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Enquiries to: Haven Walsh

Waikato REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato

401 Grey Street
Hamilton East
Hamilton 3216

Private Bag 3038
Waikato Mail Centre
Hamilton 3240

ph+64 7 859 0999
fax +64 7 859 0998
www.waikatoregion.govt.nz

7 June 2018

Low-emissions economy inquiry
New Zealand Productivity Commission
PO Box 8036
The Terrace
WELLINGTON 6143

Dear Sir/Madam

Waikato Regional Council staff submission on the Low-emissions economy draft report

Thank you for the opportunity to make a submission on the 'Low-emissions economy draft report.' Attached is Waikato Regional Council's (the Council) submission in regard to the document. Please note that while it is consistent with and re-enforces the views of the Council as set out in prior submissions on related discussion documents, this is a staff submission and has not been formally endorsed by Council. The Council looks forward to release of the final report.

Should you have any queries regarding the content of this document please contact Haven Walsh, Policy Advisor, on (07) 858 6064 or by email haven.walsh@waikatoregion.govt.nz

Regards

Mark Tamura
Manager - Integration and Infrastructure

Submission from Waikato Regional Council on the Low-emissions economy draft report

1 Introduction

1.1 We appreciate the opportunity to make a submission on the Low-emissions economy draft report (the report). The Council recognised early on that nearly every regional council activity is affected by the changing climate, or contributes to the emission of greenhouse gases, and is therefore affected by central government responses to reduce them. Council's activities span a continuum from mitigating the release of greenhouse gases to focusing on adapting to a climate that is changing.

1.2 We support the overall intent of the report which identifies options for how New Zealand can reduce its domestic greenhouse gas emissions through a transition to a low-emissions economy, while at the same time continuing to grow income and wellbeing. We commend the commission for the rigorous consultation and evidence gathering process it has undertaken. The report will be useful in building a framework to help New Zealand reach future emissions goals.

1.3 We also note our support for Local Government New Zealand's submission to the report and are supportive of its content. We look forward to release of the final report and are available to provide input to any remaining issues and solutions the Productivity Commission explores.

1.5 Our contact details are:

Waikato Regional Council
Private Bag 3038
Waikato Mail Centre
Hamilton 3240
(07) 859 0931
Attention: Haven Walsh – Policy Advisor

2 Submission Structure

2.1 Overall, we are supportive of the findings and recommendations in the report. It is noted that much of the feedback provided in the Council's submission to the issues paper has been considered in development of the report. As such, this submission provides high-level feedback on the following aspects of the report:

- Policy settings and the emissions trading scheme
- Land use change and afforestation
- Unmanaged waste sites.

2.2 Attachment 1 provides specific comments on geothermal aspects of the report for consideration.

3 Policy settings and the Emissions Trading Scheme

3.1 The report favours the existing Emissions Trading Scheme (ETS) over taxes or other market based schemes and notes that 'getting emissions pricing right' will be a big focus for successfully transitioning to a lower emissions economy.

3.2 The Council recognises the potential of the ETS to mitigate climate change impacts, most of which will impact council's core functions and responsibilities under the Resource Management Act 1991, Local Government Act 2002, Land Transport Act 1998, and Biosecurity Act 1993. We agree that carbon unit pricing needs to be carefully considered to avoid creating incentives which make it difficult to achieve other government objectives, from a regional council point of view, related to freshwater management, biodiversity and biosecurity, and community

wellbeing. As noted in the Council's previous submission on discussion documents, the Waikato region has experienced the implications of sharp downward changes to carbon unit prices and the cascading effect this had to land-use decisions (deforestation) and impacts on catchment management (increased nutrient and erosion water quality effects and impacts on biodiversity).

3.3 We support of simplifying and decreasing risk from the ETS for forest owners. The Council has previously put forward that emissions reporting for forest participants can be complex. It was noted that using average carbon stock accounting reduces risk and complexity for forest owners and may remove a barrier to enter the scheme for small scale foresters and farmers with marginal land.

4 Land use change and afforestation

4.1 The report proposes a substantial land use change in favour of large scale forestry plantation and significant growth in horticulture. It notes that an emissions price that includes agriculture should become the main driver of land use change.

