



**New Zealand Petroleum Summit 2013**

**Taranaki Gas Infrastructure – getting your product to market**  
**Steve Bielby – Chief Executive**  
September 2013

This topic was suggested to conference organisers as a way of bringing together a number of current themes/issues, by reflecting on the Taranaki experience and looking forward to new regions/basins.

Focus is unashamedly downstream gas – follows Government and industry focus on upstream investment.

*Taranaki gas infrastructure and getting your product to market* is an interesting story on its own, but there are two strategic themes that Gas Industry Co is thinking about:

- ongoing upstream investment (and the whole value chain through to consumers) relies on a healthy New Zealand gas market; and
- Government and industry are focusing on upstream investment, but “are we ready for a significant next discovery”.

And its also an opportunity for me to sneak in some governance and regulatory themes that need to be part of future developments.



**Slide 1: Quick reminder of underlying natural gas infrastructure and how/why it evolved.**

**Click:** Kapuni field and associated pipelines – developed from 1969 and heralds the new era of natural gas supply in New Zealand. Pipelines running north to Auckland, south to Wellington and link to New Plymouth. Servicing the nine natural gas companies – the original Kapuni 9 (or K9) – following a government decision to use this resource as a premium fuel and replace aging, commercially fragile coal gas manufacturing plants.

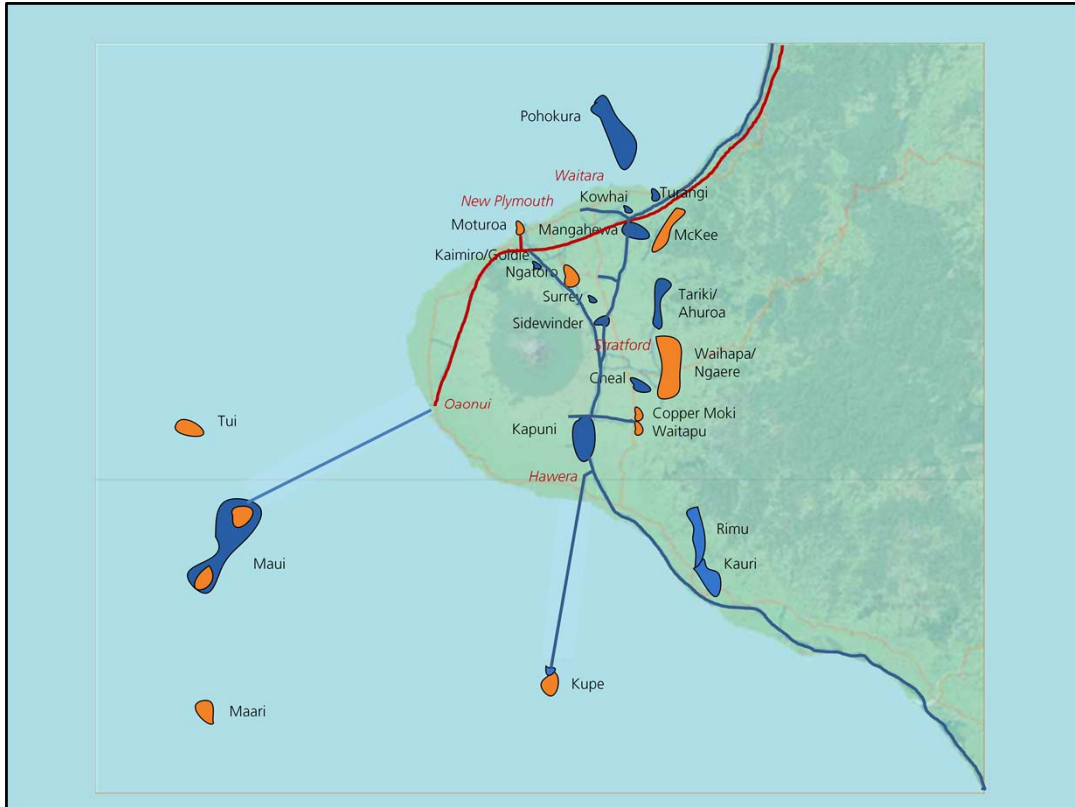
**Click:** Maui field and pipeline - discovery and development of the Maui field, opened up greater opportunities for gas utilisation. The 34-36 inch Oaonui-Huntly Maui pipeline had the capacity to transport much greater volumes of gas.

**Click:** North Island (Vector) transmission system - which enabled gas availability to be extended to service major industries throughout most of the North Island. And as the transmission system expanded new local area distribution systems were installed to service smaller commercial and residential consumers.

**Click:** Subsequent small transmission reinforcement/looping - over time, deliverability was further enhanced through reinforcements at various parts of the transmission system. No significant transmission expansion has occurred since this construction burst in the 1980s, and this infrastructure framework, until recently, has largely satisfied market demand.

**Click:** Highlight Taranaki for discussion on speech theme - *Taranaki Gas Infrastructure: Getting your Product to Market.*

The Government had a key role in developing the infrastructure. Private companies discovered the fields, but Government investment and involvement in developing the fields (eg: half ownership of Maui) and infrastructure (eg: Kapuni gas treatment plant and pipeline system through NGC -now Vector) – more on this later



**Slide 2: Taranaki Gas Infrastructure. Slide builds to show how this has naturally developed to support new industry and changing industry dynamics**

**Click:** Moturoa - Oil and gas presence in Taranaki known since Moturoa field drilling in 1865.

**Click:** Kapuni field - it wasn't until 105 years later that the Kapuni field came on line and allowed natural gas to flow north and south and open up a new world for existing and new gas consumers..

**Click:** Maui field - as mentioned, the industry was given a tremendous boost with the Maui discovery, which was the dominant force in gas supply for the next two decades,

**Click:** Current producing fields - with the decline in Maui gas production the industry has transitioned to supply from multiple smaller fields – at latest count there are 15 supplying gas into the New Zealand market – and Pohokura now holding the largest producer title.

**Click:** Tui and Maari fields - but we can't forget that any discovery has to meet the commercial acid test. So while Taranaki has continued to yield new finds, there are reminders that oil is the primary target for explorers. So we have offshore discoveries like Tui and Maari where the level of associated gas production doesn't justify the cost of getting it to market – so the gas is flared or used for operational purposes. We're also reminded of the history of the Kupe field – 22 years from the discovery to the start of production – reflecting the challenging geology, even in Taranaki, and finding the optimum production and engineering solution in an environment of comparatively cheap Maui gas that was still meeting more than the market needed.

