PEPANZ

PETROLEUM EXPLORATION & PRODUCTION ASSOCIATION OF NEW ZEALAND

ADVANCING NEW ZEALAND'S PETROLEUM SECTOR

to contribute to national prosperity, regional economic growth and global energy sustainability

CONTENTS

PURPOSE

This document outlines the existing role of the petroleum sector in New Zealand and the potential for further development of it to contribute to national prosperity, regional economic growth and global energy sustainability. It then highlights the policy settings and initiatives required to support this goal over the medium to long term.

EXECUTIVE SUMMARY

This document outlines the polices that the Petroleum Exploration and Production Association of New Zealand (PEPANZ), and its Members, believe the Government should adopt to realise New Zealand's oil and gas potential and maximise its value to the country.

In a competitive world where investment capital is increasingly mobile, it is important that New Zealand has enabling and stable policy settings, a world class regulatory environment and good geological information available on its prospective petroleum basins.

The recommendations we are making to Government fall into four broad categories: Legislative, Regulatory and Fiscal; Energy Security, Affordability and Reliability; Climate Change; and Health, Safety and the Environment.

To maximise the value of the sector to both national and regional economies over the long-term, New Zealand requires appropriate legislative, regulatory and fiscal settings. Key recommendations include: ensuring fiscal policy settings take into account New Zealand's unique circumstances and encourage early exploration; increased investment to better understand the geology of New Zealand's basins and to allow better targeting of exploration activities; incorporating petroleum potential into the Government's regional economic growth work programme; and establishing a dedicated fund for petroleum royalties to ensure future generations benefit from the extraction of this non-renewable resource.

We recommend that the Government's energy policy continues to recognise the importance of domestically produced natural gas to New Zealand's energy security and also seeks to increase New Zealand's self-sufficiency in transport fuels.

Recognising the need to respond to a changing climate, and to help meet New Zealand's emission reduction targets, we recommend the Government: ensures the Emissions Trading Scheme is comprehensive and includes agriculture; facilitates opportunities to utilise lower emitting fuels (such as natural gas) where possible in industry and transport; and aims to facilitate lower global emissions by supporting projects that have the potential to reduce global carbon emissions even though they might increase domestic emissions.

Finally, we make a number of recommendations relating to health, safety and environmental policy. Key recommendations include: putting in place a robust and balanced approach to offshore decommissioning of oil and gas assets; reducing regulatory duplication; and ensuring the future establishment of marine protected areas is science-based and provides appropriate certainty to affected sectors.

By implementing these recommendations, the Government will ensure the oil and gas sector helps drive economic growth, improve New Zealand's energy security, while at the same time also helping the country to appropriately respond to a changing climate and protect our unique environment.

PART 1

THE ROLE OF THE UPSTREAM PETROLEUM INDUSTRY IN NEW ZEALAND

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Overview

Oil is the world's key transport fuel due to its high energy density and portability. Natural gas is extensively used for electricity generation and for supplying heat in commercial, industrial and residential situations. Oil and gas are also required for the production of many chemicals (including fertilisers) and materials such as plastics that are integral to the modern economy and found in many items we use today.

The global population is expected to continue to grow until at least the middle of this century and this, combined with increasing wealth, is expected to drive increasing demand for many things including food products and energy. This increased demand needs to be met in a world that is simultaneously seeking to reduce greenhouse gas emissions whilst dealing with a changing climate.

New Zealand is an open and market based country with an export focussed economy centred on the primary sector. New Zealand is far from some markets but relatively close to fast growing countries in Asia.

The oil and gas industry has played an important role in the development of the New Zealand economy and energy system over the last half century, having initially commenced in the mid-nineteenth century. With appropriate policy settings the oil and gas industry in New Zealand can continue to develop, making an increasing contribution to the economy in a way that is compatible with global efforts to respond to a changing climate.

This section outlines the role of the upstream petroleum industry with reference to four dimensions: legislative, regulatory and fiscal; energy security, affordability and reliability; climate change; and health, safety and the environment. While it is important to consider these aspects individually it is also critical that government takes an overarching and integrated approach to policy and regulatory design and implementation.

Legislative, Regulatory and Fiscal

Petroleum resources are publicly owned in New Zealand. Government seeks to maximise the value of this resource for the benefit of all New Zealanders. Under the *Crown Minerals Act 1991* the Government chooses whether to allow exploration, development and production of petroleum resources, in which locations and on what terms. Other regulations then apply to how the required activities are undertaken.

Domestic and international oil companies invest in exploring for, developing and producing those petroleum resources on behalf of the government, which in turn receives a substantial share of the returns made in the form of royalties and taxes. The investments required, and commercial risks taken, to generate these returns are borne by industry rather than the taxpayer and New Zealand competes for investment in the petroleum sector with many other jurisdictions around the world.

The development of New Zealand's petroleum resources over the last 50 years, from one petroleum basin in Taranaki, has generated wealth directly and enabled the development of a range of industries in and around that region. Billions of dollars have been invested in the development of New Zealand's oil and gas fields, and more still on midstream and downstream infrastructure and related industries[1]. The industry's contribution to overall GDP is $2.79 billion. Direct employment is 5,068 (FTEs) while the entire industry contributes a total of 11,720 FTE jobs[2]. Oil exports are worth approximately $1.5 billion per annum.

