Pioneer energy

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28 February 2020

Energy Markets Policy Team
Ministry of Business, Innovation & Employment
P O Box 1473
Wellington 6140

By email: energymarkets@mbie.govt.nz

Dear Team,

Re: Discussion Document – Accelerating renewable energy & energy efficiency

Pioneer Energy (Pioneer) welcomes the opportunity to make this submission on the government's *'Accelerating renewable energy and energy efficiency'* discussion document (discussion document).

Pioneer's unique asset mix is achieving direct emission reductions for our customers as well as increasing New Zealand's proportion of renewable electricity supply. Pioneer owns and operates 'traditional' renewable (hydro and wind) electricity generating plant connected to the local network companies. We will have completed construction of two new embedded hydro power stations in the two years to May 2020 with a total output of 60GWh pa.

Along with a joint venture partner, Pioneer is also currently constructing New Zealand's first kerbside collected food waste to energy plant.[1]

Pioneer is both an end-use consumer and a commercial supplier of wood fuels to many industrial, institutional and small commercial boiler sites across the New Zealand process heating sector. Pioneer has also built and operates district process heating facilities capable of co-firing coal and wood fuels and supplying multiple process heat customers. We also generate electricity from biogas, have gas fired combined heat and power facilities, and retail electricity directly to our customers. Many of the boiler sites and facilities contracted with Pioneer have operated for more than 10 years making us one of the most experienced operators of wood and waste fired process heat facilities in New Zealand.[2] We have invested more than $60m in biomass fired heat and power facilities.

Pioneer have thus demonstrated that:

- biomass wood fuels can be used to replace most existing solid fuel coal boiler installations
- wood fuels are higher cost than most other fuels but are cheaper than electricity heating

[1] A fact sheet on this joint venture is attached as Appendix A

[2] The type and location of Pioneer's renewable biofuel plants is attached in Appendix B

- wood fuel supply chains can be developed and can be made as reliable as most other fuel supply options.

Pioneer strongly supports the immediate development of biomass resources and supply chains for use in the higher temperature heat segments – this should be a high priority for government. Scion have identified the potential to convert at least 50% of current coal fuel use to biomass – equivalent to 11PJ – using existing biomass resource (process wastes and wood fuels).

Biomass is a fantastic opportunity to reduce New Zealand's future emissions. New Zealand has control over supply which we can choose to make endless.

NZ Emissions Trading Scheme (NZETS)

The discussion document has a wide range of possible policy initiatives that are proposed to be complementary to the NZ Emissions Trading Scheme (NZETS). Pioneer agrees with government that the market- and price-based NZETS should continue to be the main tool for incentivising GHG emission reductions. Pioneer is making a separate submission to the Ministry for the Environment on proposed changes to the NZETS settings.

Pioneer acknowledges the greatly improved certainty provided by the Zero Carbon legislation and government's commitment to international agreements to reduce emissions. Our experience is that changes to, and deferral of, policy commitments have negatively influenced investment in Pioneer's heat business. Further, uncertainty has resulted in industrial businesses maintaining a "wait and see" mode - this is demonstrated by the stockpile of freely allocated emissions reduction units by NZETS participants.

We agree there are barriers and market failures that are delaying investment in mitigation options and behaviour change outside the NZETS. The complementary measures proposed in the discussion document are therefore non-price based.

However, Pioneer suggests it is important for MBIE to understand the level of the carbon price that we think is necessary to drive a change in behavior. Pioneer believes the greatest barrier to switching away from fossil fuels is the higher market cost of renewable heating fuels in the very cost sensitive industrial market. We believe the NZETS emissions price will need to be over \$50/t CO_2-e to achieve the level of price parity required to switch future investment decisions to renewable heating plants.

Fonterra informed attendees at a recent BANZ workshop that the Marginal Abatement Cost (MAC) to convert the Te Awamutu dairy factory to wood pellets using the existing boiler was \$76/t CO_2-e. To install a new boiler the MAC is still over \$100/t CO_2-e. This assumes a weighted average cost of capital of 10%.

In our view, this does not mean that electrification of industrial processes is a 'cheaper or easier' option. We estimate that electrifying process heat above 80°C will require approximately 3 times the level of capital investment across the delivery supply chain per MW of heat delivered than is required for switching boilers to wood fuels.

Activities that can convert to biomass at lower prices will have a competitive advantage from avoiding a rising cost from emitting carbon. Pioneer estimates the MAC for converting a smallish hospital boiler from coal to wood chip at \$35 -50/tCO_2-e.

Pioneer agrees that the NZETS settings must be enduring and ensure that emissions price signals and emissions unit allocation settings are set at levels that reasonably reflect the renewable alternatives investment costs.

The proposed NZETS settings – with a cap of $50/t CO_2-e – have the potential to delay any change in investment decisions until at least 2025. This places an increased onus on any complementary measures to achieve near term emissions reductions.

At the same time the government is consulting on a provisional emissions budget for the period 2021–2025. This budget assumes that 25% of process heat for food processing that currently uses coal or gas has switched to biofuels or electricity to save 700 kt CO2-e emissions in the year 2025.[3]

Government leadership and procurement of clean energy technologies

Firstly, Pioneer would like to commend the government for its recent decision to fund conversion of coal-fired boilers in eight schools and Ashburton Hospital to biomass boilers.

The creation of a $200 million fund for a clean powered public service will make a difference. The principal challenge thus far has been establishing a viable long-term supply chain for woody biomass whereby both forest owners at one end and customers at the other end have certainty and confidence of ongoing and growing supply of the woody biomass fuel.

Pioneer suggests that government leadership in procurement of clean energy fuels, including newer technologies, across a range of buildings and processes, is a practical solution to a number of problems described in the discussion document.

While the government may not own industrial processing plant, there are the following examples of how use of biomass fuel by government owned institutions can help with the transition by other organisations:

- increasing demand for equipment from third party suppliers – which may have a positive impact on the price of this equipment
- demonstrating the actual cost and quality of biomass fuel supply (in contrast to unrealistic or uninformed perceptions currently held by industrial process plant owners)
- increasing demand for biomass fuel
- underpinning secure development of a supply chain with associated regional employment benefits
- resulting economies of scale in production of biomass fuel should have a positive impact on the price of this fuel for other users
- creating demand for technical expertise to install and maintain this equipment
- assist with understanding the air quality issues associated with combusting biomass fuel
- publication of case studies based on government's experiences will demonstrate the economics of using biomass fuel
- practical evidence of reducing and ongoing avoidance of GHG emissions

Central government could encourage local government to also show leadership as these entities have additional responsibilities compared with central government. These include waste-water management and landfill waste management – which create biomass; and public transport which could use biofuel. The benefits listed above would be magnified several fold if both central and local government were involved.

