



Powering our low-emissions future

Energy Resources Sector Net Zero Accord: A progress report



October 2023



Foreword

When we launched the Energy Resources Sector Net Zero Accord in 2022, none of us could have foreseen the challenges that would arise both domestically and internationally.

Since then, the world has seen the continuation of conflict in Europe, supply chain disruptions, global energy crises, and increasing cost of living pressures.

While New Zealand has been insulated from many of these crises, we have also faced our own unique issues. Cyclone Gabrielle caused widespread destruction, with the storm destroying homes, businesses, and livelihoods. These international and domestic factors have once again highlighted the importance of sustainable, affordable, and reliable energy for our collective social and economic wellbeing.

Despite the tumultuous 12 months, New Zealand's energy sector has remained resolute in its commitment to playing its part in the low-emissions transition. We are extremely proud of the progress it has made over this time and are pleased to share with you some of the impressive initiatives in this document.

As a sector, progress over the last decade has been remarkable. Between 2010 and 2020, annual natural gas and LPG emissions from production, processing, transport, and use fell by 2.35 million tonnes - the equivalent of taking 870,000 cars off the road. This is thanks in large part to an 18% improvement in overall emissions efficiency of natural gas and LPG.

The upstream oil and gas sector in particular has performed very well. It has halved its overall emissions, while production fell only 22%. The sector is 37% more emissions efficient than it was in 2010.

With a spirit of collaboration and the sharing of best practises, it is possible for New Zealand's energy sector to ensure an ongoing reduction in emissions while continuing to provide affordable and reliable energy to power New Zealand's low emissions future.

Looking forward, we expect to engage constructively and collaboratively with Government to explore opportunities for further emissions reductions, in particular including carbon capture, utilisation, and storage.

John Carnegie

Chief Executive, Energy Resources Aotearoa

Convening Partner of the Energy Resources Sector Net Zero Accord

Energy Resources Sector Net Zero Accord

Our collective actions

1

Upstream decarbonisation

- Invest significantly in low-emissions upstream technologies including energy efficiency; low emission fuels; and flaring and venting reduction
- Invest in permanent and/or production forestry to offset residual emissions
- Fund a detailed technical and economic study into the viability of carbon capture, use and storage (CCUS) in New Zealand to determine if it is a feasible domestic solution

4

Supplying affordable, reliable, and low-emissions energy

We need the right policy, regulatory and market settings in place to deliver this Accord and to support New Zealand's progress toward national net zero by 2050. We will work with government and the broader sector to:

- promote policy and regulatory settings that improve investment confidence while enabling decarbonisation
- contribute to enhancing flexibility and resilience of the energy sector through engagement on the national energy strategy

2

Customer decarbonisation

- Invest directly in low emissions energy solutions like solar, wind, and CCUS
- Support Ara Ake and Venture Taranaki to scale low emissions energy by providing access to domestic and international expertise
- Commit capability to assist the scaling up of clean energy technologies where we have unique expertise (e.g., offshore capabilities for offshore wind)

3

Scaling low emissions energy

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Convening Partner



Accord Signatories



Supporting Partners





The role of the energy resources sector in New Zealand's economy

51%

Oil and gas provide 51% of New Zealand's primary energy supply (34% and 17% respectively)

Oil and gas contribute about \$2.5 billion to the New Zealand economy in sales each year (\$1.9 billion from gas and \$600 million from exported oil)

\$2.5b

7,300 jobs are supported by the oil and gas sector (including direct and indirect employment)

7,300

~10%

Natural gas generation provides ~10% of New Zealand's electricity supply

The petroleum and minerals sector is highly skilled, with an average salary of \$105,000 – twice the New Zealand average

\$105,000

\$250m

The Government collected around \$250 million in royalties and taxes from the oil and gas industry every year on average over the last decade (2013-2022)

Gas is used in ~400,000 households and businesses across the country for cooking, space and water heating, and industrial processes

~400,000

Our progress

We have seen significant progress at the national level, where we include emissions from production, processing, transport, and use of natural gas and LPG. National emissions from natural gas and LPG in New Zealand fell 27% between 2010 and 2021, while overall supply only fell 10% in the same period. This shows New Zealand is becoming more emissions-efficient at using natural gas and LPG, with overall emissions intensity of these fuels falling 18%.