Royalty and tax income from the industry has delivered substantial sums to the Government's Consolidated Fund over a long period. Over the ten year period to 2015 royalties from petroleum production amounted to NZ$3.2 billion[3]. Like other government revenue, this helps to fund public services and investment in social and economic infrastructure. Countries such as Norway have chosen to save these returns in long term funds with the intent of ensuring the financial benefits from extracting this non-renewable resource are maintained over the long term.

As well as the direct value generated from oil and gas production, gas in particular is an essential feedstock for industrial activities such as urea and methanol production. These industries exist in New Zealand as a consequence of domestic gas production and provide direct and indirect jobs. Domestically produced gas also supports a wide range of economic activities that require heat (e.g. furnaces, milk drying, timber processing, oil refining and steel production) and plays a key role in the electricity generation system.

A distinctive feature of the oil and gas industry is the scale and interwoven nature of its supply chain and its impact on the overall economic and employment base in relevant regions. Oil companies extensively contract specialist supply chain companies, as and when required, over the course of exploration, development, production and decommissioning. The ability of local companies to develop the specialist skills and expertise required to secure such work is therefore an important element in maximising the domestic benefits of the industry. Local involvement remains greatest for onshore developments and particularly in ongoing production and maintenance operations. In recent years, with New Zealand's supply chain companies gaining a positive track record of successful project delivery, the propensity for New Zealand companies to secure work has increased[4]. Some companies have used skills developed here to export equipment or services.

Petroleum related activities in the Taranaki region have helped make it one of the wealthiest regions in the country. The oil companies themselves, and the many service companies that support the industry's activities, form a large part of the Taranaki economy and provide many high paying jobs. Notwithstanding this success, the industry recognises that the potential for exploration, development and production in other regions is not well understood.

Refer to pages 20 – 22 for footnotes.

Engagement with iwi, hapū and communities has become an increasing focus for explorers and developers operating around the country.

Whilst New Zealand's oil production has increased in recent years the country is only 35% self-sufficient in oil and so continues to incur large costs as a net-importer of oil and oil products[5]. As well as providing direct revenue, increased domestic oil production would further reduce this import bill and moderate the impacts of oil price volatility on the economy. New Zealand is currently self-sufficient in gas resources, but as recently as the mid-2000s the potential importation of gas was actively considered due to temporary concerns about a potential domestic shortfall. Insufficient domestic production may again require LNG importation to be considered and this would have significant costs[6].

At present all domestic oil and gas production comes from one petroleum basin in Taranaki. Although the industry has been active in the area for many decades, the basin remains under-explored relative to many comparable basins of its size around the world and there remains considerable potential for further discoveries[7]. There is also potential for substantial petroleum resources to be located in a number of the 17 sedimentary basins around the country, many of which are large by international standards. Drilling to this point has proved the presence of working petroleum systems in some of these (e.g. Great South, Canterbury and East Coast basins) although discoveries made so far have not proved commercial to develop[8].

Successful exploration, development and production in any one or more of these additional basins could make material contributions to economic development in those regions and nationally[9]. Specifically it could provide more royalties and taxes to the government, considerable export income, employment in the relevant regions and the potential for further economic activity based on supporting this development or further processing the products from it. Whilst the ultimate extent of New Zealand's petroleum resources remains uncertain, it is important to consider the fact that the costs of exploring this potential are borne almost entirely by industry, yet the benefits are shared across both the private and public purses. Countries such as Norway have maximised the long term returns by investing royalties, increasing spillovers to the economy through active development of their domestic services sector and investing in supporting exploration.

The oil and gas industry is one of the most internationalised of industries and so New Zealand's competes with many other locations for mobile investment capital. Whilst New Zealand is a favourable destination for investment generally,[10, 11] there are a range of challenges that need to be recognised. These include the small size of the domestic market, limited infrastructure, the cost and effort of mobilising equipment, for example offshore drilling rigs, and the relatively limited knowledge of prospectivity due to comparatively limited exploration. While some of these matters can be addressed through policy interventions, there is scope to increase the knowledge of our petroleum prospectivity and fiscal settings needs to recognise this context.

Making the most of the petroleum resource and maximising its value to New Zealanders requires substantial investments in exploration, development and production. For these to occur a base line understanding of geology and petroleum potential is required. Government's investments in research and data acquisition, while potentially modest in comparison to industry investment in exploration, have and continue to play an important role in increasing the knowledge of the country's geology and petroleum resources and encouraging investment[12]. New Zealand's petroleum basins are underexplored by global standards and previous investments in early stage data acquisition (e.g. in the Pegasus basin) have led to industry making commitments to larger investments in exploration of those areas.

Refer to pages 20 – 22 for footnotes.

While oil prices have fallen from the high levels of the 2008 – 2014 period, they remain at a moderate level on a long run basis. This price fall has largely been as a result of excess supply[13]. Globally exploration activity has slowed markedly since prices fell in late 2014, with discoveries falling to the lowest level since the 1940s[14]. While the global industry has made impressive strides in efficiency and improving output from existing fields over recent years, the steep drop in exploration investment is also laying the foundation for a supply gap to emerge in coming years. This will likely lead to an increase in prices that will encourage the further exploration necessary to bring on new supplies. Successful exploration efforts in New Zealand could bring substantial economic benefits to the country over coming decades.

Energy Security, Affordability and Reliability

Access to affordable and reliable energy is essential to the growth of strong economies, sustained improvements in the quality of life and the eradication of poverty. The challenges posed by a changing climate mean that increasing energy supplies need to be provided whilst simultaneously reducing greenhouse gas emissions.

