

01 March 2019

Energy Markets
Ministry of Business, Innovation and Employment
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Sent via email: energymarkets@mbie.govt.nz

Submission: Process Heat in New Zealand: Opportunities and Barriers to lowering emissions

Please accept this letter as the submission of Methanex New Zealand (“Methanex”) on the Process Heat in New Zealand technical paper. We are largely supportive of the identified barriers and other findings in the paper and believe this is an important issue for New Zealand to understand in its drive to a lower carbon economy.

Methanex Corporation is the world’s largest producer and supplier of methanol. Methanex currently operates production sites in Canada, Chile, Egypt, New Zealand, Trinidad and Tobago and the United States. Our operations are supported by an extensive global supply chain of terminals, storage facilities and the world’s largest dedicated fleet of methanol ocean going vessels.

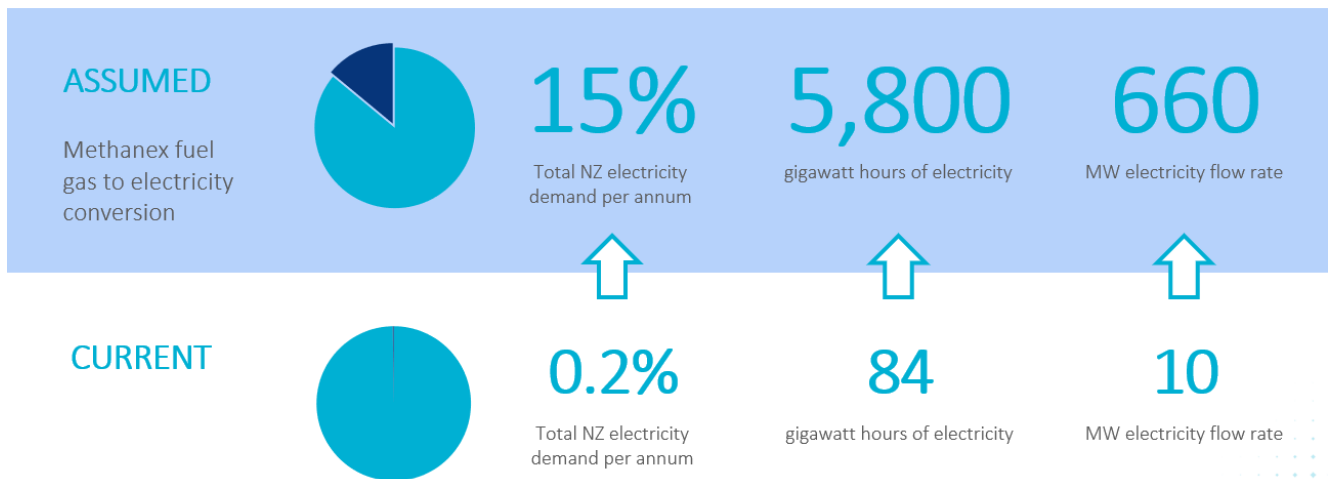
Of the questions raised within the discussion document, Q15 points to the heart of the issue and asks:

“Has your organization considered electrifying part or all of a given site’s process heat?”

Over the course of its history, Methanex has continued to review and refine its operating process to become more energy efficient, using less energy (both electricity and gas) to fuel our methanol production process. This includes a long-standing relationship with EECA, who we are currently collaborating with to identify, implement and promote relevant energy efficiency and renewable energy opportunities.

While electrifying process heat operations to reduce emissions seems like a straightforward pathway to emissions reduction, the reality is often more complex as identified in our specific scenario:

1. Methanex underpins the New Zealand gas market by entering into long-term contracts, consuming approximately 45% of the country’s natural gas output. Around thirty percent of the gas supplied to Methanex (equivalent to 13.5% of New Zealand’s total gas production) is consumed for process heat in our plants. Our ability to utilise gas as a fuel ensures we have a relatively small draw on the New Zealand electricity grid, using only 0.2%, or 84 gigawatt hours, of New Zealand’s current electricity demand.
2. If our operations were converted to an electrical process, not only would major capital investment be necessary, but we would require an uninterrupted annual renewable electricity supply of 5,800 gigawatts, or 15% equivalent of New Zealand’s current electricity provision.