And the discovery of large quantities of gas triggered the development of new industries...



**Slide 3: Gas-fired power stations appear**

First, the ability to generate electricity using gas in thermal power stations added a new and important dimension to New Zealand's electricity generation capabilities. It started with the now-closed New Plymouth station, and has been followed by co-generation plants and combined cycle technologies, such as the TCC, and more recently the modern peaker plants of Contact and Nova at Stratford and McKee.



**Slide 4: Ahuroa gas storage facility.**

**Click:** And also new, and a first in New Zealand, Contact's Ahuroa gas storage facility which has added flexibility to gas resource management.



**Slide 5: Other gas-fired power stations.**

**Comment:** While this presentation is focused specifically on Taranaki, it's important to also reflect on the wider gas picture. Here, we are reminded that the move to gas-fired power generation has not been limited to Taranaki, but in fact includes major power plants at Huntly, Otahuhu, Southdown, and a cogeneration plant providing steam and electricity to Fonterra's Te Rapa factory.

The Whirinaki plant was established in Hawke's Bay as reserve backup in 2004 in response to the 2003 electricity shortage. While it is diesel-fired, it actually consists of open cycle gas turbines. The plant was originally owned by Government and was built and operated by Contact, which bought it in 2011. Its noted here as options for its future include converting the turbines to run on gas, either where they are, or relocating them an alternative site closer to the demand base.





**Slide 6: Petrochemical plants appear.**

Second, our domestic gas discoveries triggered the development of a substantial petrochemicals industry – providing feedstock and process fuel for methanol and ammonia/urea manufacturing plants.

Methanol production in particular acts as a swing consumer, adjusting gas take to reflect field production fluctuations, as well as international methanol market conditions.

Also important is the reality of competing in international commodity markets. Periods where New Zealand methanol production has been mothballed – but, assisted by complementary development of gas production, notably Mangahewa, Methanex is now in a position to recommission all methanol production units at Motunui and Waitara Valley.



**Slide 7: LPG infrastructure appears.**

We have also seen the emergence of a fully-fledged domestic LPG industry. It has seen an LPG pipeline built from the Oaonui production station to Port Taranaki, the development of sophisticated LPG production and handling at Kapuni, Kupe and more recently Todd Energy directing Pohokura gas through a new LPG processing facility at its McKee production station.

Also notable, as NZ contemplates potential for LNG export associated with a future significant find, is the existing LPG import/export capability and link to international pricing.





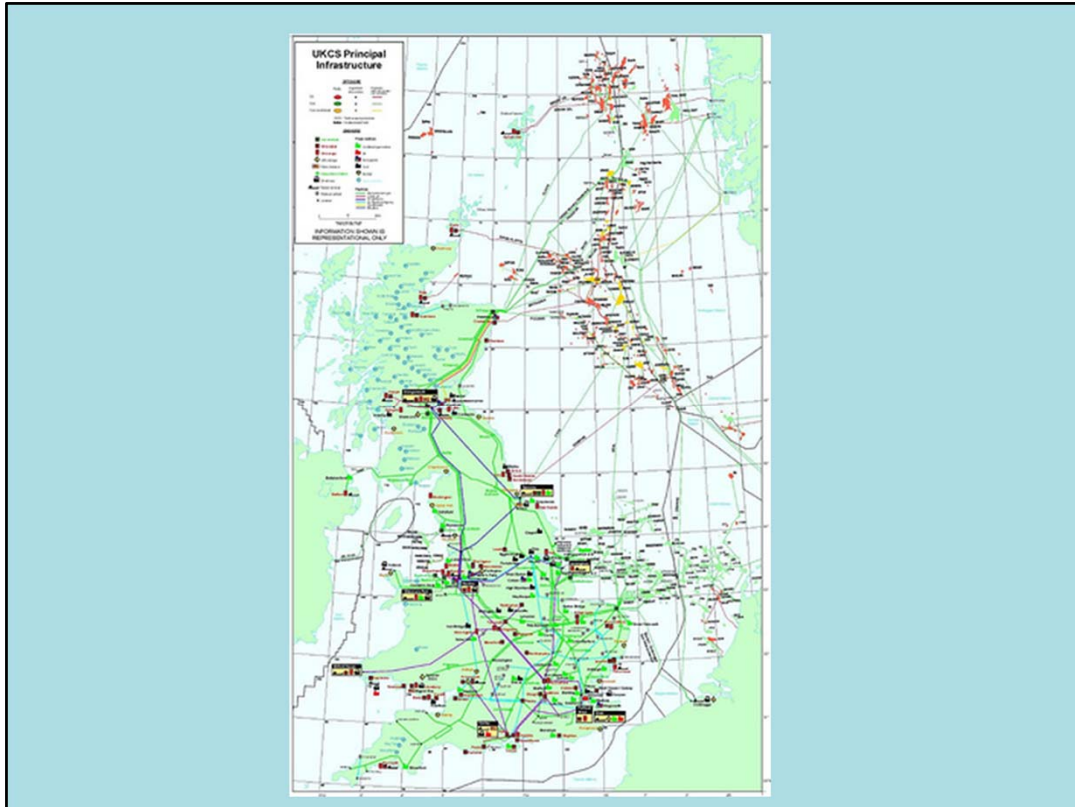
**Slide 8: National LPG infrastructure**

As with gas fired power generation, the LPG infrastructure extends well beyond Taranaki – in fact its New Zealand wide.

It includes substantial purpose-built storage depots and a network of road, rail and sea transportation that are the core of Liquigas’ operations, and which support the New Zealand domestic market.