Utilisation of renewable forms of energy will increase substantially over coming decades, but hydrocarbons will continue to play an important role for many years to come[15]. While use of renewables will grow significantly in some areas, for the foreseeable future hydrocarbons will be utilised where renewables are too costly, intermittent or lack scale and where high process-temperatures and dense energy storage are necessary, such as in steel and cement manufacturing, and in heavy freight and air transport. Whilst massive investments in renewable and other cleaner energy sources are expected in many countries over coming decades, new or increased use of coal for electricity generation is still planned in fast growing countries such as India[16].

Global energy context

Globally today hydrocarbons (oil, gas and coal) meet 81% of world total primary energy supply[17] although in New Zealand it is lower at 60% overall[18]. New Zealand's use of oil and gas is similar to global averages[19, 20] but our use of coal is substantially lower due primarily to the availability of competitively priced natural gas in the North Island and the prevalence of renewables for electricity generation.

Global energy demand is expected to continue to grow until at least the middle of this century due to population growth and income and quality of life improvements, particularly in developing countries[21]. As well as reliably meeting this demand (i.e. energy security) there is a global need to improve access to energy and to mitigate climate change. Meeting this energy trilemma[22] will require massive global investments in all forms of energy supply.

Global use of natural gas is widely predicted to grow substantially over coming decades[23] because it provides a reliable, cost competitive and clean burning fuel for direct use and electricity generation. It is the lowest emitting fossil fuel in terms of both harmful emissions (e.g. particulates) and greenhouse gas emissions. Demand for Liquefied Natural Gas (LNG) is expected to grow significantly over coming years, particularly in the Asia-Pacific region. Should large gas discoveries be made here, New Zealand's relative proximity to the growing countries in Asia would facilitate potential export of natural gas as LNG to these jurisdictions. Smaller discoveries could be commercialised through additional investment in downstream processing (e.g. chemical production) or by fuel switching.

Oil demand is forecast to continue to increase over coming years although there are differing views on global demand growth for oil in the 2020s and beyond. Demand in the Asia-Pacific region is however widely expected to continue growing over coming years as a result of increasing population and wealth.

Refer to pages 20 – 22 for footnotes.

Domestic energy context

Investment in exploration, development and production of petroleum has provided reliable gas supplies into the New Zealand energy system for almost half a century. Whilst New Zealand generates a large and increasing share of its electricity from renewable sources, domestic gas supplies continue to underpin security of electricity supply by helping to meet peak demand and providing a backup to intermittent renewables. Natural gas also facilitates a range of industrial, commercial, community (e.g. schools, hospitals, swimming pools) and residential activities (e.g. cooking and space and water heating). Predominately domestically produced Liquefied Petroleum Gas (LPG)[24] is used for space and water heating and cooking in homes and for a wide range of purposes by businesses throughout the country[25].

Gas continues to provide an attractive option for domestic, commercial and industrial users[26]. Instant (or continuous) gas water heating is the most cost-effective option in the majority of domestic situations and gas is highly competitive with log burners and heat pumps for space heating. Gas already supports a wide range of commercial and industrial enterprises and for new industrial boiler requirements, gas units can be significantly cheaper and easier to use than coal and biomass options[27]. Areas where expanded gas use could deliver benefits include displacing coal for industrial heat and electricity generation and as LNG or Compressed Natural Gas (CNG) in heavy transport. For transport, gas is a potentially cheaper and cleaner fuel, although investment in new distribution infrastructure and equipment would be required.

Continuing investment in exploration, development and production is required to support existing large scale domestic industries[28], electricity generation and meet the daily needs of a range of users. If exploration, development and production is insufficient then investments will likely be required to enable importation of natural gas (as LNG) in the medium to long term[29]. Significant LPG imports would also be required to meet the needs of commercial and residential users. These changes would reduce New Zealand's energy self-sufficiency, adversely impact the balance of payments and likely increase energy prices for consumers and businesses.

New Zealand is both a high user of oil on a per-capita basis and a significant net importer of oil and oil products. Increased domestic oil production would increase self-sufficiency, thereby reducing the costs and energy security risks associated with the current reliance on oil imports and/or allow New Zealand to export liquid hydrocarbons to consumers in other countries. Successful exploration, development and production may allow New Zealand to become a net exporter of petroleum.

Climate Change

Reducing greenhouse gas emissions is a global issue that requires international engagement and co-ordinated action. Unilateral action risks unintended adverse consequences that distort markets, reduce the competitiveness of trade-exposed industries and undermine intended environmental objectives.

New Zealand has an unusual greenhouse gas emissions profile with approximately half of emissions coming from the agriculture sector[30] and a relatively low share from electricity generation. New Zealand's Emissions Trading Scheme (ETS) is wide ranging and applies to most sectors, although as agricultural emissions are not covered by the ETS only half of New Zealand's emissions are subject to it. Emissions associated with extracting and producing oil and gas make up a very small proportion of total emissions[31].

To reduce greenhouse gas emissions the world needs to use energy more efficiently, transition from higher-carbon energy sources to lower-carbon sources and renewable energy options, sequester carbon dioxide, and find ways to reduce the various greenhouse gas emissions (e.g. carbon dioxide, methane, nitrous oxide etc.) across all aspects of the economy and society. The international Paris Agreement of late 2015 emphasised the importance of reaching net-zero emissions this century in

Refer to pages 20 – 22 for footnotes.

order to meet the objective of keeping the increase in the global average temperatures to below 2°C above pre-industrial levels. Investments in all elements of the global energy system and economy will be required to move towards these objectives whilst meeting increasing demand for energy.

