

Process Heat in New Zealand: Opportunities and barriers to lowering emissions.

Thank you for the chance to make a submission on this topic, because 60% of process heat in New Zealand comes from burning coal and gas. If we are serious about action on climate change, the use of fossil fuels for process heat needs to come to an end – urgently.

What is process heat and so my reasons for concerns

Introduction:

From my understanding process heat is primarily used for warming spaces and industrial processes. New Zealanders all have process heat plants in their neighbourhoods, but very few people realise that they are causing a lot of the air pollution in their residential neighbourhoods. My local school, Northern Southland College and Southland's Regional Kew Hospital have boilers fired by lignite (poor quality coal) used to heat their premises – that is process heat. A lot of dairy factories are also fired by coal. Local dairy factories in Southland such as Fonterra at Edendale and Mataura Valley Milk at Gore both use process heat energy derived from lignite to dry milk powder – that is process heat. My concern is that a lot of that process heat is generated by burning fossil fuels, especially coal and gas.

Impacts on Climate Change

We are in a national and international climate crisis. We need to take a lot of urgent and strong actions to stand a chance of getting out of this devastating predicament which we are all contributing to. However the most urgent need is to get rid of the most damaging polluters eg industries using process heat plants fired by non- renewable energy and pollutants ie burning coal, oil and gas.

Burning cheap fossil fuels in dairy factories not only directly produces lots of emissions, it also helps prolong the industrial dairying model which is devastating our waterways, landscapes and soils. The more coal and gas Fonterra and its allies are allowed to burn, the more cows they can

graze across our precious landscape, causing more damage to our soils, waterways, indigenous species in waterways and native plants on land. We need to take every opportunity to reduce greenhouse gas emissions from process heat which means replacing fossil fuels by renewable sources.

Basics about process heat in New Zealand.

Official Government information on process heat states:

Energy (including transport) contributes nearly 40% of New Zealand's total gross emissions. Process heat makes up one-third of New Zealand's overall energy use and contributes approximately 9% of gross emissions.

60% of process heat is supplied using fossil fuels, mainly gas and coal.

78% of New Zealand's process heat is used in industry, particularly manufacturers that turn resources into products eg, heat is used to turn wood into pulp and paper or to process milk into powder, as well as sanitise equipment.

The commercial sector uses 10% of New Zealand's process heat, mainly for space heating large buildings and offices.

The public sector uses 7% of our process heat eg, hospitals use steam for sterilisation and heating buildings.

Source: <https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/low-emissions-economy/process-heat-in-new-zealand/>

The statistics above speak for themselves with regard to the amount of pollution being done by process heat using coal, oil and gas when other renewable sources of energy are available. The Government needs to lead by example with public sector entities being funded to ensure they move to renewable energy sources thus modelling and taking full responsibility for our commitment to the Paris Accord. The private, agricultural and commercial sectors must be given incentives urgently to change their fuel sources and do their part in meeting our commitment to the Paris Accord as well.

The emphasis needs to come off GDP and on the other measures of well-being and I commend the Government for taking this initiative. The impacts of climate change on people both in NZ and internationally at present is producing a lot of stress, heartache, mental health issues alongside property destruction, environmental degradation and in the process huge increases in our mental and physical health costs, insurance costs and environmental depletion and species loss.

Alternatives to using fossil fuels.

Better sources of heat are available, including wood waste which is renewable, provided forests are replanted after harvesting. There is a huge amount of wood waste which is not harvested at present. This waste wood often is the cause of fires in forestry blocks when people burn the waste they have windrowed. This smoke is another source of air pollution. With wood chippers doing very efficient work around the country, it should be a requirement of every tree felling operation to have a chipper on site so this waste wood is turned in to a usable resource. Wood chip and wood pellet boilers are very efficient and more smaller industrial boilers and households are using them to great effect. Incentives need to be given to ensure the wood waste is chipped on site and used efficiently in producing process heat.

Electricity generated from renewable sources are other sources of process heat and excellent alternatives to fossil fuels. We are very fortunate to have electricity produced by hydro, wind and solar. Many homes are now installing solar panels in particular and some wind turbines so they are less reliant on the national grid and its price fluctuations. Small businesses could be given incentives to move from reliance on fossil fuels to renewable sources.

These alternatives are easier to implement in some places than others but reducing emissions must be an urgent priority in order for us to transition these heat process plants off coal and gas.

