New Zealand's second Emissions Reduction Plan

A SUBMISSION TO MINISTRY FOR THE ENVIRONMENT | 25/08/24

Executive summary

Clarus welcomes the opportunity to submit this response to the Ministry for the Environment's (MfE) consultation on New Zealand's second Emissions Reduction Plan (ERP2). As one of New Zealand's largest energy groups, our response is focussed on energy-related matters. There is no confidential information in this submission.

Overall, we are supportive of the draft ERP2. We support:

- The net-based approach. This is the goal that gained cross-party support in Parliament, so by aligning to the legislative target the ERP2 approach promotes confidence in the durability of New Zealand's climate goals.
- The least-cost approach, provided that it takes a balanced and long-term view of costs and benefits. This is a market-led approach that doesn't attempt to centrally plan solutions for different parts of the economy.
- The emphasis on the emissions trading scheme (ETS) as New Zealand's cornerstone climate policy and that predictability and consistency over time is of utmost importance.
- That complementary measures will be warranted where significant regulatory or market failures exist.

We invest in energy infrastructure such as electricity lines and gas pipelines, which typically has a long operational and economic life. The infrastructure investments we make have asset and commercial timeframes that are significantly longer than the three-year electoral cycle and five-year emissions budgeting cycle. As such, we take a long-term view that places value on the durability of arrangements. We encourage this Government—and future Governments—to seek out opportunities for enduring cross-party support.

In this submission, we make the following recommendations:

Recommendation	Rationale
We recommend the Government's planned *National Energy Strategy* reflect the principles set out in the ERP2. By focusing on a least-cost, ETS-centric approach the *National Energy Strategy* won't be taking options off the table.	This is especially important because of the transitional role natural gas will continue to play in supporting the electricity system.
We recommend that Government should incentivise more widespread use of anaerobic digestion technology to achieve provincial and national benefits with beneficiaries across the waste, energy and agriculture industries.	Diverting organic wastes from landfill and processing them with anaerobic digestion is more productive, reduces emissions and aids regional development.
We recommend that the parts of the *National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat 2023* (and perhaps the regulations they give effect to) that deal with gas-fired heat devices are repealed or reviewed to make use of renewable gas in process heat practicable.	While the policy statement is ostensibly only concerned with fossil fuels, the practical effect is the creation of an undue barrier for renewable gas. This regulatory barrier should be removed.
We recommend that the *Building for Climate Change Programme* and the *Carbon Neutral Government Programme* permit and reward the use of renewable gas certificates as an alternative means of achieving decarbonisation.	These programmes fail to recognise the emission reduction benefits of offsite renewable energy. This creates an undue barrier to renewable gas.
We recommend that the Government's planned review of Part 4 of the Commerce Act be widened to include the issues faced by gas pipeline businesses through the transition to a lower carbon economy.	Part 4 was designed for natural monopolies that are growing and face no/few substitutes. This is no longer the case for gas pipelines, so Part 4 is not fit-for-purpose.

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1. Affordable, reliable electricity underpins the energy transition

The electrification of energy needs is a global megatrend that is already underway in New Zealand. Any measures that undermine electricity affordability ultimately work against the emissions reductions that can be delivered through electrification. The more expensive electricity is in comparison to substitutes, the less likely consumers are to choose electricity. This same substitution can happen with firms making decisions about where in the world to operate. If Aotearoa succeeds at having reliable, low-emissions, affordable electricity then we are more likely to increase electricity usage.

Modelling for *The Future is Electric* showed that the economy achieved more decarbonisation with natural gas playing a peaking role (as compared to a 100% renewable power system). This is because gas peaking helps the affordability and reliability of electricity, enabling greater electrification of energy needs currently met by fossil fuels. Similarly, modelling for the Business Energy Council found that economy-wide optimisation led to a continued role for natural gas fuelling peaking electricity generation.