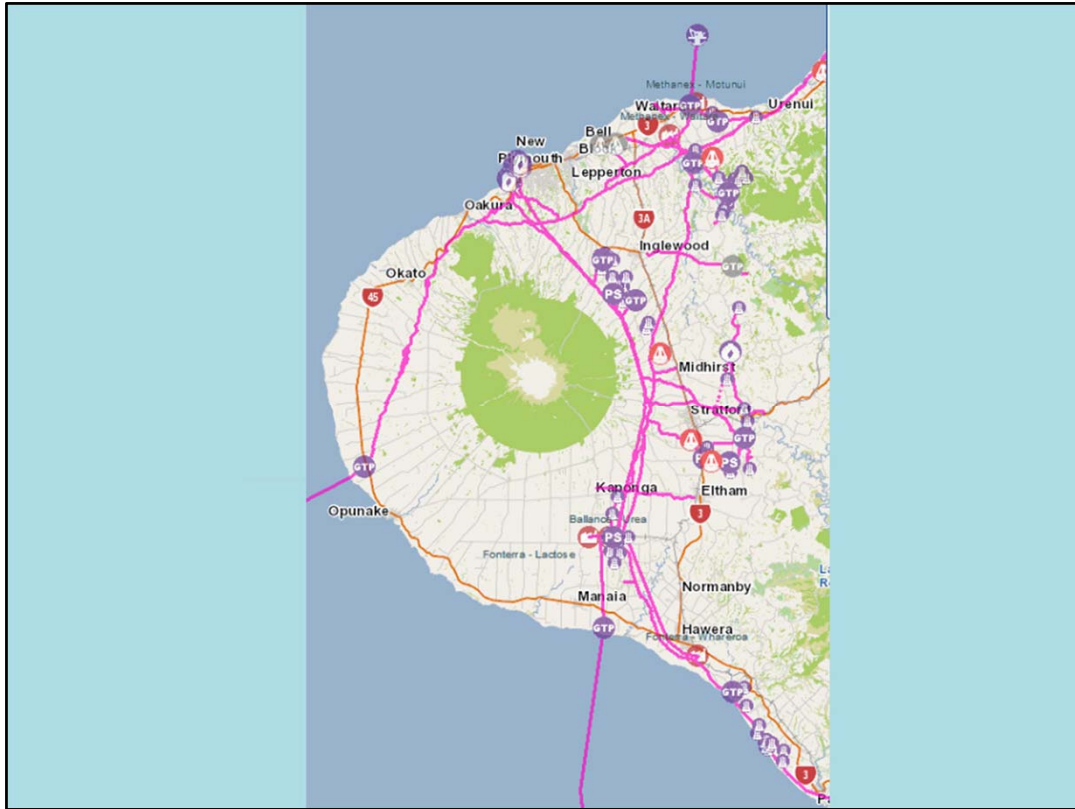
In addition energy retailers have significant bulk and bottled LPG operations, and the delivery infrastructure includes reticulated LPG networks in parts of the South Island.

Over time we have seen changes in LPG wholesaling arrangements, especially a different role for Liquigas.



**Slide 9: Infrastructure access principles and arrangements**

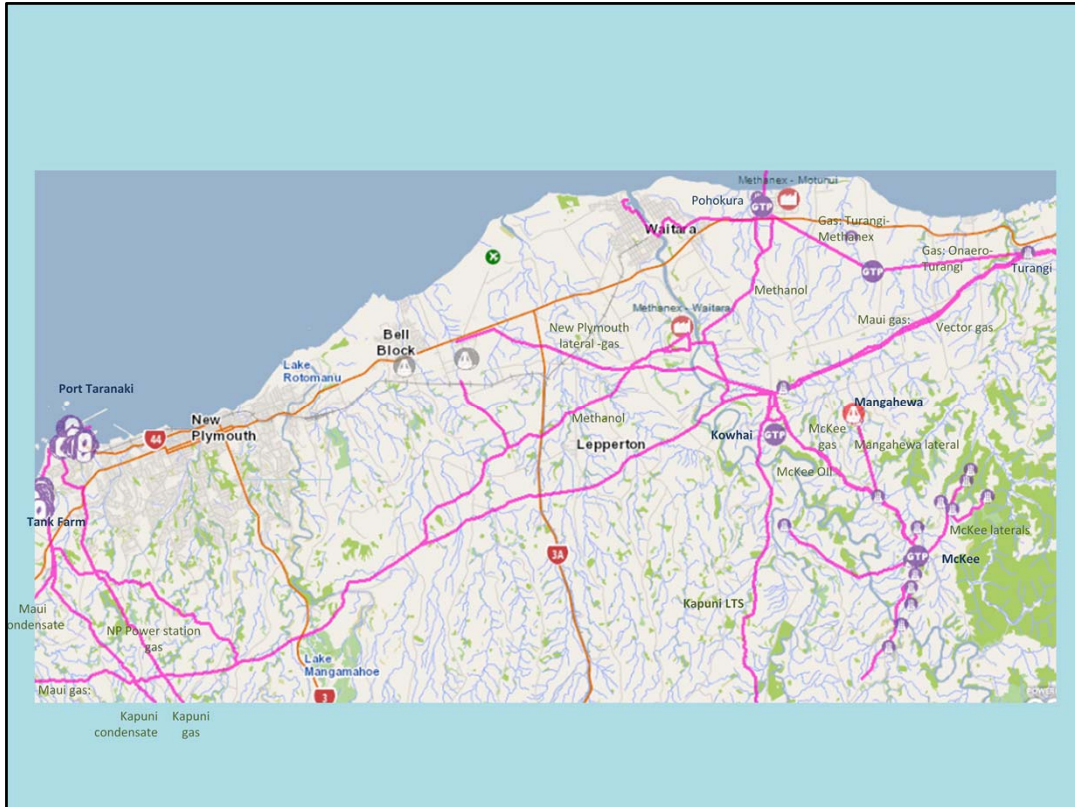
- Slide shows the complexity of physical gas infrastructure arrangements in the UK/Europe.
- Point is that the associated governance and regulatory arrangements reflect that complexity.
- Globally, there is tension between investment/ownership of own infrastructure and giving reasonable access to others.
- There is no direct 'open access' law in New Zealand. It is achieved more through the Commerce Act 1986, which strengthened competition law and outlawed use of a dominant position.
- In other countries, infrastructure access is legislated.
- For example, many jurisdictions have an Essential Facilities Doctrine. US origins, but widely applied including UK, EU, Australia, South Africa.
- Aimed at natural monopoly facilities, and requires the owner to share the facility with other parties on fair terms.



