



28 June 2021

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Dear Carolyn

**Re: Submission – Gas Market Settings Investigation**

Genesis Energy appreciates the opportunity to contribute to Gas Industry Company's Gas Market Settings Investigation. GIC is to be commended for meaningfully seeking feedback before issuing the consultation paper which provides a comprehensive summary of the issues.

Genesis is committed to empowering New Zealand's sustainable future. An important way we will do this is by decarbonising our generation fleet, while continuing to provide crucial back up to our highly renewable electricity system.

Our Future-gen strategy will see us displace 2,650 GWh of baseload thermal generation with renewables by 2030. Executing this strategy is a key component of meeting our Science Based Target, which will see us remove 1.2 million tonnes of emissions from our activities by 2025 (from a 2020 baseline).

Ensuring economic access to alternative fuels in a way that supports an increasingly flexible generation profile will be important to achieving these goals.

The market conditions over the past six months, while temporary, have demonstrated the impact gas supply constraints can have when combined with dry conditions. While the market has performed well to deliver secure supply, there has been a price and emissions impact. We are eager to ensure market settings support decarbonisation, and in particular the investment that will be necessary to underpin an affordable, low-cost electricity supply that will enable decarbonisation across the economy.

Our response to GIC's consultation focuses on the gas market, and reflects our experiences as a party that has [interests across the supply chain](#) and in downstream markets. Many of the broader, sector-wide themes are explored in more detail in our response to the Climate Change Commission's draft advice. That submission is attached as an appendix for context.

In respect of the gas market settings investigation, Genesis considers that:

1. Natural gas will play an important role in the transition to a net-zero economy. It can be a lower emissions fuel that supports the electricity generation required to back up a hydro-dependant system, with increasing intermittency as the proportion of wind grows. Other low- and zero-emissions fuels can be expected to play an increasing role as their economics (relative to fossil fuels and absolute) change.
2. Greater flexibility in access to natural gas can help ensure it plays its role most efficiently, reflecting the more flexible use of thermal generation assets as baseload is phased out. Gas storage can provide this flexibility.
3. A long-term national energy strategy, built on cross-sector 'systems' thinking will help provide investors with the confidence they need to develop energy storage without further intervention. Certainty is required regarding when any large renewable storage solution will be in place, so investors can plan to that timeframe and explore mitigation where appropriate.
4. A long-term energy strategy should also recognise the potential role of low- and zero-emissions gases and other alternative fuels, and the importance of ensuring the infrastructure to harness this potential is in place.