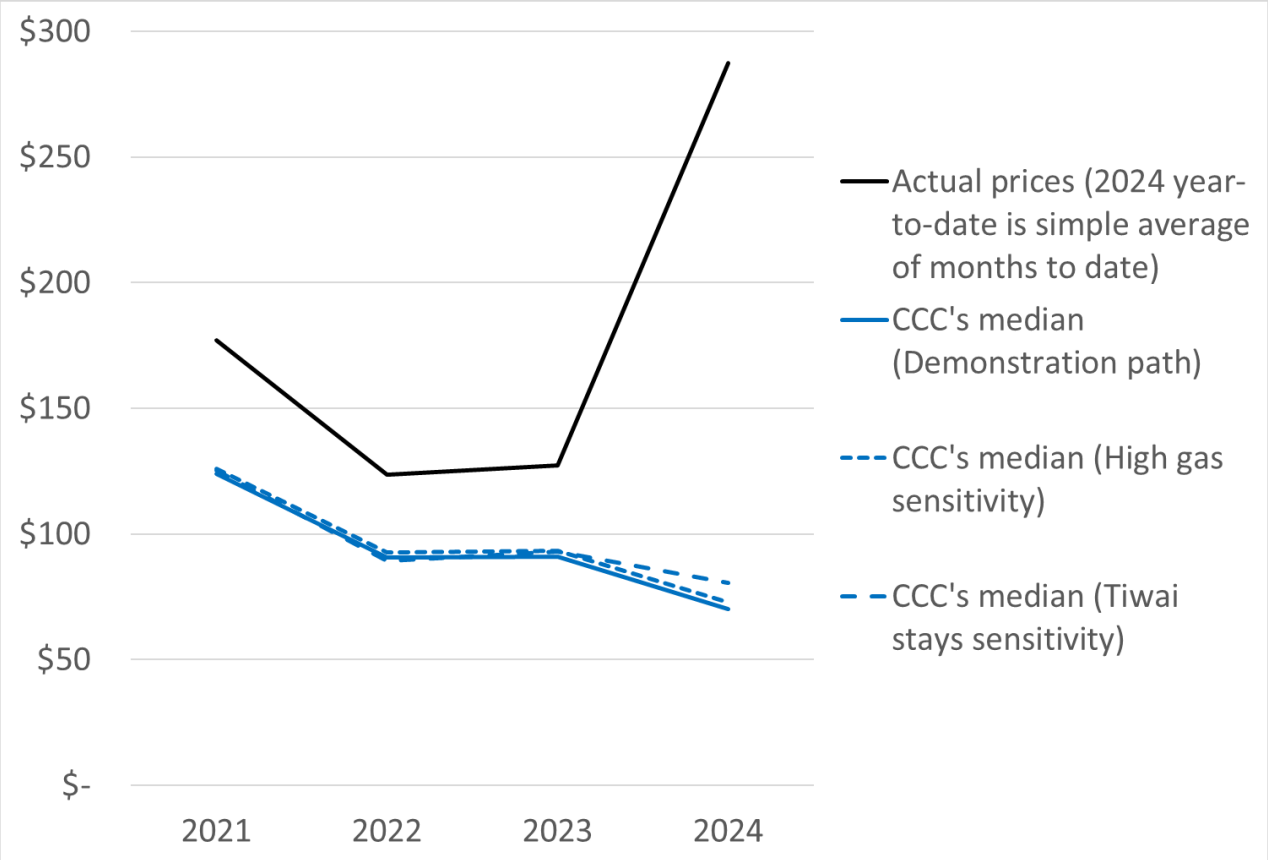
Accordingly, we support the Government's focus on electricity through its *Electrify NZ* policy. In particular, we endorse the actions in *Electrify NZ* that commit to:

- speeding up resource consenting processes for electricity infrastructure
- reviewing the restriction on common ownership of electricity distribution and generation in excess of 250 MW
- reviewing Part 4 of the Commerce Act.