**Slide 10: Access arrangements for key infrastructure - Taranaki equivalent**

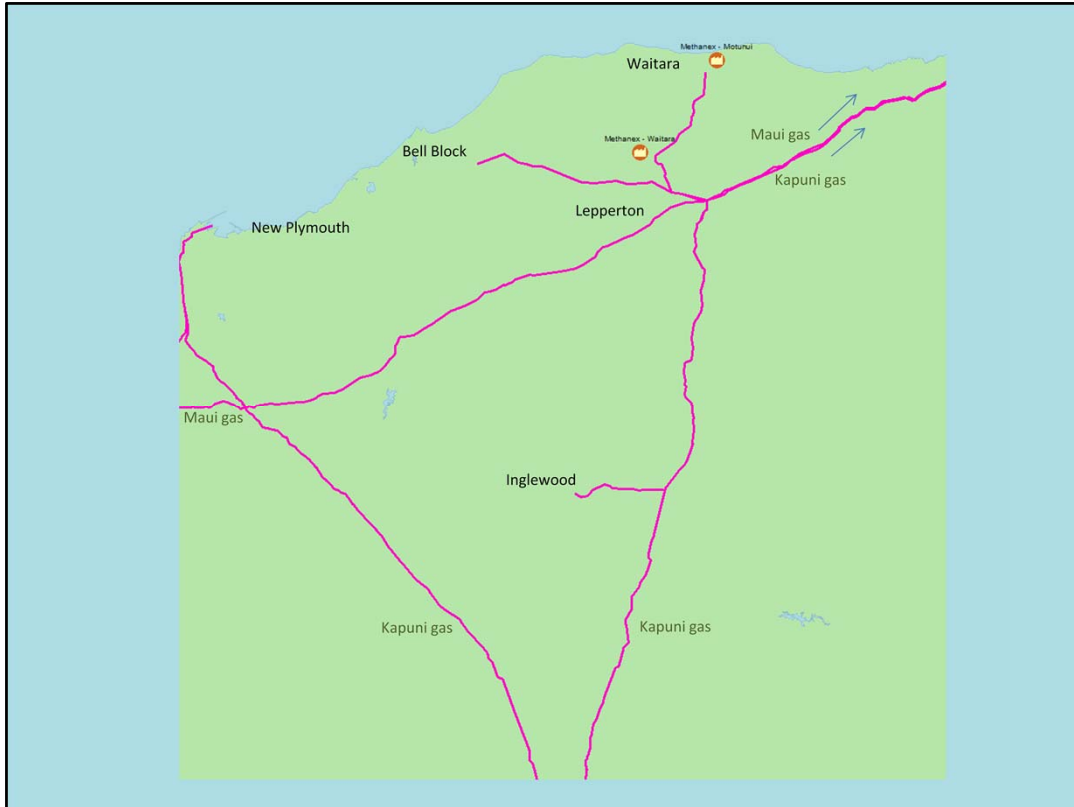
**Reference Map courtesy of Asset Space, an energy infrastructure package developed by Freeman Media/Energy News.**

- Main point – NZ infrastructure is not as complicated!
- Infrastructure built up as new discoveries developed and brought on stream.
- We have also developed less complex governance and regulatory arrangements
- Has generally been successful to date, but for the future??



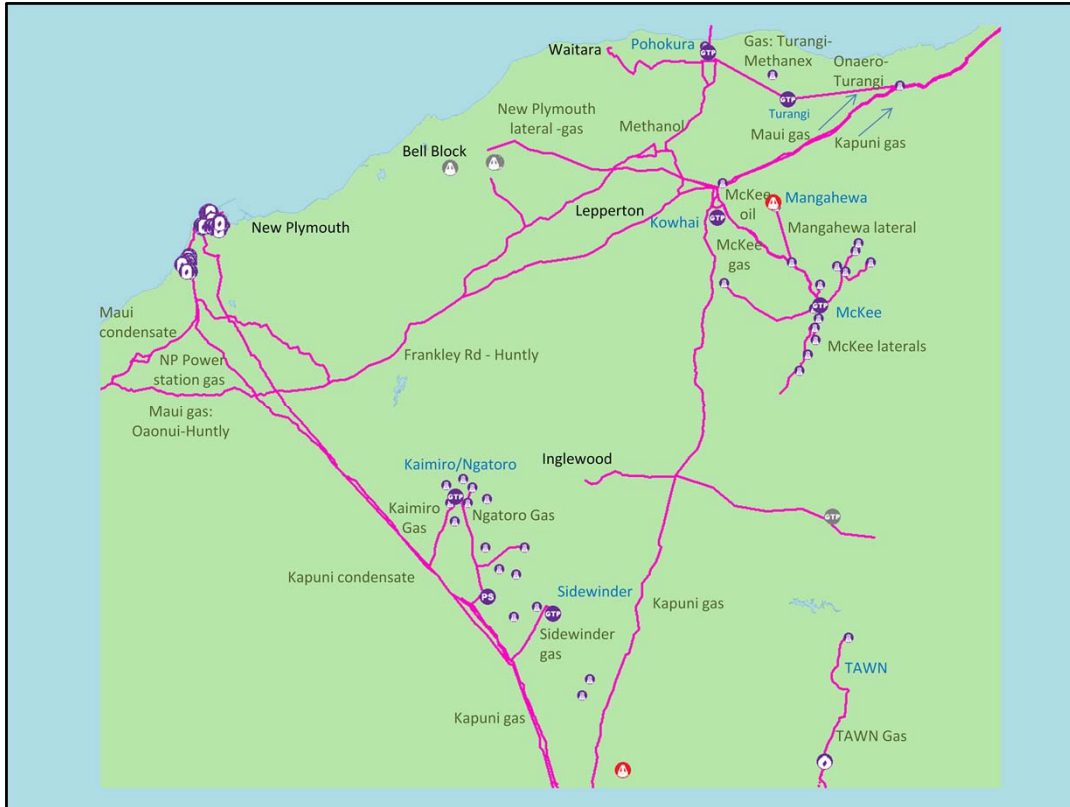
**Slide 11: Access arrangements for key infrastructure - closer look at North Taranaki pipelines**

Comment: Includes product lines, such as oil, condensate and methanol. Complex of gathering lines as wells are fed into a central production station, and dedicated gas supply lines linking field production stations directly with major users (eg: Pohokura-Methanex)



**Slide 12: Access arrangements for key infrastructure - more simplified view of North Taranaki – showing only open access gas lines (Maui and Vector)**

- An example of governance arrangements (and whether we might ever need to develop these) is open access arrangements for transmission pipelines
- All transmission pipelines are ‘private’ in the sense that there is no Government ownership and pipeline ownership resides with private companies.
- The transmission pipelines comprise open access and non-open access lines (with these non-open access pipes sometimes referred to as ‘private’ lines”).
- Those that are available for access by third parties are the Vector and Maui lines, which represent the vast majority of pipelines delivering gas directly to some large consumers, and into the local distribution networks that supply industrial, commercial and residential consumers.
- Note that this and other maps don’t show the local distribution networks – which are an important part of the total oil and gas infrastructure.
- The majority of distribution networks in Taranaki are owned and operated by Powerco and are available for third party access.



