



BRIEFING

Petroleum allocation scenarios

Date:	27 February 2018	Priority:	Urgent
Security classification:	In Confidence	Tracking number:	2219 17-18

Action sought		
	Action sought	Deadline
Hon Dr Megan Woods Minister of Energy & Resources	Agree to discuss the options for petroleum allocation.	27 February 2018

Contact for telephone discussion (if required)				
Name	Position	Telephone		1st contact
James Stevenson-Wallace	General Manager, Resource Markets Policy	04 474 2913	s 9(2)(a)	✓
Dr Marcos Pelenur	Manager, Resource Markets Policy	04 901 9887	s 9(2)(a)	

The following departments/agencies have been consulted

Minister's office to complete:

☐ Approved

☐ Declined

☐ Noted

☐ Needs change

☐ Seen

☐ Overtaken by Events

☐ See Minister's Notes

☐ Withdrawn

Comments



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Purpose

To put forward options with regard to the continuation of Block Offer, and consideration of potential release areas. The paper considers options to vary the acreage put forward, including options for offshore and/or onshore exploration.

Executive summary

Since 2012, the allocation of petroleum exploration permits has been done exclusively via an annual public tender process known as Block Offer. This is a common approach to the allocation of petroleum exploration acreage internationally.

There are immediate questions around the scope and timing of Block Offer 2018. We would like the opportunity to discuss these with you so that an announcement can be made at the Petroleum Conference on 26 March 2018 to:

- Release Block Offer 2018 for consultation (in whatever form that may take); and/or
- Confirm a review process that includes engagement with industry and other stakeholders.

For 2018, officials recommend that the Block Offer is limited to Taranaki onshore and offshore.

Recommended action

The Ministry of Business, Innovation and Employment recommends that you:

- a **Note** that a decision on Block Offer 2018 should be made prior to the Petroleum Conference on 26 March.

Noted

- b **Agree** to discuss with officials from MBIE the considerations and scenarios around the future of petroleum allocation prior to decisions being finalised.

Agree / Disagree

s 9(2)(a)

James Stevenson-Wallace
General Manager, Energy, Resource Markets
Building, Resources and Markets Group, MBIE

27 / 2 / 18

Hon Dr Megan Woods
Minister of Energy & Resources

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Background

1. The allocation of petroleum exploration permits is currently undertaken through an annual tender process known as Block Offer. This is a common approach to the allocation of petroleum exploration acreage internationally and is well understood by stakeholders. No decisions have been made with regard to Block Offer in 2018.

Decision framework

2. As Minister of Energy and Resources, you make decisions on acreage offered for Block Offer under the Crown Minerals Act 1991 (the Act).
3. Currently, the required criteria for selecting such acreage is against an objective of "efficiency" with a view to ultimately maximise the recovery of New Zealand's petroleum resources. The requirements, processes, and expectations for how this objective is achieved are spelled out further in the primary legislation, the Crown Minerals (Petroleum) Regulations 2007, the Petroleum Programme, and the Invitation for Bids (IFB) document.
4. Historically, the Minister decides the timing and regularity of the offering, for example what to put out for consultation and subsequently what to put out for tender. Officials have previously recommended that prior to any decision, an oral item is tabled with Cabinet.
5. The current annual Block Offer process was introduced in 2012, creating predictability for industry to nominate areas of interest, as well as for consultation with iwi and engagement with local authorities.
6. Consultation on and the evaluation of the tender and award processes are delegated to officials. The tender requirements, such as minimum work programme terms and conditions, are specified in the IFB, which can be changed by the Minister.

Block Offer approach

Overview

7. The Ministry issues and manages permits to prospect, explore or mine petroleum onshore and offshore.
8. Prospecting permits can be made at any time over any available area. In most cases these permits are non-exclusive (multi-client), and permit holders do not have any subsequent rights to an exploration permit. Permits are usually granted for up to two years.
9. Block Offer is the only mechanism for securing a new exploration permit. Permits are exclusive and carry subsequent rights to apply for a mining permit in the event of a commercial discovery. Exploration permits also include the right to apply to extend the land to which the permit or discovered resource relates. Permits are issued for up to 15 years, depending on the permit location.
10. Firms can also acquire existing permits via transfers or control of permit holders through a change of control (COC) as defined in the Act.
11. The Block Offer format is one type of allocation model, designed to stimulate competition via a tender type model. The aim is to increase the total level of investment with the objective of securing commercial discoveries and bringing that through to successful production as soon as possible. Acreage included in Block Offers is in part signalled by firms through an expression of interest process known as nominations.

12. Potential environmental, social and cultural impacts from exploration and production activity are managed through other parts of the broader petroleum regulatory system, including the Resource Management Act 1991, the Conservation Act 1987, the Historic Places Act 1993, the Health and Safety at Work Act 2015 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012.
13. The annualised process offers a predictable and transparent way for firms to evaluate resource opportunities, seek internal support and funding to develop a bid, and compete during the tendering process.
14. For petroleum development, attracting international investors is usually measured in years. For example it takes typically over five years for an offshore permit holder to move from initial interest to a drilling decision. Any discovery, particularly offshore, can then also take years to develop.
15. Overall, oil and gas companies will tend to look at their operation in a market like New Zealand on a portfolio basis. Should growth opportunities through exploration be removed, it may incentivise them to either sell their existing producing assets or not to invest further in extending their production life. This would have the effect of bringing decommissioning costs forward compared to what would otherwise be the case, alongside the associated Crown liabilities for a portion of these costs that represent the amount of taxes and royalties that have effectively been overpaid over the life-cycle of the field's production.