We support the least-cost, market-led approach in ERP2. The volatility evident in the electricity and gas markets this year underscores the importance of this approach. There is an underlying shortage of energy in both markets, but no shortage of experts sharing their views on how to fix the issue of high prices. Market participants are disciplined by the risks and rewards of market prices and, even so, they make plenty of errors. Putting politicians or officials in a position where they have to intervene is even more fraught.

This can be seen with the difficult task set before the Climate Change Commission (CCC) who, among many other things, attempt to forecast electricity prices. In early 2021 the CCC median forecast for wholesale electricity prices in 2024 was $80 per MWh. As shown in the graph below, the 2024 year-to-date average wholesale electricity price is $287 per MWh.

Wholesale electricity prices 2021-24: Comparison of Climate Change Commission (CCC) forecasts vs actuals



The CCC's forecasts were in line with market expectations in early 2021. On 13 January 2021, long-dated electricity futures for Otahuhu were trading at $101 per MWh. However, market conditions (and market expectations) have changed rapidly and futures now range from $373/MWh (Sept 2024 quarter) to $119/MWh (Dec 2027 quarter) .

The market's responsiveness can be seen in terms of generation investment decisions. The Electricity Authority's established the winter security standards in 2012 as a measure of whether there is enough generation to meet total and peak electricity needs over winter. Since then, the market has delivered enough capacity to both exceed the security standards and still retire the Southdown and Otahuhu gas-fired generators. While there were years of serious doubt over the viability of the New Zealand Aluminium Smelter (accounting for 14% of New Zealand's electricity use), the market held off on additional investments.

We recommend the Government's planned *National Energy Strategy* reflect the principles set out in the ERP2. By focusing on a least-cost, ETS-centric approach the *National Energy Strategy* won't be taking options off the table. This is especially important because of the transitional role natural gas will continue to play in supporting the electricity system.

Though it is not part of the ERP2 or *Electrify NZ*, we note our strong support for this Government's review of the regulation of vegetation near powerlines. We anticipate this should reduce total costs by focussing on preventative steps (rather than remedial steps) and improve the reliability of electricity supply.

2. There is a continued role for gas in the economy

Given the expectation of a more electrified economy, we also expect that gas will have a smaller role in the future. This trend has been underway for many years. From a peak of 250 PJ in 2001, total natural gas demand has fallen by more than one third to 145 PJ in 2022.

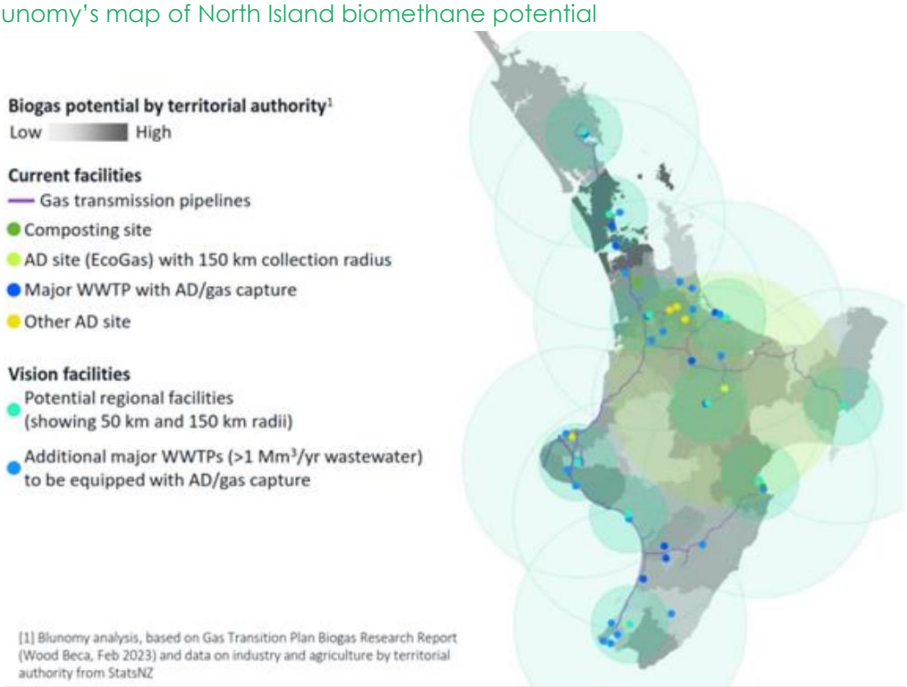
Nonetheless, fossil-sourced gases (natural gas and liquid petroleum gas (LPG)) will continue to be used in a transitional role within parts of the economy for decades to come. We expect natural gas will play a significant supporting role in decarbonisation of the economy as an energy source for firming intermittent renewable electricity generation. LPG will serve some South Island coal users as a decarbonisation stepping-stone. Both fuels will help take peaks demands off electricity networks.