Developing solutions of the scale required by the climate change challenge will be a massive and complex endeavour. What the energy system will look like in 2050, or by the end of this century, is uncertain, but it will look very different from today. It may be a world with net-zero carbon dioxide emissions but equally it will unlikely to be a world without fossil based energy. While electrification of the wider energy system (increasingly based on renewables) and equipment will play an increasing role, hydrocarbon fuels will continue to be the best option for sectors such as aviation, shipping, chemicals and some heavy industries for many years to come.

As well as increasing the use of renewable energy technologies it is imperative to also move towards lower emitting hydrocarbons (e.g. gas) and to maximise efficiency. While New Zealand has good options for generating electricity from renewables, the substitution of coal with natural gas in electricity and industrial heat generation is one of the fastest, lowest-cost and most secure routes to reducing carbon emissions[32] and improving local air quality for many countries around the world, particularly those that don't possess New Zealand's favourable combination of extensive renewable energy options and a small population. As noted above in relation to the energy system, development of any discoveries of large scale gas resources in New Zealand could support the increased use of gas globally, likely in place of higher carbon emitting fuels.

Moving towards net-zero emissions will also require the use of carbon capture and storage (CCS) technologies, both to mitigate the impacts of processing and using fossil fuels for energy and industry but also potentially for net-negative technologies[33]. In what ways, and to what extent, CCS will be utilised in New Zealand is uncertain but it may well have a role to play[34]. Although there are no laws expressly prohibiting CCS, the current legal framework is incomplete and uncertain in relation to its key stages (capture, transportation, and storage) and this creates a barrier to investment in, and potential uptake of, CCS[35]. Given the challenges in meeting emissions reductions objectives, it is logical to remove regulatory barriers to all mitigation options.

Direct use of gas and use of efficient gas technologies can lower energy related emissions. Direct gas use utilises a greater proportion of its energy when compared with its use as an energy transformation fuel, such as generating electricity. Where practicable, displacing coal use in some industries is likely one of the lower cost options for reducing New Zealand's industrial emissions. Any substantial gas-rich discoveries in the South Island that did not justify LNG export could potentially displace existing coal applications, although scale limitations and pipeline development costs would need to be addressed[36].

Given the nature of our geography and economy, transport is fundamental to supporting key industries such as agriculture and tourism. Approximately 17 percent of New Zealand's gross greenhouse gas emissions* are however from the transport sector, predominately road transport, and these have increased significantly since 1990[37]. Efforts to reduce transport related emissions should be focussed on the demand side as this is where New Zealand can most effectively contribute to reducing global emissions.

New technologies such as electric vehicles will contribute to reducing emissions over time amongst the light vehicle fleet and local heavy vehicles (e.g. city buses and delivery vehicles) but electrification appears unlikely to make a significant contribution to long distance heavy transport for the foreseeable future. Gas, often in the form of LNG, and other alternative fuels such as methanol are being increasingly used in heavy transport applications (e.g. trucks,

* 39.7 percent of carbon dioxide emissions.

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trains and ships) around the world as these can reduce CO_2 and harmful emissions whilst leveraging the lower per unit energy cost of gas.

Increased oil production in New Zealand would be subject to environmental controls not present in many jurisdictions, such as emissions pricing. This ensures domestic production accounts for emissions generated and there are strong incentives to reduce process related and fugitive emissions. Changes in domestic oil production, either increases or decreases, are unlikely to have any impact on global emissions given the small scale of New Zealand production[38] and the nature of the oil market (i.e. it is demand driven).

Health, Safety and the Environment

Good health, safety and environmental practices are integral to the operation of the oil and gas industry. Industry participants have thorough health, safety and environmental management systems. The upstream sector is seen as a leader in terms of health and safety practices. The sector's activities have a constrained environmental footprint and discrete environmental effects[39].

The upstream industry is subject to, and supports, thorough regulation and oversight by dedicated and proficient regulatory organisations. In recent years major regulatory reform of health, safety and environmental legislation has taken place to bring New Zealand's regime into line with global best practice approaches. This has been undertaken as a consequence of increased government emphasis on the sector[40] and to address community concerns around activities such as deep sea drilling and hydraulic fracturing, which have arisen from international events.

Major reforms have been undertaken in regard to the environmental management of offshore operations (notably implementing the EEZ Act[41]) and the introduction of new health and safety legislation and regulations[42]. New dedicated regulatory institutions[43] have been created and more resources applied to regulatory oversight. Regulatory capability and capacity has improved markedly although some regulatory systems are still bedding in.

The result of these regulatory reforms is a generally comprehensive and rigorous regime, albeit one that has become more complex and costly, in some areas more uncertain, and which is spread across a range of legislative frameworks and regulatory institutions. Whilst much progress has been made, some aspects of the industry lifecycle still remain to be specifically addressed (e.g. decommissioning) or updated (financial assurance requirements for offshore installations), some gaps are evident that create uncertainty (e.g. regulation for CCS and updated marine protected area policy) and there is a need for improved integration across the regulatory system.

Refer to pages 20 – 22 for footnotes.