4.2 The Council has mapped the region's Land Use Capability Class (LUC) and has been supportive of policies and programs that aim to increase afforestation in areas deemed to be erosion prone (due to the related resource management co-benefits for freshwater management and biodiversity etc). Council staff are actively looking for ways to work with central government and landowners to enable greater afforestation in these areas. To see optimal co-benefits realised, council staff recommend further consultative discussion to ensure the right species are planted in the right place.

4.3 The Council has submitted previously that including agriculture emissions in the ETS would promote land use change. Submissions noted that this inclusion would increase the relative economic value of land more suited to forestry as pastoral land would have another associated cost. The Council also submitted that although there are currently few cost effective mitigation options in the agricultural sector, its exclusion from the ETS removes the price incentive for the sector to invest in developing its own technologies and methods to reduce emissions.

4.4 Overall the Council's position is that including agricultural emissions into the ETS should be considered via a transitional approach, ie full agricultural emissions should first be recorded, before looking at paying for an increasing proportion of emissions liability over time. The dairy sector is very important to our regional economy. Council staff recommend work is undertaken to understand the broader consequences of potential changes, eg whether there will be social or community level consequences, and whether investment in different types of infrastructure will be required to service different industries.

4.5 Council staff note that certain types of horticulture require the addition of freshwater and fertiliser. In parts of the Waikato region horticulture is deemed a more intense land use than dairying and may require a resource consent. We recommend further work be undertaken to understand what areas are suited to account for growth in horticulture.

5 Unmanaged waste sites

5.1 The report notes that local government should be better supported to develop effective bylaws or consenting requirements for farm dumps and other unknown waste disposal sites, through an overarching regulatory framework, such as a national environmental standard for wastes such as agricultural waste.

5.2 We support this recommendation. As a region we have had issues with tips, dumps and landfills, including agricultural waste. Soils may be contaminated if hazardous substances are present in the waste and leachate or run-off from farm dumps may reach surface or ground waters if sites are poorly chosen. In these instances groundwater may be contaminated or surface water quality reduced. A more rigorous regulatory framework could address these issues and greenhouse gas emissions at the same time.

6 Submission points for further consideration in transitioning to a low emissions economy

6.1 The table below details submission points for further consideration**:**

Recommendation / Finding / Strategic option	**Position**	**Submission point**
Afforestation	Council staff are supportive of policies that promote afforestation because it enables co-benefits to be realised, including improved water quality and increased biodiversity	Undertake consultative discussion to ensure the right species are planted in the right place to enhance co-benefits.
Including agriculture in the ETS	Council staff support a smooth transition to incorporating agricultural emissions into the ETS	Ensure rigorous work is carried out to determine the appropriate way to include agricultural emissions in the ETS.
Growth in horticulture	Support	Undertake further work to understand what areas are best suited to account for growth in horticulture.

Attachment 1 - Geothermal scientists' notes on Productivity Commission draft report on transitioning to a low-emissions economy

Council staff from the geothermal science team have reviewed the draft report and provide the below points for consideration:

Thermal plant

In places the report refers to 'thermal generation' without differentiating between fossil fuel thermal generation and geothermal generation. For example, on page 320, 4th bullet, "holding surplus renewable generating capacity is an efficient option for reducing the need for thermal generation". We suggest the reference should be to "fossil thermal generation", and the same differentiation should be made elsewhere in the section.

Geothermal energy use and Greenhouse Gas Emissions (GHG)

Almost every reference to geothermal energy notes that geothermal fluid extraction (eg for electricity production) releases greenhouse gases. However, we suggest it needs to be pointed out that in the long run, the quantity of naturally occurring greenhouse gases released from geothermal fluid when it comes to the surface will be the same more-or-less whether the surface discharge is natural or enhanced (eg for a geothermal power station). The difference is that the discharge occurs over a much shorter timeframe when discharged from a geothermal operation. For a more complete and accurate understanding of the effect of geothermal energy use on GHG emissions, see Fridriksson et al., 2016: https://openknowledge.worldbank.org/bitstream/handle/10986/24691/Greenhouse0gas0mal0power0production.pdf?sequence=1

In quantifying the emissions from any energy conversion source, we suggest that more than the emissions during operation need to be taken into account. Other sources of GHG discharges can include fossil fuel use during drilling (for geothermal), discharges associated with creation of large concrete structures (eg hydro dams), methane production from inundated vegetation in hydro dams decomposing, and the leakage and accidental discharge of hydrocarbon working fluids (typically pentane, butane, etc) from thermal binary plants. At the link below is an analysis of life-cycle of greenhouse gas emissions of different types of power plants, and an investigation of the effect of emissions of binary plant working fluids, which turns out to be minimal (Mattson *et al.*., 2017): https://pangea.stanford.edu/ERE/db/GeoConf/papers/SGW/2017/Mattson.pdf

A more accurate life-cycle analysis of emissions is likely to favour geothermal electricity production.