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[3] See page 28 https://www.mfe.govt.nz/publications/climate-change/reforming-new-zealand-emissions-trading-scheme-proposed-settings

Government leadership can also help in framing the conversation about the benefits of biomass and address the myths. There are a number of statements in the discussion document that are provocative and ill-informed. This may be the purpose of a discussion document but once feedback is received there is the opportunity for government websites and public statements etc to be framed more accurately and positively.

Pioneer recommends central and local government should also be focusing strongly on reducing methane emissions into the atmosphere – these are some 27 times more harmful than carbon emissions. The current approach of capturing methane through composting and landfills is not effective.

Format of submission

This submission focuses on Part A of the discussion document on encouraging uptake of renewable / biofuel in industry. We have provided feedback to relevant proposals in the order that we suggest these initiatives be prioritised.

Pioneer is a member of the Independent Electricity Generators Association Incorporated (IEGA) and support the IEGA's submission which has focused on Part B of the discussion document.

Pioneer is also a member of the Bioenergy Association of New Zealand (BANZ) and support BANZ's submission.

Appendix A is a fact sheet on the joint venture Pioneer is a party to that is constructing a food waste-energy plant.

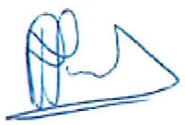
Appendix B provides information on Pioneer's process heat and woody biomass investments.

We also attach a copy of:

- a fact sheet on our Washdyke Energy Centre – a process heat energy cluster
- Pioneer's submission to the Interim Climate Change Commission's Call for Evidence provided in November 2019.

We would welcome the opportunity to discuss this submission with you in more detail.

Yours truly



Fraser Jonker

Chief Executive

PIONEER ENERGY FEEDBACK

The following feedback lists our preferred policy proposals in priority order.

Section 2: Developing markets for bioenergy and direct geothermal use

Pioneer has no prior experience in direct geothermal heating but has applied indirect ground-source heating and cooling at its District Energy scheme in Christchurch. It has found from this experience that the additional costs of in-ground drilling and operating systems management are not trivial and need to be carefully considered when making life cycle comparisons of heating options.

Our business and therefore this submission is focused on enabling development of markets for bioenergy.

Option 2.1 Developing users' guide on application of the National Environmental Standards for Air Quality to wood energy

Pioneer concurred with the conclusion in the Process Heat Technical Paper that variation in local and regional air plan rules is a barrier to the use of woody biomass. Addressing this is Pioneer's top priority.

Pioneer strongly supports a complete review of air quality standards as they relate to use of wood and other bioenergy. The standard of air quality from use of wood and other bioenergy is, in our view, something that can be determined at a national level and does not need to be determined, differently, by each local council. The existing air quality may differ across regions but it seems reasonable that the goal for the air quality standard should be the same across New Zealand.

A users' guide would perpetuate the current regional bias or approach to air quality.

The BANZ submission includes a more detailed response to this option.

Facilitating the development of bioenergy markets and industry clusters on a regional basis

In Pioneer's view the information on location and security of supply in the discussion document was particularly negative. As mentioned above, Pioneer believes the government has a role in reframing the conversation to encourage the increasing use of biomass and facilitate the development of bioenergy markets.

The government is already a significant investor in the future supply of wood residue with its 1 Billion trees programme. The example of the East Coast being an isolated source of wood residue could be viewed as an opportunity to create employment in that region from establishing a wood pellet facility (using wood residue as fuel) and transporting these pellets using the government funded re-established rail connection.

Pioneer recommends establishment of a working group drawing on expertise from members of BANZ together with officials across energy, environment, transport and forestry to inform policy development.

Source of woody biomass

There are numerous opportunities. Pioneer notes that some 50% of an exported log probably has no value to the purchaser who cuts a rectangle out of a round log for its purposes. Pioneer suggests demand for woody biomass created by a higher carbon price on fossil fuels will ensure that this 'waste' fuel is retained in New Zealand, increasing the supply of wood for bioenergy.

We understand that in parts of Europe each sawmill processes their residue into woody biomass fuel on-site (using woody biomass as the fuel to make the fuel).

Co-generation

Policy options should consider not only the option for switching fuel at existing sites but also development at new industrial sites of co-generation or an energy centre for a cluster of industrial plants. Pioneer operates a number of heat plant with different fuel types. There is little discussion in the document about the option of co-generation. Pioneer considers there is the potential for further co-generation capacity over the medium term. Pioneer has built and owns/operate on-site generation for its customers. These projects include biogas generation, natural gas fired cogeneration and solar PV. The natural gas cogeneration plant was built for a larger hospital and has run economically for more than a decade interfacing between electricity market spot and contract prices and providing heat at the alternative boiler marginal heating costs.

We would like to see some further consideration of how industrial cogeneration could also provide network reinforcement (through Transmission or Network Alternatives) and thus reduce the increase in system peak demands that will come with electrifying heating and transport.

The strongest incentive for on-site and embedded generation were regulations promulgated in 2007 for payment at peak generation for avoided transmission costs (ACOT). ACOT payments were derived from the transmission pricing methodology and its peak transmission pricing methodology. These payments provided local generators with the equivalent cost-benefit of not creating peak transmission demands i.e. Transpower's marginal investment costs. In December 2016, the Electricity Authority controversially removed ACOT payments from the Electricity Industry Participation Code for any future on-site or embedded generation – thus increasing the investment and pricing risks for consumers looking to reduce their exposure to future grid costs. This change in Code has effectively re-instated the barrier that was first identified in the early 2000's and was fixed by regulations in 2007.

The Electricity Authority has signaled its intent to again revisit the application and allocation of network common costs for embedded generation in 2019/20. Currently only incremental costs are allowed to be allocated by network companies for this embedded generation. Allocation of common costs would annul the economics of future embedded generation (as well as existing embedded generation), thus effectively favouring monopoly grid and network asset investments over competing local generation investments. Whilst these monopoly services and network values are protected by regulations from technology competition there is a major barrier to consumers making individual choices on local generation. This in turn removes incentives for developing on-site electric heating technologies as they will increasingly be penalised for their peak demands.