PART 2

POLICIES REQUIRED TO REALISE THE PETROLEUM SECTOR'S POTENTIAL FOR NEW ZEALAND

Overview

New Zealand's hydrocarbon endowment in Taranaki and across the other petroleum basins has the potential to enrich New Zealand, provide energy to support business and modern lifestyles and contribute to decarbonising the world economy over coming decades. To achieve this our policy and regulatory settings need to be comprehensive, appropriately designed and integrated.

PEPANZ advocates for a world-class regulatory environment that contributes to New Zealand being an internationally competitive location for investing in petroleum exploration, development and production. We seek policy settings that are: certain and predictable, integrated, efficient and cost effective, aligned with international norms and stable over time.

Whilst the regulatory environment is generally in good shape, this document sets out a range of initiatives and changes intended to maximise the value to New Zealand of its petroleum resources. It also emphasises areas where it is important the current policy direction and settings are maintained.

As in Part 1 of this document, the following four policy areas are discussed separately: legislative, regulatory and fiscal; energy security, affordability and reliability; climate change; and health, safety and the environment. Notwithstanding this segmentation, it is important that there is an overarching and integrated approach to policy and regulation affecting the sector.

Refer to pages 20 – 22 for footnotes.

Legislative, Regulatory and Fiscal Policy

PEPANZ supports Government, as the owner of petroleum resources, seeking to maximise the value of New Zealand's petroleum resources for the benefit of all New Zealanders. This requires encouraging investment in exploration, development and production, maximising the value of this to the national and regional economies and then ensuring the wealth derived from extracting these non-renewable resources is utilised to deliver long-term benefits. This should all be done in ways that protect the environment and people.

To realise the wider regional and national economic benefits of petroleum exploration, development and production, the Government should:

Continue to:

1. ***Ensure fiscal policy settings (royalties and tax) take into account New Zealand's unique circumstances, encourage early exploration activities and provide for potential future development scenarios.***

   Previous research by government has indicated current fiscal settings are in line with international comparator countries[45]. Stability of fiscal policy settings is a highly important factor in encouraging the substantial investments required to undertake exploration, development and production. It is nonetheless important that these settings take into account New Zealand's unique circumstances (e.g. distance from markets) and encourage early exploration activities, which are critical to realising the potential of domestic resources. It is also necessary to consider whether the current royalty and tax settings are suitable for development scenarios that have yet to occur in New Zealand, for example LNG export and/or multiple mining permits held by different parties being produced through integrated development infrastructure.

2. ***Ensure the allocation framework provided in the Crown Minerals Act 1991 and its subordinate instruments encourage investment by providing appropriate, certain and efficient processes that are future proofed and in line with global best practice.***

   The Crown Minerals Act regime provides certainty to those investing in New Zealand. PEPANZ does not advocate for any radical changes to the regime but it is important that it is updated if necessary to ensure it remains suitable for both existing and potential future investment and development scenarios.

3. ***Invest in data acquisition and research to encourage industry investment in exploration.***

   The petroleum estate is a public resource and, as with other resources, it is necessary to invest in it to secure long term returns. Industry will undertake the bulk of this investment as part of their work programmes, however, the provision of geoscientific data and interpretation supports prospectivity by improving the knowledge base upon which investment decisions are made. Government should continue to invest in building knowledge of New Zealand's petroleum systems. A comprehensive study to ensure investments are appropriately targeted at the critical gaps in knowledge should be undertaken and the current Crown Research Institute work programmes that aim to improve our understanding of New Zealand's oil and gas resources should be expanded where appropriate.

Take steps to:

4. ***Increase the efficiency of the administration of the Crown Minerals Act 1991.***

   Robust but swift processing of permit applications and requests for changes of permit conditions are fundamental to supporting commercial investment in the sector. This is an area where New Zealand can have a comparative advantage. The Ministry of Business Innovation and Employment (MBIE) should for example put in place appropriately ambitious targets to reduce processing times,

Refer to pages 20 – 22 for footnotes.

thereby further facilitating investment by enabling timely commercial transactions. The introduction of resource allocation tools and a comprehensive review of fees is required by 2019 to determine whether the administrative cost structure is appropriate and whether fair cost-recovery is occurring.

5. ***Increase the ability of iwi and hapū to constructively engage with government and operators on petroleum exploration, development and production activities.***

   The industry has increased its engagement with iwi, hapū and communities over recent years. This is not unique to the petroleum sector and consequently some organisations are subject to extensive engagement under various legislation and with central and local government policy and plan processes. This has placed a significant burden and can limit the ability of some parties to constructively engage in all these processes. Government should explore options for better co-ordinating the engagement requirements across government to reduce the burden on iwi, hapū and communities, running its own engagement processes in a way that better facilitates face-to-face engagement with iwi and hapū, providing tangible support to iwi and hapū to help to create better engagement structures and structuring annual reporting requirements so that industry can better communicate both the qualitative and quantitative elements of industry's engagement with iwi and hapū.

6. ***Incorporate petroleum potential where relevant into the Regional Growth Programme[46] work and recognise the potential for the supply chain to maximise the overall value to the economy.***

   A range of areas around New Zealand are prospective for petroleum resources. The potential for this to contribute to regional economic growth should be factored in where relevant to the Regional Growth Programme. As part of this it should be recognised that the potential value of the industry includes not only the direct value associated with extracting the resource but also the role and contribution to employment the extensive supply chain to the industry can and does make.