Exhibit 1

New Zealand's total emissions from natural gas and LPG production, processing, transport, and use.

Source: Ministry for the Environment Greenhouse Gas Inventory 2022; Ministry of Business, Innovation and Employment Energy Sector Greenhouse Gas Emissions Data.

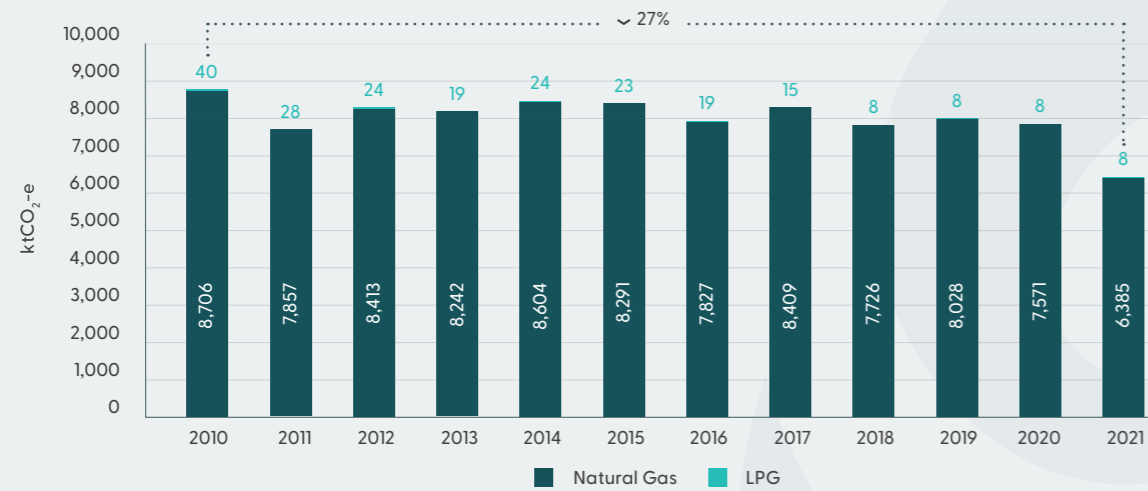
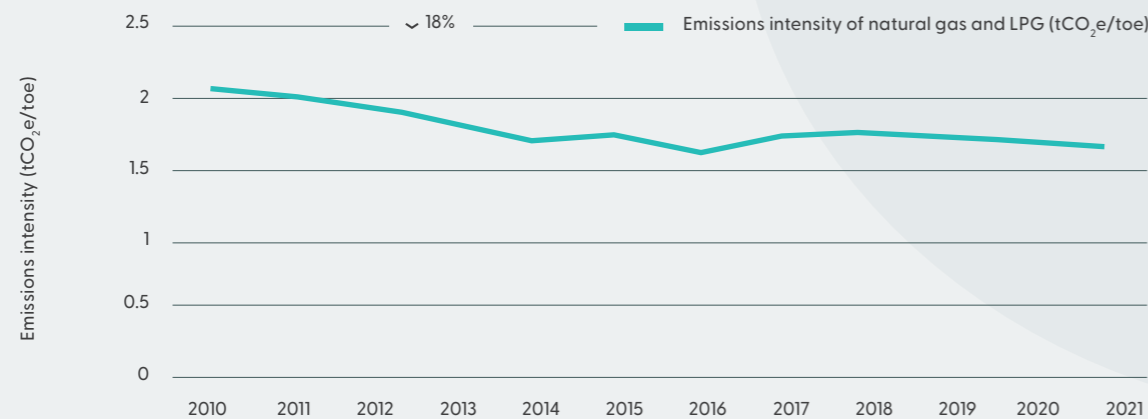


Exhibit 2

New Zealand's total emissions intensity of natural gas/LPG

Source: Ministry for the Environment Greenhouse Gas Inventory 2022; Ministry of Business, Innovation and Employment Energy Sector Greenhouse Gas Emissions Data; Ministry of Business, Innovation and Employment Energy Balance Tables.