It is to be noted that a lot of these heat process plants/ boilers are Government buildings eg schools, hospitals, government offices, local bodies, public swimming pools, universities, and I expect that these heat process plants will be phased out urgently as an example to other industries using coal and gas. The Government needs to be seen to be leading the way and modelling the

urgency to do so so we can meet our Paris Accord commitments. I applaud the Education Department for its policy of replacing coal fired boilers, when they are old and inefficient, by pellet or wood chip boilers. I am delighted that this has happened in my local schools of both Lumsden and Mossburn. However the time frame needs to be reduced so more of these boilers are replaced very soon to reduce pollution, meet our climate change commitments and also reduce the impact on our children's health when they attend schools using these fossil fuel heat sources. People who have to clean the huge amount of dangerous ash from these coal fuel fired boilers daily also have their health compromised - mostly caretakers and principals.

My other real concern is that hospitals in the South Island are still being fired by lignite, the most polluting form of coal, so the air around the hospital is highly polluted which seems a ludicrous situation when people go there to get their asthma, lung infections, pneumonia and other breathing difficulties seen to. I understand the polluted air is drawn into and through the air conditioning system which then further pollutes the air inside the hospital, affecting other patients. This particularly noticeable in the Southland Base Hospital in Invercargill where the smell of lignite is very marked, especially at the main doors at night, with the Emergency Department being adjacent to this area. People going there in an emergency situation with breathing problems will not benefit from this pollution obviously.

Another concern I have is that because of the pollution caused by coal and lignite fired process heat producers eg coal fires in homes, in South Invercargill where the hospital is situated, there were constant levels of PM 10 above the World Health standards. As a result Environment Southland encouraged and provided incentives for home owners to replace their usually very old and inefficient coal fires with efficient wood burners, chip or pellet, or more efficient electric heating systems, mostly heat pumps. The air pollution has reduced markedly and resulting health problems also, so reducing admissions to the local hospital. However the hospital is still producing air pollution from its lignite fired boiler which is a ludicrous and unjust situation, when others in the community have had to spend a lot of money replacing their polluting systems while this public facility continues to pollute.

There are many other communities around the country which are in these kinds of predicaments and they all need to be rectified urgently.

Ways Forward

The most important step which is essential in order to meet our Paris Accord commitments is to stop any new investment in fuel plant for process heat being fired by coal, oil or gas. The limited efficiencies gained by Fonterra in their existing plants are more than outweighed by the building of new plant in the dairy industry, running on coal or gas. This needs to be stopped as Fonterra is not living up to its branding theme of it being a 'clean green' industry! All new process heat plant should be renewably fuelled, or we are just wasting our time. We are also not showing our commitment to reducing our emissions, keeping to our national and international commitments and to the future of our planet, leaving it in a habitable state for future generations. We have a huge moral and ethical commitment to not only the generations of humans already on our planet as well as those coming after us along with every other living thing. This is a huge responsibility but one we are all up to carrying out for the good of others. This is a community responsibility as we all know and we as community members need to be prepared to make the necessary changes alongside the Governments commitment.

ESSENTIAL ACTIONS to be taken by Government

1. A mandatory carbon price of at least \$50/tonne, raised at regular and pre-announced intervals to reach \$100 within a couple of years, is needed to drive the urgent and significant emissions reductions that must be made.
2. The Government must put legislative and regulatory changes in place to ensure that, as existing heat plant reaches the end of its economic life, it is replaced by heat plant that is not fuelled by fossil fuels, but is powered from renewable energy sources.
3. Incentive are needed to encourage industries to change from fossil fuels to renewables in the very near future, regardless of the age of their plant, because they are doing it for the good of the planet. There are already people who have done this eg McCallums Dry Cleaning in Invercargill. They need to be commended and held up as an example of good news stories.

4. Measures must also be put in place to ensure that existing fossil fuel powered heat plant is not run beyond the end of its economic life in an effort to avoid replacing fossil fuel energy sources by renewable sources.
5. Where existing fossil-fuel powered heat plant has an economic life that extends past 2030, the Government should put in place legislative and economic measures to ensure that this plant is replaced by heat plant that is powered by renewable energy sources, ideally much earlier than 2030, with incentives to encourage that.
6. If hydrogen is used as an energy source for process heat, it must be generated by renewable means, not derived from fossil fuels.
7. Replacing one form of fossil fuel energy source with another is completely unacceptable. In particular, the idea that natural gas is a “transition fuel” away from coal is nonsense. Fossil fuels should be replaced by renewables, not other fossil fuels.
8. Health institutions and health impacts are another considerable consideration for why we need to stop using coal, oil and gas to fuel boilers, heat process plants. The impact on peoples’ physical and mental health, along with the impact on other organisms, especially other animals all needs to be considered and acknowledged because of our interconnections with biodiversity in the area of food for good health, alongside habitat loss, soil depletion and water pollution.
9. Government responsibility in all of this is paramount and it needs to be seen to be leading by example, creating strict criteria for everyone to follow and not creating exemptions for certain areas of society, when everyone else is making a realistic contribution to cutting carbon emissions. I name the farming and transport industries as examples- which are some of the biggest emitters.
10. Corporates often use bullying techniques, especially those with their roots in other countries who take most of their profit off- shore, to keep polluting, when they show only lip service to reducing carbon emissions- known as ‘greenwash’! They use lawyers to their own advantage, often holding up court cases which could move us forward in to a truly green economy and hold others to ransom. I name the coal, oil and gas industries as examples. Profit is their only criteria it seems and their activities degrade the environment, take away habitats, pollute waters, make people and other animals sick such

as through chemicals used in fracking. The Government needs to call their bluff and tell them to go elsewhere as their kaupapa is not how we do things in Aotearoa /NZ.