7. ***Dedicating the majority of petroleum royalties to the benefit of future generations by allocating them to an investment fund with a long-term focus.***

   At present royalties from petroleum production are simply paid into the Consolidated Fund[47] along with other government revenue such as income taxes. Whist New Zealanders benefit generally from this contribution to the public purse, as this resource endowment can only be utilised once it would be more appropriate if the revenues were dedicated to the long-term benefit of New Zealanders. To what beneficial purpose the royalty revenue is put is ultimately a decision for government to make but any use should be unequivocally long-term in nature. Reinvesting a small portion of royalty revenue in further understanding the petroleum estate would contribute to ensuring that the long term value to the country is realised.

Energy Security, Affordability and Reliability Policy

The role of a strong domestic petroleum sector (upstream, midstream and downstream) in providing reliable and affordable energy to businesses and consumers should be recognised in energy policy. Environmental externalities should be provided for but beyond this all energy sources should be treated consistently to avoid distortions and ensure the most beneficial outcomes are realised.

In order to maximise the contribution of oil and gas to the energy system the Government should:

8. ***Continue to recognise the importance and value of domestically produced natural gas in underpinning the electricity system and industrial, commercial and domestic consumers.***

Refer to pages 20 – 22 for footnotes.

Domestically produced gas has and continues to play a critical role in providing reliable and affordable energy to businesses and consumers. It continues to underpin electricity supply security, is the primary energy for some of New Zealand's largest industries, including key exporters, and is the fuel of choice for over 260,000 homes and small businesses. This all relies on domestic exploration, development and production continuing to provide a reliable supply of natural gas.

9. ***Seek to increase New Zealand's self-sufficiency in transport fuels through facilitating the increased use of natural gas in transport, particularly heavy transport.***

   The majority of New Zealand's transport fuels are currently imported or refined from imported crude oil. Increasing the use of domestically produced fuels such as natural gas could lower the current reliance on imported energy and reduce harmful[48] and CO_2 emissions from the transport sector. Opportunities to utilise natural gas in heavy transport (truck fleets, trains, vessels etc.) should be explored and any regulatory barriers removed.

Climate Change Policy

PEPANZ recognises the scientific consensus on human-induced climate change and supports efforts to agree on and implement measures to limit human impacts on the climate system.

There should be a framework for controlling greenhouse gas emissions that is comprehensive, robust, predictable, transparent, and aligned with international approaches. It should seek to incentivise efficiency and lower emission technologies whilst maintaining a level playing field for New Zealand firms that participate in global markets. Climate policy measures should ideally be technology, fuel and sector neutral to maximise effect, encourage innovation and avoid perverse outcomes. This includes taking steps to include agriculture in the Emissions Trading Scheme. Domestic outcomes are important but should not be pursued to the disadvantage of the New Zealand economy and global outcomes.

So as to maximise New Zealand's contribution to reducing greenhouse gas emissions whilst also avoiding carbon leakage the Government should:

10. ***Ensure the NZ Emissions Trading Scheme (ETS) is robust, in line with global approaches and over time develops strong and durable international connections.***

    The ETS is New Zealand's overarching climate change mitigation policy. PEPANZ supports the imposition of emissions pricing through the ETS on all gases and sectors. In order to avoid dis-incentivising rationale activity and new investment in New Zealand it is necessary the ETS evolves in line with similar schemes in other countries, particularly those of our trading partners and competitors. It is also critical that appropriate international trading of credits is restored so that New Zealand businesses are able to compete globally and that projects offering the greatest emissions reductions at the lowest cost are encouraged, regardless of their location.

11. ***Recognise and provide for new upstream and industrial developments in New Zealand within climate change policy, even those that increase domestic emissions, where this is globally rational from an economic and climate change perspective[49].***

    New upstream developments in New Zealand could create additional domestic emissions. With an inherently global issue such as climate change it is important to focus climate change policy on reducing global emissions rather than simply reducing domestic emissions by forcing productive industries offshore and creating "carbon leakage".

12. ***Introduce a comprehensive regulatory framework for carbon capture and storage (CCS) to enable the deployment of CCS in New Zealand.***

    CCS is one of a suite of low carbon and carbon mitigation technologies that

Refer to pages 20 – 22 for footnotes.

could play a role in reducing carbon dioxide emissions. Whilst it is uncertain the extent to which CCS will play a role in New Zealand, government has a role in addressing legislative barriers and providing certainty over policy. Otherwise opportunities to reduce emissions could be missed.

13. ***Facilitate opportunities to utilise lower emitting fuels (e.g. natural gas) where possible in industry and transport.***

    There are a range of areas (process heat, heavy transport, etc.) where the utilisation of natural gas in place of existing fuels has the potential to reduce greenhouse gas emissions and where other options such as renewable fuels may not be practical due to a lack of availability or scale. In these situations moving to gas as a lower emitting and cleaner fossil fuel is the most beneficial and practical option and should be encouraged.

Health, Safety and Environmental Policy

PEPANZ considers good health and safety practices and minimising the environmental effects of the industry's activities are fundamental and non-negotiable. We support robust frameworks for health and safety and managing environmental effects. These do however need to be integrated, proportional and efficient and recognise the practicalities of the business environment.

While current regulatory frameworks are generally appropriate, to maximise outcomes whilst reducing costs and inefficiencies, the Government should:

14. ***Work with industry on improving the integration of regulatory systems to avoid regulatory duplication, maximise cross-agency synergies, and ensure that projects subject to oversight by multiple regulators can be progressed efficiently[50].***

    The petroleum industry is subject to extensive and in some cases overlapping regulatory frameworks. Increasing the integration of regulatory systems will reduce uncertainty and costs for industry and government and ensure regimes are comprehensively addressing relevant matters. Areas of focus would include managing overlapping obligations and addressing sequencing issues.

