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OF COMPETITION AND REGULATION INC.**

Policy Considerations for the New Zealand Natural Gas Industry

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The views in this report are those of the authors and do not necessarily represent those of the institutions with which they are affiliated or their constituent members. Any errors or omissions remain the responsibility of the authors.

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Glossary of Terms, Abbreviations and Definitions

Term or Abbreviation	Definition
The Commission	The Commerce Commission
CPI	Consumer Price Index
CPP	Customised Price-Quality Path
DPP	Default Price-Quality Path
GJ	Gigajoules
GWh	Gigawatt Hours
MED	The Ministry of Economic Development
MW	Megawatts
P50 Reserves	The median estimate of reserves that are economic to produce at current prices with existing technology. P50 is also sometimes referred to as Proved plus Probable, or 2P.
PJ	Petajoules
The Reference Scenario	The Ministry of Economic Development, Energy Outlook 2010, Reference Scenario

I. Introduction

It has been some time since the New Zealand Institute for the Study of Competition and Regulation has undertaken a study of the natural gas industry in New Zealand, so it seemed to be a good idea to take a fresh look at the industry. The authors found the state of the industry to be much more interesting than they anticipated. It also turned out that this is an opportune time for such a study, as the two industry regulators are undertaking regulatory initiatives. The Commerce Commission is in the midst of setting their default price-quality regulatory framework that will take effect in July 2012.¹ The Gas Industry Company, the industry co-regulator, has just recently issued a proposal to undertake a project to determine the current need for gas transmission investment and to develop a way for any needed investment to occur.²

The Ministry of Economic Development (MED) is also undertaking policy initiatives that directly affect the gas industry. In recent years, uncertainty as to the future supply of gas has been targeted by the MED with the introduction of exploration incentives, including reduced royalty and tax rates on gas producers.³ The authors are hopeful that this study will prove useful to industry participants, policy makers and also to the two industry regulators.

The gas industry in New Zealand today has had competition introduced into all segments of the industry except, in most cases, pipelines. Production, wholesaling, retailing, and even meters are competitive. This is impressive on an international comparison basis, and no doubt New Zealanders are reaping the benefits. While Nova Energy provides some competition to other pipeline distribution systems, pipeline transmission companies, Maui and Vector, and other pipeline distribution companies, are regulated as monopolies. The policy issues mostly, but not entirely, revolve around this regulated segment of the industry.

The system of co-regulation, with the Commerce Commission and the Gas Industry Company sharing regulatory oversight of the industry, is unique to New Zealand. It does, however, seem to be working. While there might be some fear that the Gas Industry Company becomes a trade association rather than a regulator, this does not seem to be the case and there does not appear to be any cause for concern along these lines.

¹ Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011, paragraph 1.2.

² Gas Industry Company, "Proposed Gas Transmission Investment Project", Document number 170803.8, 25 May 2011.

³ Ministry of Economic Development, "Minerals Programme for Petroleum", 1 January 2005.

In preparation for this study, the authors reviewed the available public information about the New Zealand gas industry. They also met with government officials, regulators, and industry participants at all stages of production, including producers, pipeline companies, distribution companies, and retailers. The authors were also able to talk with others in New Zealand knowledgeable about the gas industry. While all of these discussions remain confidential, the information and understanding gained from these meetings has provided useful background information for the preparation of the report.

The second section of the report provides an overview of the gas industry today along with some forecasts of production and demand. Section II of the report contains various tables, figures, and maps that provide a description of the important aspects of the industry. The third section of the report provides analysis of the major policy issues confronting the industry and makes a number of policy recommendations. The last section of the report provides a summary of these policy recommendations.

II. Overview of the Gas Industry in New Zealand

This section of the report analyses the structure of the gas industry in New Zealand. First, a summary of the stages of production is presented along with the major market participants at each stage. Second, the determinants of supply and demand are outlined, and projections of future gas production and prices are discussed. Finally, transmission and distribution pipeline networks are described along with major pipeline owners and regulatory changes to pipeline businesses.

Industry Overview

The path from the gas field to the final consumer is relatively direct. Treated near the field, gas is then transmitted through pressurised pipelines to cities, gas fired electricity generators and major industrial users. Within cities and towns, low pressure distribution pipelines carry gas to industrial, commercial and residential consumers. The stages of production, along with major market participants, are shown in Table 1. Gas transmission and distribution pipeline businesses (excluding Nova Gas) are regulated as monopolies and are currently subject to price caps. Price-quality path regulation is currently being developed by the Commerce Commission and is due to take effect on 1 July 2012.⁴ Transmission and distribution pipeline businesses are the only parts of the industry that are subject to price regulation.

The gas industry in New Zealand is relatively decentralised, with growing competition in both upstream and downstream segments of the industry and few companies that are vertically integrated. The only three companies with significant vertical integration are Todd Energy, Vector and Greymouth Gas. Todd Energy operates as a producer, and through their subsidiary Nova Gas they also have distribution and retail businesses. Nova Gas' distribution network was built in order to bypass incumbent distribution networks and is not currently required by regulation to provide access to competing retailers. Vector operates both high pressure transmission pipelines and low pressure distribution networks. They also buy and sell wholesale gas through their brand OnGas. Vector has no production capacity, and OnGas sells gas only to large commercial and industrial customers. Vector's transmission pipelines and distribution networks are subject to regulation which requires them to provide network

⁴ Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011, paragraph 1.2.

access to competitors at regulated prices. Greymouth Gas is both a gas producer and retailer, with approximately 5 percent of production and a 5.5 percent retail share in 2009.⁵

Contact Energy is a large user of gas, with gas fired power stations at Stratford in the Taranaki region and Otahuhu in Auckland.⁶ Currently, Contact Energy has no production assets. Australian energy company Origin Energy owns 51 percent of Contact, and they do hold a number of petroleum exploration permits in New Zealand, including a 50 percent share in the Kupe field.⁷ The Kupe field contains approximately 13 percent of New Zealand's P50⁸ gas reserves. In response to their inflexible take-or-pay contracts for gas from the Pohokura field, Contact Energy has also developed a gas storage facility at Ahuroa, Taranaki. This will allow Contact to store excess gas for use when prices are high or when they have high requirements for gas-fired electricity generation.

⁵ See Table 1: Gas Industry Overview.

⁶ See Map 4: Major Transmission Pipelines and Large Gas Fired Power Stations.

⁷ Source: <http://www.originenergy.com.au/1864/New-Zealand> and <http://www.nzog.net/kupe>. Both accessed June 2011.

⁸ Ministry of Economic Development Energy Data File 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_43905.aspx. Accessed May 2011. P50 reserves are defined as the median estimate of reserves that are economic to produce at current prices with existing technology. P50 is also sometimes referred to as Proved plus Probable, or 2P.

Table 1: Gas Industry Overview⁹

Fields (2009 net production, share of total)	McKee (6.44 PJ, 4.0%)	Mangahewa (5.72 PJ, 3.6%)	Maui (52.81 PJ, 33.2%)	Kapuni (15.29 PJ, 9.6%)	Turangi (7.62 PJ, 4.8%)	Pohokura (68.82 PJ, 43.3%)	Others (2.32 PJ, 1.5%)
Major Shareholders (Percentage shareholding)	Todd Energy (100%)		Shell (83.75%) OMV (10%) Todd Energy (6.25%)	Shell (50%) Todd Energy (50%)	Greymouth Gas (100%)	Shell (48%) Todd Energy (26%) OMV (26%)	
Producers (2009 net production, share of total)¹⁰	Shell (85 PJ, 53%)	Todd (41 PJ, 26%)	OMV (23 PJ, 14%)	Greymouth Gas (8 PJ, 5%)	Others (2 PJ, 1%)		
Wholesalers	Vector	The Crown	Todd Energy	Contact Energy	Greymouth Gas		
Pipeline Transmission Companies (high pressure)	Vector			Maui Development			
Pipeline Distribution Companies (low pressure)	Powerco	Nova Energy	Vector	Gasnet			
Retailers (2009 retail amounts and shares of total)¹⁰	Contact (47.4 PJ, 32.3%)	Genesis (32.5 PJ, 22.1%)	Maui Development (26.9 PJ, 18.3%)	Vector (15.9 PJ, 10.8%)	Nova Energy (6.1 PJ, 4.2%)	Greymouth Gas (8.1 PJ, 5.5%)	Others ¹¹ (9.9 PJ, 6.7%)
Major Uses	Electricity generation (excluding cogeneration)	Ammonia/urea manufacture	Chemical methanol manufacture	Major users supplied directly from transmission system	Users supplied from distribution systems		
Demand (2009 demand, share of total)	(53.7 PJ, 35%)	(24.5 PJ, 16%)		(77.1 PJ, 50%)			
Consumers	Contact Energy Genesis Energy Mighty River Power	Ballance Agri-Nutrients (Kapuni) Limited	Methanex	New Zealand Steel Carter Holt Harvey Degussa Peroxide Fonterra Co-op Todd Energy/ Kiwi Cogeneration NZ Refinery Co Southdown Co-generation Tasman Pulp and Paper	Other Industry Commercial Residential Transport (as CNG)		

⁹ Source: All data except where specified are taken from the Ministry of Economic Development Energy Data File 2010. This is available at http://www.med.govt.nz/templates/MultipageDocumentTOC_43905.aspx. Accessed May 2011.

¹⁰ Source: Discussions with the Ministry of Economic Development.

¹¹ Includes Mercury Energy, Energy Direct and E-Gas. Note that E-gas has subsequently gone into liquidation and their customer database was purchased by Todd Energy's retail subsidiary, Nova Gas, in November 2010 (National Business Review, "Nova wins bid for E-Gas customers", 26 November 2010, <http://www.nbr.co.nz/article/nova-wins-bid-e-gas-customers-133889>. Accessed June 2011).