Offshore dynamic

16. The amount of offshore acreage included in previous Block Offers has largely been driven by the participation of multi-client prospecting firms.
17. These multi-client firms undertake large offshore seismic surveys to gather technical geological data through non-exclusive prospecting permits. Applications for this type of permit are not made through the Block Offer, rather applications can be submitted at any time over any available area.
18. The firms then look to on-sell their data to other companies, which then use that data to identify target areas to put in a bid for an exploration permit (through Block Offer).
19. Multi-client firms have exclusive rights over the data for up to 15 years, after which time the data is made publically available.
20. Significant surveys were undertaken in 2014 and 2017 in the Pegasus/East Coast Basin (offshore Wairarapa) and in 2016, 2017 and 2018 in the Taranaki Basin. The acquired data rights will continue through until 2029 at the earliest. Under the 2013 Petroleum Programme, and if there was available acreage subject to these seismic surveys, these areas would normally be included in future Block Offer rounds, to create certainty for multi-client firms so they are able to recover survey costs.
21. Limiting the amount of future offshore acreage on offer is the Government's prerogative. However a sudden change in approach may create a risk of legal challenge on the basis of legitimate expectations held by affected parties.
22. In general we consider the risk of successful legal challenge on the basis of legitimate expectation to be low. Although to minimise this risk, we should give as much notice as possible to affected parties.

Onshore dynamic

23. The dynamic for onshore petroleum exploration is different as there is not a multi-client market equivalent.

24. The only producing onshore area is in Taranaki, which is largely already allocated. The result is that the prospective acreage available for onshore competitive tender is limited.
25. However, competition for remaining available acreage on onshore Taranaki is still present, as experienced in previous Block Offers where two or more firms competed for similar acreage. Through competition, the Government is able to select the most effective work programme and credible firm to develop the opportunity.

Scenario of a successful exploration find

26. Where exploration is successful within a permit area, as evidenced by a possible commercial discovery, there will be a heightened interest from firms to secure the surrounding acreage and competition will increase.
27. For permits already in production, the operator will be pursuing strategies to expand the extent of their resource development opportunity. To do this, the operators may look to compete for further acreage through the Block Offer.
28. So while the Block Offer is designed to attract new investment, it is also viewed by existing permit holders as the central mechanism to acquire new acreage and therefore extend the production life of their assets.

Managing onshore and offshore allocation of areas

Current trend of an expanded acreage on offer

29. From 2012 to 2017 acreage has generally expanded up, largely driven by the offshore multi-client market. In 2017 the total acreage was capped at approximately 400,000 square kilometres by a former Minister.
30. The criticism of an ever-expanding offering is the lack of firm interest secured as a proportion of acreage on offer, and the low levels of competition in the offshore environment.
31. In addition, although the annualised Block Offer creates predictability, it frustrates some iwi and other stakeholders who are consulted each year for the same area. Those iwi who have issue with petroleum development and provide the same feedback each year with no apparent effect on the allocation process.

Options for varying acreage on offer

32. In 2016 MBIE completed a petroleum allocation review (the Petroleum Exploration, Promotion and Allocation Review or PEPAR). The broad conclusion was that New Zealand's current approach to oil and gas permitting is widely recognised as flexible, easy to navigate and pragmatic.
33. However, the review did note the limited levels of competition offshore. It recommended two ideas for further discussion. First to increase competition by reducing the amount of acreage put out to tender, and second to create a forward-looking Block Offer release schedule.
34. A forward-looking Block Offer release schedule would require a managed scale-back of acreage to the most prospective areas. From this new baseline, a forward schedule could set out which areas would be released each year, for example, for the following five years. This would help improve meaningful consultation and send a clear signal to stakeholders.

Ministerial decision-making criteria specific to acreage:

- a. You have significant discretion as to what acreage is offered.

- b. Although there are no explicit requirements for acreage selection, it must be done consistent with the scheme and purpose of the Crown Minerals Act. In the context of allocation, the objective is one of economic efficiency.
- c. As such, officials recommend that you avoid referencing any non-economic efficiency factors that influence your decision to restrict acreage.
- d. As noted in paragraph 21, removing areas where seismic surveying has occurred will create significant uncertainty for those firms as to when and if they will be able to secure a return on their investments. This creates a risk of judicial review on the basis of legitimate expectation as normally those areas would be included in Block Offer rounds. As noted, we consider the risk of successful legal challenge on this basis of to be low.

Options for continuing or ending Block Offer

Ministerial decision-making criteria specific to continuing or ending Block Offer:

- a. Currently, Block Offer is the only available mechanism to secure an exploration permit. Prior to the introduction of Block Offer in 2012, the regime was a Priority in Time (PIT) process, under where applications could be received at any time and evaluated as received.
- b. PIT was dropped in favour of Block Offer as it was judged that a first-in, first-served allocation approach did not meet the efficiency objective of the Act.
- c. A primary consideration of ending Block Offer without a review or replacement is that it could be challenged as inconsistent with the Act, since resource development would be impeded.
- d. A second consideration is that ending Block Offer without a replacement would create uncertainty for future exploration investors in a highly competitive global market.
- e. Alternatively, a "no decision" on whether to proceed (and when) or not with Block Offer creates similar uncertainties for stakeholders.
- f. However, under the Act and Minerals Programmes, you have discretion around the frequency and timing of consultation and tender as well as the ability to refine how that process is undertaken.