15. ***Where required, make use of existing instruments under the Resource Management Act 1991 to provide appropriate and consistent treatment for cross-regulatory issues, thereby ensuring consistent and efficient regulatory approaches to the upstream sector around the country, addressing potential duplication between the Resource Management Act and other regulatory regimes and variation between regions.***

    There are a number of areas where there is uncertainty as to how an issue is managed under the Resource Management Act 1991 when they are already controlled under regulations made under another framework. Examples include the management of hazardous substances and well integrity. This leads to potential duplications and to regional variations, both of which can add unnecessary complexity, cost and uncertainty. Where such issues arise central government should work through the issues with relevant parties and then issue appropriate national direction.

16. ***Revise the financial assurance requirements applying to offshore installations[51] to make them both more robust and more workable.***

    The current financial assurance rules for offshore installations are in need of updating to ensure they are fit for purpose for offshore oil and gas activities. This will enable required levels of assurance to be increased whilst making the requirements consistent with business practices.

17. ***Put in place a regime for offshore decommissioning that provides a robust and balanced approach that addresses technical feasibility, as well as environmental, health and safety and economic matters.***

Refer to pages 20 – 22 for footnotes.

Government and industry have both identified that the regulatory requirements for decommissioning existing offshore fields lack specificity and don't provide for a balanced consideration of relevant factors (e.g. technical feasibility, environmental, health and safety and economic matters). Some basic provisions were included in the Resource Legislation Amendment Bill when it was introduced but more significant reform of the EEZ Act and new regulations are required to provide an appropriate regime that is in line with international practice.

18. ***Provide a policy framework for marine protected areas that is science-based and provides appropriate certainty to affected industries.***

    Reform of the marine protected areas framework is warranted and creating greater certainty in this area would provide more certainty to sectors, particularly those that take a long-term outlook. A science-based and balanced strategy for implementing a revised marine protection framework needs to be developed and further engagement with stakeholders is necessary. Continuing to improve the understanding of the environment and the petroleum prospectivity of New Zealand's marine areas is required to properly inform the establishment of new marine protected areas.

Refer to pages 20 – 22 for footnotes.

FOOTNOTES

1. From *The Wealth Beneath our Feet 2015*, Venture Taranaki.
2. From *The Wealth Beneath our Feet 2015*, Venture Taranaki.
3. Royalty data supplied by the Ministry of Business, Innovation and Employment.
4. From *The Wealth Beneath our Feet 2015*, Venture Taranaki.
5. In the latest year NZ consumed 49.1 million barrels of oil products and produced 17.2 million barrels (from Energy in NZ 2015), making NZ about 35% self-sufficient.
6. *New Zealand Energy Scenarios, Navigating energy futures to 2050*, BusinessNZ Energy Council, 2015, page 50.
7. From *New Zealand Petroleum Basins*, Ministry of Business, Innovation and Employment, 2014, page 20.
8. For example the Galleon discovery in the Canterbury Basin and the Kawau discovery in the Great South Basin, refer to *New Zealand Petroleum Basins*, Ministry of Business, Innovation and Employment, 2014.
9. For example "Modelling shows that there would be a 1.2 percent increase in national GDP if a pattern of oil and gas field developments occurred over a 30-year time frame in a South Island petroleum basin that is currently undeveloped", from page 19 of *Economic contribution and potential of New Zealand's oil and gas industry*, Economic Development Group Occasional Paper 12/07, August 2012, available from http://www.mbie.govt.nz/publications-research/publications/economic-development/2012-occasional-papers/Economic%20contribution%20and%20potential%20of%20NZs%20oil%20and%20gas%20industry.pdf.
10. New Zealand was ranked the 13th most competitive country in the world, according to the 2016 Global Competitiveness Index, refer to https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1/.
11. New Zealand was ranked number one in ease of doing business in the World Banks, *Doing Business 2017: Equal Opportunity for All* report.
12. Current examples of this include a four-year GNS Science led project into understanding petroleum source rocks, fluids, and plumbing systems in New Zealand basins.
13. IEA Oil Market Report – October 2016, https://www.iea.org/oilmarketreport/omrpublic/.
14. Refer to http://www.bloomberg.com/news/articles/2016-08-29/oil-discoveries-at-a-70-year-low-signal-a-supply-shortfall-ahead.
15. *IEA Energy Outlook 2015*.
16. *IEA Energy Outlook 2015*, page 547.
17. *IEA Key World Energy Statistics 2015*, slide 6, available from https://www.iea.org/publications/freepublications/publication/KeyWorld_Statistics_2015.pdf.
18. *Energy in New Zealand 2016,* available from http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/publications/energy-in-new-zealand.
19. From *Energy in New Zealand 2016*, oil accounted for 32% of New Zealand's total primary energy supply and gas for 21%.
20. *IEA Energy Outlook 2015.*

21. The World Energy Council estimates that total primary energy supply (equal to consumption) will increase globally from 546 EJ (152 PWh) in 2010 to 879 EJ (144 PWh) in its Jazz scenario and 696 EJ (193 PWh) in its Symphony scenario in 2050. This corresponds to an increase of 61% in Jazz and 27% in Symphony. Refer to *World Energy Scenarios: Composing energy futures to 2050 World Energy Council*, 2013.

