Submission template

Gas Market Settings Investigation 2021 Submission prepared by: Todd Energy Limited and Nova Energy Limited ("**Todd**")

Todd's key messages in relation to the consultation document are summarised as follows:

(a) Natural gas plays a vital role in the New Zealand economy and will remain an important energy source that will support NZ to achieve the net zero carbon policy goal by 2050.

(b) There are sufficient gas resources 'in the ground' to meet demand until at least 2035, **if** stable policy and regulatory settings and the underlying demand support investment on a commercially reasonable basis.

(c) However, the gas supply and demand curves in the consultation document appear optimistic and the risks associated with delivering that supply are underestimated.

(d) The current investment environment is challenging. This is due to uncertainty over the government's response to Climate Change Commission's ("**CCC**") advice, the 100% renewable electricity target and the related NZ Battery project, the phasing out of fossil fuels in process heat, the Crown Minerals Act ("**CMA**") review recommendation to impose significant and potentially perpetual financial security obligations on upstream producers. This uncertainty adds significant risk to investment decisions for producers and investors in new electricity generation, deters any entrants from investing in NZ, and will impact negatively on reserves and the prospects of converting contingent resources to reserves and their production.

(e) This uncertain environment also discourages oil and gas service and engineering companies from investing and continuing operations in NZ and adds a further layer of risk and cost to development economics.

(f) Methanex's presence in New Zealand creates the stimulus for, and the appraisal and development of, natural gas resources at prices that are economic for both the producer and Methanex. Should Methanex exit the market, there would be sufficient gas resources for the remaining demand. However, the price of that supply will inevitably be higher in the long run among the remaining consumers, reflecting the loss of economies of scale in the market with higher supply volumes to share costs across.

(g) In terms of long-term contracting, Todd agrees that long term contracts have an important role to play in ensuring further development of resources as longer-term supply contracts are required to underpin investment at economic market gas prices, particularly in the current environment with the decline of Pohokura's output.

(h) With regard to gas storage, providing more incentives to store gas in the short term may not resolve the tightness of supply due to the significant Pohokura output decline. The issue of the lack of supply relative to demand will still need to be addressed. In relation to the transition, gas storage is only a solution if thermal peakers still have a role to play after 2030. Without thermal generation, existing gas storage capacity provides more than adequate flexibility to meet the requirements of industrial, commercial and residential consumers. Todd considers that the key issue to ensure security of supply is to clarify the role of thermal peakers and natural gas in the transition and post 2030. The market can then resolve the issue of additional storage investment or alternative sources of gas deliverability.

(i) In relation to comments that the spot electricity price is driven by spot gas prices, this is incorrect. The spot gas volume sold per annum is only equivalent to 2% of the gas market. The gas spot market follows the highest available pricing on a day whether it is the wholesale electricity price or wholesale gas price. In other words when marginal electricity prices exceed gas price, it is the spot electricity price that determines the spot gas price. The price in the electricity spot market is set by the marginal generator with hydro generation being the marginal technology around 85 % of the time this year and diesel and natural gas together only 5%[1].

(j) Regarding users' concern that suppliers' ability to curtail supply has a significant impact on users' ability to carry on their business, especially in a climate of tighter supply, Todd considers that this issue is not a contracting issue per se, but rather a short-term supply capacity issue exacerbated by lack of deliverability from Pohokura. However, without the right regulatory and policy settings, supply curtailment may occur in the near future as suppliers will not have the confidence to invest in further development. If that happens, consumers are best placed to manage the risk of supply shortfall where there are limited means of mitigating through increased supply.

