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**Q1**

Privacy Information

Respondent skipped this question

Page 4: Submitter information

**Q2**

Name

Nyree Hill

**Q3**

Organisation and role (if submitting on behalf of a company or organisation)

Strategic Advisor, GNS Science

**Q4**

Email Address

n.hill@gns.cri.nz

**Q5**

Are you happy for MBIE to contact you, if we have questions about your submission?

Yes

**Q6**

Please clearly indicate if you are making this submission as an individual, or on behalf of a company or organisation.

Company/Organisation

Page 5: Transitioning our gas sector

**Q7**

How can New Zealand transition to a smaller gas market over time?

Respondent skipped this question

**Q8**

INCOMPLETE

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**Q1**

Privacy Information

Respondent skipped this ques

Page 4: Submitter informati

**Q2**

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Powerco - Policy Manager

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Please clearly indicate if y company or organisation.

Company/Organisation

Page 5: Transitioning our ga

**Q7**

How can New Zealand trar

Respondent skipped this ques

**Q8**

An unmanaged transition poses challenges for the sector and could contribute to unintended adverse consequences:

1. The potential loss of industries which mostly rely on gas in their manufacturing process (e.g., Methanex).
2. A decrease in the energy sector resilience due the loss of gas operated power plants (in emergency scenarios),
3. The risk of a loss of gas pipelines and infrastructure, leaving various small users without mature solutions to replace gas (earlier than planned).

### Q9

What factors do you see driving decisions to invest or wind down fossil gas production?

Respondent skipped this question

### Q10

Does the Government have a role in enabling continued investment in the gas sector to meet energy security needs?

Don't Know

### Q11

Could you explain why you gave that answer?

Respondent skipped this question

### Q12

Does the Government have a role in supporting vulnerable residential consumers as network fossil gas use declines?

Yes

### Q13

Could you explain why you gave that answer?

Yes, GNS Science recommend that the government should ensure equity in transition for residential consumers.

### Q14

What role do you see for gas in the electricity generation market going forward?

GNS Science sees the role of gas declining in the electricity market as New Zealand moves towards the net zero target. As with all aspects of the energy transition, gas must be phased out of the market strategically to ensure energy security at a customer, local and national scales.

Considering the vulnerability of New Zealand to natural disasters, having an emergency energy backup, in the form of gas, could play a role in ensuring energy security in the interim. As this transition will take time, there may be merit in retaining gas as a back-up source for electricity generation.

### Q15

What would need to be in place to allow gas to play this role in the electricity market?

Respondent skipped this question

### Q16

Do you think fossil gas can play a role in providing security of supply and/or price stability in the electricity market? Why / Why not?

Respondent skipped this question

### Q17

Do you see alternative technology options offering credible options to replace fossil gas in electricity generation over time? Why / Why not?

Increase in geothermal can offer replacement for gas as baseload electricity generation. Geothermal energy generation, unlike hydro, wind and solar, provides continuous, reliable baseload supply and doesn't rely on weather conditions.

New Zealand's geothermal resources are already widely utilised to generate low-carbon electricity. Geothermal energy has a realistic pathway to more than double its current contribution of electricity generation by accessing deeper superhot supercritical resources, and significantly expand direct heat use applications.

### Q9

What factors do you see d

Respondent skipped this ques

### Q10

Does the Government hav energy security needs?

Respondent skipped this ques

### Q11

Could you explain why you

Respondent skipped this ques

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Respondent skipped this ques

### Q15

What would need to be in

Respondent skipped this ques

### Q16

Do you think fossil gas car electricity market? Why /

Respondent skipped this ques

### Q17

Do you see alternative tec electricity generation over

Respondent skipped this ques

### Q18

If you believe additional in should be funded?

Respondent skipped this ques

Page 6: Key Issues and Opp

### Q19

How important do you thir

Respondent skipped this ques

### Q20

Q18

If you believe additional investment in fossil gas infrastructure is needed, how do you think this should be funded?

Respondent skipped this question

Page 6: Key Issues and Opportunities

**Q19**

How important do you think biogas is for reducing emissions from fossil gas?

Respondent skipped this question

**Q20**

Why did you give this rating?

Respondent skipped this question

**Q21**

Do you see biogas being used as a substitute for fossil gas?

Respondent skipped this question

**Q22**

If YES, how?

Respondent skipped this question

Page 7

**Q23**

How important do you think hydrogen is for reducing emissions from fossil gas use?

Respondent skipped this question

**Q24**

Why did you give this rating?

Respondent skipped this question

**Q25**

Do you see hydrogen being used as a substitute for fossil gas?

Respondent skipped this question

**Q26**

If YES, how?

Respondent skipped this question

**Q27**

What else can be done to accelerate the replacement of fossil gas with low-emissions alternative gases?

Respondent skipped this question

Page 8

**Q28**

How important is a renewable gas trading scheme to supporting the uptake of renewable gases?

Do you see biogas being u

Respondent skipped this ques

**Q22**

If YES, how?

Respondent skipped this ques

Page 7

**Q23**

How important do you thir

Respondent skipped this ques

**Q24**

Why did you give this ratir

Respondent skipped this ques

**Q25**

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Respondent skipped this ques

**Q26**

If YES, how?