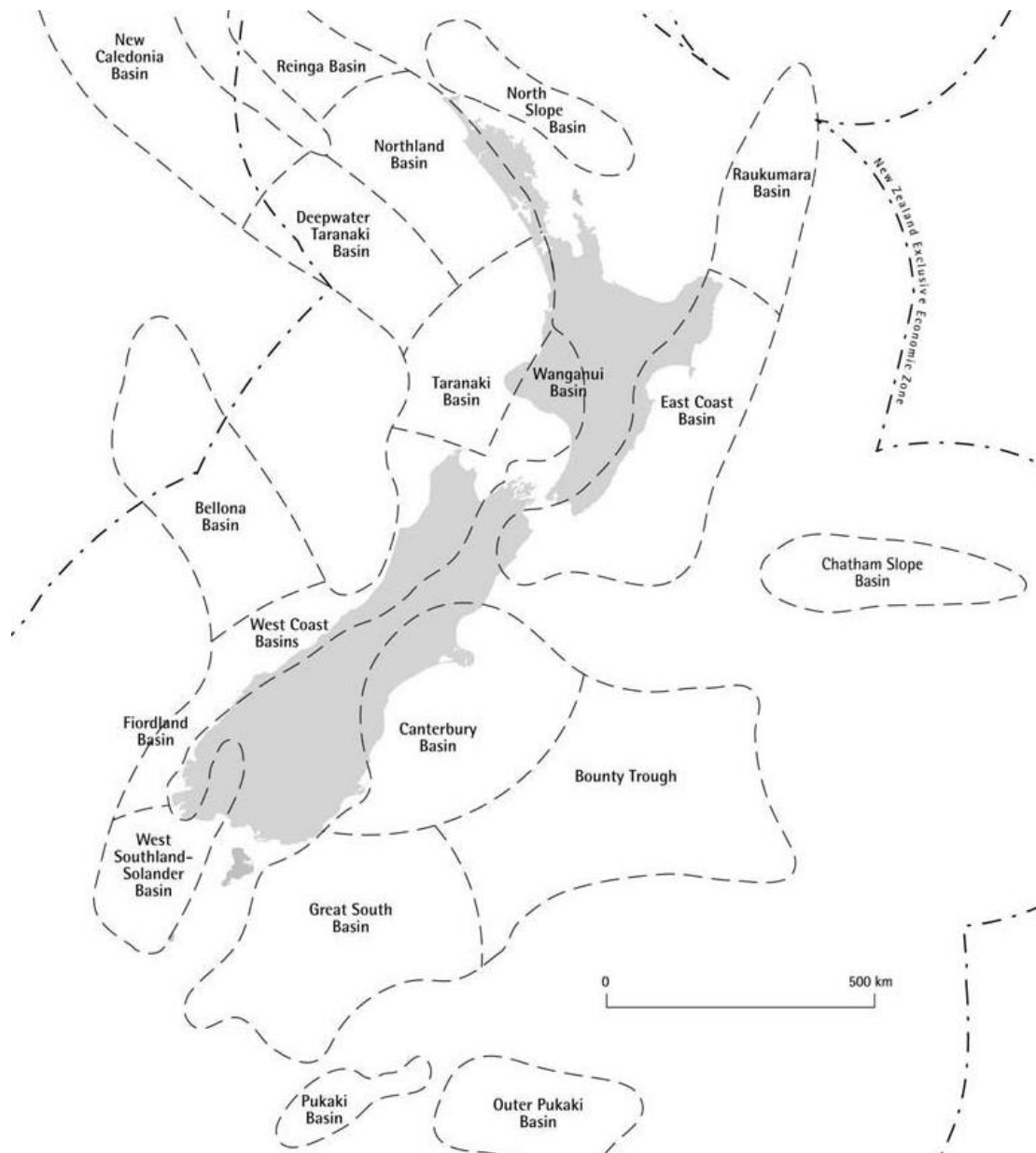
Exploration and Production

Currently, all gas production in New Zealand is in the Taranaki basin. Early stage exploration is currently underway in the Canterbury, Great South, Northland, Deepwater Taranaki and Raukumara basins. The MED's Energy Outlook 2010 Reference Scenario predicts that by 2030 around one third of New Zealand's gas production will come from these frontier basins.¹² Coal seam gas prospects are also being considered for development in the Waikato, Southland and West Coast regions.¹³ Map 1 shows the sedimentary basins of New Zealand, which have the potential for petroleum deposits.

¹² Ministry of Economic Development, Technical Guide: Energy Outlook Modelling, Version 1.1, March 2011. Available at: <http://www.med.govt.nz/upload/76133/Technical%20Guide%20v1.1.pdf>. Accessed May 2011.

¹³ Ministry of Economic Development, Crown Minerals: New Zealand Petroleum Basins, 2010. Available at: <http://www.nzpam.govt.nz/cms/pdf-library/petroleum-publications-1/2010%20NZ%20Petroleum%20Basin%20Report-WEB.pdf>. Accessed June 2011.

Map 1: The Sedimentary Basins of New Zealand¹⁴



¹⁴ This map provides a general indication of the primary sedimentary basins of New Zealand, which have the potential for petroleum deposits. Source: Crown Minerals, “Minerals Programme for Production”, 1 January 2005. Available at <http://www.nzpam.govt.nz/cms/pdf-library/petroleum-publications-1/mins-prog-for-petroleum-2005.pdf>. Accessed May 2011.

Within the Taranaki basin, the Maui field has historically provided most of New Zealand's gas supply. As reserves and production at the Maui field have declined, a range of new fields, particularly Pohokura, have been developed in the region, offsetting much of the fall in Maui production. Figure 1 shows historical net gas production by field.

Figure 1: Net Gas Production by Field (PJ) ¹⁵

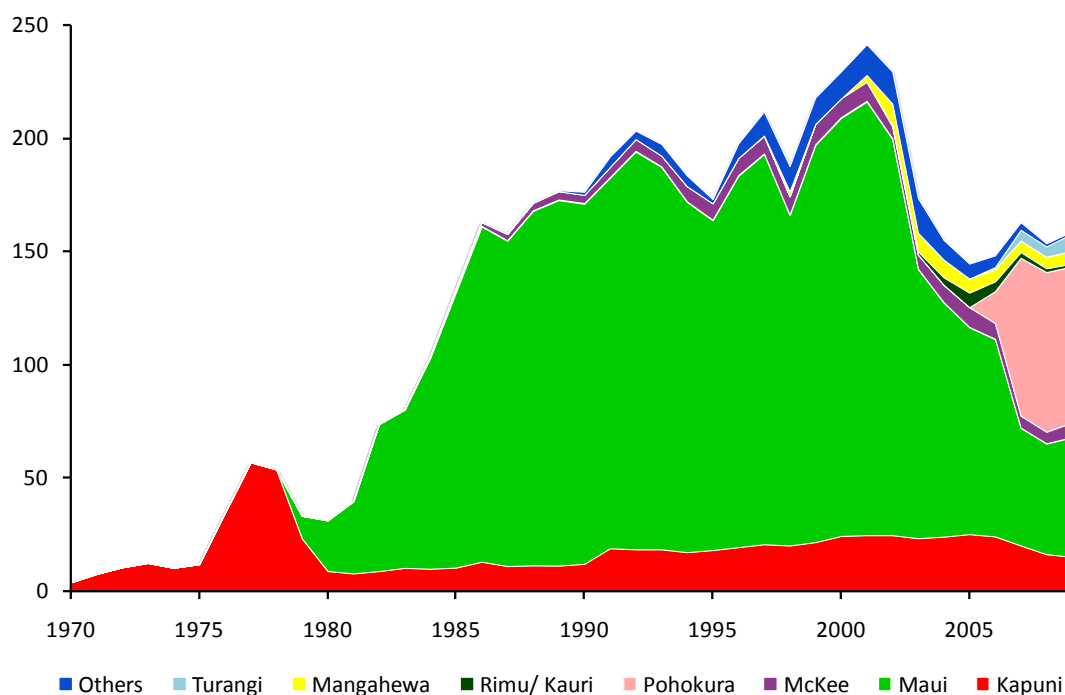


Figure 2 displays recent estimates of P50¹⁶ gas field reserves in Taranaki compared with real average wholesale gas prices. As the prices on the graph are averages, they can diverge from the marginal price of gas in the period. Energy consultants and forecasting company Energy Link estimate a medium term contract rate for gas of around \$6 per GJ for April 2011. The average wholesale prices reported by MED are influenced by long term contracts and also do not distinguish between flexible and inflexible contracts. Therefore, the average price reported by MED can diverge from the current market price for gas.

Changes in wholesale gas prices affect reserves through the definition of P50 reserves and by increasing producers' incentives to verify them. First, P50 reserves are defined as resources

¹⁵ Ministry of Economic Development Energy Data File 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_43905.aspx Accessed May 2011.

¹⁶ P50 reserves are the median estimate of reserves that are economic to produce at current prices with existing technology. P50 is also sometimes referred to as Proved plus Probable, or 2P.

with a probability of production of 50 percent or higher at current prices. Following an increase in the price of gas, a greater amount of known reserves become economic to produce and so are captured under the definition of P50 reserves. Second, reserves are costly to verify and require a significant investment on behalf of the producer. For this reason, producers prefer to push back exploration until they believe that it will be profitable to produce from these resources.

Prior to 2003, the Maui gas field sold all of its gas to the Crown at a price determined by a legacy contract. The Crown then sold this gas to users including electricity generators and retailers. This is indicated in Figure 2 by the near constant real wholesale gas prices between 1996 and 2002. The price paid by the Crown was below what would have prevailed as a market price, and consequently P50 reserves at the Maui field were depleting rapidly and new discoveries were not occurring.

In 2003, the Maui supply contract was re-determined. A portion of the gas was removed from the supply agreement and allowed to be sold at market prices. As shown in Figure 2, the prevailing market prices for gas after 2003 were considerably higher than the price under the legacy contract. With the increase in wholesale prices following the Maui re-determination, producers undertook significantly more investment in exploration and development of reserves. Subsequently, proven reserves have increased significantly with large new discoveries including the Pohokura field. Figure 2 also shows that reserves as measured by implied years of supply have rebounded and have tended towards an equilibrium level of around 14 years.

Since 2005, government incentives have been introduced in order to encourage exploration. These incentives include reduced royalty rates for oil and gas producers.¹⁷ To date, the success of these incentives is questionable, with high rates of exploration but no large new discoveries.

¹⁷ Ministry of Economic Development, “Minerals Programme for Petroleum”, 1 January 2005.

Figure 2: P50¹⁸ Reserves (PJ, Left Hand Scale), Real Wholesale Gas Price (2009 Dollars per GJ, Right Hand Scale) and Implied Years of Supply (Lower Panel)¹⁹

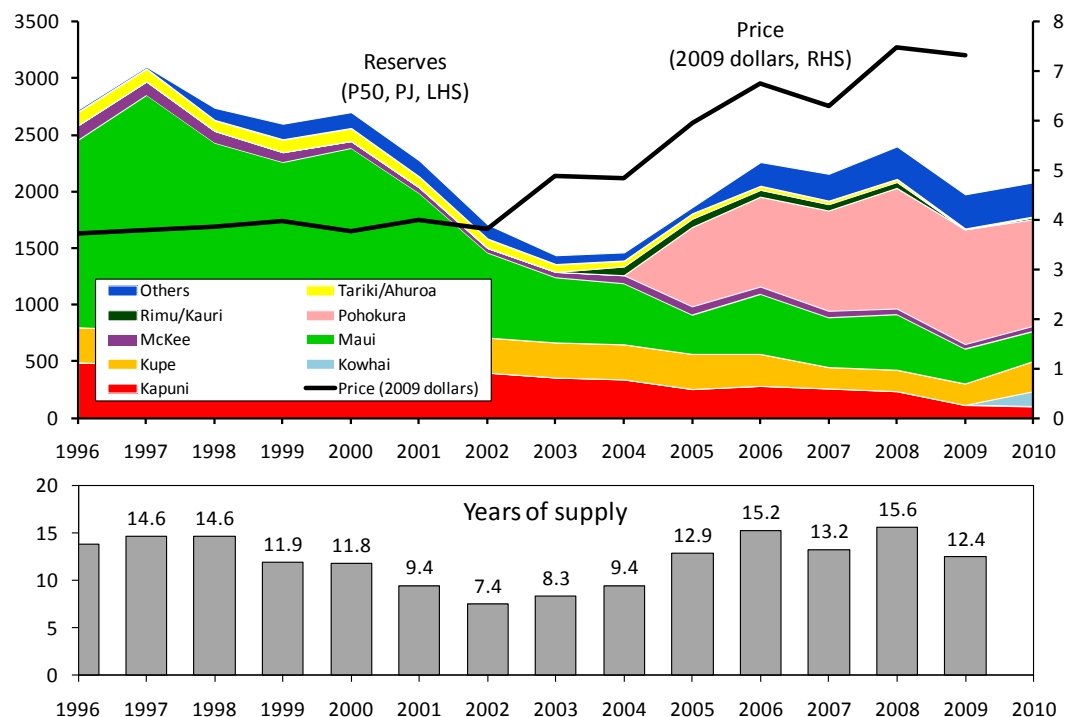


Figure 3 shows gas reinjection rates as a share of gross production. Gas is normally drawn from wells in constant rates but can be re-injected back into the well in order to manage supply to meet demand or to increase the pressure in the well. Increasing the pressure in the well through gas reinjection can in some cases increase the flow of oil.