3. It should also be noted that the New Zealand electricity market is not producing excess renewable electricity. Therefore, electrifying the methanol process would simply require most gas or coal-based electricity production, an inefficient cycle.
4. The barriers to electrification of the methanol process are significant, hence, gas-based commercial methanol production is still the lowest emission and energy efficient commercial production process available. Irrespective of what form of energy is used for process heat, we still require gas as the feedstock for the production of methanol.
5. While total electrification of our process is untenable, we continually work with internal and external experts to review our own energy consumption and find efficiencies within our process, with any implemented solution needing to be both commercially as well as environmentally viable.
6. With the global economy recognising gas and gas-based fuels as a major contributor to the reduction in emissions, it is foreseen that international demand for our gas-derived methanol will remain; with our production process being the lowest emission commercial scale methanol production globally. With methanol demand growing globally, we are looking to remain the global leader in methanol by investing in new gas-based methanol production in the United States, Canada and Australia.
7. Therefore, despite the significant barriers to electrification of our process, New Zealand gas-based methanol is already a positive contributor to a global low emissions economy and provides a platform from which to implement future improvements as they are developed.
8. Should methanol manufacture be forced out of New Zealand through domestic policy settings, then this production would be replaced by coal-based methanol in China (as China is the marginal producer with abundant coal reserves). If this were to happen, the increase in global emissions to produce the equivalent amount of methanol using coal would be an additional 4 to 6 million tonnes of CO₂ (dependent on coal composition).¹ This is far greater than any domestic CO₂ reduction through electrification of our production process.
9. Our foremost challenge in New Zealand is to continue to secure gas supply and remain internationally competitive within our industry. Gas is critical to our production process and without it we cannot operate. It is also critical to New Zealand's electricity industry to allow it to provide lower emission, stable supply. To maintain this equilibrium, we believe that any carbon targets and associated ETS pricing need to remain internationally competitive for each industry.

¹ Bassani, A., Bozzano, G., Pirola, C., Ranzi, E., Pierucci, S., & Manenti, F. (2018). Low Impact Methanol Production from Sulfur Rich Coal Gasification. *Journal of Sustainable Development of Energy, Water and Environment Systems*, 6(1), 210-26.

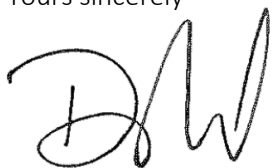
10. As a product, methanol is making its own impact in reducing process heat emissions, by providing alternative energy to coal fired boilers. Being clean and affordable, methanol demand as an industrial boiler fuel is growing in Northeast China as the Chinese government continues to reduce reliance on coal-fired boilers and cook stoves.
11. Methanol would be a proven, easily transportable replacement for New Zealand's coal based, high heat, energy generation problems, which could drop relevant emissions by half. Only minor modifications are needed to adapt existing coal fired process plants to accommodate the use of methanol as a fuel.

Methanex will continue to be part of the conversation about a "just transition" to a lower emission economy and how this will look for major gas users. We encourage the development of supportive policies in areas such as research & development, low emission fuels and gas exploration, and to encourage transitional technologies.

New Zealand needs to create a long term, considered plan that aligns infrastructure requirements and environmental goals and delivers economic and energy stability that will meet the ongoing needs of New Zealand before discounting viable energy solutions.

We would welcome the opportunity to discuss these matters face-to-face or provide you the opportunity to visit our production facility here in New Plymouth.

Yours sincerely

A handwritten signature in black ink, appearing to be 'DR', written in a cursive style.

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We are the world's largest producer and supplier of methanol to major international markets, with production sites around the globe.

How methanol production is used:

55%

HIGH TECH
HIGH DEMAND
PRODUCTS



Pharmaceuticals, wind turbines, solar panels, paint, clothes, electronics and medication.