Biomethane has a growing role in productive use of waste with co-benefits in waste management and agriculture

We see valuable—and near-term—potential for biomethane in New Zealand. A 2023 study by Blunomy found that smart use of 24 PJ of organic waste/residue feedstocks would contribute ~6,000 jobs in provincial areas, 23% towards targets to divert waste from landfills, up to 9% of the increase in renewable energy needed to meet the then-target of 50% for total final energy consumption from renewables, and up to 24-46% of the reductions in biogenic methane needed to meet the 2050 target. We commissioned the Blunomy study jointly with Ecogas and Powerco.[1]

The way that this potential could be realised is through a network of regional anaerobic digestion (AD) facilities, as shown in the figure below.

Blunomy's map of North Island biomethane potential



The benefits of biomethane are much broader than just the energy sector or indeed the gas itself. Smart use of organic wastes can reduce landfilling and emissions from the waste sector, provide biomethane, biogenic carbon dioxide, renewable heat and biofertiliser. The benefits accrue across the waste, energy and agriculture industries. The technology is mature and proven overseas.

[1] Blunomy's *Vision for biogas in Aotearoa New Zealand* is available here

We recommend that Government should incentivise more widespread use of anaerobic digestion technology to achieve provincial and national benefits (including avoided emissions) with beneficiaries across the waste, energy and agriculture industries. We are open-minded about the policy measures that should be used in this regard, but credible options include:

- Instructing the Gas Industry Company to investigate the merits of both voluntary and mandatory approaches to achieving renewable gas targets
- Instructing the Gas Industry Company to oversee progress on renewable gas certificates, including through consultation with other public sector officials
- Request advice from MfE on whether ETS treatment of medium and large wastewater treatment plants is appropriate
- Direct Ministry of Business, Innovation and Employment to develop a framework for public private partnerships between local government and private sector for development of regional organic processing facilities.2

In summary, there are a range of options available to policymakers when designing an incentive regime for biomethane facilities. We are open-minded about the best design options. We encourage policymakers to be ambitious and 'not let the perfect be the enemy of the good'.

Some government policies and programmes may be barriers against use of renewable gas

The *National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat 2023* gives effect to regulations that prohibit resource consent approval for some forms of new process heat (e.g. coal-fired boilers) and restricts others (other fossil fuelled heat devices). Any heat device that is currently natural gas fired can instead by fired with biomethane with no conversion costs.

But the underlying regulations means a consenting authority would need to be satisfied the device will not, ever, be fired with natural gas. This will be difficult to monitor and enforce and effectively expects consenting authorities to also be the 'carbon police'. This will be further complicated by the fact that the actual physical molecules combusted could be fossil-sourced, but the process heat owner purchases renewable gas certificates to eliminate their process heat emissions. Other complications exist:

- What if the process heat owner has 'only' a five-year contract for supply of renewable gas certificates?
- What if the device will primarily run from onsite biogas but will be supplemented with natural gas?
- What if the device uses 100% biogas under normal circumstances, but when biogas production is interrupted it is fed with natural gas instead?