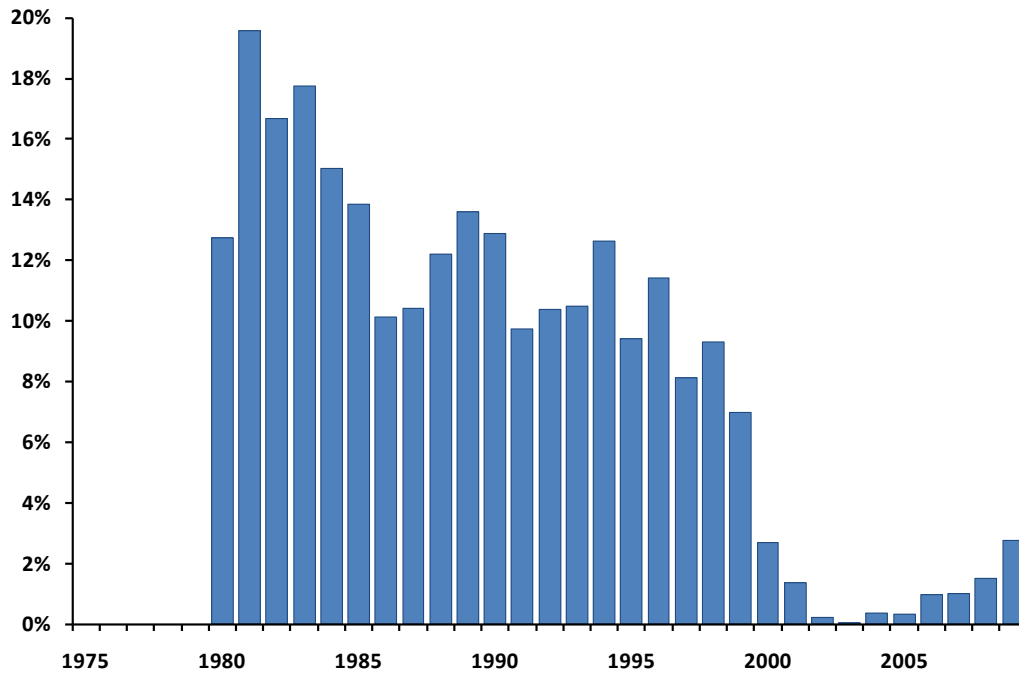
Installing gas reinjection at a field can require a large initial investment, and in many cases reinjection can decrease the potential future production of the field. According to industry participants, early purchase agreements for gas at the Maui field included options to take a variable supply from the field. This required the field to be extremely flexible and run high levels of gas reinjection. Decreases in reinjection would increase net supply if the demand for gas increased. This high use of reinjection decreased the life of the Maui field, and as reserves declined, reinjection was decreased and purchase agreements became less flexible.

¹⁸ P50 reserves are the median estimate of reserves that are economic to produce at current prices with existing technology. P50 is also sometimes referred to as Proved plus Probable, or 2P.

¹⁹ Sources: MED Energy Data File (1997-2010), MED Energy Outlook 2010. The MED Energy Data Files are available at http://www.med.govt.nz/templates/StandardSummary_15169.aspx. The MED Energy Outlook 2010 is available at http://www.med.govt.nz/templates/MultipageDocumentTOC_45552.aspx. Both websites accessed May 2011.

In recent years, gas reinjection rates have started to increase. This is indicative of excess gas supply, which would increase the incentives for producers to retain the gas for future sale and also increase the use of gas to increase pressure in oil rich wells.

Figure 3: New Zealand Gas Reinjection as a Share of Gross Production²⁰



²⁰ Ministry of Economic Development Energy Data File 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_43905.aspx. Accessed May 2011.

Demand

Figure 4 displays real average gas prices as reported by the MED. The prices reported are averaged over users and time and over fixed and variable costs. The average prices shown are inclusive of transmission and distribution costs, which vary geographically.²¹

Demand for gas is seasonal in New Zealand, due largely to demand from electricity generators. Electricity generation accounts for approximately 35 percent of annual gas demand.²² Geothermal electricity generation has high initial costs but extremely low marginal costs. Geothermal plants are therefore generally operated at full capacity and provide a stable base load output. Other renewable forms of electricity generation including solar and wind power are more intermittent, providing a variable supply. Hydroelectric generation can be used for flexible generation, but its capacity is greatly reduced in years of low rainfall. Hydroelectric generation accounted for approximately 61 percent of national electricity generation in 2009.²³ Gas fired electricity generation can be flexible and is suitable for offsetting intermittent wind powered generation, as well as for base load capacity in dry years when lake levels are low.

The lack of reinjection facilities at the Pohokura gas field has reduced the flexibility of the gas supply in New Zealand in recent years. Retailers and electricity generators have only been able to secure take-or-pay contracts for gas, where they must pay for the full contracted amount of gas whether they use it or not. This inflexibility of gas supply contracts has prevented electricity generators from effectively utilising the flexible nature of gas fired power stations. Contact Energy's recent investment in gas storage at Ahuroa, and producers' investments in reinjection technology at other newly developed gas fields, should allow flexible supply that will encourage efficient use of gas fired electricity generation.

²¹ For residential customers, calculating an average price for gas is particularly difficult. This is because many residential gas customers purchase both gas and electricity from the same retailer, which can lead to cross-subsidisation. Also, residential contracts often contain both fixed costs and costs dependent on usage. Determining an average price from these contracts can be difficult. Discussions with industry participants suggest that the recent volatility in reported residential retail prices is not likely to be representative of actual market conditions but rather may be caused by difficulties in aggregating and averaging prices.

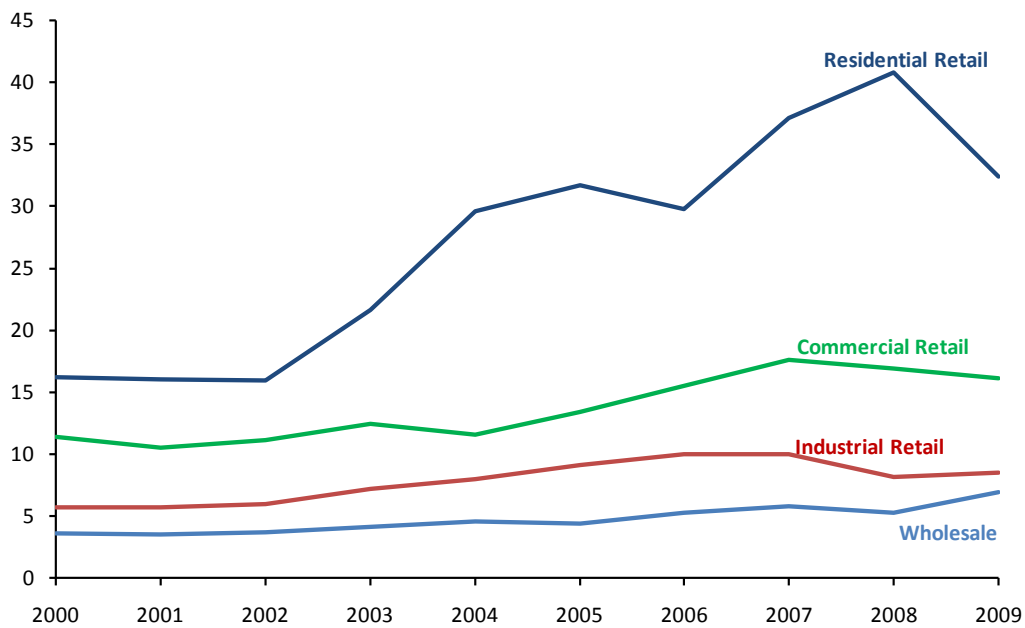
²² See Table 1: Gas Industry Overview.

²³ Source: Ministry of Economic Development Energy Outlook 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_45552.aspx. Accessed May 2011.

Demand for gas for industrial and commercial use follows different patterns than for electricity generation. Users with highly variable consumption patterns include Methanex, whose demand is based largely on international methanol prices and the foreign exchange rate; and Fonterra, who have significant demand throughout most of the year, dropping for a short period towards the end of winter.

In the future, demand for gas will be largely dependent on developments in the electricity sector. Energy Link find that increasing base load gas fired generation is becoming uneconomic compared to renewable generation, but that increased inflexible geothermal and intermittent wind electricity generation will increase the need for highly flexible gas fired power stations that can be used both for short term peaking and for dry year generation.

Figure 4: Real Average Gas Prices (2009 Dollars per GJ)²⁴



²⁴ Ministry of Economic Development Energy Data File 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_43905.aspx. Accessed May 2011.

Projections

This report makes use of forecasts from the MED Energy Outlook 2010, Reference Scenario²⁵ (referred to from here on as the Reference Scenario). The MED Energy Outlook was designed primarily for modelling electricity prices; however, it contains a simulation of gas production, demand and prices, which are critical determinants of electricity generation in New Zealand. The Reference Scenario includes a carbon price of 50 2009 NZ dollars per tonne.

The Reference Scenario forecasts an increasing role for wind and geothermal electricity generation in New Zealand. Geothermal generation's low marginal costs make it suitable for stable base load generation. Wind powered generation is intermittent even in high quality locations. In order to match supply and demand, this inflexible and intermittent generation must be offset by flexible generation, such as hydro or gas fired peaking plants. The Reference Scenario forecasts an increase in hydroelectric capacity of 1,500MW by 2030 and an increase in gas peaking capacity over the same period of 460MW. Figure 5 shows recent trends and Reference Scenario projections of electricity generation by fuel.

The Reference Scenario forecasts that the dual gas and coal fuelled generating units at Huntly will all be decommissioned by 2030 and that the remaining gas fired base load plants at Stratford and Otahuhu will be decommissioned in 2025 and 2030 respectively. From this point, the use of gas will decline as reserves in Taranaki become depleted and New Zealand must rely on more expensive gas from frontier basins, including Canterbury, Great Southern, Northland, Deepwater Taranaki and Raukumara basins. The Reference Scenario predicts that by 2030 around one third of total gas production could come from these frontier basins.²⁶

²⁵ Reference Scenario including a carbon price of \$50 per tonne, Ministry of Economic Development Energy Outlook 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_45552.aspx. Accessed May 2011.