(k) There are risks associated with arbitrary and unilaterally imposed targets e.g. 100% renewables by 2030 target:

---

[1] See : https://www.ea.govt.nz/assets/dms-assets/28/Market-Performance-1st-Quarter-Review-2021.pdf
Figure 18 (page 14)

i The government policy of 100% renewables by 2030 sends strong signals to thermal generators regarding their future and there is a high risk that thermal generators will exit the sector prior to 2030 or limit investment and expenditure on maintaining thermal generation capacity without greater revenue certainty. This will likely lead to reduced reliability and security of supply in the electricity market. Todd has also put on hold incremental investments in peaking plant efficiency and capacity projects because of changes to government policy which would have ensured more electricity is generated with the same amount of fuel.

ii the uncertainty around supplier investment is aggravating the ability for industrial customers to continue to run their business in New Zealand in the near term and undermines their ability to transition into 2030. In other words, without improving the investment environment, a just transition may not be possible. Methanex, in particular, has an important role to play in the transition to a low emissions economy through assisting in the development of sufficient gas reserves. This will also support other gas consumers and thermal generators in the transition to alternative energy sources over time and in a manner that achieves the country's climate change objectives at least cost to the NZ economy and to consumers in general.

iii arbitrary targets give no consideration to when alternative technologies will be affordable and available at scale. There is also a risk as to how required infrastructure would be put in place to enable businesses to move to low emissions fuels before alternative fuel sources and technologies are available or how existing infrastructure may be repurposed for greener options such as hydrogen or biogas.

iv the lack of investment in natural gas development will lead to imported coal replacing gas for security of supply for electricity and closure of companies that provide jobs and incomes for regional economies as well as economic wealth for New Zealand.

(l) To support security of supply, Todd considers that the following factors are required:

i a stable, enduring and predictable policy and regulatory environment to support much needed investment in gas development.

ii clear recognition that natural gas is needed as a transition fuel and it is a recognised component of a future National Energy Strategy.

iii moving away from arbitrary targets or policy focus on particular fuels or technology. This is reflected in the CCC's advice to government to replace the 100% renewables target with a goal of aiming to achieve 95-98% renewables by 2030 which takes account of investment that will otherwise occur in the normal course of business.

iv ETS being the primary tool for achieving New Zealand's emission targets. The role of supplementary policy should be on removing regulatory barriers that disincentivise investment. One such policy example would be the development of a legal framework that enables CCS.

v a stable, enduring and predictable investment environment for major gas users and certainty and clarity around thermal generation for security of supply for the electricity market.

References to sections and headings in this paper are references to sections and headings in the GIC consultation document.

Question		Comment
Q1	Do you agree with our characterisation of the role of gas in New Zealand?	Yes. Todd considers that natural gas plays a vital role in the New Zealand economy and will remain an important energy source that will support NZ to achieve the net zero carbon policy goal by 2050. **Section 1.4 A note about the current gas supply situation** Todd considers that: (a) in the current market conditions the spot price for gas is being determined by the relative value that the hydro generators are placing on water storage to meet their electricity retail plus hedge position (see further details below). If hydro generators took a much more conservative position on hydro storage over summer, then current gas prices would not be so high during winter. (b) the uncertainty of the future of the Tiwai aluminium smelter has also affected natural gas and electricity contracting strategies of various industry participants especially during 2020, i.e. following the announcement of Rio Tinto's strategic review of the Tiwai smelter in early 2020, followed by the closure announcement in July 2020 and lastly the reversal of that decision in early 2021. (c) the consultation paper mentioned (in this section) the long lead times in upstream development. The risks of failure at any point in this process should also be noted, as reliance on just one or two drilling programmes or field developments can quickly lead to system stress in the event of failure. When the time frame to address a potential energy shortage becomes compressed, the available options to overcome the issue become limited.
Q2	Do you have any comments in relation to the gas supply and demand outlook?	**Section 3.1 Gas supply and demand outlook** Todd considers that:

		(a) there are sufficient gas resources 'in the ground' to meet demand until at least 2035, **<u>if</u>** policy and regulatory settings and the underlying demand support the investment on a commercially reasonable basis. (b) the characterisation of how much gas is required in Figure 1 is in fact understated. The gas required to support hydrology assumes a 10-90 percentile spectrum, whereas NZ is currently below the 10th percentile this 2021 winter. (c) the gas supply curve (both 2P and 2C) appear to be 10-15% overestimated and the risks associated with delivering that supply are underestimated in this report. This view is based on the following: i the 2P supply information does not reconcile with the 2019 MBIE data (2020 data is expected in June); ii recent and proposed regulatory changes (offshore exploration ban, CCC draft recommendations, CMA/decommissioning regulations review) have added significant risk to the multi-billion-dollar capital investments required to develop reserves and resources which are included in the supply assumptions. The increased risk relating to the availability of specialist personnel and equipment to execute supply side projects is also absent from the consultation document. iii 2P reserves include a significant amount of undeveloped reserves which requires significant investment. iv the success rate of 50% of the full 2C resource conversion is overestimated based on New Zealand's middle to late life natural gas assets. (d) the 2P supply profile increasing from ~160 PJ p.a. in 2021 to ~180 PJ by 2023/24 does not reconcile with the 2019 MBIE data adjusted for Pohokura decline performance. The additional 2P/2C gas supply to deliver ~190-200 PJ p.a. will likely require high side results of Maui, Pohokura, Mangahewa and Kapuni development programmes and potentially new gas from appraisal or exploration programmes i.e. Maui 8 and Toutouwai. (e) the report incorrectly states that the current tight supply conditions will possibly be avoided if remedial work at Pohokura over the 21/22 summer is successful. The tight supply side conditions is more likely to be avoided by the outcome of the planned Maui A, Mangahewa and Kapuni drilling programmes with a combined total investment of over $500 mm as these will have the most significant impact on 2022 supply conditions. (f) further, the report often quotes 2P as "proven". This terminology is incorrect. 2P is defined as "proven and probable". 1P is considered proven.

		(g) the consultation document could expand on the benefits that the significant upstream investment will bring for e.g. in terms of creating jobs, wealth, supporting regional diversification and contributing to increased living standards for NZ[i]. Todd notes that on the margin, the long-term supply and demand for gas is determined by its relative economics versus other energy sources, for example: (h) the economics of gas are directly impacted by the economics of oil and methanol in the international markets. New Zealand cannot avoid the fact that the prices of these commodities are highly volatile and will have an influence on the returns from producing gas in New Zealand; (i) the need for gas supply flexibility and storage options are heavily influenced by the availability and management of hydro storage; (j) the costs of fuels that natural gas competes with including (but not limited to) coal, diesel, biomass, biofuels, geothermal, wind hydro-electricity and solar PV.
Q3	Do you agree with our characterisation of the commercial outlook for gas?	**Section 3.2 Commercial outlook** Todd considers that the risks associated with the commercial outlook for natural gas supply have been significantly understated in this report particularly in relation to investment in gas supply. Government policy direction and regulatory settings will affect the incentives for upstream producers to invest billions of dollars together with the normal risks associated with the upstream sector such as, the technical risks relating to the success and failure rates of appraisal and development wells and the market risks relating to prices for oil, methanol, natural gas and ETS units. Given the magnitude of the ongoing investments required, and critical role of the major industrial loads, policies impacting on the wider energy sector will directly impact on investment decisions in the natural gas market. **Section 3.2.1 Investment in gas supply** As mentioned above, the current environment is challenging for producers not only due to CCC's final advice and the government's climate change policy but also the CMA review recommendation to impose significant and potentially perpetual financial security obligations on upstream producers. This uncertainty adds significant risk to investment