In any event, a process heat owner seeking consent for a heat device that can be operated with fossil fuels is forced to commission a 'suitably qualified person' to review and make recommendations on their plans.

For these reasons, we are concerned that the policy statement and the underlying regulations will act as a barrier to uptake of renewable gas. **We recommend** that the parts of the *National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat 2023* (and perhaps the regulations they give effect to) that deal with gas-fired heat devices are repealed or reviewed to make use of renewable gas in process heat practicable.

There may also be some undue barriers to renewable gas embedded within the *Building for Climate Change Programme* and the *Carbon Neutral Government Programme*. Both of those programmes link up with the NABERSNZ building rating system. The rules behind the NABERSNZ system mean that any onsite energy production (such as solar panels on the roof, or biogas production from waste feedstocks) does not count toward the assessment and thereby improves the building rating. This seems appropriate given the boundaries of a building rating system. However, it does point to an inconsistency between the climate goals of the aforementioned programmes not aligning perfectly with the scope of the NABERSNZ system. **We recommend** that the *Building for Climate Change Programme* and the *Carbon Neutral Government Programme* permit and reward the use of renewable gas certificates as an alternative means of achieving decarbonisation.

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2 There are existing frameworks to draw on, such as Te Waihanga's PPP guidance or Infrastructure New Zealand's *Model Two: Community Partnership Models for Smaller Scale Infrastructure Delivery*.

Hydrogen will have a growing role with more significant potential from 2035

Looking beyond the near-term benefits of biomethane, hydrogen will become increasingly important from the mid-2030s. We see roles for hydrogen supporting the electricity system with inter-seasonal storage, decarbonising fertilisers and methanol, steel production and heavy transport such as sustainable aviation fuels. We foresee that hydrogen hubs will provide critical mass for a nascent industry to develop around. Hydrogen hubs will be the foothold from which the industry can scale up and eventually support new low-carbon industries and export products.

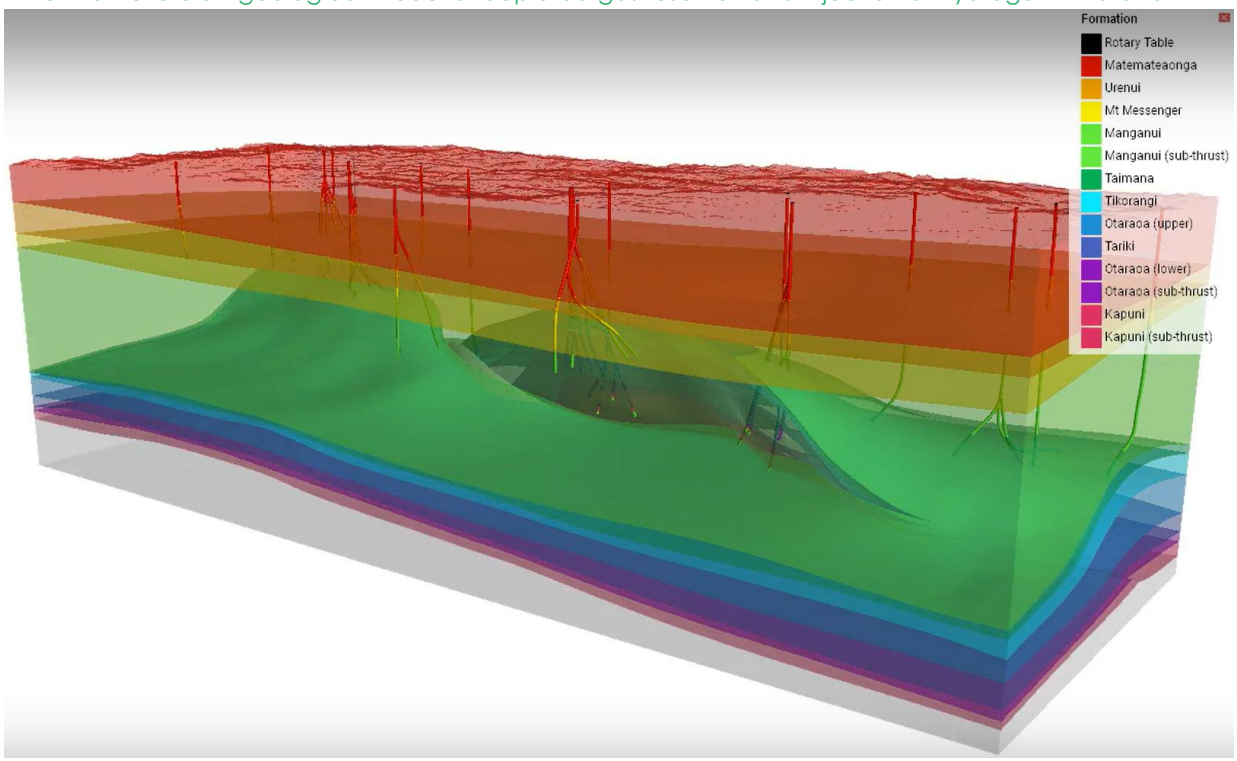
Indicative location for new hydrogen pipeline