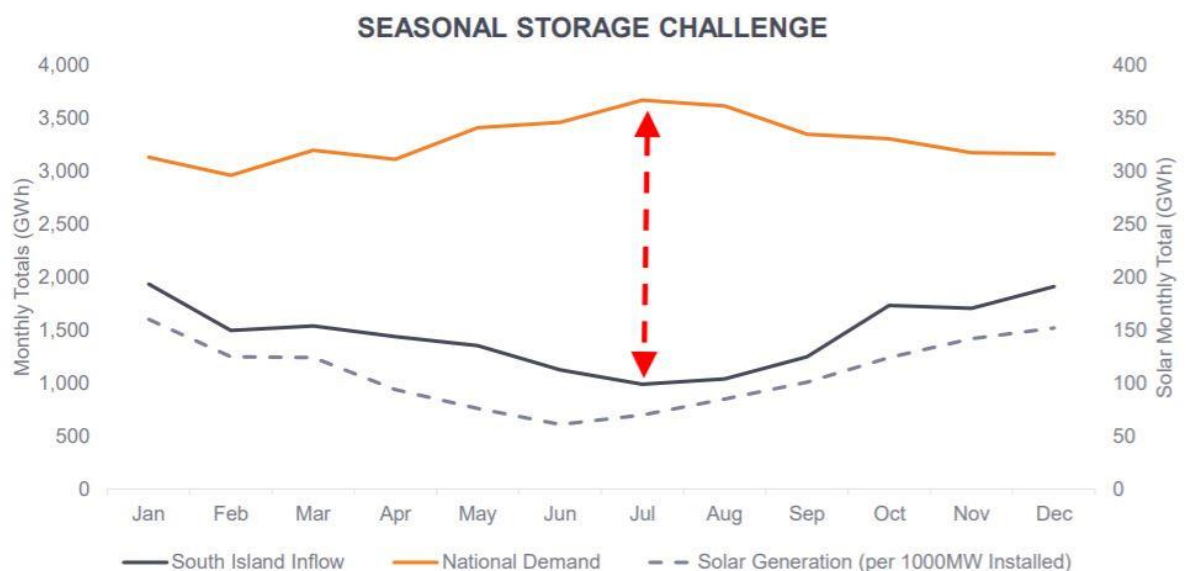
Yours faithfully

A handwritten signature in blue ink, appearing to read 'Shaun Goldsbury', with a stylized flourish at the end.

Shaun Goldsbury  
Chief Trading Officer

## Energy storage is key to decarbonisation

1. Genesis supports New Zealand’s goals of net zero long-lived gases by 2050, and reduced biogenic methane emissions.
2. We agree with the Climate Change Commission’s analysis that low-emissions electricity will be crucial to achieving this ambition.
3. Genesis agrees with the Commission’s advice that New Zealand should not pursue a 100% renewable electricity system at the expense of the affordable and secure supply necessary to decarbonise transport and industrial process heat.
4. Genesis also strongly supports the Commission’s recommendation that a cross-sector national energy strategy should be developed which drives lower carbon outcomes with due regard for the views of both industry and consumers.
5. This strategy should be built on cross-sector ‘systems’ thinking, rather than single issue ‘siloed’ thinking. The transition must be focused on outcomes and the plan must have regard to the interplay of factors within, and interconnectedness between, the various sectors in our economy.
6. Energy storage is a key area this strategy will need to address.
7. New Zealand currently requires about 7,000 GWh of deep energy storage to manage the seasonal shift in demand between summer and winter, and to cover dry years. In winter, New Zealand typically needs 2,000 GWh more stored energy than our hydro lakes can provide.
8. In dry years an additional 5,000 GWh or more can be needed. Thermal plant at Huntly Power Station fills most of that storage gap today, and we expect it will meet the entire gap within the next few years.



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<sup>1</sup> Genesis Energy analysis

9. Genesis' Future-gen strategy will see us displace 2,650 GWh of baseload thermal generation with renewables by 2030. Executing this strategy is a key component of meeting our Science Based Target, which will see us remove 1.2 million tonnes of emissions from our activities by 2025 (from a 2020 baseline).
10. While baseload thermal is phased out, Genesis intends to maintain thermal capability to back up the electricity system with seasonal and dry year energy storage.
11. This energy storage could take the form of natural gas – physically stored or capacity reserved via contract – or coal. Alternative fuels may play this role in future as their economics improve.
12. It is preferable for backup generation capacity to be provided by natural gas rather than coal, as it has around half the emissions intensity and has much lower impact on infrastructure and communities.

### **Flexibility**

13. Transitioning from a baseload operating model to increasingly providing flexible back up requires an accompanying increase in flexibility of fuel supply.
14. This flexibility is currently provided by coal as a last resort. This has been demonstrated by the operation of the electricity market over the past few months where hydro storage has been low and gas supply constrained.
15. Regardless of the energy storage solution that is found to support the post-2030 electricity system, thermal generation will continue to provide the storage the system requires in the meantime.
16. In the absence of secure and increasingly flexible gas supplies, there is a risk that energy storage will continue to be provided by coal, which is sub-optimal from an environmental perspective.
17. Genesis considers that a commercial case can be made for investing in fuel storage to support a more flexible operating model for thermal generation. Modelling to support our Future-gen strategy suggests a requirement for access to around 20 PJ of gas storage, with capacity to inject/withdraw 55 TJ per day.
18. We believe that the industry can arrive at a gas storage solution that is commercially viable and supports the decarbonisation of New Zealand's electricity sector and the economy more broadly.
19. However, ongoing uncertainty concerning how long such a solution would be necessary/viable is a key challenge to firms making what would be a significant financial commitment to a storage project.
20. Genesis does not consider regulatory intervention is necessary or desirable at this stage to ensure gas storage is developed to help reduce emissions in the electricity sector and the wider economy. This may change as the system becomes increasingly renewable and carbon prices increase.
21. Investors require certainty regarding the operating environment. Having a clear timeframe and commitment for the period of time in which a flexibility solution would be required would create an environment in which the market could find solutions with confidence.