		decisions for producers, deters entrants from investing in NZ, and will impact negatively on reserves and the prospects of converting contingent resources to reserves and their production. With the increased level of regulatory and demand uncertainty, producers and their funders are unlikely to accept 10-year investment returns for new gas infrastructure projects. Less capital-intensive projects with lower risk profiles and investment timeframes of less than five years will be preferred. This uncertain and unpredictable environment also discourages oil and gas service and engineering companies from investing and continuing operations in NZ. Upstream producers are and will continue to face increasing costs and time delays due to the inability to access the specialist skills and equipment required to safely develop reserves and resources as service companies concentrate their businesses in countries that are supporting natural gas developments to sustain their energy supply. This adds a further layer of risk and cost to development projects. In terms of long-term contracting, Todd agrees that, with the requirement for capital investment to convert 2P undeveloped reserves to production and continue to appraise and convert 2C resources to reserves, there is a requirement for longer term supply contracts to underpin these investments. In the past, 2–3-year term contracts optimised buyer pricing however, they disincentivise supplier investment. This issue was mitigated significantly by the stability of Pohokura production. However, in the current environment, new producer investment must be underpinned by longer term contracts as Pohokura declines. Typically, longer term contracts also provide gas buyers with increased levels of supply flexibility. Todd notes users' concern with finding uncontracted gas elsewhere in the consultation document. Producers respond to demand so without demand certainty, producers cannot invest. Therefore long-term contracts have an important part to play in ensuring further development of resources at economic market gas prices. **Section 3.2.3 Implications for gas deliverability to generators** The report (in this section) characterizes the government's 100% renewable electricity generation policy as subject to a normal hydrological year assumption which in Todd's view is not accurate as no such policy limitation appears in the government's revised policy for e.g. the NZ Battery Project. Other factors impacting on investment decisions include uncertainty of the future of Tiwai Point and the NZ Battery project. These risk factors affect investment decisions of a wide variety of parties including (but not limited to)

		investors in new electricity generation (renewable and thermal), gas producers and consumers who are considering their own investment decisions. Todd agrees that there is a high risk that thermal generators will potentially exit the sector prior to 2030 or limit investment and expenditure on maintaining thermal generation capacity without greater revenue certainty due to the NZ Battery Project. This will likely lead to reduced reliability and security of supply in the electricity market. Todd has also put on hold incremental investments in peaking plant efficiency and capacity projects because of the change to government policy (see further details below).

Q4	Have we captured the issues fairly and accurately? Have we missed anything?	**Section 4 Current arrangements and potential issues** Todd considers that generally, the overall messaging in the GIC's analysis is accurate with the exception that supply side risks have been understated. **Section 4.1.3 Gas trading** Todd notes the users' concern that suppliers' ability to curtail supply have a significant impact on users' ability to carry on their business, especially in a climate of tighter supply. Todd considers that this issue is not a contracting issue per se, but rather a short-term supply capacity issue exacerbated by lack of deliverability from Pohokura. However, without the right regulatory and policy settings, supply curtailment may well occur in the near future as suppliers will not have the confidence to invest in further development and consumers are best placed to manage the risk of supply shortfall in these circumstances. From Todd's perspective, the uncertainty around supplier investment is aggravating the ability for industrials to continue to run their businesses in the near term and undermines their ability to transition into 2030. In other words, without improving the investment environment, a just transition may not be possible. **Section 4.2.1 The role of gas in electricity generation** While the role of natural gas in baseload electricity generation is declining, Todd considers that thermal generation is still needed to support peak winter demand for both direct heat, peak electricity demand, and hydro generation shortfalls. The CCGT's (Huntly unit 5 and Taranaki Combined Cycle) still have an important role in hydro firming as they are more efficient than the OCGT peakers, can operate on the margin, and provide reserves. To support security of supply, there is a need for producers to continue making appraisal and development investments and thermal generators to keep maintaining their assets and generate electricity. Producers will be more incentivised to do so if there is: (a) a stable, enduring and predictable policy environment; (b) a clear recognition that natural gas is needed as a transition fuel; and (c) a recognition that gas is a component of a future National Energy Strategy.