²⁶ Ministry of Economic Development Technical Guide: Energy Outlook Modelling, Version 1.1, March 2011. Available at: <http://www.med.govt.nz/upload/76133/Technical%20Guide%20v1.1.pdf>. Accessed May 2011.

Figure 5: New Zealand Annual Electricity Production by Fuel (GWh)²⁷

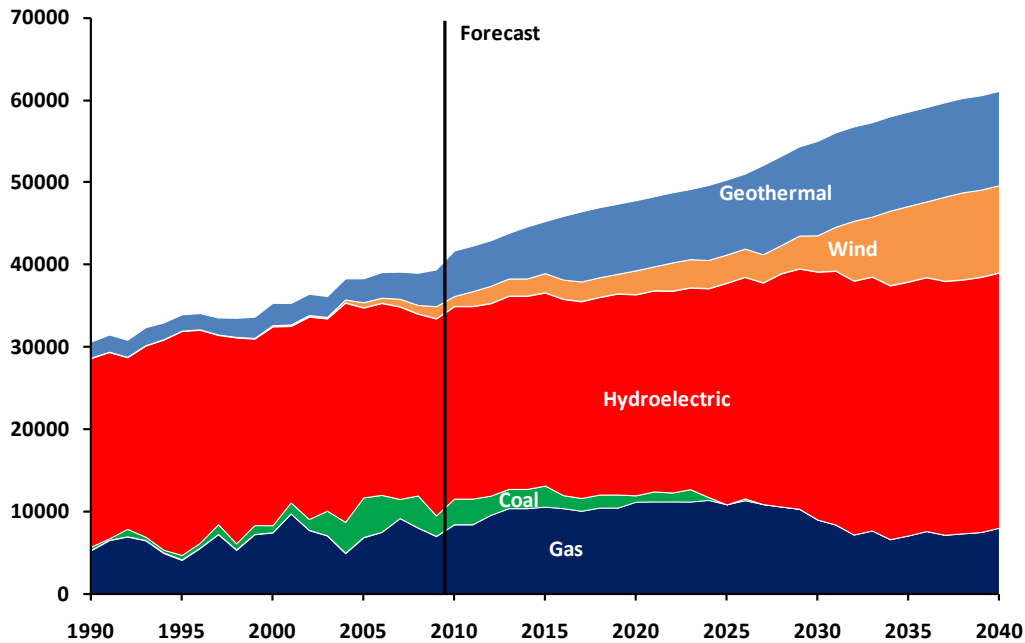


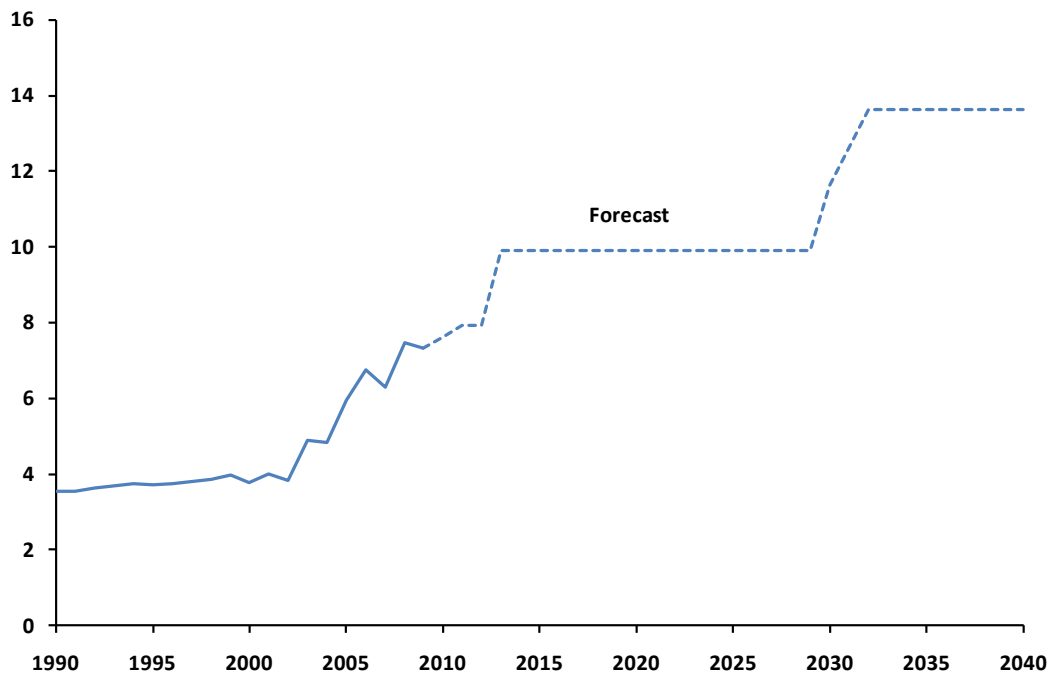
Figure 6 shows the Reference Scenario forecast for real wholesale gas prices in 2009 dollars. The large increase in prices in 2003 follows the redetermination of the Maui gas field, which introduced market prices for wholesale gas in New Zealand. The increase in prices in 2013 is due to the introduction of the New Zealand Emissions Trading Scheme (ETS). The Reference Scenario is based on a carbon price of 50 2009 dollars per tonne.

The real wholesale gas price is forecast to remain constant in the Reference Scenario until 2030. From 2030 onwards, frontier basins including the Canterbury, Great Southern, Northland, Deepwater Taranaki and Raukumara basins become a major source of gas supply, contributing around 30 percent of national production. These supplies are predicted to have higher break even costs of production than fields in the Taranaki region, and this higher cost of production leads to an increase in real gas prices from \$9.92 to \$13.64 from 2029 to 2032.

²⁷ Ministry of Economic Development Energy Outlook 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_45552.aspx. Accessed May 2011.

Energy Link also considers that frontier basins have the potential for large discoveries but that these basins are likely to have low to medium probabilities of drilling success. There is, therefore, considerable uncertainty over the economics of these basins and whether they can provide a substantial share of New Zealand’s gas supply. In absence of significant discoveries in frontier basins, Energy Link sees the probability of imported LNG increasing at a moderate rate from 2020.

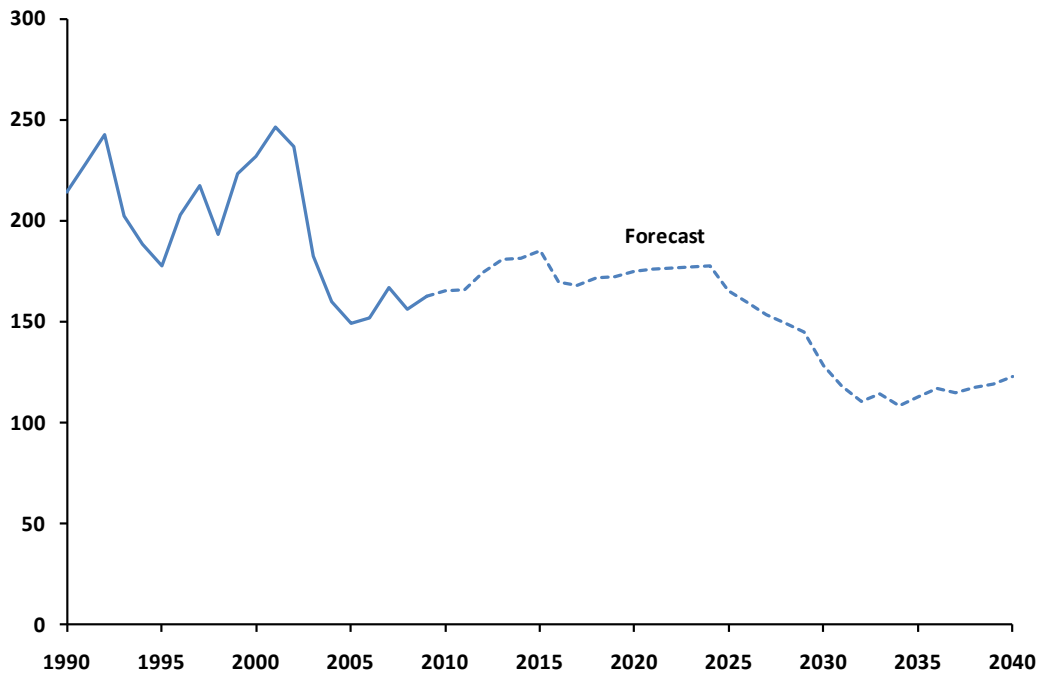
Figure 6: Wholesale Gas Average Real Prices (2009 Dollars per GJ)²⁸



As gas reserves declined in the 1990s and early 2000s, the Huntly power station which can operate with a mix of gas and coal fuel, increased its coal share relative to gas. Methanex also decreased their use of gas in manufacturing methanol. The resulting decrease in annual gas production from 2000 is seen clearly in Figure 7. As shown, the Reference Scenario predicts gas production to rise in the medium term, before declining from 2025 onwards as fields in the Taranaki basin are depleted.

²⁸ Reference Scenario including carbon price of \$50 per tonne, Ministry of Economic Development Energy Outlook 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_45552.aspx. Accessed May 2011.

Figure 7: Annual Gas Production (PJ) ²⁹



A number of industry participants expressed concern over the certainty of future gas supplies. Producers, however, were confident that New Zealand is under explored and that supply concerns are misplaced. Recent increases in gas reinjection and the operation of Methanex facilities in converting gas to methanol suggest that surplus gas is currently available. Exploration is likely to increase as reserves in existing fields are depleted and to decrease following significant discoveries.

²⁹Reference Scenario including carbon price of \$50 per tonne, Ministry of Economic Development Energy Outlook 2010. Available at http://www.med.govt.nz/templates/MultipageDocumentTOC_45552.aspx. Accessed May 2011.

Transmission

Map 2 shows the high pressure gas transmission networks in New Zealand. Gas produced in the Taranaki region is delivered throughout the North Island through these networks. Most areas in the North Island are served by these networks, with the notable exception of the Wairarapa region. There is currently no transmission of gas from the North Island to the South Island and no production of gas in the South Island.

Much of the existing gas pipeline and distribution networks were built in the 1970s by the then state-owned Natural Gas Corporation. Natural Gas Corporation was privatised in 1988 with the sale of parent company Petrocorp to Fletcher Challenge Ltd.³⁰ These pipeline businesses remained unregulated, but in 2004 the Commerce Commission determined that pipeline and distribution businesses were earning excess profits.³¹ Price controls for gas transmission and distribution pipelines were subsequently ordered in 2005.³² The Commerce Commission intends to set their initial default price-quality path in July 2012.³³ Both the Vector and Maui pipelines are subject to proposed price quality regulation from the Commerce Commission.

The Maui pipeline is a large pipeline that generally operates with large amounts of spare capacity. Demand for transmission capacity on the Maui pipeline is volatile. This is because some large users including the Huntly power station have variable demand dependent on gas and electricity prices. The Maui pipeline can accommodate this variable demand by varying the pressure and, consequently, the amount of gas in the pipeline. This also permits the Maui pipeline to provide a balancing function for the entire gas transmission system, including the Vector system to which it is connected, when supply and demand on the system are not equal.

Users on the Maui Pipeline operate on short term contracts. The relatively low utilisation of the pipeline means that there is an insignificant risk of lack of availability for users. They are, therefore, willing to contract on a short term basis.

