investors as it is dependent on the whim of the market what might happen.

#### **Q27**

**What approaches, such as regulatory frameworks or policy settings, would help embed wide support among New Zealanders for effective reduction of domestic greenhouse gas emissions?**

Government leadership and integration of climate policies across all regulatory areas and having a government that appeared serious about climate change would assist achieve wide support amongst New Zealanders. The very hands off approach currently results in nothing being achieved.

#### **Q28**

**Is New Zealand’s current statutory framework to deal with climate change adequate? What other types of legislation might be needed to effectively transition towards a low-emissions economy?**

No. For example there is regulatory guidance for the use of renewable energy for the generation of electricity but there is no such similar guidance as to the use of waste, added value wood processing, wise use of land, and the use of renewable energy for heat. National Policy Statements in these areas would provide significant assistance to transition.

**Q29**

**Does New Zealand need an independent body to oversee New Zealand's domestic and international climate change commitments? What overseas examples offer useful models for New Zealand to consider?**

It is not so much that there is a need for an independent body. What is required is for a properly funded body with a serious mandate to develop and implement a plan for how the Paris targets are to be achieved. This body can also advise on the appropriate targets that could be achieved. This could be a Crown Agency.

**Q30**

**How can adaptability best be incorporated into the system supporting New Zealand's low-emissions transition?**

**Q31**

**What types of analysis and underlying data would add the greatest value to this inquiry?**

Improving the collection of data on manufacturing heat use and providing an on-going framework for annual monitoring would mean that policies would be established based on fact rather than guesswork.

Analysis of the regional discharge of methane from waste would provide a framework for regional decision making. Establishing a framework for its on-going monitoring would then allow progress to be assessed.

No work has been undertaken on the quantum of opportunities that farmers have available to them from their existing farm operations that could offset biological emissions.

Analysis of the full value chain of opportunities that are available from the wood energy sector would assist with development of policies.

**Q32**

**What should be the mix, and relative importance of, different policy approaches (such as emissions pricing, R&D support, or direct regulation) in order to transition to a low-emissions economy?**

Because climate change is a community benefit there needs to be a full portfolio of interventions to assist investors transition to a low carbon economy..

**Q33**

**What are the main co-benefits of policies to support a low-emissions transition in New Zealand? How should they be valued and incorporated into decision making?**

The co-benefits of bioenergy solutions are wide and cover regional economic development, employment and the achievement of environmental outcomes.

**Q34**

**Who are the most important players in driving forward New Zealand's transition to a low-emissions economy?**

Leadership from Government and a serious will to achieve the Paris Climate Change targets by reduction of greenhouse gases rather than purchase of international carbon credits is the single most important action that can be done in order to achieve the targets.

**Q35**

**What measures should exist (and at what scale and duration) to support businesses and households who have limited ability to avoid serious losses as a result of New Zealand's transition to a low-emissions economy?**

There should be minimal losses of transitioning to a low emissions economy as in general there will be benefits as well as losses. An orderly approach will also allow for a smooth transition.

However changes to energy pricing to reflect true costs (eg electricity) may well cause disruption to those exposed to it. This is probably best dealt with as an affordability issue, although the heating etc of rental properties may require direct intervention.

**Q36**

**What are the essential components of an effective emissions-mitigation strategy for New Zealand that will also be economically and politically sustainable?**

If there is a clear publicly available plan developed by Government then this will provide more certainty than currently exists.

**Q37**

**Should New Zealand adopt the two baskets approach? If so, how should it**

**influence New Zealand's emissions reductions policies and long-term vision for the future?**

The two basket approach is not supported as a key criteria of any policy should be that it is simple to understand and use. Already the NZTS is too complex and not understood by most interested parties and making distinctions like this when exact impacts are still being understood is pushing the science beyond its current limited.

Much more appropriate is to take a risk management approach, namely to give priority to those areas where the upsides are high and the downsides are low, while investing in understanding how to manage the risks that have significant net downsides for the country.

**Q38**

**How should the issue of emissions leakage influence New Zealand's strategy in transitioning to a low-emissions economy?**

The policies adopted in New Zealand should not be too out of line with other countries.

**Q39**

**What do you see as the main benefits and opportunities to New Zealand from a transition to a low-emissions economy?**

The bioenergy contributions to a low emissions economy can provide a wide range of new business and products based around the co-products of the energy products. Often the bio-based products produced as co-products of the energy products are of higher value than the energy products.

The energy and co-products from biomass will be replacement for petroleum based materials and products as the market demand moves against their use and/or the cost of petroleum increases because of various regulatory interventions to internalize the externalities.

**Q40**

**What does your long-term vision for a low-emissions economy look like?**

**Could a shared vision for New Zealand be created, and if so, how?**

A shared vision for a low carbon economy based on use of renewable natural resources and waste fits with the already shared vision of a Clean Green New Zealand. The community already embraces this vision which can be strengthened by adoption by government of the policies outlined in this submission. In this area the community aspirations want this to happen but central government is yet to get on board.



Critical to adopting this vision is thinking of biomass and waste as valuable and not a problem. This requires a positive mindset with regard to biomass and waste as an opportunity. With current technology biomass and waste is able to be recycled or used as a feedstock for new products. In a world where resources are finite it is imperative that communities move to sustainability and the utilization of waste, rather than hiding it, should become a platform for the community economic and social wellbeing.

Utilisation of biomass and waste should also be considered within the nation's economic growth strategy and climate change action plan. Utilisation rather than disposal of waste can create employment and new business. Organic waste can be recycled into new products, processed into compost, or used as a feedstock for the production of energy. With the right policies and leadership from central government many of these applications are already economic or close to being economic.

Hitachi Zosen Inova would be pleased to meet with the Commission to discuss aspects of this submission.