22. GIC's paper also addresses the potential for LNG to contribute to New Zealand's energy security.
23. Genesis considers that the principles outlined above regarding gas storage also apply to LNG. LNG's higher costs can be expected to mean domestic natural gas storage solutions would likely be developed first, but investors in either option would equally need certainty around the long-term operating environment to commit the necessary capital.
24. In any case, Genesis agrees that it is unlikely that one single solution that provides greater confidence to support the required investment in gas supply and flexibility. Addressing security of supply of natural gas should form part of a long-term energy strategy, that recognises the interconnected nature of the system.

## Challenges

25. GIC's paper rightly highlights uncertainty around payback times as a key barrier to investment in gas storage. Explicit recognition of the role of natural gas in the transition to a net zero economy, and mapping a pathway through the transition in a long-term national energy strategy, can help provide the certainty that investors need to make the best use of New Zealand's resources. Policy predictability and stability is key.
26. Genesis recommends that any energy policy decisions have regard to their impacts across the system, and seek the best overall emissions outcome. With currently available technology, that means ensuring that barriers to reducing the system's reliance on coal should not be introduced, and where they exist, be removed.
27. The New Zealand Government is currently undertaking the New Zealand Battery Project, which aims to find a renewable solution to provide the energy storage the electricity system requires.
28. In particular, a business case is being prepared for a pumped hydro energy storage (PHES) project, with a 5,000 GWh project at Lake Onslow seemingly of particular interest.
29. MBIE's indicative timeline suggests, if the analysis supports proceeding, construction on PHES at Lake Onslow could begin in 2024.
30. Assuming a seven-year construction period (including filling and commissioning), a PHES at Lake Onslow could be operational by 2031.
31. Genesis agrees with the conclusion in GIC's discussion paper, that the prospect of Lake Onslow PHES (or an equivalent Government-backed energy storage scheme) presents a material risk to the commercial viability of investments in flexible gas supply for generation.
32. Resolving the uncertainty regarding future energy storage would provide the direction required for investors to materially reduce the electricity sector's emissions through the transition.
33. Investing in gas storage, or another alternative to coal, could still be achieved on a commercial basis even in a situation where Lake Onslow (or equivalent) is built. The key enabler is certainty around timeframes, to enable any commercial risks to be mitigated (potentially through a programme of compensation for stranded assets or similar mechanism).

34. Certainty and predictability are similarly important upstream, so producers can have the confidence to invest the \$300 - \$500 million every three-to-five years the GIC estimates will be necessary produce existing reserves and maintain production levels.