22. The "trilemma" refers to the World Energy Council's definition of energy sustainability based on three core dimensions – energy security, energy equity, and environmental sustainability.

23. The *IEA Energy Outlook 2015* estimates global gas consumption will increase 47% by 2040.

24. Liquefied Petroleum Gas is the generic name for mixtures of hydrocarbons (mainly 60% propane and 40% butane). When these mixtures are lightly compressed (approx. 800 kPa or 120 psi), they change from a gaseous state to a liquid.

25. New Zealand is as of 2016 a net exporter of liquid petroleum gas (LPG), refer *Energy in New Zealand 2015*. It is exported in summer when demand is lower and some is imported in winter when demand is higher.

26. All this paragraph is from the Gas Industry Company's *The New Zealand Gas Story*, May 2016, available from http://www.gasindustry.co.nz/about-the-industry/nz-gas-story.

27. From the Gas Industry Company's *The New Zealand Gas Story*, May 2016, page 16.

28. e.g. Methanex methanol plants at Motunui and Waitara Valley and the Ballance Ammonia-Urea Fertiliser Production plant at Kapuni.

29. Both scenarios in the New Zealand Energy Scenarios produced by the BusinessNZ Energy Council in 2015 provided for the construction of an LNG import facility, in the 2030's or 2040's respectively. The scenarios are available from http://www.bec.org.nz/projects/bec2050.

30. New Zealand's Greenhouse Gas Inventory 1990 – 2014, page viii, available from http://www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-greenhouse-gas-inventory.

31. Oil and gas extraction and processing (including fugitive emissions) comprises 2.9% of energy sector emissions or a little over 1% of total emissions. From *Energy Greenhouse Gas Emissions* (web tables), MBIE, http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/publications/energy-greenhouse-gas-emissions.

32. Different fuels emit different amounts of carbon dioxide (CO_2) in relation to the energy they produce when burned. Pounds of CO_2 emitted per million British thermal units (Btu) of energy for various fuels are between 214.3 and 228.6 for coal versus 117.0 for natural gas. Natural gas is primarily methane (CH^4), which has a higher energy content relative to other fuels, and thus, it has a relatively lower CO_2-to-energy content. From the Energy Information Administration (EIA) at https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11.

33. For example bio-energy with carbon capture and storage (BECCS), a technology which produces negative carbon dioxide emissions by combining energy from biomass with carbon capture and storage.

34. *Transition to a low-carbon economy for New Zealand*, Royal Society of New Zealand, April 2016, page 18, available from http://www.royalsociety.org.nz/expert-advice/papers/yr2016/mitigation-options-for-new-zealand.

35. *CCS in New Zealand, can capture and storage deliver value to New Zealand as we head towards a low carbon future?*, Summary Report, September 2011, page 14, available from http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-efficiency-environment/carbon-capture-and-storage/ccs-in-new-zealand.

36. From the Gas Industry Company's *The New Zealand Gas Story*, May 2016, page 24.

37. Increase of 61% since 1990, all data from *New Zealand's Greenhouse Gas Inventory 1990 – 2014*.

38. New Zealand production in 2014 averaged 39,600 barrels per day (data from Energy in New Zealand 2015) versus global production of around 92 million barrels per day (IEA Energy Outlook 2015), thereby representing approximately 0.043% of the total at that time.

39. *New Zealand's Environmental Reporting: Our marine environment 2016*, Ministry for the Environment and Statistics New Zealand, page 28.

40. The Government's 2009 "Petroleum Action Plan".

41. *Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012.*

42. *Health and Safety at Work Act 2015 and the Health and Safety at Work (Petroleum Exploration and Extraction) Regulations 2016.*

43. For offshore operations these most notably include the Ministry of Business Innovation and Employment, the Environmental Protection Authority, Maritime NZ, WorkSafe NZ, the Department of Conservation and the Ministry of Primary Industries and for onshore operations the Ministry of Business Innovation and Employment, regional and district/city councils and WorkSafe NZ.

44. As evidenced by New Zealand' being ranked 14 of 126 jurisdictions in terms of Policy Perception Index in the Fraser Institutes *Global Petroleum Survey 2015*, with many of the higher ranked jurisdictions being individual states within the United States of America.

45. *Evaluation of the Petroleum Tax and Licensing Regime of New Zealand*, Final Report to the Ministry of Economic Development, July 2009, available from http://www.mbie.govt.nz/info-services/sectors-industries/natural-resources/oil-and-gas/petroleum-expert-reports/AUPEC.pdf/view.

46. The Regional Growth Programme has been commissioned jointly by the Ministry of Business, Innovation and Employment and the Ministry for Primary Industries working in partnership with stakeholders – businesses, iwi and Māori, and councils in each region, see http://www.mbie.govt.nz/info-services/sectors-industries/regions-cities/regional-growth-programme.

47. The Consolidated Fund is effectively the main bank account of the government.

48. Harmful emissions include particulates and nitrous oxides.

49. For example constructing a new plant to produce a product in a way that is highly efficient in terms of greenhouse gas emissions by global standards but still increases domestic emissions, versus allowing the product to be produced in other countries and with potentially higher emissions.

50. Examples include overlaps and uncertainties related to well integrity regulation, onshore and offshore projects under the EEZ Act and the Resource Management Act, and the overlap between HSW PECPR/Pipeline 1999 regulations and the HSW (PEE) 2016 regulations.

51. Refers to the requirements outlined in *Maritime Rules Part 102*.

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