45%

ENERGY
APPLICATIONS



Marine fuel, transport fuels, biodiesel and industrial boilers.



Our key markets in New Zealand are China, Japan and Korea.



Our contributions to the economy total

8% of Taranaki GDP
\$834 million
Nationally



Methanex is New Zealand's **only** methanol producer, exporting up to **2.4 million tonnes per year** from our two sites in Taranaki.

We underpin the New Zealand gas market, using approximately 45% of the country's natural gas output.



We employ over 270 jobs directly & 3,000 jobs indirectly.

Our headquarters are in Vancouver, Canada.
Methanex is listed on the Toronto and NASDAQ stock exchanges.

REDUCING GLOBAL EMISSIONS



RENEWABLE ENERGY

Methanol can be made from geothermal and industrial waste gas feedstocks. We have commercial interest in a plant in Iceland (CRI) making renewable methanol; though not yet at a commercial scale.

REDUCE EMISSIONS

Methanol is important in manufacturing products that help reduce emissions. E.g. electric cars, solar panels, batteries and wind turbines.



34%

Reduction of Methanex global CO2 intensity since 1994.

Our gas-based methanol plants are among the most CO2 efficient plants in the world; with less than half the emissions of coal-based plants.



READILY BIODEGRADABLE

Methanol is a clean-burning, clear liquid chemical that is water soluble.



EMISSION REDUCTION COMPARED TO CURRENT FUEL

CO2*

25%

Sulphur (SOx)

99%

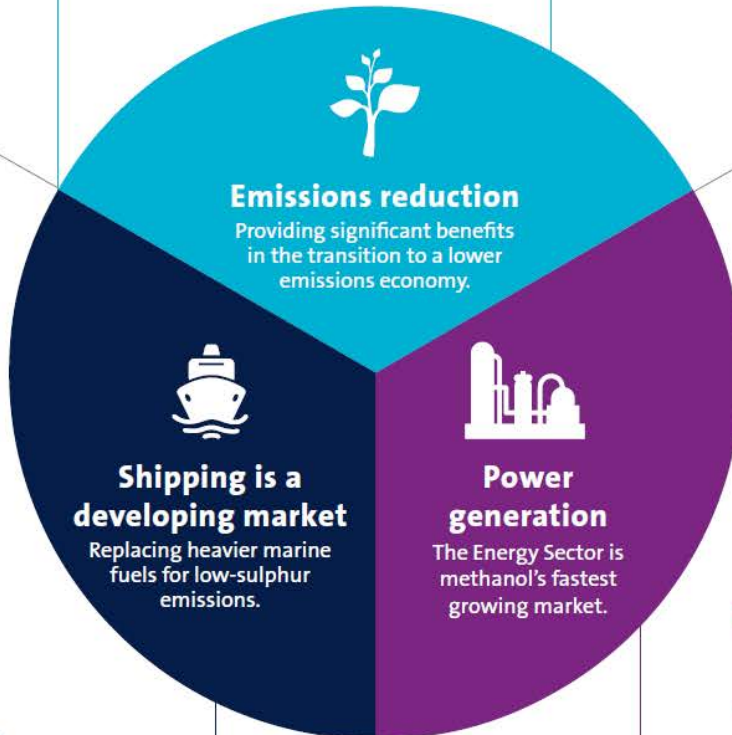
Nitrogen (NOx)

60%

Particulate Matter (PM)

95%

*According to recent Stena Line trial



Methanol is a cost effective liquid fuel alternative for power generation.



1000+

INDUSTRIAL BOILERS CONVERTED IN CHINA

To run on liquid methanol. Demand for methanol is expected to grow as China phases out coal-fueled boilers.



BOILER AND SHIPPING CONVERSIONS

Only minor modifications are needed to accommodate the use of methanol as a fuel.



WE'VE ADOPTED THE TECHNOLOGY

Seven methanol powered ships, with four more on order, were introduced to our fleet in 2016; they are regular visitors to Port Taranaki.