Industrial clusters

Pioneer has successfully created energy centres in established clusters of industrial plant. Washdyke, near Timaru, is one example. We have attached a fact sheet about this energy centre to our submission.

Concerns about the lack of adequate wood fuel supply chain depth and reliability can be managed. Pioneer set up its own wood fuel business in 2008 to address this perceived risk and has met its contractual wood fuel supply obligations ever since. In our view, these risks are manageable using the same engineering and procurement standards as are applied to any other fossil fuel solution.

Pioneer's wood and waste fueled industrial process heat plant are contracted over many years and many have operated for more than 15 years with the same availability (>95%) and reliability (>98%) KPI's as for any standard coal or gas boiler.

Long-term contracts and relationships underpin success.

Section 4: Phasing out fossil fuels in process heat

Pioneer agrees that:

- Industrial energy investment decisions are:
    - long-term - coal boilers have an economic lifespan of about 25 years
    - involve high capital costs and extending the economic life of a boiler requires less upfront capital than replacing it. Boilers are often repaired and maintained to be used for much longer periods (some coal boilers have been used for over 40 years).
    - highly dependent on the relative capital and fuel costs of different energy sources – with coal being the cheapest form of energy, and also the most emissions intensive
- uncertainty about future carbon prices and policy has contributed to maintaining fossil fuel technologies' on-going attractiveness for investment
- carbon price expectations are often not factored into decision-making because of this uncertainty
- for the reasons above, the carbon price signal alone will not be sufficient to deliver a timely transition that prevents the lock-in of high-emission and long-life assets that run the risk of becoming stranded over time.

Please refer to our cover letter discussion on the NZETS. In summary, Pioneer believes the proposed NZETS settings – with a cap of $50/t CO_2-e – have the potential to delay any change in investment decisions until at least 2025. This places an increased onus on any complementary measures to achieve near term emissions reductions.

Pioneer recently made the strategic decision that it will not be investing in any new coal-fired thermal plant.

With Pioneer's experience in both renewable electricity generation and biomass process heat investments we recommend government adopt a balanced approach in policy development and not choose any 'winners'.

Option 4.1 Introduce a ban on new coal-fired boilers for low and medium temperature requirements

A decision to ban investment in new coal-fired boilers may only delay replacement of these boilers. As the discussion document highlights extending the economic life of a boiler requires less upfront capital than replacing it. Boilers are often repaired and maintained to be used for much longer periods (some coal boilers have been used for over 40 years).

It is interesting that officials' evaluation of the ban on new coal (low-high temperatures) and for new fossil fuels (all temperatures)[4] have high rankings against the criteria but are not preferred options. Pioneer suggests there is insufficient information in the discussion document to inform readers about why these are not preferred.

Pioneer recommends the focus should be on conversion of existing plant to burn wood. This involves a lower capital spend with no need to write-off existing assets.

Option 4.2 Require existing coal-fired process heat equipment supplying end-use temperature requirements below 100°C to be phased out by 2030.

This option provides a clear signal with considerable notice that existing coal-fired process heat equipment supplying end-use temperature requirements below 100 degrees celsius must be phased out. This relates to water and space heating.

However, the quantity of emission reductions that would be achieved by this intervention is not disclosed.

Section 5: Boosting investment in energy efficiency and renewable energy technologies

We continue to believe that access to capital is not the primary barrier to investment in renewable energy technologies but that prioritisation of available capital is the primary driver. Pioneer's heat business has prepared perhaps 100 or more different outsource (Build Own Operate) proposals across almost all process heating sectors in New Zealand over more than a decade. In every case the required capital (usually between $3m and $15m per proposal) was accessible to customers through Pioneer's own balance sheet. In our experience, the decisions were more to do with the cost of capital vs cost of debt and the long-term contract commitments required, as opposed to access to capital.

Alternative financial solutions that could positively impact the business case for investment in the use of biomass could be:

- accelerated depreciation for biomass boiler equipment
- a connection with the already existing research and development tax credits
- reduced or no fuel tax for transporting biomass fuel (ie assuming it is equivalent to off-road transport).

[4] Page 44 of the discussion document

Section 1: Addressing information failures

Option 1.1 Require large energy users to publish Corporate Energy Transition Plans (including reporting emissions) and conduct energy audits

There may be other activities that provide a higher return in terms of emissions reductions than asking businesses to commit cashflow to developing and publishing regularly a Corporate Energy Transition Plan and conducting energy audits.

For example, the Marginal Abatement Cost Curve information published by the Ministry for the Environment has a range of activities with negative abatement costs but despite this the investment is not being made. Pioneer suggest the government could usefully gain a more detailed understanding about why these activities are not being pursued to reduce carbon emissions when the benefits exceed the cost.

Further, it would be useful to understand the reaction and conclusions from the Ministry for the Environment's consultation on Climate-related Financial Disclosures before proceeding with this option.

As we submitted previously, in Pioneer's view sustainability criteria are driving management to consider renewable options but are generally not yet influential enough to support conversion at costs above non-renewable alternatives. Those with clear sustainability policies are more likely to consider renewable options, but the relative market costs of energy options will generally win-out in investment decisions. Sustainability objectives are secondary to risk-return criteria, at least for larger capital investment projects. More discretion may be applied to management for smaller incremental investment decisions.

That is, does requiring a company to prepare and publish a Corporate Energy Transition Plan require the company to undertake this investment? We see no material impact on decisions to invest in new process heat technologies from a requirement to disclose information. These investment decisions are taken in a very disciplined manner through design and due diligence. The preferences of end use consumers (in NZ and export markets) are probably more likely to influence a company to become more 'green' than publication of a Plan.

Option 1.2 Develop an electrification information package for businesses looking to electrify process heat, and offer EECA's business partners co-funded low-emission heating feasibility studies

Pioneer disagrees with this focus purely on electrification information. As mentioned above, we estimate that electrifying process heat above 80°C will require approximately 3 times the level of capital investment across the delivery chain per MW of heat delivered than is required for switching boilers to wood fuels. This ratio will deteriorate as renewable plant becomes a higher proportion of total electricity supply.[5]

An information pack is equally relevant for businesses looking to convert process heat to biomass.

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[5] As an aside, the commentary assumes this plant will be connected to the transmission grid. It could be connected to a distribution network – further complicating what can only be generic information.

As stated above, with Pioneer's experience in both renewable electricity generation and biomass process heat investments we recommend government adopt a balanced approach in policy development and not choose any 'winners'.