³⁰ Reuters, "COMPANY NEWS; New Zealand Deal", 4 March 1988.

³¹ Commerce Commission, Gas Control Inquiry: Final Report, Public Version, 29 November 2004.

³² New Zealand Government, "Commerce (Control of Natural Gas Services) Order 2005", Order in Council, 25 July 2005.

³³ Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011, paragraph 1.2.

The Vector pipeline network consists of smaller pipelines that are connected to the Maui pipeline at various points and that carry gas to large industrial users and distribution networks. In the case of users not meeting their booked capacity, overruns (or under-runs) are balanced by Vector with the Maui pipeline, and any costs are then passed through to Vector's customers.

The gas fired power stations at Otahuhu and Southdown in Auckland hold long term contracts for transmission capacity on the Vector pipeline. In addition, retailers hold one-year capacity contracts. These contracts are negotiated bilaterally but are subject to the Vector Transmission Code, which affords users the option to renew their contracts when they expire. The right to renew transmission contracts effectively gives users perpetual rights on the Vector pipeline.

Although gas use is lower now than it was in 2000, this decline has been mostly due to the increase of coal used to fuel the Huntly power station and a reduction in the use of gas for methanol manufacture in Taranaki. These two large users are connected directly to the Maui pipeline. Some of this decline in demand by these large users has been offset by new industrial users located around and north of Auckland. These users are dependent on the Vector pipeline network. Vector has recently announced that sections of their pipeline network have become fully booked. Retailers relying on the Vector pipeline system are able to supply new small customers, but they are unable to supply new large industrial or commercial customers.

There is some suggestion amongst industry participants that retailers are holding excess capacity on the Vector pipeline, that the physical capacity limit on the pipeline has not been reached and that the pipeline is not being used efficiently. Some shippers may hold excess capacity in their role as electricity generators in order to have access to transmission capacity in dry years for increased gas-fired electricity generation. Other shippers may be reluctant to give up any excess capacity because of the threat of not being able to secure additional capacity in the future when it is needed.

Map 2: Major Transmission Pipelines³⁴

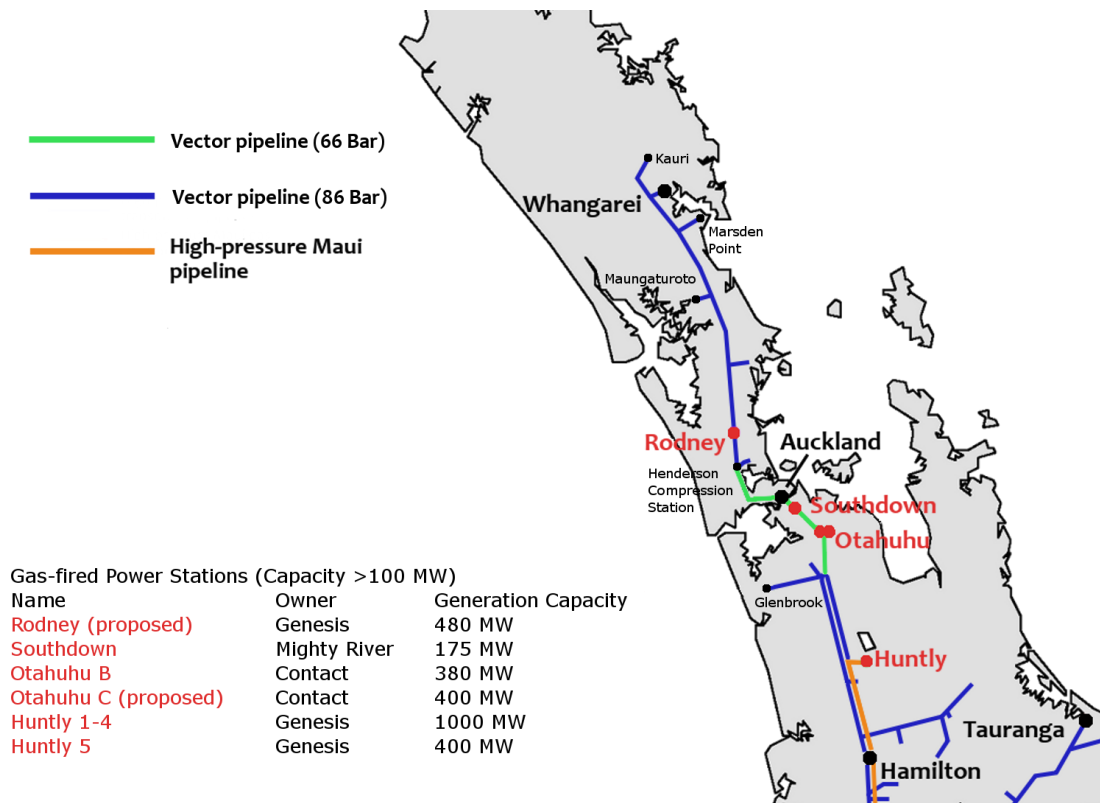


Map 3 shows the northern part of the North Island. The Maui high pressure transmission pipeline carries gas as far north as the Huntly power station, which can be fuelled by either coal or gas. North of Huntly, the Vector high pressure transmission pipeline carries gas through Auckland to Whangarei. Major gas users on the Vector transmission pipeline in this area include NZ Steel at Glenbrook, the Otahuhu and Southdown gas fired power stations, Fonterra at Kauri and Maungaturoto and the Marsden Point Refinery.

³⁴ Locations of transmission pipelines are based on discussions with MED and industry participants. The map is designed for indicative purposes only.

The section of the transmission pipeline from Papakura to Henderson (shown in green on Map 3) was designed to operate at a lower pressure than other sections of Vector’s transmission network. This section is currently capacity constrained, and an upgrade of capacity large enough to support further industrial or electricity generation use would require a by-pass pipeline to be built alongside some sections of the current pipeline. This investment would be large, and although current capacity is constrained, it is unlikely that a significant share of the new capacity resulting from the investment could be absorbed by current demand without a new large user such as the proposed Otahuhu C or Rodney gas fired power stations.

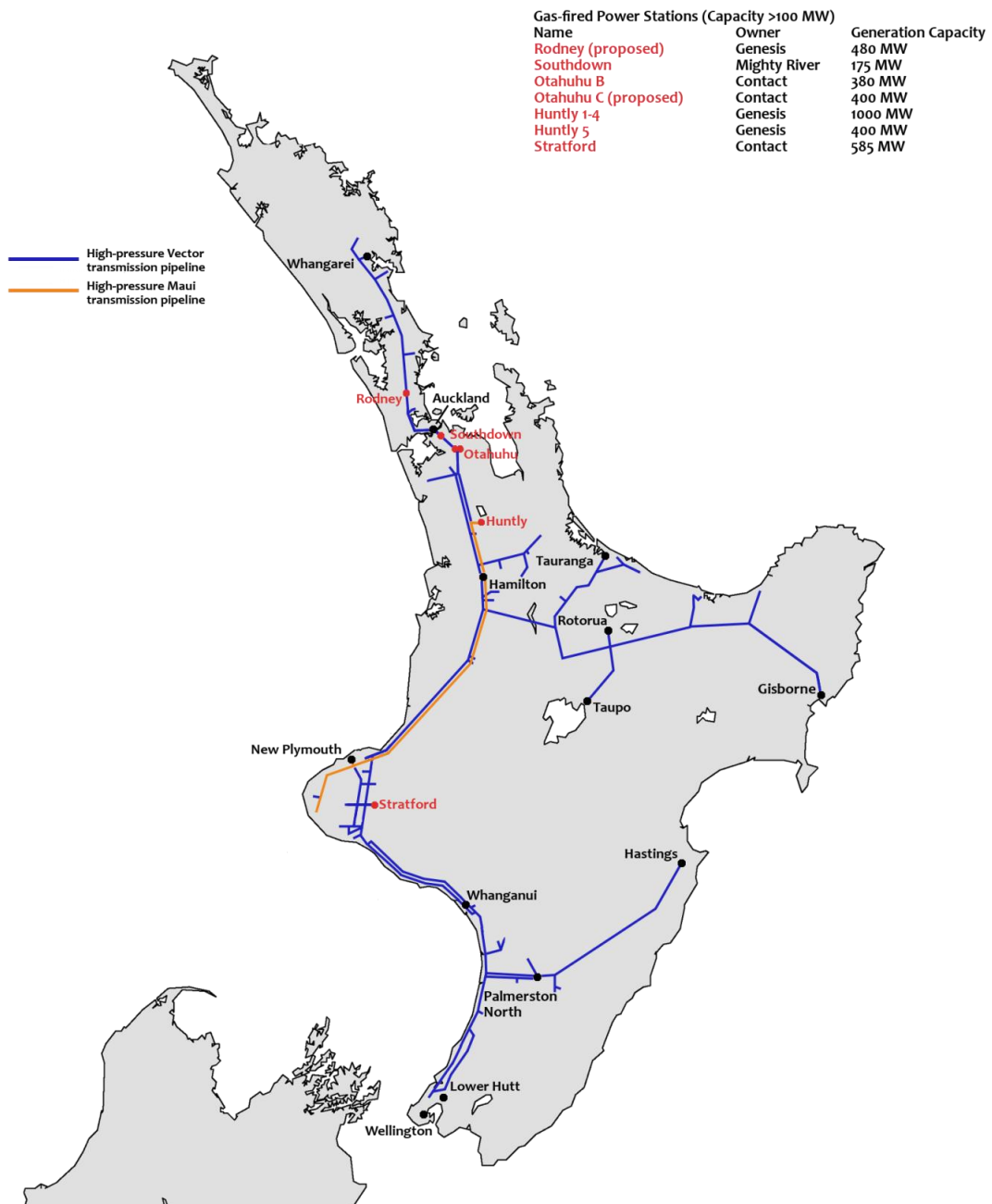
Map 3: Northern New Zealand Transmission Pipelines³⁵



³⁵ Locations of transmission pipelines and pressure ratings of pipelines are based on discussions with MED and industry participants. The map is designed for indicative purposes only.

Map 4 shows the major high pressure transmission pipelines in New Zealand, and the large gas fired power stations with capacity over 100MW. Also indicated are proposed power stations at Otahuhu and Rodney.