		In addition, the 100% renewables by 2030 policy by government also sends strong signals to thermal generators regarding their future and as such they will likely make operating and capital investment decisions accordingly that potentially affects security of supply prior to 2030. **Section 4.2.2. Generator business operations** In terms of the comments on gas storage in this section, Todd considers that: (a) providing more incentives to store gas in the short term may not resolve the tight supply conditions due to the significant Pohokura decline. The issue of the lack of supply relative to demand will still need to be addressed. For the future however, providing better incentives to store gas may help with security of supply for electricity generation. However, note Todd's comments below regarding the need to clarify the role of thermal peakers post 2030 as thermal peakers provide the most need for gas storage. (b) Todd notes the comment that "as there was little gas stored ahead of the current energy shortage, this suggests that the current incentives may not be sufficient to drive this behaviour for the benefit of the wider market" (paragraph 3, page 31). While Todd does not dispute this statement, the question can equally be pointed at the hydro storage levels and the extent to which hydro generators make commitments to supply electricity to their retail book plus hedge contracts against an uncertain supply. If the hydro generators (particularly those with storage) were to take a conservative position on their capacity to meet electricity demand under conditions of low hydro inflows, then less reliance on thermal generators would be required to meet the balance of supply during times of stress. (c) broader issues such as the see-sawing decisions regarding the future of the Tiwai smelter will also have had an impact on participants' fuel management decisions as well as the uncertain impact of Covid-19 on the New Zealand economy. Prior to gas supply issues emerging in late 2018 with the Pohokura pipeline issues followed by offshore well performance issues, Contact Energy had adopted a short-term gas procurement policy and Genesis was also seeking to manage its gas position in the lead up to Kupe gas re-contracting negotiations which were legitimate strategies for those parties at that time. (d) commentary with respect to stakeholder views regarding "collective management" appear to ignore the regulatory requirements governing competitive markets and reflect views with the benefit of hindsight.

		Section 4.2.3 Flexibility *Gas storage arrangements* In Todd's view, thermal peakers provide the most need for gas storage. Therefore, gas storage is only a solution if thermal peakers still have a role to play after 2030. For e.g. without thermal generation, the existing Ahuroa gas storage facility is more than sufficient to meet the demand for supply flexibility from industrial, commercial and residential consumers. Todd considers that the key issue to ensure security of supply is to clarify the role of thermal peakers and natural gas post 2030. The market can then resolve the issue of additional storage investment or alternative sources of gas deliverability. *Imports* The prospects of expanding gas storage or creating supply flexibility through building LNG import capability are in part linked to the prospect of hydro storage being built as part of the NZ Battery Project. There is no doubt that for New Zealand to reduce its reliance on coal, it needs to either expand energy storage (gas or hydro) or develop more flexible sources of energy (gas production or LNG importation). Notwithstanding government policy, natural gas, as supported by CCC, can play an important role in New Zealand's transition to a low emissions economy in moving to a net zero carbon emissions profile by 2050. Imported LNG can potentially support that role in the provision of flexibility and security of supply for domestic gas production. **Section 4.2.4 Critical failure impact** Todd considers that force majeure provisions are a standard means of allocating risks outside of the control of both buyers and sellers of gas. In the event of a disruption to supply of gas the gas provider has limited means to mitigate and as such, the risk is best allocated to the consumer who should then take that into account in their own arrangements. Force majeure provisions also benefit the customer when their own operations are disrupted, and the supplier must deal with the natural gas it would otherwise have supplied to the customer. Force majeure risk is also mitigated in some circumstances where gas supply contracts also include provisions with respect to priority rights and portfolio supply (i.e. contracting for supply with providers of multiple supply sources) that reduces the impact on customers. Some consumers value security of supply and have entered into contracts that better

provide for that. Some consumers place more priority on price and term and make the trade-off against other aspects, such as security of supply, in their choice of supplier.

4.3 Unpredictability

Todd considers that the policy and regulatory framework and settings needs to be sufficiently stable to enable market forces to meet the long-term objective of reliable, affordable and environmentally sustainable energy supply to NZ homes and businesses. In particular, the role of natural gas post-2030 in supporting renewables needs to be clarified.

There are risks associated with arbitrary and unilaterally imposed targets e.g. 100% renewables by 2030:

(a) the government policy of 100% renewables by 2030 sends strong signals to thermal generators regarding their future and there is a high risk that thermal generators exit the sector prior to 2030 or limit investment and expenditure on maintaining thermal generation capacity without greater revenue certainty. This will likely lead to reduced reliability and security of supply in the electricity market. Todd has also put on hold incremental investments in peaking plant efficiency and capacity projects because of changes to government policy such as the energy efficiency project at its peaker plants which would have ensured more electricity is generated with the same amount of fuel.