**Slide 13: Access arrangements for key infrastructure - Overlay of gas and product lines that are essentially not open access and exempt from the Part 4 provisions of the Commerce Act.**

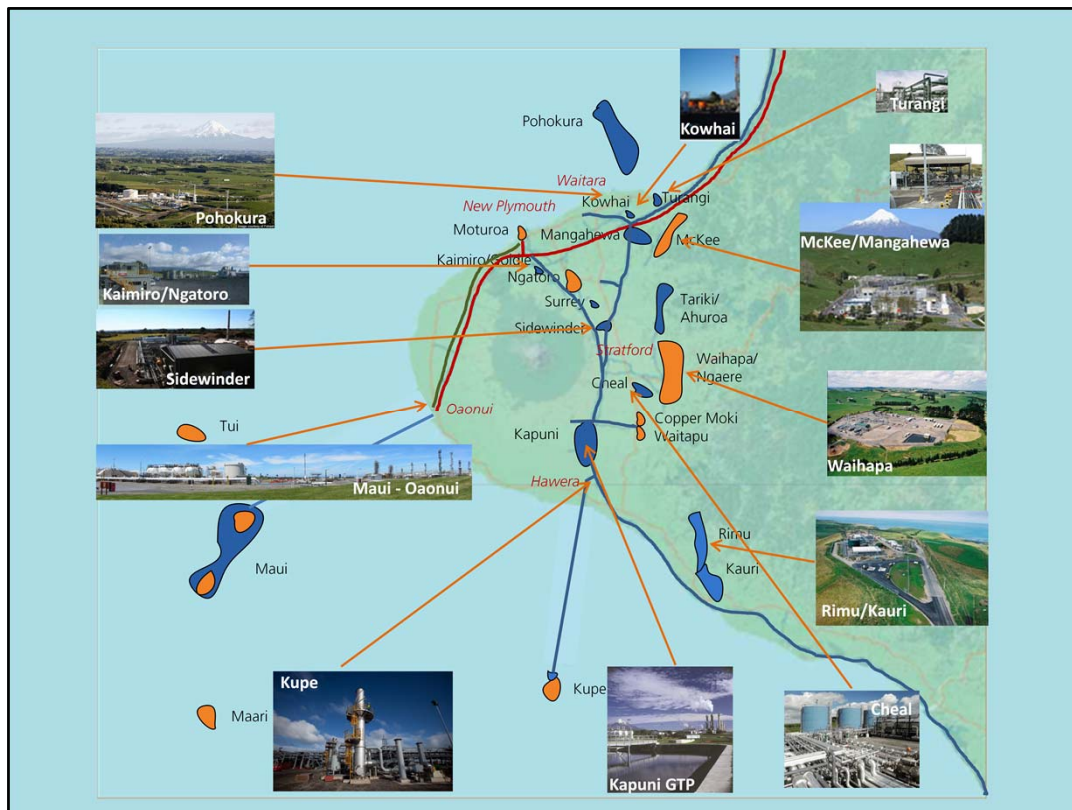
- There are a range of non-open access “private pipelines”.
- Includes TAG’s Sidewinder discovery which has been tied into the Vector transmission system.
- Outside of this particular view is TAG’s Cheal field, which was more recently connected into Vector system.
- Gas Industry Co is under an obligation to the Minister of Energy and Resources to assess interconnections. Access includes an ability to interconnect with the existing lines – either to inject new gas, or for offtake at new delivery points.
- GIC has been monitoring new connections at request of the Minister – so far have looked at Sidewinder and Cheal, and are about to look at interconnections associated with new wholesale trading platforms.
- We have found that interconnection arrangements are consistent with guidelines, and have identified nothing to suggest that this type of access is presenting a barrier to entry.
- The guidelines don’t apply to non-open access private pipelines, or to other, often special purpose or dedicated lines, that are specifically exempted aspects of the Gas Act.
- There have been a few discussions about third party access to private pipelines over years, but none has become a significant dispute nor led to serious suggestions about an access regime.





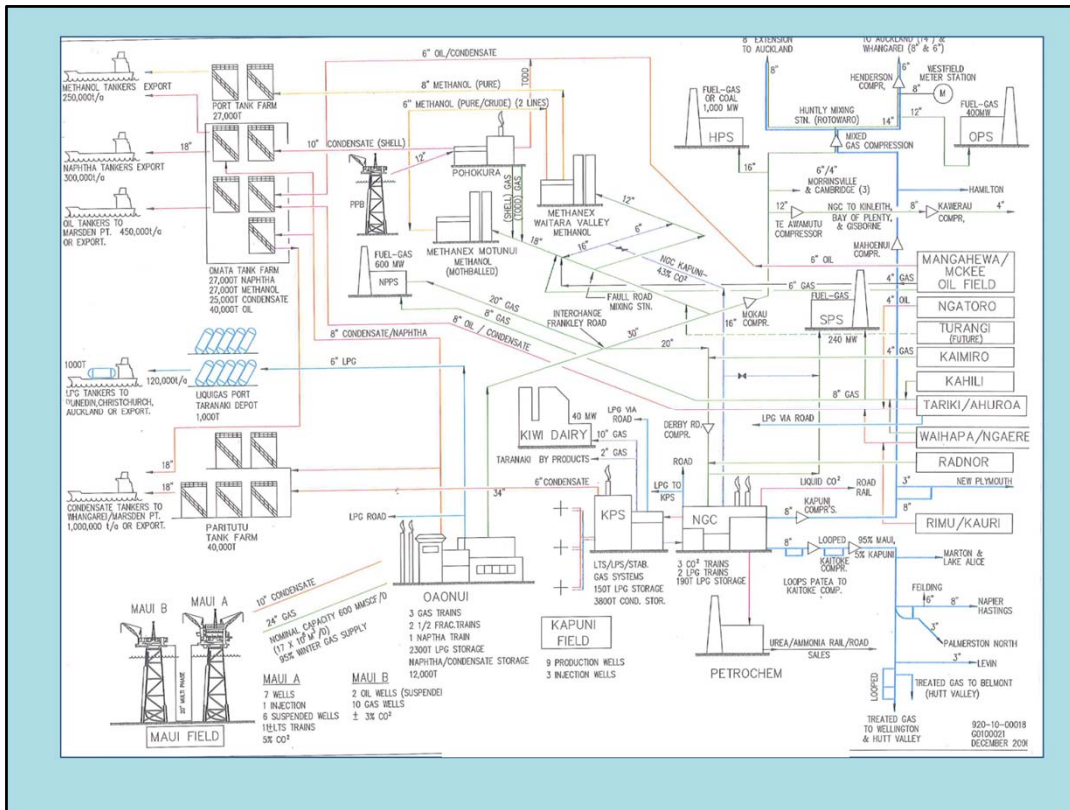
**Slide 14: Access arrangements for key infrastructure - Simple view of overall pipelines in Taranaki.**