11. Future generations' involvement in these discussions is essential as the world we are leaving them is not going to be a nice place to bring up children, have access to healthy food, health services, clean water, clean air and all the other necessities for a good life as our generation has been privileged to have. They need to be listened to and their ideas acted on- urgently – so they see our concern for them and their world in to the future.
12. Well -being philosophy has a lot to be commended for and changing this whole way of looking at our economy, what it means to be well and how we can ensure those principles are enacted in to law for the benefit of every living thing is a matter of urgency. I commend the Government for this change in our kaupapa.
13. Energy conservation which involves everyone is another urgent need. We have done this before in 1950s when there was an energy shortage , during the Gulf War, during the World Wars and at other times more recently when we saw the need to conserve and not waste energy. Ministry for the Environment is very capable of bringing back those principles and actions which we all took for granted for the good of ourselves and others at the time. This involves everyone, self -monitoring and community action and raises awareness as well as reducing emissions.
14. Good news stories as examples for others- getting together to share new ways of doing production with lower emissions, less environmental impacts and well -being of those employed there eg reducing industrial dairying, need to flood the news media to encourage people to know they can do a lot more to help! .

Responses to some supplied detailed questions

Q4: Does the NZ ETS provide an incentive to significantly reduce emissions beyond current levels for business who receive industrial allocation?

No. A carbon price of at least \$50/tonne, raised at regular and pre-announced intervals to reach \$100 within a couple of years, is needed to drive such significant emissions reductions. If carbon prices of this magnitude are to be accepted, the revenue needs to be paid back to the people on an equal per capita basis.

Q17: What does your organisation consider are the largest barriers to the electrification of its production?

As an individual I believe it is clear from the discussion in this section that companies and institutions' unfamiliarity with electricity as a source of process heat is a substantial barrier to its adoption. Here, the Government should partner with both public and private sector users of process heat to ensure the early uptake of electricity for process heat at a range of scales.

Electrification should not proceed beyond the point where all new capacity can be provided from renewable sources, bearing in mind with Climate Change water and sun availability for hydro, solar and wind are less predictable now because of climate pattern reliability and usual weather patterns being less reliable.

Q21: What does your organisation consider to be the largest barrier(s) to the use of biomass for supplying heat?

I believe the largest barrier to the use of biomass for process heat is one that is not listed in this section of the discussion paper: the lack of a carbon price that means that companies pay the true cost of their greenhouse gas emissions. With such a price in place, companies that currently emphasise the barriers listed in this section may well find that these barriers were less substantial than they currently claim.

However, it will also be important to ensure that other sources of emissions related to biomass (e.g. transport emissions) are minimised, and that the sources of biomass are environmentally sustainable (e.g. using wood waste rather than crops grown for biomass).

A major barrier is consultants who are familiar with coal and gas and just use their existing templates to design plant. EECA needs to compile a list of consultants who are familiar with the use of wood waste and other waste biomass and will recommend quality boilers to use these fuels.

Q27: Has your organisation identified any other barriers to, or co-benefits from, the direct use of geothermal heat that we have not included above?

Although geothermal energy is not a fossil energy source, exploiting geothermal energy sources does result in CO2 production. While these are substantially less than from the burning of fossil fuels, this means that renewable energy sources should still be preferred to geothermal energy.

Conclusion

It is essential that our transition to a net zero emissions economy is comprehensive and coordinated across all sectors, with overall responsibility for these plans lying with the government.

Changing the ways process heat plants are fired, not using coal, oil or gas, represents a major step forward in Aotearoa/ New Zealand's progress in addressing climate change and all the ramifications involved. It needs to be established so it engages the whole country in a sustained effort for a future which honours our commitment to succeeding generations of not only people, but also every other living organism.

New Zealand has a history of being the world's first – we were the first country to give women the vote and become nuclear-free. It's time to do that once again, on the world stage, and make sure we leave our future generations of all living things the world they deserve.

Nau to rourou, naku te rourou, ka ora te iwi.

From your food basket and my food basket, there is sufficient for everyone

I do wish to be heard if there is a hearing re submissions- but it would need to be by teleconference, Skype or Zoom.

Kia ora koutou,

Jenny Campbell, QSM for the Environment