Beyond a revised acreage offering, other options for you to consider are to:

- a. Continue existing Block Offer arrangements on a different calendar cycle, for example launch consultation at 2018 Petroleum Conference, with awards in 2019 (not 2018).
- b. Vary from annual cycle to every second (or third year). This is broadly the approach taken in Norway where the most prospective acreage is offered every year, but more frontier/less prospective areas are offered every second year. This approach could be accommodated within a forward release schedule as a way of providing certainty to industry and other stakeholders
- c. Pause/temporary moratorium on Block Offer, to allow time to review aspects of petroleum development in New Zealand.
- d. Alternatively you could signal a re-introduction of PIT or other allocation method. Any replacement allocation approach would need to better meet the efficiency objective of the Act. In the case of PIT, a judgement was exercised in 2011 that a first-in, first served approach was less efficient than a competitive tender approach.

- e. Permanent moratorium on issuing any new petroleum permits, i.e. prospecting, exploration, or mining. This scenario will affect holders of petroleum exploration permits (PEPs). They currently have a right under section 32 of the Crown Minerals Act 1991 to apply for a subsequent mining permit should they find a commercial discovery. Such parties will have invested, potentially very significantly, on that basis. Removing that right would require a change to the Act and, while possible, the Crown needs to be very cautious before removing vested statutory rights.

Option analysis

35. Officials welcome the opportunity to discuss options with respect to the future of petroleum allocation approaches.
36. We would like to discuss and better understand your objectives and considerations for the future development of petroleum in the context of energy security, affordability and emission reduction objectives.
37. We have provided a high level analysis of preliminary options for discussion purposes. We note there are a wide range of options available to you.

	Option	Pros/cons	How to minimise risk	Implementation
1	No decision	Pros: <ul style="list-style-type: none"> allows further time for Minister to consult with colleagues and officials Cons: <ul style="list-style-type: none"> impact on investor certainty does not position NZ well for upswing in commodity prices 	Provide update for industry regarding current thinking and future direction	Present at 2018 New Zealand Petroleum Conference – late March
2	2018 Block Offer onshore and offshore with similar acreage to 2017 (status quo)	Pros: <ul style="list-style-type: none"> maintains investment climate honours multi-client prospecting investment provides diversity of acreage to increase potential of gas discovery opportunity for regions other than Taranaki to benefit from development of industry best way to ensure medium/long term security of supply Cons: <ul style="list-style-type: none"> large area offered may not yield competitive results 	Increase consultation resource consider some limitations to overall acreage offering to improve competition	Normal Block Offer implementation pathway as described in Annex three
3	2018 Block Offer limited to Taranaki onshore and offshore	Pros: <ul style="list-style-type: none"> maintains investment climate in producing region focuses investment/competition to area most likely to yield new discovery in the short term – goes some way 	Confirm intention to review Pegasus/East Coast and Great South/Canterbury regions after exploration	Announcement at 2018 New Zealand Petroleum Conference – late March

		<p>to limiting security of supply risk</p> <ul style="list-style-type: none"> • maintains existing regional employment opportunities and services sector • allows exploration programmes in other basins (such as Pegasus/East Coast & Great South/Canterbury) to pass key milestones prior to further allocation taking place • honours investments of multi-client firms in Taranaki <p>Cons:</p> <ul style="list-style-type: none"> • unlikely to meet materiality threshold for larger firms • does not honour investments of multi-client firms in areas other than Taranaki (Pegasus/East Coast, Northland/Reinga basins) 	<p>milestones have been met.</p>	<p>Implementation as described in Annex two</p>
4	<p>2018 Block Offer limited to Taranaki onshore only, seek a review of how we approach offshore (note high level scope) in advance of a 2019 offshore offering</p>	<p>Pros:</p> <ul style="list-style-type: none"> • maintains investment climate in producing region • goes some way to limiting risks to security of supply • allows for allocations approach to be developed and tested with Ministers & stakeholders • maintains existing regional employment opportunities and services sector <p>Cons:</p> <ul style="list-style-type: none"> • currently limited acreage to offer coupled with relatively limited available market to attract may lead to muted interest • erodes investment certainty generally, but specifically with larger firms <p>does not honour investments made by multi-client firms</p>	<p>Careful messaging to stakeholders regarding scope of review and time frames</p> <p>Confirm intention to offer offshore acreage post review</p>	<p>Announcement at 2018 New Zealand Petroleum Conference – late March</p> <p>Implementation as described in Annex two</p>
5	<p>Deferred Block Offer to 2019 seeking a refinement of the existing BO allocation model. For example, this may include an offering on</p>	<p>Pros:</p> <ul style="list-style-type: none"> • allows time for policy programme to be developed and consultation to occur with Ministerial colleagues and stakeholders • allows available acreage to aggregate • may allow greater synergy 	<p>Careful messaging to stakeholders regarding scope of review and time frames</p> <p>Confirm intention to offer offshore</p>	<p>Announcement of deferral and review at 2018 New Zealand Petroleum Conference – late March</p>