- Open access arrangements were developed by the industry players voluntarily, and without the need for regulated access – although there was some political nudging especially with the Maui line.
- Its interesting to look at the various phases in developing open access arrangements:
  - In 1992, there was price unbundling following reregulation
  - Vector (then NGC) system open access 1996. Operated under Pipeline Code from 1998, until replaced with VTC in 2007
  - Three years for arrangements to be completed for Maui gas pipeline to become open access in 2005.
  - Currently reviewing transmission capacity allocation arrangements in light of changing market conditions.
- On ‘private’ pipelines, many are specifically excluded from Part 4 of the Commerce Act, and Gas Industry’s advised the Minister in 2010 that private pipeline owners are deemed outside the provisions of the voluntary Transmission Interconnection Guidelines.
- Where private lines run parallel to an open access network, we don’t see significant issues. However, there is recognition that issues can arise where there is no parallel open access network and the private network is the only means of supply end users.
- So no current experience/rationale supporting an access regime, but should it be part of preparation for future new gas finds?
- **Click:** Discuss LTS line. Initially built to provide carbon dioxide-rich feedstock gas for the Synfuel plant. Use changed and there was a prospect, raised by then NGC when it was floating a gas gathering proposal, for this line to be reversed flowed to bring raw gas from new discoveries to the KGTP.



**Slide 15: Access arrangements for key infrastructure - Gas processing plants**

- It is a similar story with gas processing plants. The New Zealand experience has been that these are generally built in conjunction with the development of new fields and are tailored to the size, wellstream composition, and current and predicted production characteristics of that field.
- The 2004 Government Policy Statement on Gas Governance saw access to processing facilities as a potential barrier to entry as production from the Maui field declined and New Zealand became more dependent on supplies from multiple smaller fields with potentially shorter production lives.
- GIC has also been monitoring the potential for gas processing access issues through a fixed-term regulated information disclosure regime introduced in 2008 and due to expire in June next year.
- Our assessment has shown that where third party access is required it is achieved and governed through commercial bilateral contracts.
- Our monitoring of processing facility access has not identified any entry barrier or other issues and we have recommended to the Minister that there is no need for permanent regulations, and the temporary regime should lapse upon its expiry next year.
- As a general observation, for commercial and productive efficiency reasons gas processing plant owners with spare capacity could be expected to welcome opportunities to toll third party gas. An example is NGC's plan in 2004 to establish a gas gathering network centred on its Kapuni gas treatment plant to tie small gas discoveries directly into the KGTP, thereby making more efficient use of the plant while avoiding potentially unnecessary development costs for marginal fields.
- Its interesting that this proposal did not attract any takers, including the Kupe field owners, perhaps reinforcing a preference for field independence.



**Slide 16: Showing complex web of Taranaki infrastructure.**

- Previous slides have highlighted key elements.
- The total story, including interconnections, is complex.
- Discuss the current extent of infrastructure – including fields, production stations, processing facilities, pipelines – gas, liquids, LPG, and special purpose (eg: LTS line), storage (oil, condensate, LPG, methanol). Note some lines open access, others private, or dedicated (eg: gas lines feeding petrochemical plants, and power stations).