Our understanding is that EECA already offers co-funded feasibility studies. We suggest the effectiveness of already completed studies be evaluated to ensure the benefits of future co-funding are maximised. This could include publishing more information based on the information gained from prior feasibility studies.

Option 1.3 Provide benchmarking information for food processing industries

While the proposal is to focus on one particular sector - food processing - Pioneer queries whether true benchmarking can be achieved given the range of 'food' that is being processed. There is also a difference between particular processing sites (singular) and ownership by food processing businesses of multiple sites which can undertake their own benchmarking.

Customer consultants are more likely to compare a new renewable option against a generic industry level performance benchmark for existing coal or gas fired plant, even if that existing plant is more than 30 years old and operating below industry benchmarks. It can be difficult to get like-for-like comparisons when engineering advisors see more risk in one solution than the "tried and true".

Section 3: Innovating and building capability

Option 3.1 Expand EECA's grants for technology diffusion and capability-building

Pioneer suggests that New Zealand's size means we are usually a technology taker from overseas and the cost of technology or equipment benefit from economies of scale. Existing technologies are available to deliver emission reductions using renewable biomass fuel – this should be the principal focus, at least initially.

As discussed in our cover letter, we suggest the government has the opportunity to lead in testing promising new technologies. Demand from government would facilitate or support private sector investors prepared to bring these technologies to New Zealand.

Option 3.2 Collaborate with EIHI industry to foster knowledge sharing, develop sectoral low carbon roadmaps and build capability for the future using a Just Transitions approach

The discussion document describes this option as:

> "*This initiative would look to create a partnership between government and EIHI industries on industrial decarbonisation. The partnership would provide a platform for collaboration on emissions reduction and knowledge sharing of existing and emerging technical opportunities. Government could support the platform as a facilitator, and bring in international energy and engineering experts.*"

Officials need to be clear that this activity will actually change investors' minds and result in investment in biofuel and emission reductions.

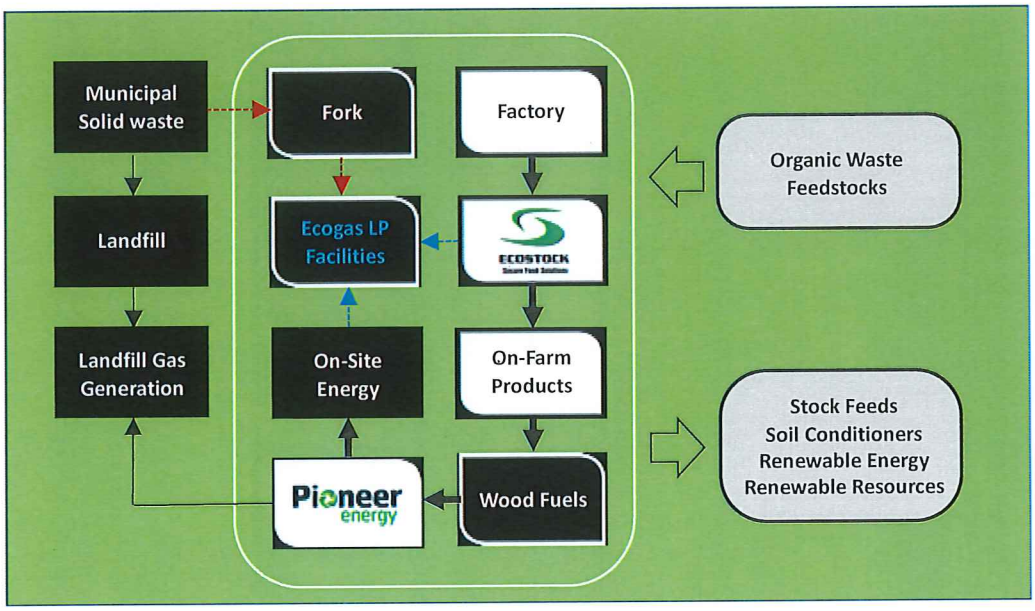
Section 6: Cost recovery mechanisms

Pioneer suggests there is not enough specificity provided thus far about what the increased government activity would be focused on to be able to comment about whether a levy on consumers of coal is appropriate.

APPENDIX A

Overview of Ecogas Limited Partnership

Ecogas Limited Partnership is a joint venture between Ecostock Supplies Limited and Pioneer Energy Limited. The business is converting organic food wastes into beneficial products including renewable energy from biogas and an organic bio-fertiliser suitable for direct application onto land.



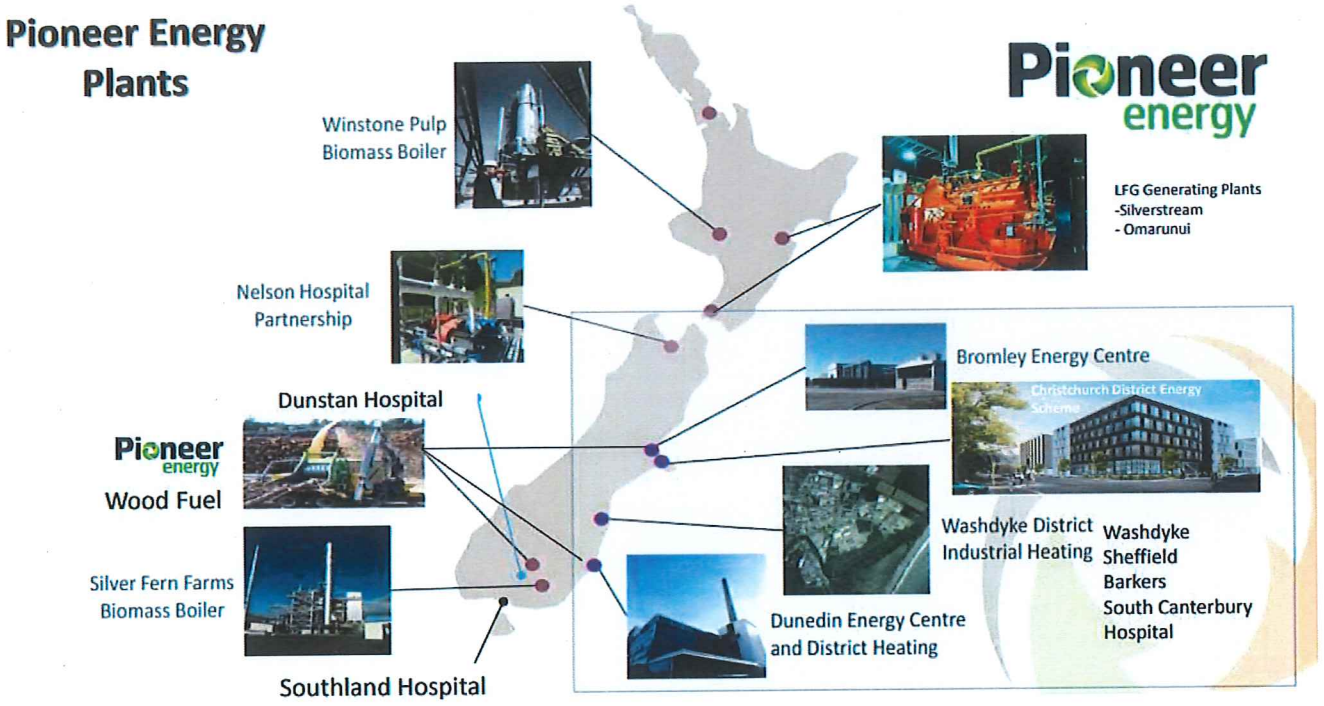
Ecostock Supplies currently converts 35,000 tpa of commercial food waste into stock feed and Pioneer Energy runs landfill gas generation and industrial process heating plant using 30,000 tpa of local waste and woody biofuels. Ecogas brings the experiences of these two businesses together to own and operate utility scale anaerobic digestion facilities located in regional service hubs.