#### **Current state**

35. It is important to distinguish the current energy market conditions from the more 'normal' operating environment. GIC's conclusion that the current market stress is likely to continue into 2022 before easing in 2023/24 aligns with Genesis' expectation. The current tension may be alleviated earlier in the case of successful remedial work at Pohokura<sup>2</sup> gas field.
36. Any interventions should be carefully considered and aimed at improving long term stability and security, and improving investment confidence. The temptation to react to the current situation should be resisted, given the material risk of unintended consequences that dampen future investment.
37. Similarly, a Cabinet Paper dated 13 February 2021 addressing progress on implementing the recommendations of the Electricity Price Review raises the potential for provision of emergency powers to the Minister of Energy and Resources "to reallocate electricity or gas in situations of acute electricity or gas shortage"<sup>3</sup>. Genesis considers that the performance of the market during the current challenging conditions demonstrates that such a power is not necessary. Such a measure would also introduce uncertainty that carries the real risk of chilling investment from major users that currently support the stability of the market.
38. Despite the very challenging operating environment, the current market settings have enabled participants to come to commercial arrangements that have ensured gas has been allocated efficiently.
39. Genesis has been able to leverage its position at the intersection of the gas and electricity markets to broker agreements to secure gas at short notice. These arrangements have demonstrated the pragmatism and flexibility of producers and large users, and that market settings are largely appropriate for the current overall supply and demand environment.
40. The discussion paper points to a potential misalignment between the objectives of gas producers, who require long term contracts to support large investments in field development, and users who desire shorter term contracts.
41. Genesis does not consider that this currently represents any market failure justifying intervention.
42. Sophisticated participants are perfectly capable of taking more flexible approaches to contracting. We have worked with large users to break their contracted volumes into smaller amounts from a more diverse range of suppliers.
43. More parties are also participating in the emsTradepoint gas spot market. Genesis considers that this is an indication that the market is maturing and building in more flexible approaches to securing supply.

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<sup>2</sup> <https://www.energynews.co.nz/news/oil/97320/new-pohokura-well-next-year>

<sup>3</sup> Ministry of Business, Innovation and Employment 2020; Progressing the Electricity Price Review's Recommendations

44. A more predictable policy environment and a long-term energy strategy would support investment in ensuring the necessary flexibility and security of gas supply, which in turn improves the commercial environment in which contract negotiations take place.

#### **Future gases**

45. As part of mapping New Zealand's lowest cost and most productive pathway to a net zero economy, a national energy strategy should seek to make the most efficient use of our resources. The scale of the decarbonisation challenge means the country will need to ensure a range of low- and zero-carbon options remain available.
46. While recognising the significant role that our low carbon electricity system can play, the strategy should acknowledge the areas where it is not suitable and that other low- and zero-carbon fuels can play a role.
47. The industry is currently working on how green gases like biogas/LPG and hydrogen can play a greater role in New Zealand's energy mix over time. The Climate Change Commission has noted that bioenergy and hydrogen "have significant potential for reducing emissions in transport, space and process heat, and industrial processes"<sup>4</sup>.
48. Genesis agrees that these fuels have the potential to play an important role in future. The costs of future gases can be expected to come down as technology develops, and increasing carbon prices will make them increasingly cost-competitive with natural gas. This pathway applies to biomass also.
49. The existing gas pipeline network could transport increasing blends of green gas over time, reducing the emissions intensity of the network. Hydrogen also has potential as a fuel for transport applications for which electricity will not be suitable.
50. Genesis considers that the industry will make the necessary investment to prove up and deploy future gas technologies if there is sufficient confidence that they are able to be harnessed. Accordingly, policy settings should recognise the potential value of the existing gas transmission and distribution networks in delivering these future low- and zero-emissions technologies in a cost effective and safe way.

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<sup>4</sup> Climate Change Commission 2021; Ināia tonu nei: a low emissions future for Aotearoa

**Appendix 1**  
**Genesis Energy's role in the energy system**

**Genesis Energy**

1. We believe Genesis is New Zealand's most diverse energy business. Our view of the gas market is unique in the New Zealand context.
2. Upstream, Genesis currently has a 46% interest in the Kupe joint venture. Genesis receives all of the natural gas produced from the field, which fuels our thermal power plants and we supply to our customers. Our interest in this asset is currently the subject of a strategic review.
3. Several of our generation units at Huntly Power Station run on natural gas either all or some of the time:
  - a. 405 MW Huntly Unit 5 combined cycle plant – gas fired.
  - b. Two 250 MW Rankine Units – gas or coal fired. An additional 250 MW unit is kept in storage and used to meet gaps in the country's available energy storage or generation capacity. That unit has been used extensively in recent months, reflecting very low hydro storage and constrained gas supply.
  - c. 50.8 MW Unit 6 – open cycle gas turbine (peaker) which can run on gas or diesel.
4. These thermal assets support New Zealand's electricity system by providing crucial back up to variable renewables. This includes our 361 MW Tongariro Power Scheme, 138 MW Waikaremoana Power Scheme, 185 MW Tekapo hydro assets, the 8MW Hau Nui Wind Farm, and the 133 MW Waipipi Wind Farm built by Tilt Renewables with the support of a 100% power purchase agreement with Genesis.