Map 4: Major Transmission Pipelines and Large Gas Fired Power Stations³⁶

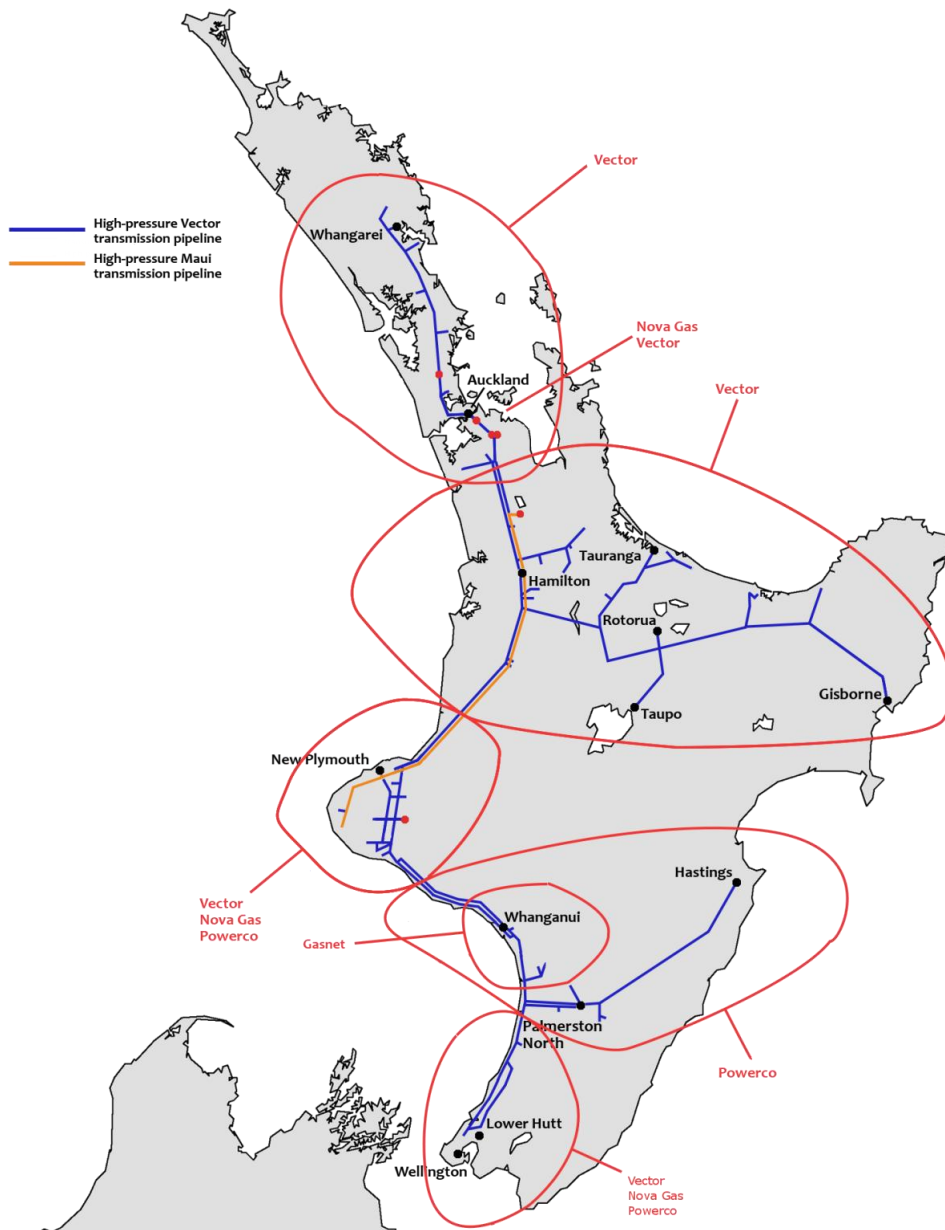


³⁶ Locations of power stations and transmission pipelines are based on discussions with MED and industry participants. The map is designed for indicative purposes only.

It is costly to transport both gas and electricity, so the location of new gas fired power plants will be based on the tradeoff between having production either local to demand or local to the supply of gas, as well as a consideration of transport capacity both on the pipeline network and on the electricity transmission grid. Current capacity shortages on the Vector pipeline system suggest that new gas fired electricity generation plants are likely to be built mainly in the Taranaki region, close to the gas fields. This trend is also supported by recent increases in investment in the electricity transmission grid throughout New Zealand.

Map 5 shows the high pressure gas transmission pipelines in New Zealand and also indicates the regions served by different low pressure gas distribution companies. Vector and Powerco operate the largest distribution networks and along with Gasnet are subject to proposed price quality regulation by the Commerce Commission. Nova Gas operates distribution networks in Auckland, New Plymouth and Wellington. These networks were built as by pass networks in order to compete with incumbent distribution companies. Nova Gas' distribution network is not subject to the Commerce Commission's proposed price quality regulation, nor is it subject to the open access requirement.

Map 5: Transmission Pipelines and Distribution Networks³⁷



³⁷ Locations of transmission pipelines and distribution networks are based on discussions with MED and industry participants. The map is designed for indicative purposes only.

III. Analysis and Policy Issues for the Gas Industry in New Zealand

Studying the gas industry in New Zealand leads to several areas where policy recommendations are in order. This section of the report provides some analysis in each of these areas and offers policy recommendations where appropriate. The topic that all industry participants are currently talking about is the issue of the Vector pipeline system, whether or not there is an actual capacity constraint, and, if so, how the problem can be solved. There are, however, additional important policy considerations, including those centred on regulation and privatisation.

Information

There does not seem to be consistency across parties in the gas industry as to basic industry data. For example, producers say plenty of gas is available, and plenty of reserves, and the low cost gas permitting the Methanex plant to operate is consistent with this position. Todd Energy's McKee field is only producing at around 25% of capacity, for example. Producers also argue that reserves will not be proven too far in advance because of the cost, but they seem confident that reserves are available and point out that the geology around New Zealand is favourable to gas. Supporting this position is the fact that the Taranaki area and other areas around New Zealand are relatively under-explored by global standards.

There has been substantial exploration around New Zealand in response to government incentives, but so far there has not been much drilling and there have been no new gas discoveries. Nonetheless, producers are confident that gas would be available if demand increased or reserves were depleted. At this time, however, producers seem more concerned about a large gas discovery that could not be absorbed by the New Zealand market rather than any shortage of gas. **The Ministry of Economic Development should consider its total package of gas exploration incentives at such time as the Ministry determines that finding new gas reserves is a priority.**

There is some evidence to support the position of the producers. For example, Figure 1 shows that gas production remains high, with the drop since 2000 mostly accounted for by the increase in the share of coal relative to gas used to fuel the Huntly power station and cutbacks at the Methanex facility. Figure 2 shows that while wholesale prices have risen, reserves have

recovered. Even more clearly, the figure shows that the years of supply available from reserves is at normal levels, between 12 and 16 years. Because of the cost of proving reserves, years of supply cannot be expected to be greater than this. Figure 2 also shows that when reserves dropped, and the years of supply dropped below ten, additional gas was forthcoming, as producers argue would happen again. Furthermore, increasing gas reinjection rates as shown in Figure 3 are an additional indication of ample gas supplies.

Retailers, however, seem uncertain as to the availability of supplies, especially in the longer term, and retailers and customers seem reluctant to make plans that depend on additional long-term supplies of gas. Retailers are also uncertain as to the availability of transmission capacity on Vector's system. Some parties expect Vector to build capacity in response to demand, but Vector says that the demand for new capacity is unclear and that current regulatory rules make it too risky to undertake new pipeline investment. In contrast, other parties suggest that Vector is simply not willing to accept normal business risk and expect Vector to do so in the face of demonstrated demand.

There does not seem to be a consistent view across parties of supply and demand conditions in the industry. **The Gas Industry Company could facilitate the communication of information to all parties, including industry supply conditions and pipeline capacity availability.** Information could be tested by all parties, and as a result everyone would have a more consistent view of the state of the industry and of the short and longer-term supply and demand conditions.

Vector Pipeline Capacity Constraint

Short Term

There may or may not be a capacity constraint on the Vector pipeline, but in the short term it seems to be large customers who are harmed by the current situation. It is clear that the pipeline is essentially full. Vector is unable to implement any additional low-cost fixes to get small increments of available capacity (these were exhausted in 2009). The threat of a capacity shortage has caused shippers to hang on to any excess capacity they have, and the grandfathered shipping rights that certain shippers have has made the problem worse. The cost of holding excess capacity is not great, as in total gas transmission charges are only about 10% of the average total retail cost of gas (holding 10% excess capacity would only cost 1% of the total cost of gas, for example). If anyone gains from this situation, it will be retailers who have essentially captive large customers, perhaps giving the retailers some market power, permitting them to capture some economic rents.

The use of Vector's pipeline may not be fully optimised, as there seems to be some excess capacity under Vector's contract carriage regime at most or all times. This amount of excess capacity is small, however, and shippers may want to hold some excess capacity in any case. A switch to a common carriage regime, as is sometimes suggested, will not make any additional capacity available, and it is not clear that it would reduce the incentive for shippers to hold excess capacity if there was still a fear of a transmission capacity shortage. Similarly, ending the grandfathered rights of some shippers, which would involve breaking contracts, will not make any additional capacity available, or at least not much, if there is still an incentive to hold whatever excess capacity may exist.

While customers may move from one retailer to another, this does not increase the total demand for pipeline transmission capacity. Large customers are, however, unable to do this at the current time because retailers are unable to procure shipping capacity to serve new large customers.

The decline in overall use of gas³⁸ was due to the decrease in gas used at the Huntly power station, but the Huntly plant is connected directly to the Maui pipeline and so did not have any effect on Vector's capacity constraint. Similarly, the Methanex plant contributed to the overall decline in gas use, but it is also not connected to the Vector pipeline system.

At the same time, there does not seem to be new shippers or existing shippers who are actually willing to pay for new pipeline capacity. This may be partly because of uncertainty over the availability of gas in the medium to long term. It is for this reason, though, that it is unclear if there is actually a capacity problem on Vector's pipeline.

It is the large customers who are harmed by the real or imagined transmission shortage. Because residential customers make up such a small portion of the total demand for gas, and because individual residential (or small commercial and industrial) customers are so small, they are able to change retailers without problem. Retailers cannot, however, solicit large commercial or industrial customers who are served from Vector's pipeline system as they do not have the spare transmission capacity available on Vector's pipeline that would be needed to serve such a customer. Any available spare capacity is apparently small, and is not necessarily available at all times, and is therefore insufficient to supply such a customer. This is the case even though a large customer changing retailers would not increase the total demand for transmission capacity on Vector's pipeline.

A short-term solution to the Vector pipeline capacity problem is to let large customers (this would need to be defined) take their Vector transmission capacity with them when they switch retailers.³⁹ While this does take some property rights to Vector transmission capacity away from retailers, at the same time it would permit all retailers to compete for large customers, and it would permit large customers to benefit from competition among retailers in ways they cannot do now. The likely result of this is to reduce any economic rents accruing to retailers as a result of the capacity constraint, with a consequent benefit to large customers. On balance, this seems less extreme than simply breaking all of the contracts between Vector and its shippers and would more closely match the limited interference in existing contracts with the problem and the potential benefits. Letting existing large

³⁸ See Figure 1: Net Gas Production by Field (PJ)

³⁹ The authors developed this recommendation independently from the Gas Industry Company which has proposed a similar, although perhaps more complex and interventionary, option. "Retail Competition and Transmission Capacity Statement of Proposal: Submissions Analysis and Next Steps, Gas Industry Company Limited, April 2011, available at http://www.gasindustry.co.nz/sites/default/files/u180/retail_competition_and_transmission_capacity_so_p_submissions_analysis_final_155240.9_1.pdf. Accessed June 2011.

customers take their capacity with them when they switch retailers will benefit existing large customers, but it will not make new capacity available to serve a new large customer. Such a new customer can only be served if the pipeline capacity is expanded.

Attempting to create a market for capacity on Vector's pipeline will probably fail under current conditions because there is little or no incentive for any shipper holding capacity to sell it.