The anaerobic digestion process is a proven technology with thousands of plants operating worldwide. New Zealand has historically relied on landfills to dispose of its waste streams and the anaerobic digestion plant provides a better alternative for processing of organic food wastes into renewable energy and bio-fertlisers. Bioenergy Association NZ has estimated that moving organic wastes from landfills into anaerobic digestion plant would reduce our climate change emissions by up to 1.8Mt per annum.

An Ecogas plant can divert 75,000 tpa of food wastes from both commercial (Factory) and consumer kerbside (Fork) wastes and produce enough renewable electricity to supply local factories or more than 1,000 local homes. The plant will produce enough bio-fertiliser to cover more than 3,000 ha of farmland, reducing our reliance on imported and artificial fertilisers.

APPENDIX B

Overview of Pioneer Energy's biofuel plants



Industrial Energy Partnership

Process Heat Energy Cluster, Washdyke Energy Centre

> "Good start up; seamless take-over of load; good uninterrupted supply."
>
> TREVOR LLOYD, DB MAINLAND'S PRODUCTION MANAGER

Pioneer energy

As part of Pioneer Energy's long-term vision to provide sustainable energy futures for New Zealand business, they have long term partnerships with a number of manufacturers and processors located in Washdyke.

Customers connected to the Washdyke Energy Centre network have outsourced and entrusted their thermal energy supply needs to Pioneer Energy and in return receive the energy cost benefits that can only be achieved through economies of scale. Customers also enjoy peace of mind in the knowledge that there is ample capacity for their current and future heat and hot water supply needs.

The operation has multiple boilers which enhance security of supply, and environmental consent for an additional 20MW of generation in the future.

As the energy centre can be partially fuelled on wood chip fuel, the energy cluster has the potential to play a major role in the improvement of air quality, and increased sustainability.

PIONEER'S ROLE

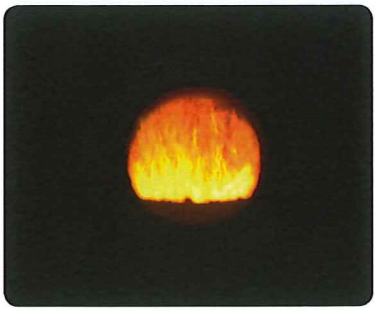
As a leading energy solutions partner for New Zealand industry Pioneer provides some of New Zealand's leading exporters and manufacturers with globally competitive and sustainable energy solutions.

Pioneer Energy works with customers to discover their energy future and strives to maintain the integrity of the natural environment, while maximising the value of natural energy resources, aiming to reducing greenhouse gases.

LEADING BY EXAMPLE

The Washdyke Energy Centre is an award winning reference site for other regional industrial energy clusters in New Zealand. It demonstrates the best practice for the sustainable energy management for customers' who receive a cost effective, secure supply of process heat and steam.

> "Not having boilers on-site has been a major benefit."
>
> SIMON PHILIPS - OPERATIONS MANAGER NZ LIGHT LEATHERS LTD



> The Energy Centre development in Washdyke is an extremely important and significant initiative ensuring the growth and economic development of this district.

WENDY SMITH - CEO, AORAKI DEVELOPMENT AND TOURISM

WOOD CHIP FUEL

To ensure the reliable supply of quality renewable fuel, Pioneer Energy has a wood fuel supply chain business with fuel supply hubs in Canterbury and Otago. Strong relationships have been established with forest owners and wood residue suppliers and the business has large storage and stock capability at its regional wood hubs.

Owning the wood chipping plant and delivery vehicles means the customer's wood fuel specifications can be supplied. With such a reliable supply chain Pioneer encourages the uptake of renewable duel heat plants for New Zealand industrial customers.

Pioneer Energy sees a bright future for wood energy and biomass fuels and are well positioned to satisfy the growing demand.

Pioneer Energy can help you reduce energy use, lower your operating costs, free up capital, and contribute to a cleaner energy future.

From a suite of intelligent energy management solutions, Pioneer Energy works with you to build the right energy solution for your business.

Contact us to find out more about how we can help.

Facts at a glance

Project Description

Foundation Customers:
DB Mainland Ltd, NZ Light Leathers Ltd, Juice Products NZ

Location:
Washdyke, Timaru, NZ

Application:
Steam supply for industrial manufacturing & process heat

Scope of Work:
Design, Build, Own, Operate

Capacity:
20 MWth

Fuel:
Coal with option to burn wood chip fuel

System Highlights

Commissioned date:
November 2011 (Stage 1)

Availability:
In excess 98%

Avoided Emissions CO_2:
Depends on customer steam loads and amount of wood fuel use

Displaces:
Aged plant on existing customer sites

Pioneer Energy uses best practice emissions controls minimising the environmental impacts

Pioneer energy

Awards

Winner, Technology and Innovation
- South Canterbury Chamber of Commerce Business Excellence Award 2012

Contact

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E enquire@pioneerenergy.co.nz
W www.pioneerenergy.co.nz

Call for evidence: response form

We are looking for responses that are evidence-based, with data and references included where possible. Please limit your response to each question to a maximum of 400 words, plus links to supporting evidence, using the template provided. Please answer only those questions where you have particular expertise or experience.