New Zealand's upstream oil and gas sector has made huge strides in reducing both its overall emissions, and its emissions intensity. Overall upstream emissions from the exploration, production, and processing of domestic oil and gas in NZ more than halved from 2010 to 2021, from 1.6 Mt to 0.7 Mt. Production fell only 31% in the same period. This is made possible by significant investments in efficiency and emissions reduction by upstream oil and gas operators – including all signatories of the Energy Resources Sector Net Zero Accord. These investments include significant reductions in venting and flaring (down 74%). Upstream oil and gas production in 2021 was 36% less emissions intensive on a per-unit basis than in 2010.

Exhibit 3

Upstream oil and gas emissions

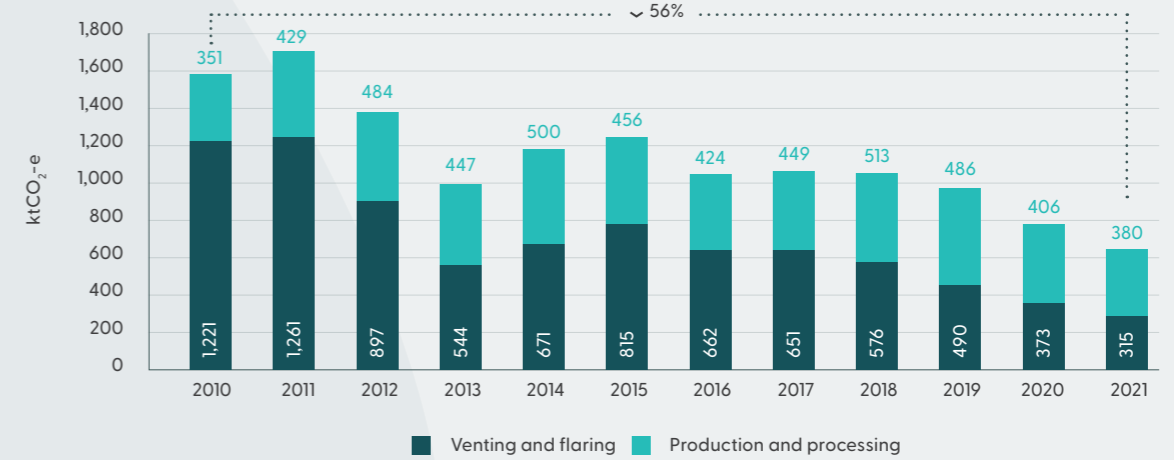
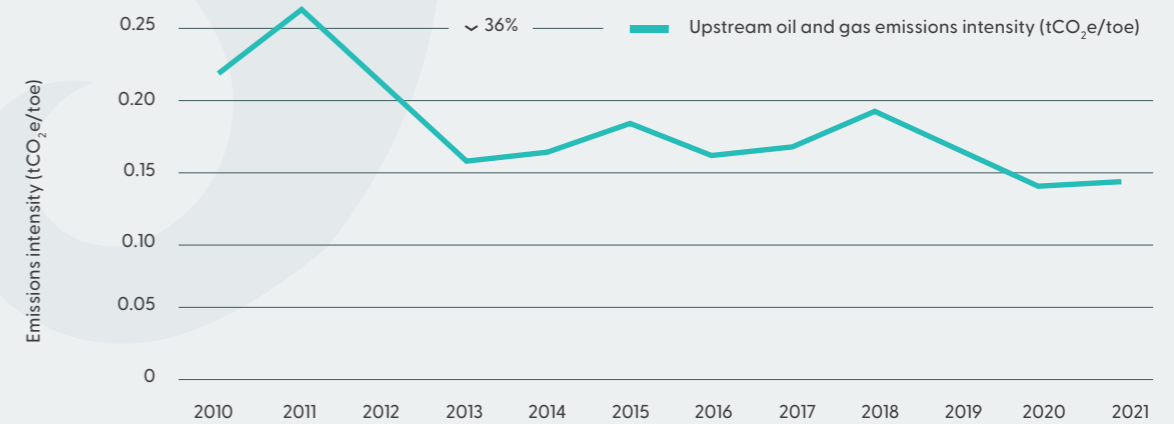