5. Genesis is New Zealand's largest gas retailer by connections, currently supplying about 106,000 customers. Genesis customer gas sales totalled almost 8 PJ in the 12 months to March. Residential and SME customers accounted for about half of this and large industrial consumers purchased the rest.
6. Genesis is currently New Zealand's largest electricity retailer by connections, currently supplying approximately 480,000 customers.
7. Genesis is New Zealand's second largest LPG retailer, with around 80,000 customers. Genesis also owns reticulated LPG networks in Otago and Canterbury.

## Appendix 2

### Comments on GIC's proposed solutions

Proposed solution	Comments
<b>Gas storage</b>	Genesis considers that gas storage is likely to play an important role in decarbonising the electricity sector through the transition. The industry is likely to be able to deliver this without intervention. Providing there is sufficient certainty over the timeframes gas storage and associated thermal generation will continue to play an economic role. This should be reflected in a long-term national energy strategy that maps a pathway to a low-emissions future, and enables the right sequencing and prioritisation of actions and ensures low cost and reliable energy supply for all New Zealanders.
<b>Increasing information availability</b>	Genesis considers that the availability of information has materially improved in recent years with the introduction of the upstream information disclosure Code. Further improvements are likely through the proposed regulated solution.
<b>Better understanding of risks</b>	It appears that the understanding of risks flowing from currently available information is an area that could be improved. Genesis also believes there is potentially a place for translating the current security of supply information published by Transpower (electricity risk curves) into associated reporting that outlines market/price risks.
<b>ETS</b>	Genesis considers that the Emissions Trading Scheme should be the primary lever for decarbonisation. But we also recognise that there exist some imperfections with how the ETS interfaces with markets and that not all sectors of the economy are included. Any additional policy interventions must be considered carefully in terms of their consequences and should be limited to ensuring a fair and just transition.
<b>Regulatory framework for gas pipelines</b>	We support a review of the regulatory framework for gas pipelines.
<b>Green gases</b>	We agree with the Climate Change Commission that future gases could play an important role in decarbonisation. A long-term national energy strategy should recognise this role, and policy settings should have regard to their impacts on the infrastructure required to make best use of these emerging technologies.

<b>Support for long-term wholesale contracts</b>	Genesis considers that the current settings support long-term contracts, and that increasing sophistication among market participants provides for the objectives of consumers and producers to be met on commercial terms at the present time.
<b>Increasing policy predictability</b>	Increasing policy predictability is crucial to support the long-term investments necessary to ensure a just transition. Genesis strongly supports development of a long-term national energy strategy built on cross-sector 'systems' thinking. The transition must be focused on outcomes and the plan must have regard to the interplay of factors within, and interconnectedness between, the various sectors in our economy.
<b>Potential contribution of LNG</b>	We consider that if gas field development takes place, gas storage can provide the flexibility the system requires without requiring LNG at present. However, it is important to ensure policy settings do not create uncertainty and cost which prevents commercial development of LNG infrastructure should it be necessary in future.
<b>Reserves capacity market for energy</b>	Genesis does not consider there is material market failure that justifies introduction of a reserves or capacity market for gas at this time.
<b>Potential government investment</b>	We have not seen any market failure that justifies Government investment. Commercial operators are perfectly capable of meeting the system's needs at least cost, and there should be a very high bar for the use of taxpayers' funds in the gas market.

### **Appendix 3**

**Genesis Energy submission – Climate Change Commission 2021 Draft Advice for Consultation**

**[Uploaded separately as Appendix\_3-GENE\_CCC\_response\_FINAL]**