As use-cases grow, the value of storage and transport will grow as well. In 2023, we highlighted the role that transporting hydrogen could play with a high-level estimate for a 550 km pipeline.

If underground hydrogen storage is viable in New Zealand, this would give energy users and producers valuable options for utilising hydrogen in their industries. It would enhance national energy security and flexibility. It would help to overcome the low volumetric energy density of hydrogen gas. A research group of academics is exploring exactly that topic through the five-year Pūhiko Nukutū project.

The storability of gas molecules underpins a source of competitive advantage of gas in all its forms. This manifests in various energy security benefits: more resilience, greater diversity of energy mix and supply chains, energy system balancing through gas dispatchability.

A Pūhiko Nukutū 3D geological model of depleted gas reservoir and injection of hydrogen in Taranaki



Given decreasing demand for natural gas, the future of pipelines needs to be planned for

While we see a growing role for renewable gas, the overall demand for gas in the economy will diminish. Part 4 of the Commerce Act regulates natural gas pipeline owners as natural monopoly businesses. It was designed for steady or growing businesses with little or no competition. That is no longer the case.

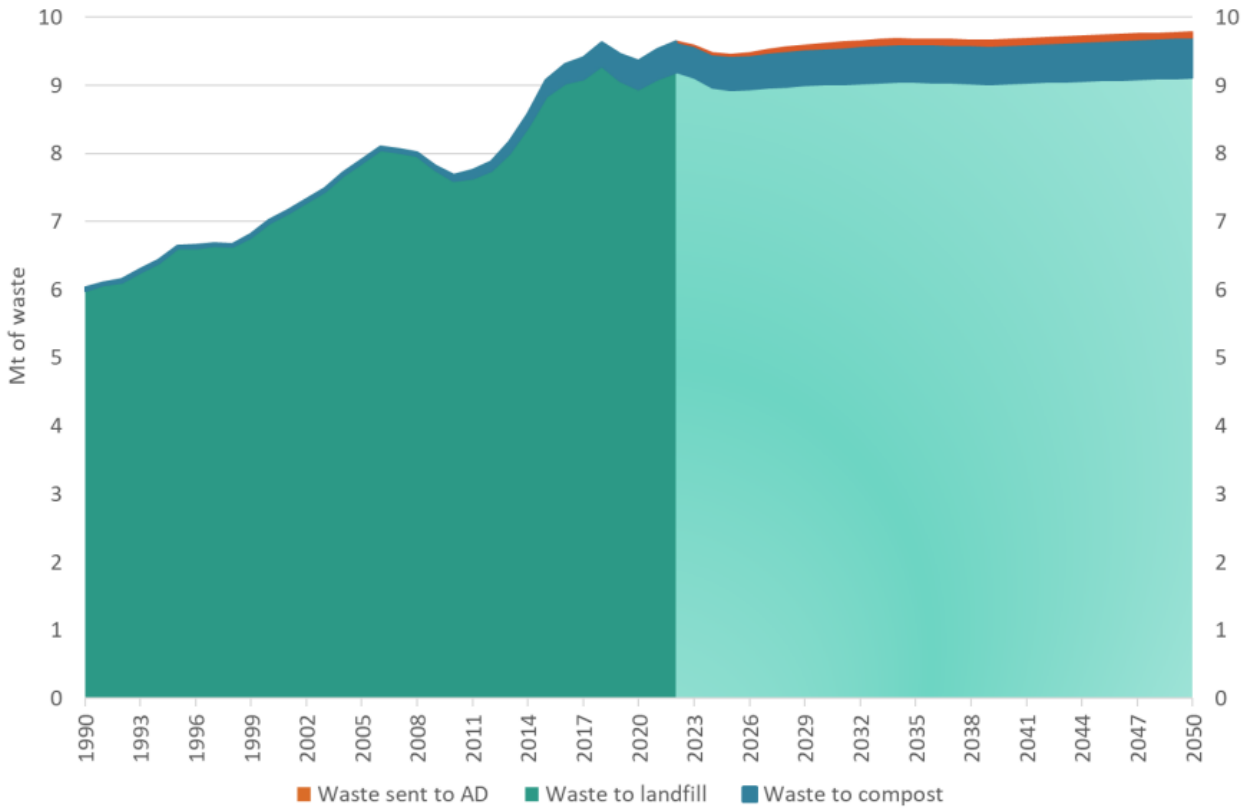
Electricity distributors face rapid growth, whereas gas pipelines face declining usage, asset stranding risks and decommissioning decisions. The Commerce Commission and gas pipeline businesses need new tools to manage risks through the energy transition, including network rightsizing and the changing nature of the gas being transported via pipelines.

We recommend that the Government's planned review of Part 4 of the Commerce Act be widened to include the issues faced by gas pipeline businesses through the transition to a lower carbon economy.