	alternate years or refinement within the current allocation model	<p>between allocation and Crown Research Institute outputs</p> <p>Cons:</p> <ul style="list-style-type: none"> • impact on investor certainty • does not position NZ well for upswing in commodity prices • potentially risks existing multi-client investments 	acreage post review	
6	Temporary moratorium on BO to allow a review of the allocation model in favour of a new allocation model (e.g. PIT)	<p>Pros:</p> <ul style="list-style-type: none"> • allows time for policy programme to be developed and consultation to occur with Ministerial colleagues and stakeholders • allows available acreage to aggregate <p>Cons:</p> <ul style="list-style-type: none"> • impact on investor certainty • does not position NZ well for upswing in commodity prices • reduces investment certainty for multi-client firms and potentially puts at risk their existing investments 	<p>Careful messaging to stakeholders regarding scope of review and time frames</p> <p>Confirm intention to offer offshore acreage post review</p>	<p>Possible amendment required to the Crown Minerals Act by taking a bill through the House</p> <p>Likely amendment required to the Petroleum Programme via Order in Council</p>
7	Permanent moratorium on issuing new petroleum permits (prospecting, exploration, mining)	<p>Pro:</p> <ul style="list-style-type: none"> • Investor certainty <p>Cons:</p> <ul style="list-style-type: none"> • significant risk to security of energy supply • continued upward pressure on domestic gas prices • perceptions of sovereign risk (including beyond the energy sector) • may accelerate decommissioning of facilities • significantly alters regional employment opportunities and services sector • residual risk of legal challenge from investors 	<p>Preserve rights of existing exploration permit holders to proceed to mining should a discovery be made.</p> <p>Consider exemptions for areas subject to significant multi-client investments (i.e. 3D data only)</p>	Major amendments to the Crown Minerals Act 1991 and Petroleum Programme

Officials proposed pathway for 2018

38. Officials recommend Option 3: 2018 Block Offer limited to Taranaki onshore and offshore.
39. Should you wish to review current settings for offshore arrangements, Option 4 is favoured. Depending on the scope of change, the new settings could come in place for a 2019 Block Offer or if the new settings require legislative or regulatory changes, then a 2020 Block Offer. This option requires careful messaging to stakeholders with regard to the scope.

Rationale for Option 3:

40. To ensure we continue to deliver on the purpose of the Act, we support a competitive allocation model such as Block Offer.
41. Based on the PEPAR report, there are a number of identified potential improvements to the system, such as:
 - a. Reduce acreage. We could achieve this by limiting the 2018 Block Offer to onshore and offshore Taranaki, since it is a mature basin that is well understood.
 - b. Announce the likely introduction of a forward release schedule, after consulting with affected stakeholders, such as iwi, to improve certainty for industry and the public.
42. Option 3 also seeks to address the current uncertainty in the market by confirming commitment from Government to honour existing investment in exploration permits in the Pegasus Basin and Great South Basin. The the upcoming drilling commitments for 2018/19 will be a pivotal point in the development of those basins and will inform the likely level of economic reward in the area .
43. We note that there is significant discretion to refine the offshore area (consistent with the Act) and welcome a discussion with you on how we might approach that prior to consultation. We have included proposed acreage for onshore and offshore Taranaki in Annex one to aid our discussion.

Possible Implementation:

44. Should you support either Option three or four, we have outlined an implementation pathway in Annex two, starting with announcing Block Offer for consultation with iwi and local authorities at the Petroleum Conference in 2018.
45. Under Option four, we have proposed a draft scope of review in Annex four.
46. Officials do not support Options five to seven due to the likely disruptive impacts for current and future investment, as well as drop in exploration and future gas supply. The potential impact on other policy objectives, such as security of supply and consumer prices are outlined in Annex five.
47. We particularly emphasise the role of gas in the context of:
 - a. Energy security and its contribution to the energy sector during the transition to a net-zero emissions economy.
 - b. Contributing 16 per cent to electricity generation in the first three quarters of 2017 and supporting peak periods, as well as contributing to process heat in the North Island. A severe gas disruption could place upward pressure on consumer electricity prices.
 - c. Likely to play a continuing role in generation (MBIE's current modelling has gas in the electricity system through to 2050, which is as far out as it models), although recognise that a number of technology changes increases uncertainty.
 - d. Its use as an input in a wide range of industrial processes and commercial and residential applications. A fall in gas reserves has a direct impact on price, potentially making some export industries, notably methanol production, uncompetitive.
 - e. Royalty and tax returns. Between 2013 and 2017, the petroleum sector paid over \$1.3 billion dollars in royalties and Energy Resource Levies. The amount of corporate taxation is not precisely known due to taxpayer confidentiality.

Annexes

Annex One: Offshore, Onshore charts (separate pages)

Annex Two: Implementation plan for Options 3 and 4 (put into a flow chart –briefing to Minister (decision), oral item cabinet, consultation launch/close, analysis, recommendations, tender, bid closing, award dates).