(b) the uncertainty around supplier investment is aggravating the ability for industrial customers to continue to run their business in New Zealand in the near term and undermines their ability to transition into 2030. In other words, without improving the investment environment, a just transition may not be possible. Methanex, in particular, has an important role to play in the transition to a low emissions economy through assisting in the development of sufficient gas reserves. Methanex's participation also supports other gas consumers and thermal generators in the transition to alternative energy sources over time and in a manner that achieves NZ's climate change objectives at least cost to the NZ economy and to consumers in general.

(c) arbitrary targets give no consideration to when alternative technologies will be affordable and available at scale. There is also a risk as to how required infrastructure would be put in place to enable businesses to move to low emissions fuels before alternative fuel sources and technologies are available or how existing infrastructure may be repurposed for greener options such as hydrogen or biogas.

		the lack of investment in natural gas development will lead to imported coal replacing gas for security of supply for electricity and closure of companies that provide jobs and incomes for regional economies as well as economic wealth for NZ. **Section 4.3.1 Transitional timing** As an example of the impact of arbitrary deadlines on Todd's business, Todd Generation Taranaki invested $118mm in the McKee peaker plant (commissioned in 2013) and $90mm in the Junction Road peaker plant (commissioned in mid-2020). Both projects were consented for 150MW of capacity. Fast start peaker plants enable daily and seasonal demand peaks to be met and ensure that NZ's electricity supply is affordable and secure with the lowest practicable emissions profile. Todd Generation Taranaki was planning to invest in: • thermal peaker plants at its consented 360MW Otorohanga site consistent with Transpower's assessment that more peaking plants will be required; and • efficiency improvements to its two peaker plants which would result in more electricity being produced with the same amount of fuel. This investment would be economic if the plants were expected to run on a sufficiently frequent basis over their expected life of more than 20 years. Plans to develop these projects were materially progressed. However, Todd Generation Taranaki made a difficult decision not to proceed due to increased risks after the NZ Battery project and the 100% renewable electricity target by 2030 were announced by the government. **Section 4.3.2 Accounting for emissions** Todd agrees with the themes discussed in this section. Recent changes to the ETS, including converting the ETS to a cap-and-trade scheme linked to New Zealand's emission budgets, mean the ETS is now fit for purpose. Todd is concerned that other government policies are undermining the ETS which have the unintended consequence of reducing investor confidence. An example is the proposed national direction on industrial greenhouse gas emissions which is neither fuel nor technology agnostic and therefore is establishing a policy framework which contradicts that established by the Climate Change Response Act. It is unreasonable to expect businesses to invest in sectors where the policy settings are uncertain, contradictory and are subject to change depending on who is in government. A strength

		of the Climate Change Response Act was the cross-party support for it giving the best chance for an enduring and sustainable regulatory framework. Government policies that prematurely pre-empt advice from the CCC creates regulatory risk that will hinder efficient investment decisions. An example is the government's 100% renewable electricity target which conflicts with the CCC's advice. Feedback to the GIC that a number of emission reduction opportunities are not being advanced due to regulatory uncertainty reinforces the above concern. In Todd's view, the ETS is the most effective tool for achieving New Zealand's emission targets and therefore should be the government's primary mechanism for reducing emissions. The role of supplementary policy should be on removing regulatory barriers that disincentivise investment, for e.g. the development of a legal framework that enables carbon capture sequestration. **Section 4.3.3 Certainty of Supply** Todd notes the comments in this section regarding the gas supply and demand analysis which may help alleviate concerns about longer term certainty of supply. Todd refers the GIC to its comments under Question 2 regarding the gas supply and demand outlook. Regarding users' comments that more information about the ongoing supply situation is urgently needed in order that users can make decisions about their ongoing business, Todd supports the disclosure of information to the wider market however additional information requests be leveraged as much as possible from available sources of information. *Upstream concentration* Regarding comments with respect to the lack of future competition in the upstream sector, Todd notes that natural gas is a fuel that competes with other fuels including coal, diesel, biomass and other biofuels, geothermal steam, wind power solar POV and hydro-electric generation. Inclusion of carbon prices in fossil fuels and geothermal energy (which also emits carbon emissions) creates a level playing field for parties to consider when making investment decisions whether that be in relation to process heat or electricity generation. *Capital availability*