Exhibit 4

Emissions intensity of New Zealand's upstream oil and gas sector



Case study



Optimising for emissions efficiency



OMV – process optimisation as a pathway to emissions reduction

OMV's ongoing development of a portfolio of optimisation opportunities proves emissions reductions don't always require large CAPEX projects.

In 2023 OMV is on track to achieve 0.059 tonnes CO₂e/toe, below even the minimum International Association of Oil & Gas Producers emissions intensity benchmark.

- It has replaced a 792 kW gas-turbine compressor with a 125 kW electric compressor at its Maui production facility, reducing emissions by ~3,200 tonnes per year
- It has replaced steam-fired water makers with reverse-osmosis units, reducing emissions by ~6,000 tonnes per year
- It has implemented new operating practices for its Maui A turbines to achieve significant efficiencies, reducing emissions by ~3,000 tonnes per year.
- It has upgraded its burner management system, reducing emissions by ~4,000 tonnes per annum.



Case study



Enabling Taranaki's wind energy future



Beach Energy – supporting a portfolio of energy options to support consumers through the journey to a low emissions economy

Beach Energy's wind energy activity demonstrates the complementary role existing energy producers can play in the exploration and development of 'new energy' while still working to keep the lights on.

- In June 2023 Beach Energy, in collaboration with its joint venture partners Genesis Energy and NZ Oil & Gas, installed a LiDAR on the Kupe offshore platform, 30 km off the Taranaki coast. It will collect wind and weather data that Beach Energy will share with a range of potential offshore wind developers.
- Beach has also announced it is in the preliminary stages of exploring a potential 216 MW onshore wind farm near its Kupe production station in South Taranaki. It could pursue this project as a foundation customer for its electricity, or as a project partner.
- In parallel, Beach Energy is drilling a new production well in the Kupe field, aiming to bring its gas production up from ~52 TJ/day to ~77 TJ/day, to ensure gas remains available as a lower emissions alternative to coal.



Case study



Leading the solar charge

Todd Corporation – leading the charge on solar energy in New Zealand



Net Zero Accord signatories bring the expertise, capital, and experience to help drive meaningful progress in building out the energy portfolio of the future.

Todd Corporation is an example of what this looks like in practice.

- In mid-2021, Nova Energy – a subsidiary of the Todd Corporation – commissioned what was then the largest solar farm in New Zealand, a 2.1 MW installation at Kapuni in South Taranaki.
- In late 2022 it was granted resource consent for a much larger 400 MW solar farm at Rangitāiki, near Tāupo (currently subject to appeal). Once fully developed it is expected to generate enough electricity to power 100,000 homes.
- The first stage of the project is to build and connect up to 150MW of capacity to the grid in the next two years.
- Nova's plans at Rangitāiki include restoring wetlands, native riparian planting, and training and employment for locals.



Case study



Sustainable decarbonisation



Matahio – progressing emissions reduction projects

These projects ensure an economically sustainable approach to carbon footprint reduction alongside resource development, demonstrating that striving toward net zero can effectively complement growing a viable hydrocarbon business.