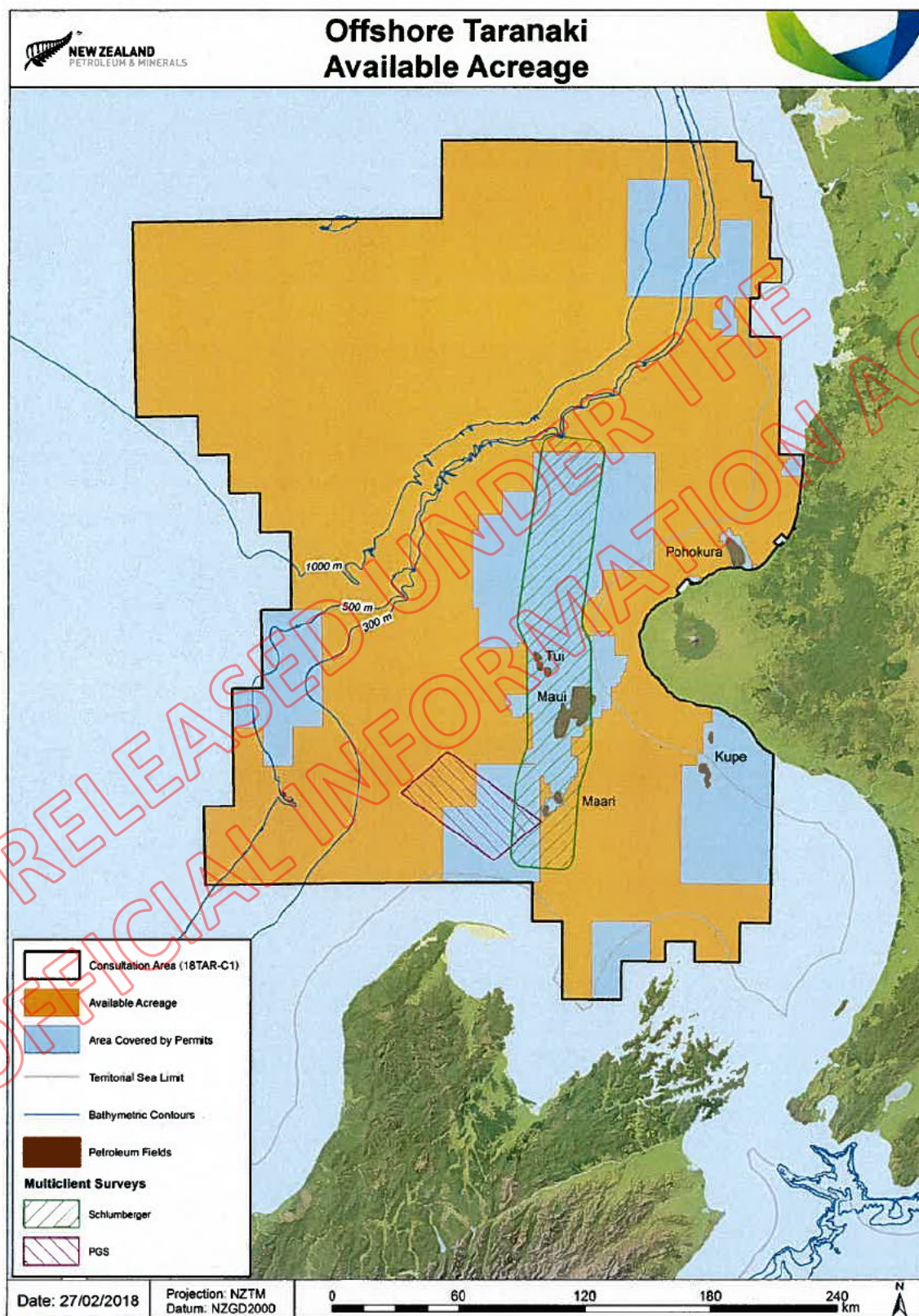
Annex Three: Block Offer stage 1 – 13 summary

Annex Four: Scope of possible review under Option 4

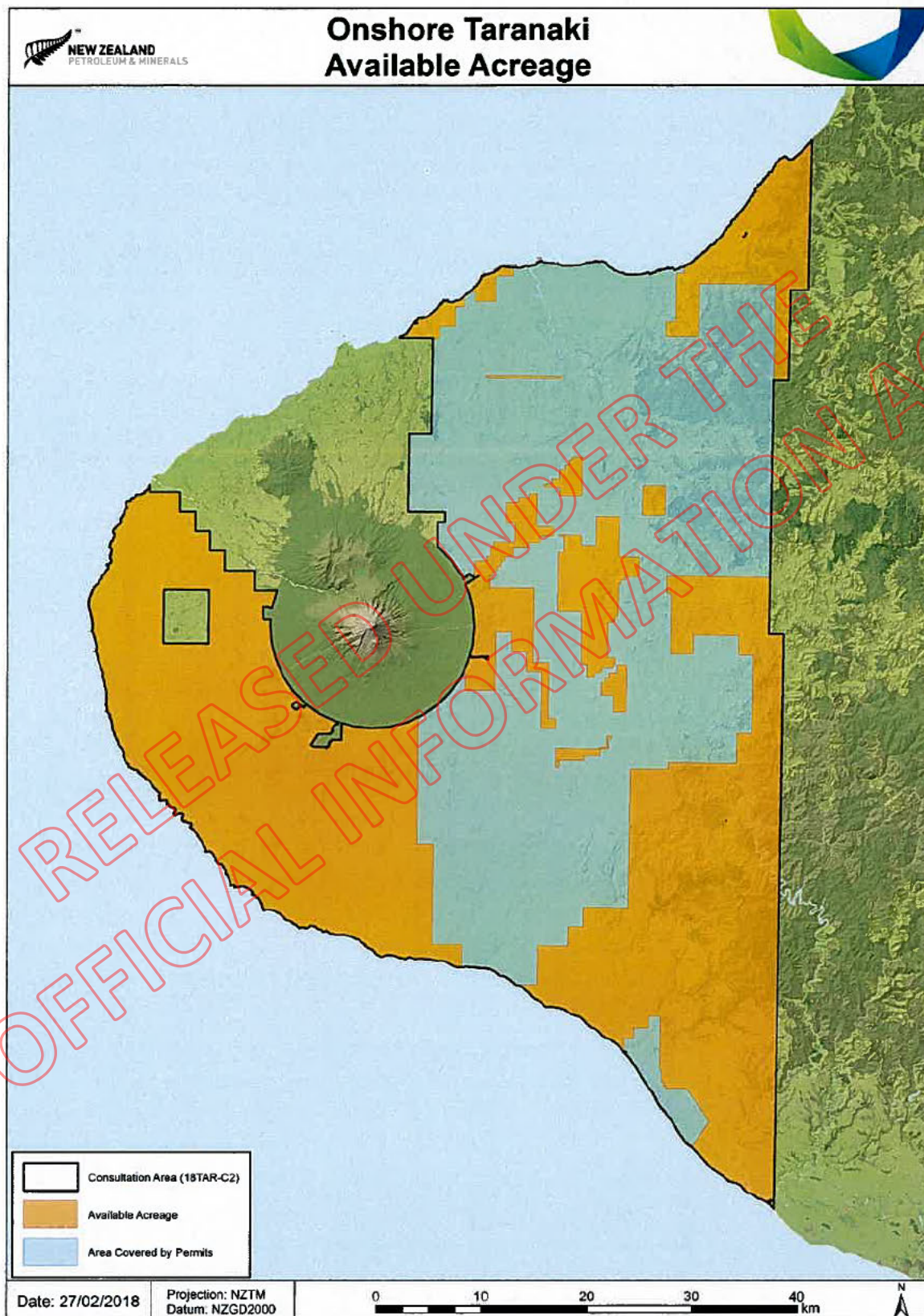
Annex Five: Consideration against other policy objectives for gas