Respondent skipped this ques

**Q27**

What else can be done to
gases?

Respondent skipped this ques

Page 8

**Q28**

How important is a renewa

Respondent skipped this ques

**Q29**

Why did you give this ratir

Respondent skipped this ques

**Q30**

What role do you see for tl

Respondent skipped this ques

Page 9

**Q31**

How important do you thir
fossil gas use?

Respondent skipped this question

**Q30**

What role do you see for the Government in supporting such a scheme?

Respondent skipped this question

Page 9

**Q31**

How important do you think carbon capture, utilisation and storage is for reducing emissions from fossil gas use?

Respondent skipped this question

**Q32**

Why did you give this rating?

Respondent skipped this question

**Q33**

What do you think are the most significant barriers to the use of carbon capture, utilisation and storage in New Zealand?

The amount of available carbon to store may be too low to justify a Carbon Capture Usage and Storage (CCUS) operation. The high cost of Carbon Capture and Storage) CCS is mainly dependent on transportation cost of CO2 and capacity of storage largely depends on production quantities. Our carbon emitters are distributed geographically and capturing their emissions as well as transporting them could be too expensive to justify this solution.

CCS/CCUS can potentially be achieved in low scale using mineralization processes in rocks or cement if the technology to do so are shown be efficient. GNS Science recommends further science and innovation research and investment to assess the technical feasibility and the economic value of CCUS for New Zealand specific landscape.

**Q34**

Do you see any risks in the use of carbon capture, utilisation and storage in New Zealand?

GNS Science has had a long-standing engagement with industry (since 1996) over Carbon Capture Usage and Storage (CCUS); in part through its role as the New Zealand representative to the International Energy Agency Greenhouse Gas R&D Programme (ieaghg.org). The organization has started engagement with industry stakeholders to get a clearer insight into how opportunities and risks in relation to progressing subsurface energy storage solutions are perceived by this stakeholder group. Some of the challenges that were identified in the discussions are well known, and the conversations themselves revealed mitigating factors:

- High compression costs associated with reservoir depth (approximately 3km) could be offset by pricing mechanisms that take into account the fact that these energy stores are meant to be deployed at times of particular stress in relation to energy supply to the grid.

- Given how many cost related pinch-points were identified in the discussions, a robust cost-benefit analysis (under different scenarios of legacy infrastructure use) may be a useful next step to this research.

- Regulatory uncertainty is another key area of concern, particularly the uncertainties associated with regulating very long-term, complex energy subsurface storage operations. Since there are policy drivers with vested interests in progressing work around more fit-for-purpose regulatory settings for Carbon Capture and Storage (the Taranaki 2050 energy transition planning process as well as the Gas Transition Plan in particular), aligning next steps regulatory work in relation to subsurface energy storage with this may be strategic.

- With industry actively engaged with thinking through how legacy oil and gas infrastructure can be re-deployed cost-effectively for other purposes, there is appetite for collaboration on feasibility testing of energy subsurface storage options in the country, particularly in the Taranaki region.

**Q35**

In what ways do you think carbon capture, utilisation and storage can be used to reduce emissions from the use of fossil gas?

Respondent skipped this question

Respondent skipped this ques

**Q33**

What do you think are the storage in New Zealand?

Respondent skipped this ques

**Q34**

Do you see any risks in the

Respondent skipped this ques

**Q35**

In what ways do you think emissions from the use of

Respondent skipped this ques

**Q36**

If you have any other views comment here:

Respondent skipped this ques

Page 10: Options to increase

**Q37**

What role do you see for g

Respondent skipped this ques

**Q38**

How important do you thir supply?

Respondent skipped this ques

**Q39**

Why did you give it this rat

Respondent skipped this ques

**Q40**

What should the role for g

Respondent skipped this ques

Page 11

**Q41**

Our position is that LNG ir disagree with this position

Respondent skipped this ques

**Q42**

Please explain why you ch

Respondent skipped this ques

Respondent skipped this question

Page 10: Options to increase capacity and flexibility of gas supply

**Q37**

What role do you see for gas storage as we transition to a low emissions economy?

GNS Science views that gas storage is a viable transition fuel. However, there are a lot of technicalities that haven't been reviewed, in particular around injection and CO2 reservoirs. Further scientific and engineering investigations must be achieved before commercial entities could achieved securely gas storage.

**Q38**

How important do you think increasing gas storage capacity is for supporting the security of gas supply?

Respondent skipped this question

**Q39**

Why did you give it this rating?

Respondent skipped this question

**Q40**

What should the role for government be in the gas storage market?

Respondent skipped this question

Page 11

**Q41**

Our position is that LNG importation is not a viable option for New Zealand. Do you agree or disagree with this position?

Agree

**Q42**

Please explain why you chose your answer?

We agree with this position. Importing Liquified Natural Gas is not a viable long-term solution for customers due to the high cost.

**Q43**

What risks do you anticipate if the New Zealand gas market was tethered to the international price of gas?

Respondent skipped this question

Page 12

**Q44**

Is there any other information you would like to provide to inform the development of the Gas Transition Plan?

Respondent skipped this question



Page 12

**Q44**

Is there any other informat
Transition Plan?

Respondent skipped this ques