1. Energy Demand and Efficiency:

- Progressing replacement of rod pumps with novel concentric jet pump (CJP) technology, which reduces power consumption and increases reliability. Two CJPs have now been installed with three more planned in the coming months.
- Most emissions derive from the exhaust stream of power generators. Matahio NZ is installing upgrades and modifications that will enable Cheal's generators to burn fuel more efficiently and reduce flaring.
- Finally, Matahio NZ is investigating the feasibility of rehabilitating an existing electric compressor to replace Matahio NZ's gas fired export compressor.

2. Gas Recovery and Asset Integrity.

- Initial studies are underway on installing a Cheal vapour recovery unit to collect waste gas and reduce flaring – current analysis highlights a challenging economic case, but work continues to investigate optimization avenues.

In addition to these operational abatement projects, Matahio NZ continues to assess more novel options for carbon capture that are more feasible for smaller players like Matahio NZ. In addition to a full technical review of Cheal reservoirs for carbon storage, Matahio NZ has been investigating other emerging technologies. As an example, Matahio NZ has been working with New Zealand National Institute of Water and Atmospheric Research (NIWA) to understand how algae could be used for capturing Cheal's CO₂ emissions.





A circular economy for carbon

Carbon capture, utilisation, and storage (CCUS) is a technology whose time has come. In the same way that the upstream oil and gas sector is bringing its global expertise to bear in supporting the uptake of low-emissions energy, it could play a key role in enabling a 'circular economy for carbon'.

The energy resources sector is advocating strongly for a regulatory regime that will enable CCUS to occur. This could be achieved either through a dedicated CCUS Act, or through a series of changes to existing regulatory regimes. The key thing is to look at these options and proceed with urgency - several reports have identified 2027 as a feasible start date for CCUS if the regulatory framework is developed with sufficient urgency.

Acting decisively could enable a 'circular economy for carbon' to emerge centred on Taranaki, leveraging its depleted gas reservoirs, its existing pipeline infrastructure connected to industrial users; and its highly skilled energy workforce. Establishing a CCUS cluster now could enable future forays into direct air capture from the atmosphere.

Carbon capture: The opportunity

A WoodBeca report prepared for the Gas Industry Company in support of the Gas Transition Plan found that CCUS in at least two Taranaki gas fields is technically and economically feasible. It suggested up to 4.4 Mt of upstream natural gas processing emissions could be avoided by 2035, at indicative costs of NZ\$30-110 per tonne.

A Castalia report, commissioned by the gas sector industry groups, also found that CCUS could significantly decarbonise New Zealand's hard-to-abate industrials (such as methanol, cement, steel, and urea production). It could also play a role in power generation. It suggested up to 15 Mt of emissions could be avoided by 2035, with the overall economic costs of this scenario being lower than a business-as-usual scenario.



Moving forward together

Our signatories – currently the major players in the upstream oil and gas sector – are committed to playing a central role in the journey toward net zero by 2050. The case studies laid out in this report tell some of the stories which highlight this commitment.

Our support partners underpin this journey by offering their services, infrastructure, insight, and expertise. Without their critical support the innovation and collaboration that net zero requires would not be possible.

Our collective commitment recognises that the net zero journey requires a community of likeminded organisations and individuals, working together in new ways to explore and expand the energy system of the future. There is much more work to do, and we encourage organisations throughout New Zealand's energy ecosystem to join us.

We can build on the foundations of the Energy Resources Sector Net Zero Accord by expanding its membership to include signatories and support partners throughout the energy resources value chain. We welcome participation from producers, movers, retailers and users of all energy resources, including liquid fuels, gas, electricity, biofuels, hydrogen, and more.

Our low-carbon energy future could not be more exciting. Join us to make it a reality.

Signatories and Support Partners of the Energy Resources Sector Net Zero Accord

Accord Signatories



Convening Partner



Supporting Partners