Number of NZ geothermal electricity plants

On page 326, Box 12.1 states:

> *The emissions intensity of New Zealand's most intensely emitting geothermal plant (Ngawha) is higher than that of a low-efficiency gas plant. Even so, six of New Zealand's seven plants have substantially lower emissions than high-efficiency gas plants. The volume-weighted average emissions intensity across all plants is approximately a quarter of that of gas.*

There are seven geothermal systems under development but that is not the same as seven power plants, as several systems have more than one station on them. Carey *et al.* 2015 provides a table of New Zealand geothermal power stations: https://www.geothermal-energy.org/pdf/IGAstandard/WGC/2015/01052.pdf. This report identifies each individual facility, although often some of them are grouped together as one station, for example the Wairakei Binary Plant is considered part of the Wairakei Power Station. Grouping adjacent stations that are connected with each other, eg Mokai 1, 2, and 3, which is the commonly accepted approach by the power companies, gives a total of 16 power plants.

Switching stations on and off

On page 330 it states:

> *I. G. Mason et al. (2013) investigate the technical feasibility of eliminating all thermal plant from New*

Zealand's electricity system, while maintaining resource adequacy under conditions that pertained in recent years. Their full model uses a combination of wind, pumped hydro and over 600 MW of geothermal generation, which is switched on and off to manage the variation in generating inflows (and, implicitly, in demand). Without the use of pumped hydro, which has a high capital cost and is probably environmentally and economically infeasible, Mason et al.'s model achieves 99.8% renewable generation.

Poihipi Rd geothermal power station has been run on a peaking basis, in that its continuous operation was briefly ramped up twice a day to cover peak demand. This is known as 'load following' and is not the same as switching a power station on and off, which is normally only done once a year for maintenance. There are multiple significant technical issues with effects on plant, steam pipelines, wells and underground aquifers from starting and ceasing flow, and it is not feasible to switch a geothermal plant on and off daily. Cooling and reheating of the kilometres of pipe and the station equipment can cause problems of metal contraction and expansion. Well flow characteristics can change and some wells may cease to flow. We consider your report would more accurately reflect current reality and possibilities if it referred to load following rather than switching on and off.

Geothermal energy as a renewable resource

Throughout the document, geothermal energy is referred to as a renewable resource, in line with its definition as such in the Resource Management Act 1991, S2. For example, page 7 says:

New Zealand's largely decarbonised electricity sector is a major advantage, and considerable scope exists to further increase the supply of electricity from renewable sources, such as wind (the cost of which has been falling rapidly) and geothermal energy (which still produces some emissions).

However, on page 346 it states:

New Zealand already has 85% of its electricity generated from mostly low-emissions renewable sources. In the longer term, new technology should enable even more electricity to be generated at reasonable cost from low-emissions sources even as electrification of transport and industrial heat push up demand. Yet providing on-call generation to meet peaks in demand, and most importantly to provide energy in dry years, will remain a challenge. Under current technology, assigning this on-call role to non-renewable sources such as geothermal generation will cause a substantial rise in electricity prices. The Government should be cautious about setting stringent targets for electricity sector emissions before technology becomes available to further reduce emissions at reasonable cost.

Since geothermal energy is defined as renewable by statute, we believe that references to geothermal energy as non-renewable need to be corrected. This error perhaps indicates confusion between a renewable energy source and the sustainable use of that energy. Geothermal energy can be used at a rate that is unsustainable, even though it is a renewal energy resource.

East Waikato Council(s)

On page 370, a paragraph states:

Some examples of this exist. For example, Auckland, Christchurch City and East Waikato Councils discuss climate change in their WMMPs…

There is no local government body called East Waikato Council. We would suggest more clearly identifying which councils are included in this text.