		Todd agrees that the ability for upstream producers to secure funds to execute projects has become significantly more challenging given the uncertain regulatory and demand environment. Todd considers this is exacerbated by the lack of clarity around the timing of the transition which does not address the role of gas in achieving the renewable targets. As noted previously, significant investment in the upstream sector also represents significant employment and economic contributions to the regions where they are located[ii] which the consultation document has not covered. **4.3.4 Predictability of demand** Todd considers that it would be incorrect to assume that if Methanex exits the market, there would be sufficient gas supply for the remaining demand sectors (as indicated by Figure 3). If Methanex were to exit the market due to insufficient supply gas supply will be available for consumers. However, the price of that supply will almost inevitably be higher in the longer term due to the loss of economies of scale in the market with higher supply volumes to share costs across. Methanex's presence in New Zealand creates the stimulus for development of natural gas at prices that are economic for both the producer and Methanex. In the same manner, the government's policy with respect to 100% renewables by 2030 and the NZ Battery project, which is contrary to the advice of the CCC (the expert body appointed by government), also creates uncertainty for investors and owners of thermal electricity generation and consequently gas producers. **Section 4.3.5 Policy and regulatory framework** Todd agrees with the statements in the consultation document on the need to have an enduring policy framework that provides stability and predictability for those who are seeking to invest capital to develop more gas resources to ensure security of supply Such an environment also assist investors more broadly including investors in renewable generation or bio-energy sources for process heat as it is helpful for such investors to understand and have confidence in the means by which renewable firming can occur especially during a period of transition. **Section 4.4.3 Declining gas reserves** In relation to this section, Todd considers that: (a) the absence of any new gas discoveries coupled with delays in developing existing producing assets adds further supply side risk as highlighted by the impact of the Pohokura field decline.

		(b) the exploration ban, the concentration of upstream producers, and the unlikely addition of any new participants prepared to invest in NZ upstream sector have contributed to the reduced likelihood of a excess supply side capacity scenario occurring in the future. (c) natural decline rates for existing gas fields of between 10-20% p.a. requires upstream producers to commit substantial amounts of capital to projects delivering 2P undeveloped reserves just to maintain current levels of supply of ~160-170 PJ per annum. (d) generally speaking, New Zealand has sufficient gas resources to meet expected demand until at least 2035. However, the appraisal and development of reserves and resources to increase production levels carry a higher level of risk and longer timeframe and therefore require a higher degree of commercial and regulatory certainty. **Section 4.4.4 The impact of oil prices on gas** The consultation paper states that gas field development is largely linked to oil prices. Todd considers that while oil is an important component of revenue and impacts returns, producers will not bring additional gas into production if there is no demand for it. When oil prices drop there is a need to reduce costs which can impact on capital available for investment. However, generally, field development in New Zealand is very much driven by gas supply and demand and not oil pricing as might be the case in other jurisdictions because the remaining fields are predominantly gas condensate. **Section 4.4.5 The impact of gas on electricity prices** Todd does not agree that spot gas prices set the wholesale electricity price: (a) regarding the GIC statement that "we have seen no evidence that a gas generator will price its generation based on the opportunity cost of selling gas into the spot gas market", most generators are running generation to support retail sales which is a different incentive to spot gas purchase. The spot gas volume sold per annum is only equivalent to 2% of the natural gas market. So thermal generators will price to reflect supply contracts, not infrequent spot sales. (b) regarding the impact of electricity prices on gas, the gas spot market follows the highest available pricing on the day whether it is the wholesale electricity price or wholesale gas price. In other words, when marginal electricity prices exceed gas price, it is the spot electricity price that determines the spot gas price. The price in the