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Annex One: Offshore charts



Annex One: Onshore charts



Annex Two: Accelerated timeline of Options 3 and 4

Block Offer 2018 announced in late March 2018 at the New Zealand Petroleum Conference

- Iwi consultation and submission analysis late March to early July 2018
 - MBIE direct engagement with relevant district and regional councils and hui with specific iwi
- Ministerial/Cabinet process early July to August 2018
 - Ministerial briefing
 - Cabinet papers
- Open Block Offer 2018 for bidding around mid-August 2018
- Close Block Offer 2018 for bid assessment around December 2018 / January 2019
- Bids are assessed, ending in permit grant in March/April 2019 (or any other date as determined)

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Annex Three: Block Offer stages 1 – 13 summary

The current Block Offer process is as follows:

- **Stage 1 Nominations** - At the Petroleum Conference (March) of the preceding year, a request for nominations from the industry for areas to be offered in the next Block Offer is made. Nominations close late May.
- **Stage 2 Geological merit** – Officials identify areas with geological merit, principally based on sediment thickness.
- **Stage 3 Prospectivity** – Officials identify areas with prospectivity. This is principally based on evidence for components of a working petroleum system and previous industry interest, as expressed by data acquired.
- **Stage 4 Commerciality** – Officials identify areas of commercial interest. This is principally based on industry nominations. It is also informed by market interest and progression of activity in areas of interest by current and potential permit holders
- **Stage 5 Statutory obligations** – Officials remove areas unavailable for petroleum exploration by legislation.
- **Stage 6 Policy considerations** – Officials remove areas excluded from previous Block Offer acreage in line with previously announced Government commitments, and after balancing the concerns raised during previous consultation rounds against the prospectivity of the area.
- **Stage 7 Iwi consultation** (usually October – December)
- **Stage 8 Consideration of iwi submissions** and establishing the land to be offered.
- **Stage 9 Drafting tender document** (known as the *Invitation for Bids*)
- **Stage 10 Tender opens** at the Petroleum Conference (in March of the next year)
- **Stage 11 Tender closes**
- **Stage 12 Bid evaluation**
- **Stage 13 Decisions on bids**

Annex Four: Scope of possible review under Option 4

Draft review scope for future Block Offers:

- Scope and terms of reference to be worked through with the Minister. It may include such matters as:
 - the factors that need to be taken into account when granting a permit;
 - engagement processes;
 - the idea of a forward-looking release schedule model and how this would interface with multi-client client investment.
- Advise Minister around September/October 2018

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Annex Five: Consideration against other policy objectives for gas

Gas and the 100 per cent renewable electricity challenge

1. Focusing solely on reaching 100 per cent renewable electricity (in normal hydrological years) may not necessarily achieve the lowest level of emissions possible.
2. Absent the use of gas, there is potential for overbuild of geothermal (which has some emissions¹) or intermittent renewables such as wind and solar. The risks with overbuilding renewables are that it displaces hydro (which has no emissions) as base-load generation, or raises costs to consumers.
3. Natural gas could continue to play a key role in supporting electricity security of supply in dry years, and therefore continue to be an integral part of the electricity system in the medium term at least.
4. Optimally utilising gas-fired electricity generation for unusually high winter peaks for example² could make sense from a security of supply and consumer cost perspective, and result in lower emissions overall.

Gas has a role in transitioning the energy sector to lower emissions

5. Another important aspect is that a key opportunity to reduce energy sector emissions is to fuel switch from fossil fuels to electricity (particularly in transport and industrial process heat). Transitioning to 100 per cent renewable electricity too quickly risks raising electricity prices to levels that could impact on fuel-switching, for example, by slowing the uptake of electric vehicles or high temperature electric heat plants that replace coal-fired boilers.
6. We would expect the Climate Change Commission to comment on gas as a transition fuel but not on the allocation approach.

Long exploration cycles and ready international alternatives means that continuity of policy settings is important

7. New Zealand faces a range of challenges in attracting international exploration investment. The largest overriding challenge is our prospectivity. Internationally, the success rate from exploration drilling is in the order of one in four (that is you will, on average, need to drill four wells for one commercial discovery). In New Zealand that ratio has historically been more like one in ten.
8. Compounding this geological challenge is New Zealand's distance from international markets which significantly adds to the costs of exploration, the fact that we are perceived as gas prone (which undermines the economics of any potential discovery), our small domestic gas market, and the lack of any major exploration success in recent years.
9. For an international explorer, the difficulties and costs of exploring in New Zealand need to be weighed against the ready range of alternative international exploration opportunities available to oil and gas explorers. With the fall in oil prices since mid-2014, exploration activity in New Zealand has fallen dramatically as explorers have focused their reduced exploration budgets in other, less expensive markets. There were only four exploration wells drilled in 2015 and 2016, none of which were offshore, compared to 40 exploration wells in 2013 and 2014.