We recommend that you refer to the Climate Change Response (Zero Carbon) Amendment Bill when considering your answers, which can be found here.

If you have any questions about completing the call for evidence, please contact us via feedback@ICCC.mfe.govt.nz. Please include a contact number in case we need to talk to you about your query.

Please email your completed form by **12 noon, Friday 15 November 2019** to feedback@ICCC.mfe.govt.nz. We may follow up for more detail where appropriate.

Contact details

Name and/or organisation	***Pioneer Energy Limited***
Postal Address	*PO Box 275 Alexandra 9320*
Telephone number	*03 44 000 22*
Email address	*enquire@pioneerenergy.co.nz*

Submissions on similar topics

Please indicate any other submissions you have made on relevant topics, noting the particular material or information you think we should be aware of.
Answer: **Pioneer Energy has been active in the renewable energy space and in relation to ACOT charges**

Commercially sensitive information

Do you have any objection to the release of any information contained in your response, including commercially sensitive information? ***If yes, which part(s) do you consider should be withheld, together with the reason(s) for withholding this information.***
Answer: **Pioneer Energy has provided a summary of our market experience as summarised by our evidence of de-carbonisation costs. We are happy to provide further commercially sensitive evidence from our business, but under normal business confidentiality terms if desired.**

Questions for consideration:

Section A The first three emissions budgets

Under the proposed Zero Carbon Bill, the proposed Commission will have to provide advice to government on the levels of emissions budgets over the coming decades.

Currently, the Zero Carbon Bill requires budgets to be set from 2022-2035 (three separate budgets covering 2022-2025, 2026-2030, and 2031-2035). When preparing this advice the proposed Commission will have to consider the implications of those budgets for meeting the 2050 target. The Commission will also need to consider the likely economic effects (positive and negative) of its advice.

Question 1: ***In your area of expertise or experience, what are the specific proven and emerging options to reduce emissions to 2035? What are the likely costs, benefits and wider impacts of these options? Please provide evidence and/or data to support your assessment.***
Answer: **Evidence for Lowering Carbon Emissions** **Pioneer Energy Ltd is one of only a few energy businesses in New Zealand offering a comprehensive Design, Build, Own, Operate complete investment package to its range of industrial, institutional and commercial customers. As such, our business builds and owns assets that supply all types of fuels including electricity, coal, gas, landfill and biogas and wood fuels, either directly through Pioneer Energy or one of its subsidiary retailing brands, including Energy for Industry, Ecotricity LP, Ecogas LP, Pulse Energy Alliance and Christchurch District Energy.**

Through these businesses we own and have operated cogeneration and process heating assets covering a range different customer demands from pulp and paper, meat and food processing, hospitals, universities and council facilities. Investments in cogeneration and process heating have totaled more than $100m over some 15 years. Thus, we have considerable experience and evidence as to what customers value when making decisions on replacing or upgrading process heating assets and what the major institutional and market barriers are to decarbonisation in most sectors.

Cost of Supply

Customers generally want a least cost solution and historically for process heating in the South Island this solution has traditionally been lower grade coals (lignite or sub-bituminous coal. In the North Island natural gas has displaced coal as having the lower overall cost, when accounting for plant capital costs.

Wood fuels have been adopted successfully in most parts of New Zealand, but primarily in the South Island, for smaller installations such as schools, swimming pools and small businesses that have considered other favorable aspects of wood fuels such as cleanliness, health and environmental emissions.

Pioneer has been able to add a 15% proportion of wood fuels into its Dunedin Energy Centre coal boilers servicing the Otago District Hospital, University and Cadbury's factory before its recent closure. The cost of those drier wood chip fuels has been 35% higher than the cost of the low-grade coals, excluding the above-mentioned benefits

Pioneer also owns and operates process heating plant on three industrial sites servicing a pulp mill, a major meat processing plant and a cluster of three mid-sized food processing businesses. The pulp mill and meat plant have innovatively designed wood and waste fueled plants operating between 8.5MW_{th} and 11.5 MW_{th} and both were expensive capital solutions made possible by the utilization of on-site process waste residues. The mid-sized food cluster has two 10MWth boilers, one coal and one wood fired, plus a third 6MWth coal boiler. The wood fired boiler has been held in mothballs for more than 5 years, waiting for when the ETS carbon price reflects the full cost of coal emissions.

Pioneer operates a commercial wood fuels business supplying businesses in Central Otago, Otago, Southland and Canterbury. This business utilizes lower grade billet wood and other cutover residues recovered from forest harvesting as well as seasons low grade pulp logs for chipping. The business has operated for more than ten years and supplies around 250,000 GJ per annum to a range of wood boiler customers. The business is Bioenergy Association NZ accredited has not run out of wood fuel, nor failed to deliver wood fuel supplies to customers through a range of weather events. The delivered cost to provide a reliable supply of quality wood fuels in New Zealand is currently between $10/GJ and $14/GJ depending on the location and scale of the boilers. This fuel cost is 50% higher than local coals, 30% higher than natural gas in the North Island and around half the cost of LPG bottled gas in the South Island.

To achieve wood fuels price parity with fossil fuels, the ETS price on carbon emissions needs to be above $50/t c. Crown Agency Scion and Bioenergy Association

NZ have gathered sufficient evidence that supports at least 10PJ of low value wood fuels resource could be sourced from current plantation forest harvesting, sufficient to replace half the 25PJ volumes of coal fuels currently used in the process heating sector. At $50/t_c the 10PJ of wood fuel options would have parity with coal fuels.

To achieve further emissions reductions using wood fuels, the main source of wood fuel will be higher grade fibre and sawmill residue which would be competing with local Board mills. At $75/t-c ETS price, Pioneer would be able to compete at parity with Board mills for clean wood chips. This would increase the available wood fuel resources to more than 20PJ per annum and would enable access to natural gas fired process heating market segments.

To assist customers with their conversion from coal to wood, further willingness and a direct emphasis on conversion could be supported with the existing EECA feasibility funding grants, whereas EECA would contribute up to 75% of the cost of study, supplemented with the return of the 40% capital contribution. This approach would instantly sway more industries to convert to a lower carbon option by removing the perceived capital constraints of new plant. Pioneer has examples of converting 7MW boilers for a small percentage (5%) of the new capital cost of such; with industry knowledge and know-how this would become a viable step towards early transition / transitioning permanently off coal.