		electricity spot market is set by the marginal generator with hydro generation being the marginal technology around 85% of the time this year and diesel and natural gas together only 5%.[iii] (c) there is a difference in the way the wholesale electricity market and the wholesale gas market operate. The wholesale electricity market is a 'gross pool' market i.e. a centralised market where all electricity is sold and purchased through the pool. Under this centralised market model, the production schedule for electricity generation and market price is determined by the market operator on a half-hourly basis. The gas sector operates under a decentralised bilateral contracts market where delivery, volume and pricing decisions depend on each party's requirements, not the market operator. (d) the different market models mean that pricing influence flows from electricity to gas, not the reverse. In the electricity market, on-the-day pricing is discovered on a half hourly basis. There is opportunity for generators to monetise their gas on a day via thermal generation by offering bids into the market. Conversely, long term bilateral gas supply agreements cannot and do not change according to electricity price volatility and variations because price is locked in under a long-term supply agreement. A secondary market for gas (the EMS Tradepoint spot market) does exist and it is logical that at the margin short term electricity and gas market prices may well converge in certain circumstances such as shortage. (e) as hydro storage levels reduce, hydro generators increase offer prices for electricity to preserve water. This increases wholesale electricity price which in turn, incentivises thermal generation and raises spot gas price. *Electricity pricing in constrained periods* In future scenarios where there are hydrological shortages, there will unlikely be sufficient gas for security of supply without further investment. See comments above on investment uncertainty. Todd agrees that situations like the 2021 dry year may occur more frequently. *Demand response* The electricity demand response is a direct impact of the supply and demand balance whereas gas demand response is indirect. A gas demand response is reliant on having thermal generators with available plant capacity. For example, Methanex can turn down its consumption but the gas seller can only support security of supply if it is able to sell the gas to a generator with capacity to use that gas.

		In other words, because of hydro plants, any electricity demand reduction benefits the country directly. The benefits of gas demand destruction depend on there being thermal generation capacity being available to utilize that gas.
Q5	What are your views on the potential solutions stakeholders have raised? Can you share any more detailed information to help inform us on how feasible or effective they might (or might not) be?	To support security of supply, the following factors are key: (a) a stable, enduring and predictable policy and regulatory environment to support much needed investment in gas development; (b) clear recognition that natural gas is needed as a transition fuel and is a recognised component of a future National Energy Strategy; (c) moving away from arbitrary targets or policy focus on particular fuels or technology. This is reflected in the CCC's advice to government to replace the 100% renewables target with a goal of aiming to achieve 95-98% renewables by 2030 which takes account of investment that will otherwise occur in the normal course of business; (d) ETS being the primary tool for achieving New Zealand's emission targets. The role of supplementary policy should be on removing regulatory barriers that disincentivises investment. One such policy example would be the development of a legal framework that enables CCS; and (e) a stable, enduring and predicatble environment for major gas users and certainty and clarity around thermal generation for security of supply for the electricity market. In terms of LNG, Todd considers that importing LNG can potentially support that role in the provision of flexibility and security of supply for domestic gas production.
Q6	Are there any other potential solutions?	

Q7	Do you agree that there is potential in a set of solutions linked to providing greater confidence to support the required investment in gas supply and flexibility, and that there is unlikely to be a single solution?	Yes.
Q8	What are the most important next steps to ensure that gas can support security of supply in the electricity market and that major users have sufficient certainty/transparency about gas supply for their operations during the transition?	(a) Certainty around the 2030, 2035 and 2050 targets. There is speculation in the market as these are not well understood. (b) Clear recognition that natural gas is needed as a transition fuel and it is a recognised component of a future National Energy Strategy.

[i] In this respect, see the Castalia-EITE Business' contribution to NZ's low emissions economy January 2019 report

[ii] Ibid

[iii] See: https://www.ea.govt.nz/assets/dms-assets/28/Market-Performance-1st-Quarter-Review-2021.pdf