¹ Fugitive emissions from geothermal plants are normally in the range of 10 – 400 g/kWh compared to 400 g/kWh for gas-fired combined cycle plants.

² Utilising gas-fired generation for winter peaks provides more financial incentive to own and operate such a plant, than only being able to generate in dry years.

10. One of our compelling characteristics internationally is New Zealand's low sovereign risk, which includes respecting existing rights and a relative continuity in policy settings.
11. Existing rights for petroleum explorers include the right to proceed through to production through the grant of a mining permit in the event of a commercial discovery, and also the right to extend the land to which the permit or discovered resource relates, subject to conditions set out in the Petroleum Programme.
12. The timeframes involved in attracting international investors and then getting them to invest in seismic surveying and drilling is measured in years (typically over five years for an offshore permit holder to move from initial interest to a drilling decision). Any discovery, particularly offshore, can then take years to develop (18 months at the earliest). Once investors have left it can be very difficult to get their interest back.
13. Oil and gas companies will tend to look at their operations in a market like New Zealand on a portfolio basis. That means that any material change to the exploration side of their business may have an impact on how they view their existing producing assets, and vice versa. Should exploration opportunities be removed, it may have an impact on how oil and gas companies consider their overall presence in New Zealand, potentially incentivising them to either sell their existing producing assets or not to invest further in extending its production life. In the latter case, this would have the effect of bringing decommissioning costs forward compared to what would otherwise be the case, alongside the associated Crown liabilities for a portion of these decommissioning costs that represent the amount of taxes and royalties that have effectively been overpaid over the life-cycle of the field's production.

Gas is an input into high technology, high value exports

14. Gas is an input and a feedstock into a range of high technology and high value exports. Two notable examples are for drying milk powder at Fonterra's milk factories and for the production of methanol. Methanol is an intermediate petrochemical feedstock used in a wide range of applications. Formaldehyde and acetic acid are its traditional uses which are in turn used to make products like adhesives, foams, plywood subfloors, solvents and windscreen washer fluid. In more recent years global demand growth for methanol has been driven by energy applications – either in direct blending with petrol in China, marine fuel, dimethyl ether, or MTBE (an oxygenate that is used in the refining process to increase the octane level in petrol).

Gas security of supply remains critically important

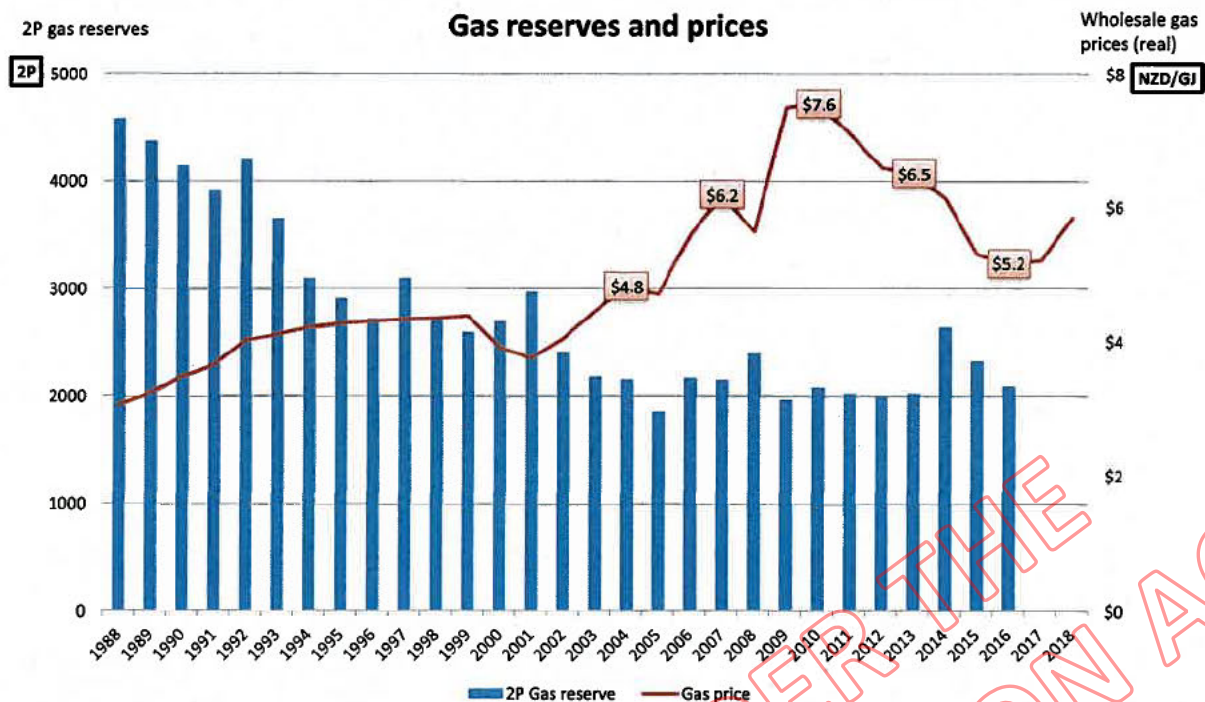
15. In the case of gas, New Zealand is completely disconnected from the rest of the world. We can only consume what we produce.
16. Following a major write down in reserves at the Maui field in 2002/03, ensuring ongoing exploration efforts to meet New Zealand's gas demand has been an important objective. A range of Government initiatives were introduced in 2004 to encourage gas exploration. While security of supply has always remained a critical underlying consideration, the Government's focus changed to economic development considerations following the launch of the Petroleum Action Plan in 2009. These economic development considerations have been accompanied by efforts to strengthen the checks and balances in the system, notably with the inclusion of a preliminary assessment of an applicant's health, safety and environmental capability as part of the permit application process.
17. Officials are continuing to look at areas where checks and balances can be strengthened so as to reduce any residual risks to the Crown. Cases in point are the proposed amendments to section 41 of the Act that relate to transfers and dealings. At present, a change of control of a permit participant who also happens to be the permit operator (the party responsible for the day-to-day management of the permit) only requires a notification to officials. The policy

intention has always been that a change of operator would be subject to a formal approval process that would have regard to health and safety considerations alongside the technical and financial capability of the applicant.