To assist customers with their conversion from natural gas to wood fuels, additional capital is required. A wood fueled installation will have installation costs and space demands similar to coal boilers but nearly double the equivalent required for gas boiler installation. For example, for a standard heating boiler, the difference in capital amortisation costs for a wood vs gas boiler will be the equivalent of a +$5/GJ surcharge on the wood fuel costs. At $100/t-C ETS costs on gas fuels, the life cycle costs of wood fuels will be at or near parity with natural gas fired boilers. Access to lower cost of capital financing, or depreciation and tax benefits would also help the close this +$5/GJ investment gap for customers looking to reduce their emissions through wood fuels.

Electric Process and Space Heating

Pioneer Energy is also a renewable electricity business, owning both hydro and wind generation and retailing through three retail brands. Pioneer also owns and operates three district energy schemes in Dunedin, Timaru and Christchurch and provides commercial and institutional building heating from coal, wood fuels and electricity.

The district heating and cooling precinct solution built for Ngai Tahu's King Edward Barracks development in Christchurch is owned and operated by Pioneers Christchurch District Energy company (CDEC). The scheme utilizes the ground source aquifer for efficient transfer and storage of heat and $cool_{th}$ using modern electric heat pumps and storage systems. Our experience with this form of district heating and cooling was too complex for most New Zealand building owner/developers, including the government as developers responsible for their Anchor Projects. Cheaper capital solutions were available and for the most part those lower capital cost solutions were preferred by most building owners or their project managers. Evidence in many other countries show that district energy schemes

adopted in many cities have stronger government and local government support, often implemented by way of a mandated utility model. To achieve something similar in New Zealand cities, to get economies of scale, new policy and regulations will be required for procurement of renewable energy solutions within our cities. These new policy and regulatory tools will also need to concurrently address the management of network infrastructures for electric vehicle charging and district energy systems and their management of demand should be a part of that solution.

Electrical heating for processing industries is hampered by being the most expensive fuel in a cost-sensitive market. The life cycle costs of a direct electrical heating installation are 20% higher than for a wood fueled boiler, which is already 30% higher than a coal or natural gas fired boiler. That is, direct electrical heating is around 50% higher life cycle costs than for current coal and gas process heating installations. Evidence from more than 100 different customer boiler proposal, made over 15 years, is that this level of renewable cost for electric heating will be considered unaffordable by most of industry.

Direct electric heating will require an ETS cost of more than $150/t-c to achieve cost parity with today's fossil fuels, 50% higher than for wood fuel options. Modern heat pumps and process heating and cooling storage systems will be required to reduce industrial emissions. Even with the benefit of higher efficient solutions the evidence provided to the Electricity Authority and governments Electricity Price Review committee by the Independent Retailers shows that the wholesale electricity market is not yet delivering adequate liquidity that would enable larger industrial buyers to switch to electricity with confidence in future market prices.

We believe that to achieve Net Zero outcomes innovation has to be encouraged and not hindered by policy and regulations. Our evidence, as a small but innovative energy market business, is that for at least the last 5 years Pioneer has been forced to spend as much time and resources on regulation changes to protect the value it had already created. Similar evidence has more recently provided by a majority of submitters to the Electricity Authority's Transmission Pricing Methodology, indicating there is a lack of confidence in how their economic models are being applied without enough reference to engineering system realities. These regulatory implementation issues provide early evidence of the types of issues government and regulators will be dealing with in future in pursuit of zero emissions outcomes. The Productivity Commissions report on Net Zero Emissions highlights similar concerns with how policy and regulations are applied to make substantive changes without also considering how energy market design can enable rather than hinder investments.

Options Value Approach

When there is a lot of future uncertainty in markets, an Options Value approach is often adopted to ensure there is more than one option and that each option has its own value. We believe there is an opportunity for the ICCC to consider in its carbon budget setting process on having different carbon reduction Options valued across the market and across longer timeframes.

For example, Pioneers generation assets are all embedded into local Networks. There was a pricing and payment mechanism in the Electricity Code for distributed generation (DG) called avoided cost of transmission (ACOT) that provided both Transpower and Networks with real options for managing demand peaks more effectively. The Option value averaged 1.2c/kWh (or $12/MWh and <10% of delivered electricity costs) for each MW of local capacity that would respond to network and transmission system peaks. The mechanism was removed by the Electricity Authority as inefficient and a subsidy, but it was only paid to DG when the MW Option was actually exercised. Removal of that ACOT mechanism removed the incentive and the option for DG to help manage grid renewable intermittency. Electrification to decarbonize industry and transport sectors will now require the reinstatement of those types of incentives to ensure availability and this requires changes in market design.

When setting internationally recognized carbon budget targets, Pioneer believes that a future option value is created i.e. the future international cost of carbon has a trading forecast. Pioneer would like to see a clear international trading market option value that is mirrored back into the domestic carbon market and can be contracted against. It would be useful then to have clear policy settings on what is paid as an option for managing future uncertainties and what is a paid as a subsidy to get something otherwise uneconomic started. The Option should be structured so as to be commercially bankable and the subsidy should be time-bound to reflect the cost learning curve expectations. Carbon budgets may then be set and aligned with those two mechanisms.

Summary

Pioneer has developed evidence from over 15 years of ownership and operations in the process heating market that ETS carbon costs will need to be over $50/t-c to achieve price parity between fossil and renewable heating fuels.

Pioneer also has sufficient evidence from actual investments on 15 customer sites that renewable and process waste fuels will add a capital surcharge to life cycle investments equivalent to +$50/t-c marginal costs on gas fuels, to achieve investment cost parity with natural gas boiler installations.

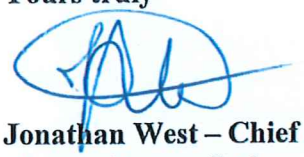
Pioneer has evidence from its wood fuels business that the forest supply chain, with a $50/t-c ETS emissions cost, can support up to 10PJ per annum of bioenergy substitution for coal fuels. Pioneer Energy supports the Bioenergy Association NZ submission on this claim.

Pioneer has evidence from developing and operating 3 x District Energy supply schemes that customers and building developers preferences are for least capital cost outcomes, with lowest complexity and simplest delivery. Electricity driven process heating systems are the most expensive to run and will need storage and market price responsive controls to become more cost effective. Regulators are currently removing market incentives rather than encouraging providers to participate.