Long Term

In the long term, there may be an actual capacity constraint on the Vector pipeline system, in other words, demand from new customers such that the available capacity could not satisfy all the demand for pipeline transmission capacity. In this case, **the only long term solution is to increase Vector's pipeline capacity either by boosting pressure or building a new pipeline.** Depending on where the additional demand would need to be accommodated, it might be worthwhile to focus on expanding capacity through Auckland, between approximately Papakura and the Henderson Compression Station, which is a section of the Vector pipeline that operates at a lower compression rate than the sections directly north and south of it.⁴⁰

Before undertaking any such pipeline capacity expansion, however, Vector and its regulators would need to be satisfied that there is enough actual incremental demand to justify such an investment. The amount of incremental demand is also connected to potential customers and retailers' understanding the availability of new gas supplies, as discussed previously.

Addressing the long term capacity constraint will also solve, of course, any short-term capacity issues as well. If it is understood that there is sufficient capacity on the Vector system, the incentive for shippers to hold excess capacity will be removed.

⁴⁰ See Map 3: Northern New Zealand Transmission Pipelines.

Privatisation

While a substantial privatisation of the gas industry took place in the 1990s, one important participant in the gas industry, Genesis, remains government owned. Aside from losing whatever benefits privatisation might deliver, having state-owned enterprises (SOEs) and private companies operating side-by-side in the gas market causes problems. SOEs fear that they will have constraints imposed on them by the government that make it difficult to compete in the market. Privately-owned competitors fear that SOEs will get favourable interest rates and access to capital and other benefits only available to SOEs, resulting in private companies being reluctant to compete against a SOE. In the end, both SOEs and their privately-owned competitors are leery of the arrangements, and this can inhibit the functioning of the market.

There could be benefits from the partial privatisation of Genesis, but there would be more benefits from a full privatisation. This would result from treating all companies the same and removing impediments to competition. In its new budget proposed in May 2011, the government included a partial privatisation of Genesis.⁴¹ This would, apparently, be a privatisation of a minority share of the company. Such a privatisation might bring benefits, primarily from the increased scrutiny of the company by the investment community, and the necessity of making its transactions and business relationships more transparent. This could also result in more efficient operations. Such a partial privatisation, however, would still leave the government with a controlling interest on Genesis' Board and would not address the concerns of Genesis and its competitors regarding a SOE participating in the market with private companies. While a partial privatisation is better than none, it is still not as good as a full privatisation.

Ministry of Economic Development (MED)

MED collects a great deal of useful information on the gas industry, but it would be helpful if **The Ministry of Economic Development could provide greater analysis of the gas industry data to assist industry participants in understanding current conditions and future trends. The Ministry could also play a greater role in developing and recommending policy for the gas industry.**

⁴¹ NZHerald.co.nz, "Budget: SOE sell-off to raise \$5-7b", 19 May 2011.

Currently, MED seems to provide little if any analysis of the data that it collects. The available data appear to be reasonably complete, but without some analysis and interpretation of the data, their usefulness is reduced, and they are subject to misuse by others who do not understand the assumptions behind the data and their limitations. Furthermore, it is not until the data are subject to the rigors of analysis that any inconsistencies or errors may become apparent. Finally, analysis of the data will assist MED in its policy planning function.

Location of New Gas Generating Facilities

While it is fairly obvious, given the gas pipeline transmission constraints and the current insufficient incentives for investment to increase that capacity, it makes sense to **locate new gas-fired electricity generation facilities nearer to the gas fields such that they do not need to use the Vector transmission system.** Improvements to the electricity grid make it likely that such new generating plants could be accommodated more easily than Vector's transmission system could handle the equivalent gas. The exception to this would be if a new electricity generating facility on the Vector system were sufficient to call for the investment to expand the pipeline.

Regulation and Investment Incentives

Regarding Commerce Commission (the Commission) regulation of gas pipeline companies, it is important to make the point that the Commission has proposed forms of price regulation, either a weighted average price cap or a revenue cap,⁴² that are superior to, for example, rate-base rate-of-return regulation in terms of the efficiency incentives and flexibility that they provide. **The Commerce Commission's proposed general regulatory framework seems to conform to international best practices.**

There are a number of components to the regulations facing gas transmission and distribution companies, and each of these components potentially can have an effect on the risk and return from new pipeline investment. If one component, such as the rate of return or the depreciation schedule, were perceived as unsatisfactory by potential investors, this might not be enough to derail new investments. It seems to be the case, however, that gas industry participants express reservations about nearly every one of the regulatory components put in

⁴² Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011. The Commerce Commission's Final Determination is due 29 February 2012 and the initial default price-quality path is intended to be set on 1 July 2012.

place or proposed by the Commission to regulate gas pipeline companies. Such disagreements between the regulator and the regulated companies are to be expected, of course, but even so the totality of the regulations and the incentives inherent in them call into question whether companies will be willing to invest in new pipeline facilities under the current and proposed regulatory rules. Furthermore, some of the components of the regulations seem to increase the risk of investing without any offsetting benefit, and there is some question on the part of the regulated companies, as discussed below, as to whether the Commission will honour its part of the regulatory bargain. **The Commerce Commission should evaluate whether its package of current and proposed regulations is adequate to permit regulated companies to invest in new pipeline facilities.**

Certainty of the return of new investment

Regulated companies expect with a reasonable certainty that they will be able to charge prices sufficient to permit them the return of their investment – in other words, that depreciation rates are adequate and depreciation can be recovered through prices. The lumpy nature of pipeline investment – new investment will result in a relatively large increase in capacity – coupled with the weighted average price cap proposed for all of the pipeline companies other than Maui⁴³ suggests that the risk of getting a return of any new investment may be significant.

The Commission’s proposed weighted average price cap permits the weighted average of prices to increase with a measure of inflation, the CPI.⁴⁴ Revenues can increase to the extent that the quantities sold at each price increase. If new investment is undertaken, the investing company can increase total revenues within the regulatory period with increased sales within the weighted average price cap. This is noted by the Commission as an advantage of the weighted average price cap for Vector and distribution businesses with large networks considering incremental investment.⁴⁵ However, the investing company would have to have quantities increase sufficiently to generate revenues sufficient to permit it to recover its investment. With the case of lumpy pipeline investment, this might require quantity increases that are unreasonable to expect in the early years after the investment is made. Under a total revenue cap, alternatively, the investing company would be able to recover the costs of

⁴³ Commerce Commission, “Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses”, 1 April 2011, paragraphs 4.12 and 4.42.

⁴⁴ Commerce Commission, “Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses”, 1 April 2011, paragraph 4.7.

⁴⁵ Commerce Commission, “Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses”, 1 April 2011, paragraph 4.9.

investment when the regulatory asset base is adjusted to account for the new investment. Any increase in quantities sold following an investment would be compensated for by a decrease in prices in order to maintain revenues below the cap.

If pipeline investment is considered to be necessary, some alternative to a weighted average price cap will be required to provide the incentive for companies to invest. A revenue cap could be a solution to this problem, as prices would initially increase to levels sufficient to permit a return on and of the investment, and prices would decline over time as quantities increased so that the investing companies' revenues remained below the revenue cap. The revenue cap itself would increase to adjust for the investment in new capacity, and then it could change over time – for instance, the Commission has proposed that Maui's revenue cap increase with inflation, measured by the CPI.⁴⁶ Ironically, the Commission has proposed a revenue cap for Maui precisely because it does not anticipate Maui making significant investments and weighted average price caps for the other pipeline companies that might be making significant investments.⁴⁷ This may be backwards.

The Commission has proposed to adjust the weighted average price caps and revenue cap by the CPI. The measure of inflation used to adjust the price cap should be as closely related as possible to the cost changes that are faced by the regulated company. Using the CPI may not reflect cost changes for a capital-intensive industry such as a pipeline. Certainly, the CPI is a questionable inflation measure for the annual adjustments to the asset values that are part of the Commission's proposal. Using the CPI for these adjustments introduces additional risk for the regulated companies and would necessitate a higher rate of return to compensate for this risk. **The Commerce Commission should consider using a measure of inflation in its weighted average price cap and revenue cap methodologies that better reflects the costs confronted by the regulated companies and the change in the replacement cost of their assets.**

⁴⁶ Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011, paragraph 4.5.

⁴⁷ Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011, paragraph 4.39.

There is a related issue in that annual increases in asset values as a result of an increase in the CPI are treated as income. This creates profits without off-setting cash flow. Based on this proposed regulation and other approved and proposed regulations, **the Commerce Commission needs to recognize the effect of this lack of cash flow on the pipeline companies and consider whether they will have adequate cash flow to maintain the credit rating that is assumed in determining the allowed rate of return.**

Customised price-quality paths

The Commission is proposing customised price-quality paths (CPP) to address the problem of recovering lumpy investments. Under the proposed CPP, upon approval of the new investment, the default price-quality path (DPP) would be modified to a CPP with conditions that are more appropriate for the firm's particular circumstances.⁴⁸

There are shortcomings to this approach that may prevent the possibility of a CPP from having the effect on investment anticipated by the Commission. Once a company applies to the Commission for a CPP, it loses the option of reverting to the DPP and cancelling the investment if the company were to determine that the approved CPP were inadequate.⁴⁹ This is a problem to the extent that regulated companies are not confident that the Commission will confine its review for the CPP only to the proposed new investment but will reconsider all of the company's investments and expenses. If the Commission sets less favourable conditions under the CPP than under the DPP, they may also apply claw back on earlier revenues.⁵⁰ In addition, any CPP may only apply for a maximum of five years, after which time a reapplication must be made or the company must revert to the DPP.⁵¹ These conditions introduce an element of risk for the regulated companies and may prevent them from undertaking new investments. Overall, the implementation of the CPP does not appear to be good regulatory policy, at least insofar as its potential effect on investment. **The Commerce Commission should consider offering companies the possibility of reverting to the default price-quality path after they apply for a customised price path, and the Commission should consider reaffirming exactly what would be considered in the analysis leading to the possible establishment of a customised price-quality path.**

⁴⁸ Commerce Commission, "Discussion Paper: Initial Default Price-Quality Path for Gas Pipeline Businesses", 1 April 2011, paragraph 2.11.

⁴⁹ Commerce Act 1986 No 5 (as at 01 November 2010), Public Act. Part 4 Section 53R.

⁵⁰ Commerce Act 1986 No 5 (as at 01 November 2010), Public Act. Part 4 Section 53V (2)(b).

⁵¹ Commerce Act 1986 No 5 (as at 01 November 2010), Public Act. Part 4 Section 53W.

There is a problem unique to Vector even if a CPP were to be approved by the Commission. Vector uses the Vector Transmission Contract (VTC) with its shippers. This is a negotiated contract that sets the price for using the Vector pipeline. Vector cannot unilaterally increase its prices under this contract. If it did, the shippers could refuse to pay, and there would no longer be an enforceable contract in effect. Vector's recourse at this point would be to cut off the shippers, which is probably politically impossible, as cutting off gas to electricity generating stations or residential customers would not be acceptable. Under current regulations, the Commission would not impose new, higher prices on Vector's shippers, so even having a CPP approved by the Commission would not permit Vector to increase prices to generate sufficient revenues to recover its investment.