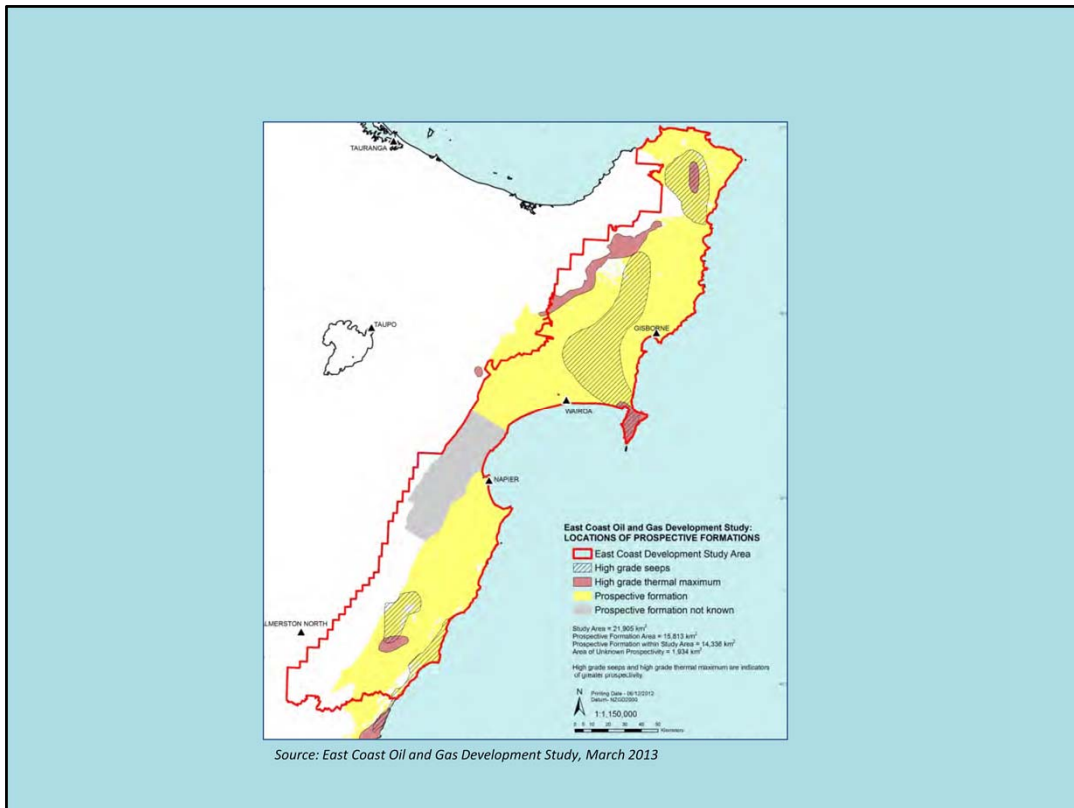
**Commentary points:**

- Infrastructure has evolved with demand growth.
- These developments have occurred from natural commercial imperatives. No need to for Government, regulatory demands for it to be put in place.
- Looking to future, no reason to suspect the same won't happen.
- Reference past examples of search for creative solutions – example is the NGC gas gathering initiative.



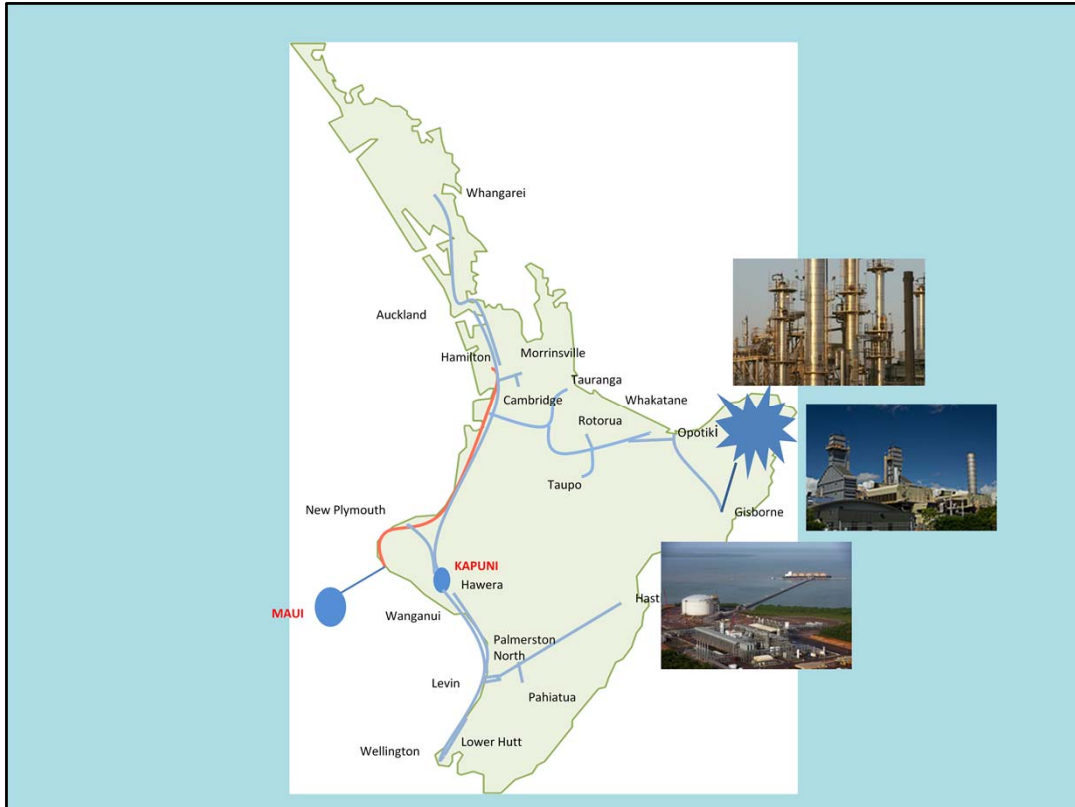
**Slide 17: Government's role in getting to this point...**

- The Muldoon government had a significant hand in the industry development discussed above. What should be the role of government going forward?
- Kapuni and Maui discoveries by private companies – but no significant gas market. Governments of the day saw wider national benefits and took direct approach.
- Kapuni: Government decided use of natural gas as a premium fuel to replace old town gas plants making gas from coal. Formed Natural Gas Corporation as a Government owned company to own and operate the Kapuni gas treatment plant and pipelines to Auckland and Wellington.
- Maui: Government took direct ownership stake of 50% through Offshore Mining Company and underwrote gas production through a take or pay sale and purchase arrangement.
- Government also set up its own exploration and production operation through the then Ministry of Mines , then consolidated all of its direct interests into a new wholly owned company Petrocorp. Petrocorp in turn took a 51% interest in the Waitara Valley methanol plant with Canadian company Petralgas as the minority owner. That plant now is part of Methanex's operations and is about to be restarted after several years in mothballs.
- Government also had a separate direct interest in what was the synthetic petrol plant at Motunui, which converted gas into methanol then into petrol. The petrol conversion was relatively short lived and after a couple of ownership changes the plant is now Methanex's main methanol production facility in New Zealand.
- In the late 1980s, the Government began a process of exiting its direct interests, and all gas-related operations are today in private ownership.



**Slide 18: How does the Taranaki experience inform in the future?**

- Experience with the gas and broader energy developments in Taranaki is instructive as we cast our minds to the future – especially if there’s a gas bonanza in another part of the country.
- The East Coast serves as a good example – especially as it was the subject of a recent (March 2013) oil and gas development study involving MBIE, and eight local councils in the East Cape, Hawke’s Bay region.
- In assessing the potential benefits and impacts of developing an onshore oil and gas industry there, it draws heavily on the Taranaki experience.
- It’s not my intention to speculate on the chances of a major discovery in the East Coast, what it might look like, or exactly where it might be found, but it has both conventional and unconventional prospects and it’s informative to note comment by New Zealand Energy Corporation ‘ - which holds permits in four areas of the East Coast – of it having “vast potential, with shale beds of up to 600 metres thick.”



**Slide 19: Potential options for a big East Coast gas find**

**Comment:** But it is interesting to take a hypothetical look at potential options of what to do with a big gas find on the East Coast.