Pioneer would like to see investigations of an Options value approach to setting and maintaining carbon budgets. We would like to see evidence from other international markets on how Options are value and exercised, as opposed to describing everything as subsidies. It would be very useful to have policy setting separate Options from Subsidies and also be set in appropriate structures and timeframes that reflect both international and domestic carbon trading market values.

Thank you for the opportunity to provide a summary of our market experience as summarised by our evidence of de-carbonisation costs. We are happy to provide further commercially sensitive evidence from our business, but under normal business confidentiality terms if desired.

Yours truly



Jonathan West – Chief Financial Officer
Pioneer Energy Ltd

Question 2:

In your areas of expertise or experience, what actions or interventions may be required by 2035 to prepare for meeting the 2050 target set out in the Bill? Please provide evidence and/or data to support your assessment.

Answer:

Pioneer has developed evidence from over 15 years of ownership and operations in the process heating market that ETS carbon costs will need to be over $50/t-c to achieve price parity between fossil and renewable heating fuels.

Pioneer has evidence from its wood fuels business that the forest supply chain, with a $50/t-c ETS emissions cost, can support up to 10PJ per annum of bioenergy substitution for coal fuels. Pioneer Energy supports the Bioenergy Association NZ submission on this claim.

Question 3:
In your areas of expertise or experience, what potential is there for changes in consumer, individual or household behaviour to deliver emissions reductions to 2035? Please provide evidence and/or data to support your assessment.
Answer: N/A

Question 4:
When advising on the first three emissions budgets and how to achieve the 2050 target, what do you think the proposed Commission should take into account when considering the balance between reducing greenhouse gas emissions and removing carbon dioxide from the atmosphere (including via forestry)?
Answer: N/A

Question 5:
What circumstances and/or reasons do you think would justify permitting the use of offshore mitigation for meeting each of the first three emissions budgets? And if so, how could the proposed Commission determine an appropriate limit on their use?
Answer: N/A

Section B Emissions reduction policies and interventions

The proposed Commission will also need to consider the types of policies required to achieve the budgets it proposes. This consideration should include:

- sector-specific policies (for example in transport or industrial heat) to reduce emissions and increase removals, and
- the interactions between sectors and the capability of those sectors to adapt to the effects of climate change.

Question 6:

What sector-specific policies do you think the proposed Commission should consider to help meet the first emissions budgets from 2022-35? What evidence is there to suggest they would be effective?

Answer:

Pioneer operates a commercial wood fuels business supplying businesses in Central Otago, Otago, Southland and Canterbury. This business utilizes lower grade billet wood and other cutover residues recovered from forest harvesting as well as seasons low grade pulp logs for chipping. The business has operated for more than ten years and supplies around 250,000 GJ per annum to a range of wood boiler customers. The business is Bioenergy Association NZ accredited has not run out of wood fuel, nor failed to deliver wood fuel supplies to customers through a range of weather events. The delivered cost to provide a reliable supply of quality wood fuels in New Zealand is currently between $10/GJ and $14/GJ depending on the location and scale of the boilers. This fuel cost is 50% higher than local coals, 30% higher than natural gas in the North Island and around half the cost of LPG bottled gas in the South Island.

To achieve wood fuels price parity with fossil fuels, the ETS price on carbon emissions needs to be above $50/t_c. Crown Agency Scion and Bioenergy Association NZ have gathered sufficient evidence that supports at least 10PJ of low value wood fuels resource could be sourced from current plantation forest harvesting, sufficient to replace half the 25PJ volumes of coal fuels currently used in the process heating sector. At $50/t_c the 10PJ of wood fuel options would have parity with coal fuels. To assist customers with their conversion from coal to wood, further willingness and a direct emphasis on conversion could be supported with the existing EECA feasibility funding grants, whereas EECA would contribute up to 75% of the cost of study, supplemented with the return of the 40% capital contribution. This approach would instantly sway more industries to convert to a lower carbon option by removing the perceived capital constraints of new plant. Pioneer has examples of converting 7MW boilers for a small percentage (5%) of the new capital cost of such; with industry knowledge and know-how this would become a viable step towards early transition / transitioning permanently off coal.

Question 7:

What cross-sector policies do you think the proposed Commission should consider to help meet the first emissions budgets from 2022-35? What evidence is there to suggest they would be effective?

Answer:

To assist customers with their conversion from coal to wood, further willingness and a direct emphasis on conversion could be supported with the existing EECA feasibility funding grants, whereas EECA would contribute up to 75% of the cost of study, supplemented with the return of the 40% capital contribution. This approach would instantly sway more industries to convert to a lower carbon option by removing the perceived capital constraints of new plant. Pioneer has examples of converting 7MW boilers for a small percentage (5%) of the new capital cost of such; with industry knowledge and know-how this would become a viable step towards early transition / transitioning permanently off coal.

Question 8:

What policies (sector-specific or cross-sector) do you think are needed now to prepare for meeting budgets beyond 2035? What evidence supports your answer?

Answer:

To achieve further emissions reductions using wood fuels, the main source of wood fuel will be higher grade fibre and sawmill residue which would be competing with local Board mills. At $75/t-c ETS price, Pioneer would be able to compete at parity with Board mills for clean wood chips. This would increase the available wood fuel resources to more than 20PJ per annum and would enable access to natural gas fired process heating market segments.

Section C Impacts of emissions budgets

The proposed Commission will need to consider the potential social, cultural, economic and environmental impacts of emission budgets on New Zealanders, including how any impacts may fall across regions and communities, and from generation to generation. Potential impacts may be either positive or negative.

Question 9: ***What evidence do you think the proposed Commission should draw upon to assess the impacts of emissions budgets?***
Answer: **Wellness and Jobs vs profit** **Benefit of health-related costs and additional onshore Jobs vs company profits,**
Question 10: ***What policies do you think the proposed Commission should consider to manage any impacts of meeting emissions budgets? Please provide evidence and/or data to support your assessment.***
Answer: **N/A**

Section D Other considerations, evidence or experience

Question 11: ***Do you have any further evidence which you believe would support the future Commission's work on emissions budgets and emissions reduction policies and interventions?***
Answer: **Pioneer Energy Limited has provided a summary of our market experience as summarized by our evidence of de-carbonisation costs. We are happy to provide further commercially sensitive evidence from our business, but under normal business confidentiality terms if desired.**

Please email your completed form to feedback@ICCC.mfe.govt.nz by **12 noon, Friday 15 November 2019.**

If you have any questions about completing the call for evidence, please contact us via feedback@ICCC.mfe.govt.nz.