Given the lumpy pipeline investment, it may be impractical to expect a pipeline company such as Vector to accept the risk that quantities might rise quickly enough to permit it to recover its investment under either the DPP or a CPP, given that Vector cannot in practice increase prices to its shippers. **If new pipeline investment is required, some form of revenue cap, such as is proposed for Maui, with enforceable prices, might be required for Vector to be able to invest.** This would entail a regulatory change to the VTC such that prices could be increased for current shippers to a level expected to generate sufficient revenues. Over time, as quantities increased, the prices would decline.

Another possibility is that a new power plant to be served by the Vector pipeline could be responsible for purchasing enough of the new pipeline capacity that it would be possible for Vector to build it under the proposed DPP regulation. If the quantity of capacity purchased increased sufficiently as a result of the new power plant, the quantity risk that Vector would face from the new pipeline investment would be manageable. In addition to an electricity generator knowing that there would be pipeline capacity available, it also relates to the issue of the availability of gas supplies and the different views held by producers as opposed to retailers and customers.

Asset values

One component of the DPP is the valuation of the regulated company's assets. The price cap or revenue cap is initialised using asset values for the company and an approved rate of return to determine the revenues that are required to provide the permitted return on assets. When pipelines were initially regulated, the Commission determined in 2000 the asset values that it would use. This was not the result of a comprehensive regulatory review but, rather, appears

to be a valuation put in place quickly so that the Commission could determine how to move forward. Subsequently, the Commission undertook a two-year review, with the participation of all parties, of the methodology it should use to value pipeline assets, and these valuations were determined in 2005. The resulting valuation methodology conformed to international standards.

For reasons that are not entirely clear but apparently have to do with the fact that the 2005 valuations were higher than the 2000 valuations, the Commission rejected the use of its 2005 valuations, which were the result of a long and comprehensive review, and reverted to the lower valuations from 2000, which had not benefited from such a review. There are two consequences to this action. First, to the extent that the 2000 valuations are lower than is justified by the methodology resulting from the review, it makes the current return on investment less attractive and, consequently, acts as an impediment to new investment which might be similarly undervalued. Second, it affects the credibility of the Commission because the Commission did not stand by the results of its own analysis. **The Commerce Commission should, therefore, consider valuing pipeline assets using the methodology that led to the 2005 valuations.**

Rate of return

The rate of return is used along with the asset value to initialize the DPP and any CPP. While the rate of return is determined based on past or current credit market conditions, it will presumably be used for new investments at least until such time as another rate of return study is undertaken. Parties might reasonably expect, however, that any new study to reflect changed credit market conditions might follow the same methodology.

The Commission recognises that the risks of setting the allowed rate of return are not symmetrical, that the risks of setting the rate too low are greater than the risks of setting the rate too high. Consequently, the Commission uses various methodologies and determines a midpoint of the rate of return calculations. Recognising the asymmetric risks, however, the Commission determined that it would use the 75th percentile rate of return for the purposes of initialising its DPPs for each regulated pipeline company.⁵² While this is commendable and seeks to avoid setting a rate of return that is too low, some regulated parties view the allowed rate of return, even at the 75th percentile, as too low.

⁵² Commerce Commission, “Decision Number 718: Determination of the Cost of Capital for Services Regulated under Part 4 of the Commerce Act 1986”, 3 March 2011, Paragraphs 24, 37.

There are other concerns about matching the term of the risk-free assets used in the rate of return calculations to the economic life of pipeline investments. Using a shorter-term, which generally carries a lower interest rate, does not match well with the longer-term lives of the assets. Some parties also have more technical concerns as to the manner in which the weighted average cost of capital was determined.

Regulated companies can, of course, be expected to object to any such determinations by the regulator. Nevertheless, because there is concern around a number of components of the regulatory framework for the pipeline companies, **the Commerce Commission should reconsider its rate of return determinations to be certain that the allowed rate of return is sufficient to permit the regulated pipeline companies to attract new capital.**

Complexity of the proposed default price-quality path plan

There is some evidence that the proposed default price-quality regulatory plan is too complex. This is evident from the fact that not all the parties have the same understanding of what the plan actually is. The plan is also difficult to explain in detail.

The proposed plan also may be unduly risky. Most price regulation plans make annual adjustments to the price cap (or revenue cap in the case of revenue plans) based on a pre-determined productivity adjustment and actual inflation. The Commission has determined that the productivity adjustment, or *X*, should be zero, and, therefore, the price or revenue cap would change each year with inflation, measured by the CPI. Instead of making these annual adjustments based on actual inflation, however, the Commission is proposing to make the adjustments based on a forecast of inflation for the five years. This appears to introduce additional risk for the regulated companies – risk that inflation might be greater than the forecast – without any offsetting benefit to the regulated companies. As a result of this example, and perhaps other aspects of the proposed regulation, **the Commerce Commission should consider simplifying the proposed default price-quality path methodology and taking steps to reduce the risk inherent in the regulations.**

Regulatory Treatment of Companies that are Sold

Regulatory treatment of companies that are sold is not the same as for companies that are not sold. In other words, rates permitted for a company that has never been sold will most likely be different, and probably higher, than rates for a comparable company that has been sold. This seems to be a horizontal equity issue both for customers and for investors.

This asymmetry comes about in the instance, for example, that a company is acquired at a price that values the assets of the company being acquired at more than the value of the assets for regulation. The higher tax base generates more depreciation and hence a lower corporate tax. This lower corporate tax is a lower expense, for regulatory purposes, than for the company that was not sold. The company that was not sold has a lower depreciation deduction and a larger corporate tax that is an expense in the regulatory context. Using the regulatory asset base results in a revenue requirement and rates that are higher for the company that was never sold than for the company that was sold. **The Commerce Commission should consider eliminating the asymmetric treatment of rates and revenues when regulated companies are sold and the purchased asset values are different from the regulated asset values by using the regulatory asset base, depreciation, and tax liability for the company that was sold.**

Commerce Commission Credibility

Fundamental to regulating a company such as a pipeline company is the concept of the regulatory bargain. Under the regulatory bargain, the company is subject to economic regulation, but the regulator promises the company a return adequate to provide a market rate of compensation to its shareholders, to permit a return of its investment, and to attract new capital. For this to work, the regulated companies must be confident that the regulator will honour its side of the bargain.

Because of past and proposed actions, a number of industry participants are not confident that the Commission will keep its part of the regulatory bargain. Some of these contributing factors are the valuation of the asset base for regulation, the determination of the rate of return, the mechanics of the proposed DPP, and the determination of a CPP. This uncertainty simply serves to increase risk for current and potential investors. It is also a problem because the Commission proposes an initial default price-quality path plan with five years duration. Investments in the gas transmission business, of course, have an economic life much longer

than that. Companies are concerned as to what the Commission might do at the end of the five year period and if there will be a claw back of any efficiency gains that have been realised as a result of the incentives in place under the default price-quality path regulation. There are advantages to a default price-quality path regulation with no fixed term, although a five year term might be required under the current circumstances in New Zealand where there is less experience with this type of regulation in the gas industry. As a result, **the Commerce Commission should consider steps to bolster the industry's perception that it will honour its side of the regulatory bargain before, during and at the end of the term of the price regulation.**

A Spot Market and Gas Storage

There does not seem to be any prospect or need for a spot market for gas in New Zealand. The market is rather small to support one, and many of the functions that buyers and sellers would get from a spot market seem to be provided by flexible long term gas purchase contracts and the ability of the Maui pipeline to handle some overage and underage through line packing. The Gas Industry Company's attempt to establish a spot market was not successful. There was some criticism that the attempted spot market mechanism was too complex, and that a simpler one might have worked, but on balance such success does not seem likely.

The prospects for gas storage in New Zealand are limited. Contact Energy's gas storage investment is driven by its take-or-pay contract. Otherwise, there do not seem to be facilities available for storage, and the low seasonal price variations make storage less attractive than it is in other countries where seasonal price variations may be greater. The low seasonal price variation also makes interruptible gas contracts less desirable for large customers, as they cannot save enough money to justify dealing with an interruptible gas supply.

IV. Summary

The gas industry in New Zealand is presently facing a number of challenges. The main barrier facing market participants is a lack of pipeline transmission capacity in and north of Auckland. This lack of capacity is preventing new industrial customers from using gas and preventing competition among retailers for existing large customers. The authors are hopeful that the following policy recommendations will prove useful for policy makers and the two industry regulators.

1. The Ministry of Economic Development should consider its total package of gas exploration incentives at such time as the Ministry determines that finding new gas reserves is a priority.
2. The Gas Industry Company could facilitate the communication of information to all parties, including industry supply conditions and pipeline capacity availability.
3. A short-term solution to the Vector pipeline capacity problem is to let large customers (this would need to be defined) take their Vector transmission capacity with them when they switch retailers.
4. The only long term solution is to increase Vector's pipeline capacity either by boosting pressure or building a new pipeline.
5. There could be benefits from the partial privatisation of Genesis, but there would be more benefits from a full privatisation.
6. The Ministry of Economic Development could provide greater analysis of the gas industry data to assist industry participants in understanding current conditions and future trends. The Ministry could also play a greater role in developing and recommending policy for the gas industry.
7. Electricity generators are expected to locate new gas-fired electricity generation facilities nearer to the gas fields such that they do not need to use the Vector transmission system.

8. The Commerce Commission's proposed general regulatory framework seems to conform to international best practices.
9. The Commerce Commission should evaluate whether its package of current and proposed regulations is adequate to permit regulated companies to invest in new pipeline facilities.
10. If pipeline investment is considered to be necessary, some alternative to a weighted average price cap will be required to provide the incentive for companies to invest. A revenue cap could be a solution to this problem.
11. The Commerce Commission should consider using a measure of inflation in its weighted average price cap and revenue cap methodologies that better reflects the costs confronted by the regulated companies and the change in the replacement cost of their assets.
12. The Commerce Commission needs to consider whether pipeline companies will have adequate cash flow to maintain the credit rating that is assumed in determining the allowed rate of return.
13. The Commerce Commission should consider offering companies the possibility of reverting to the default price-quality path after they apply for a customised price path.
14. The Commerce Commission should consider reaffirming exactly what would be considered in the analysis leading to the possible establishment of a customised price-quality path.
15. If new pipeline investment is required, some form of revenue cap, such as is proposed for Maui, with enforceable prices, might be required for Vector to be able to invest.
16. The Commerce Commission should consider valuing pipeline assets using the methodology that led to the 2005 valuations.
17. The Commerce Commission should reconsider its rate of return determinations to be certain that the allowed rate of return is sufficient to permit the regulated pipeline companies to attract new capital.

18. The Commerce Commission should consider simplifying the proposed default price-quality path methodology and taking steps to reduce the risk inherent in the regulations.
19. The Commerce Commission should consider eliminating the asymmetric treatment of rates and revenues when regulated companies are sold and the purchased asset values are different from the regulated asset values by using the regulatory asset base, depreciation, and tax liability for the company that was sold.
20. The Commerce Commission should consider steps to bolster the industry's perception that it will honour its side of the regulatory bargain before, during and at the end of the term of the price regulation.
21. There does not seem to be any prospect or need for a spot market for gas in New Zealand.
22. The prospects for gas storage in New Zealand are limited.