**Click:** For example, it may warrant an LNG plant development for export markets.

**Click:** How about a gas-fired power station – although, like Whirinaki, an East Coast location may not be the optimum for a new power plant ...

**Click:** Maybe it could attract the attention of, say, Methanex, as an opportunity to build a new methanol plant?







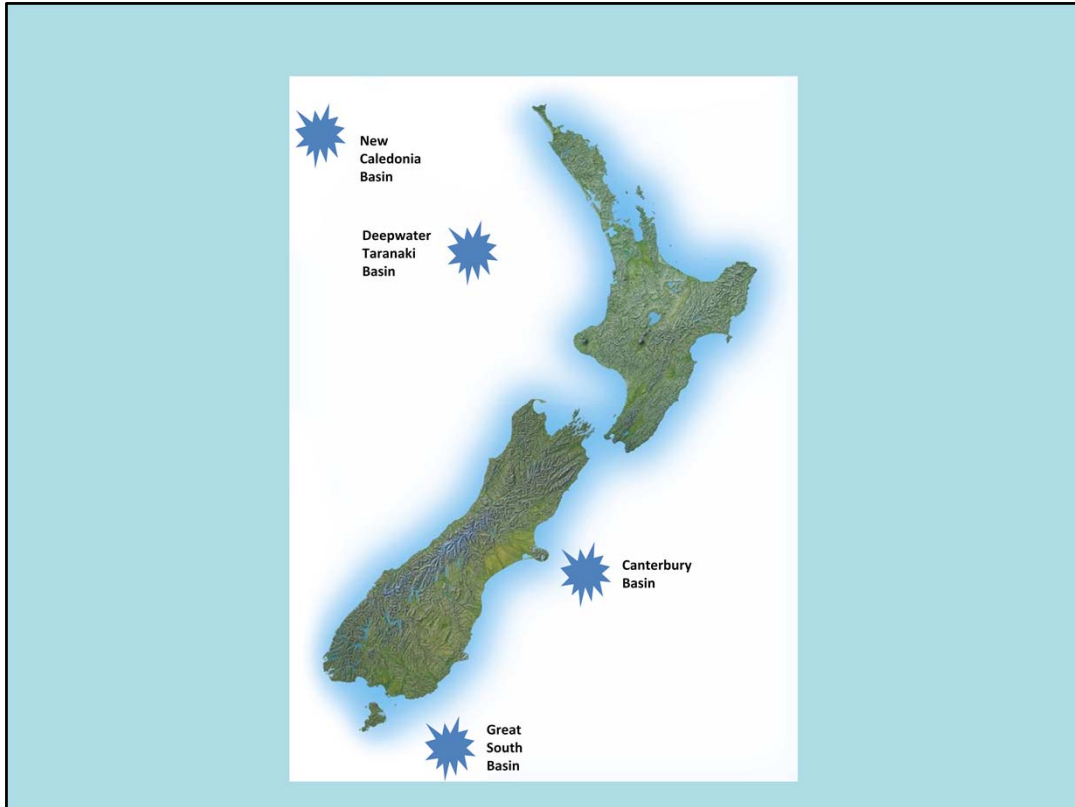
**Slide 21: Potential options for a big East Coast gas find – new pipeline to Auckland?**

If the existing line is too small – particularly through the Waioeka Gorge - how about building a totally new pipeline to plug directly into Auckland?



**Slide 22: Potential options for a big East Coast gas find – feed back through the Hawkes Bay line?**

We know the Waioeka Gorge is a pinch point that may not accommodate large volumes. Could East Coast gas be routed south through a reverse-flowed Hawke’s Bay line. This was mooted in the late 1990s (1998) when Westech Energy recorded a gas flow from its Kauhauroa well near Wairoa and was looking at what sort of market there was for it, and how to get it there.



**Slide 23: Potential options for a big East Coast gas find – feed back through the Hawkes Bay line?**

- But future prospects lie not just not on the East Coast of the North Island.
- There continues to be significant explorer interest, and activity, in the Canterbury Basin, the Great South Basin and more remote deepwater plays in the Taranaki Basin. Also, there's been recent news of interest in the New Caledonia Basin, well to the west of the northern New Zealand.
- Development of any major finds in these areas will present significant challenges – but challenges which New Zealand will undoubtedly be pleased to have the chance to grapple with.



#### Slide 24: Government role in today's world

- Today, New Zealand governments don't build pipes or underwrite gas contracts any more.
- The expectation is that investment will continue to be in the hands of the private sector.
- But there will certainly be discussions between Government and a producer. And is interesting to consider what could be in the mix, especially if help or incentives suggested to achieve a better option for NZ:
  - as in Australia – 'reservation policy'?
  - regulatory holiday or similar certainty for infrastructure investment (as in Crown fibre)?
  - financial incentives – eg: tax/royalty treatment?
- The extent, if any, of Government involvement may depend on the size,, timing and development/production economics of the discovery.
- If the economics are positive, it is likely Government involvement will be unnecessary and the discoverers will proceed alone (eg: like Kupe, Pohokura).
- Challenges may arise if the economics are marginal or sufficiently negative to dissuade private enterprise, but nonetheless represent a resource that the Government of the day sees as being in the national interest to develop. This may be particularly so if current producing fields supplying the domestic market are in decline
- However, it is hard to see government taking a direct investment approach as happened with Maui, or establishing a new SOE to run with infrastructure development and operation, as occurred with the formation of NGC in the Kapuni field context.



### Slide 25. To Recap

- This is the NZ Gas Story publication – more background detail in there.
- Focus on Taranaki helps us look forward, especially:
  - how do we maintain/grow a healthy domestic gas market that supports Government policy and upstream investment
  - teases out 'are we prepared for a significant new find'
- Key themes:
  - industry rather than regulation has led infrastructure development
  - Government will have a key role, but not the same as in the 1970s
  - there is an ongoing drive to bring new discoveries to market
  - the Taranaki story reminds us that existing New Zealand market was given a big Government underwrite, but has transitioned to private hands
  - that includes transmission and other governance arrangements developed by industry
  - these have proven to be fit for purpose in the small New Zealand gas market and industry should work to retain the confidence of Government and consumers in governance going forward
  - Government will have a key role to play. It will be different to the Muldoon/Birch role, and it is helpful to think about what Government and industry discussions can take place regarding a next significant gas find that would best incentivise investment and get the best overall outcome for New Zealand.