3. Anaerobic digestion should and will play a much larger role in waste management

The technical annex to ERP2 includes this chart showing destination of waste to landfills, composting and AD.

Figure 16: Historical and ENZ interim projected waste tonnages by destination of waste, 1990–2050



Note: Darker shade = historical data; lighter shade = projections. AD = anaerobic digestion.

We expect a much larger role for AD technology than the above chart predicts. The aforementioned study by Blunomy showed AD's potential to divert 0.75 Mt of organic wastes from landfill. This would meet 23% of waste diversion targets and reduce emissions by 3.7 Mt CO2e, which would contribute 24-46% of the reduction in biogenic methane needed to meet the 2050 target.

AD technology enables far greater productive use of waste streams and more circular use of outputs. If organic waste is landfilled, we can capture a majority of the methane and put that to productive use as an anergy product. If organic waste is composted, we can capture productive use that as a soil/agricultural product. However, if organic waste is processed using AD technology, we can capture the biomethane for energy, bioCO2 for future fuels and agricultural uses (currently dependent on fossil-sourced CO2), heat in commercial processes and digestate/biofertiliser as a soil/agricultural product.

The multi-value proposition of AD technology is both a strength of, and a challenge to, its development. Local government is focused on waste management at low cost. They are not in the business of selling energy or agriculture products. As such, we support the proposed changes to the Waste Minimisation Fund and agree that public-private joint investments are highly credible where AD facilities are involved. Please refer to our **earlier recommendations** about promoting renewable gases are relevant here as they could unlock significant public-private investment in AD technology, possibly within the framework of formalised public-private partnerships.