18. Since the Maui reserve write down, reserve levels have fluctuated between 10 and 14 years of annual gas demand. Importantly, however, reserve additions have largely been provided by ongoing development at existing producing fields (moving gas from the contingent resource category into the reserve category) rather than through the discovery of any new fields. There has been no new discovery of note since the Turangi field was discovered in 2005.
19. Officials are aware of a significant pending reserves downgrade of 18 per cent at the Pohokura field which is New Zealand's largest producing field. This is equivalent to approximately two-thirds of a single year's gas demand. It is likely to reduce the amount of gas reserves to less than ten years of annual demand, which would be the first time that this has occurred since the Maui reserve write down in 2002/03.
20. The behaviour of Methanex is a barometer for the health of the gas sector as a whole. When Methanex is unable to secure sufficient supply to meet all of its demand requirements, then it indicates that the supply/demand balance is becoming tighter. Methanex is the macro demand side balancing agent. Methanex has the capacity to take up 92 PJ of gas per annum, equivalent to approximately half of New Zealand's gas demand in 2017. Should gas demand become tight, Methanex is the first major demand user that would likely exit the market. Given its size, Methanex's potential exit provides a potential buffer to other industrial, commercial, and residential users of gas. s 9(2)(b)(ii)

Reduced gas reserves results in higher prices for consumers

21. There is a direct correlation between gas reserves and gas prices. Following the Maui reserve downgrade in 2002/2003 a suite of new gas contracts were signed for the yet to be commissioned Pohokura field. Wholesale gas prices effectively doubled overnight for these new contracts.
22. Wholesale gas prices continued to rise through the rest of the decade but have tapered off in real terms since then following a number of demand-side responses, including the commissioning of a gas storage facility in 2011 and the closure of the Southdown and Otahuhu B gas-fired power plants in 2015.
23. Short-term wholesale gas prices have increased significantly in 2017 and 2018, indicating that gas supplies are becoming tighter.



Any significant discovery of gas for export could also result in a global reduction of emissions through a displacement of coal

24. New Zealand is perceived as being gas prone. Should a major discovery be made then there is every chance that it will include a significant gas component. Should the size of the gas discovery be big enough to export as liquefied natural gas, then these future exports would be likely to displace coal for power generation with a reduction in emissions.
25. Coal is forecast by the International Energy Agency to continue growing strongly in Southeast Asia through to 2040. Under their base case scenario, coal-fired power generation is due to grow by 99 gigawatts through to 2040. That is equivalent to a new four unit, 1,000 megawatt coal-fired Huntly power station built every 12 weeks for the next 23 years. The export of competitively priced LNG would offset some of this projected increase in coal-fired power demand in electricity. New Zealand has the potential to play a role in this area should a major discovery be made.

A gas discovery in the South Island has the potential to displace the use of coal

26. There is no natural gas supply in the South Island and so coal is typically used in large industrial processes. Much of this coal is lignite, which is a particularly low grade of coal. In the same way that the export of gas has the potential to displace coal internationally, the same applies in New Zealand should a discovery be made that would allow reticulation to the South Island.

Reconciling domestic petroleum production with climate change aspirations

27. Restricting or curtailing domestic petroleum production results in a negligible decline in the country's domestic emissions profile but would likely result in carbon leakage, with a rise in global emissions as well as removing the potential to reduce emissions both domestically and internationally should a material gas discovery be made.
28. As the vast bulk of energy-related emissions occur from the combustion of fossil fuels, it is appropriate that New Zealand's climate change efforts are focused on the demand side

rather than the production side. The Climate Change Response Act 2002 is the primary mechanism to influence consumer behaviour as it puts a cost on carbon.

29. Carbon leakage from a curtailment of domestic gas supply would occur as a consequence of the potential shutting down of domestic industries that have no alternative to using natural gas and whose direct competitors use coal and whose production might be expected to increase to fill the gap created in the market. A case in point is Methanex which consumed 78 PJ of gas in 2017, or 41 per cent of total gas demand. Methanex's New Zealand operations at Motunui and Waitara are the swing producers of methanol for the Asia-Pacific region. Its main source of competition comes from Chinese methanol producers who use coal, rather than gas, as a feedstock. Any reduction of New Zealand-produced methanol would be replaced by Chinese coal-produced methanol with a higher emissions footprint.

Economic development

30. The main yardstick for success in the Act is the royalties the Crown receives from the development of its Crown owned minerals. The vast bulk of royalties come from petroleum development. While royalties have been declining in recent years alongside the fall in the international price of crude oil and declines in domestic production, the petroleum sector still provided over \$170 million in the way of royalties and Energy Resource Levies (ERLs) in FY 2017 alone. Between 2013 and 2017, the petroleum sector paid over \$1.3 billion dollars in royalties and ERLs.
31. The amount of corporate taxation is not precisely known due to taxpayer confidentiality.
32. The economic impact of the upstream petroleum sector is disproportionately felt in Taranaki. As a high value industry with a low footprint, the industry provides amongst the highest per capita wages in the country and is highly productive.