4. Appendix A: Responses to selected consultation questions

Our answers to selected consultation questions are set out in the following table.

Ref	MfE question	Our response
Q5.5	What three main additional actions could the Government do to enable businesses to take up low-emissions fuels and carbon-capture technology?	As set out earlier in our submission, we recommend that Government should incentivise more widespread use of anaerobic digestion technology to achieve provincial and national benefits (including avoided emissions) with beneficiaries across the waste, energy and agriculture industries. We are open-minded about the policy measures that should be used in this regard, but credible options include: - Instructing the Gas Industry Company to investigate the merits of both voluntary and mandatory approaches to achieving renewable gas targets - Instructing the Gas Industry Company to oversee progress on renewable gas certificates, including through consultation with other public sector officials - Request advice from MfE on whether ETS treatment of medium and large wastewater treatment plants is appropriate Direct Ministry of Business, Innovation and Employment to develop a framework for public private partnerships between local government and private sector for development of regional organic processing facilities.
Q5.7	If you are an electricity generator, please explain and/or provide evidence of how Electrify NZ could increase the likelihood that new projects will be investigated.	Currently, section 73 of the Electricity Industry Act 2010 prohibits related companies from owning any electricity distribution in combination with Transpower-connected generation in excess of 250 MW. Government policy commitments (specifically, the coalition agreement between National and New Zealand First) will review this prohibition. We support the revocation of section 73.
Q6.6	What opportunities might there be from rolling out new technologies to reduce emissions from aviation and shipping?	If the work from the Pūhiko Nukutū project is favourable for development of underground hydrogen sotrage, then storage and transport of hydrogen will be significant opportunities to support variable/intermittent hydrogen production with economies of scale. Hydrogen molecules are necessary but not sufficient for the future fuels for aviation and shipping. They will need bioCO2 at large scale as well. Accordingly, bulk transport of CO2 in pipelines is another supporting opportunity. This may happen in conjunction with carbon capture technologies. There will be growing markets for captured carbon to be used in aviation and shipping (and competing uses). If carbon capture technology is particularly successful, captured carbon may be stored permanently underground.

Ref	MfE question	Our response
		Internationally, hydrogen hubs are often pursued as a policy measure to promote hydrogen development, use of bioCO2 and retaining or enhancing the industrial productivity of particular regions and their workforces. Ideal locations for hydrogen hubs will have all of the following features: potential for large-scale intermittent renewable electricity generation, a long-term industrial usage of hydrogen, good linkages to infrastructure (especially electricity grid, gas grid, roads) and access to labour (preferably with relevant skills and expertise). There is a strong overlap between these desired features and what Transpower is seeking in Renewable Energy Zones (REZs). As such, there may be synergy in seeking to co-locate REZs and hydrogen hubs. A considered investigation could identify the best prospects for hydrogen hubs in Aotearoa. In our view, the areas that best meet these desired features are Taranaki, Glenbrook and Marsden Point.
Q10.1	Do you agree or disagree that the Government should further investigate improvements to organic waste disposal and landfill gas capture?	We agree. However, we consider that the ERP2 gives too much emphasis to use of landfills. AD technology (as set out earlier in our submission) is far superior and should be the preferred technology for organic waste where sufficient scale exists. We support the ERP2 plan to direct Waste Minimisation Funding towards organic waste diversion and emission reductions. The study by Blunomy suggests that the ERP2 statement that "Directing funding from the WMF to resource recovery systems and infrastructure targeting organic waste has the potential to support emissions reductions of up to 250 kt CO2-e per year" is understating the potential. Blunomy estimated a potential of 3.7 Mt CO2e reduction.
Q10.3	What is the main action the Government could take to support emissions reductions from waste (in households and businesses or across the waste sector)?	Our response to question 5.5 above is also relevant here. In particular, the option to promote PPPs between local government and the private sector for development of anaerobic digestion facilities will have significant benefits to the waste-related outcomes sought by ERP2.