Macro gas issues

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These last 15 years have been a roller coaster for New Zealand’s gas market

What factors are likely to determine the future gas outlook for New Zealand?
It’s all about supply and demand

Upstream
- Why gas & oil are tightly linked in New Zealand
- Why a flexible downstream matters for the upstream

Downstream
- How global factors will drive NZ’s gas market
- Why downstream flexibility may be more limited
Changes in gas reserves explains much of the price roller coaster

- Change in reserves a combination of two factors
  - upstream success
  - major downstream changes
Exploration effort is largely driven by the search for oil – not gas
Because oil can only be produced with the gas, the ability to commercialise associated gas is critical to the economics of upstream investment.
Without the petrochemical & gas-fired power gen sectors, New Zealand would have foregone $billions in petro revenues

But might the downstream sector be reaching limits, such that further upstream production will be constrained?

- The enabling role of the petrochemical & power generation sectors is to absorb the ups and downs of upstream success
Upstream
• Why gas & oil are tightly linked in New Zealand
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Downstream.
• What is the outlook for the main downstream sectors?
  – Petrochemicals: Methanol & Urea
  – Power generation
  – Industrial, commercial, and residential energy
Methanex is the most influential player in the NZ oil & gas sector

- Methanex is big: ≈ 45% of projected 2014 NZ production
- Methanex can vary its consumption

What drives Methanex’s production & pricing decisions?
Methanol is a global commodity whose price is closely linked to oil.
High world methanol prices $\rightarrow$ high ability to pay for NZ gas

So why aren’t New Zealand gas prices at these levels?
Methanex has a portfolio of international plants from which to choose where to produce Methanol.

Methanex is constantly seeking to optimise its global production decisions.
Methanex’s *willingness* to pay in NZ is driven by overseas gas prices

- Recently the US used to be an unattractive place to produce methanol.
- But the shale gas revolution has meant it is now a very attractive place.
- Methanex (and others) are rapidly increasing US production capability - including physically moving plants from Chile to Louisiana.
- Why pay high gas prices in NZ when it is cheap in the US?

Methanol production parity with cheap US gas is a key driver of NZ gas prices.
Methanex demonstrating the value of arbitrage...

US gas benchmark
However, as Methanex reaches full capacity, its ability to *consume* may be being reached.

- In the short term, likely to lead to softer gas price
- However, it is likely to suppress additional oil production & revenues
Could Methanex invest in a fourth production train?

• Unlikely...
  – Huge investment (≈ NZ$2bn)
  – Would require confidence in reserves to support investment over at least 15 years (≈ another Pohokura-size field)

• ...but not impossible
  – Always possible that significant new reserves could be discovered
  – LNG developments in US are expected to deliver sustained upwards pressure on US prices
Increasing LNG exports should progressively align US gas prices with ‘world’ gas prices.

- 6 LNG terminals already approved ≈ 25% global LNG demand
- Further terminals possible ≈ 50% global LNG demand
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Urea production is the other main petrochem gas user in NZ – albeit <10% of methanol’s size

- Dairy growth $\rightarrow$ NZ imports 2/3 of its urea (from Canada, S.E. Asia, & M. East)
  - High oil prices $\rightarrow$ high shipping costs
  - An opportunity for a new NZ plant?

- Two main issues:
  1. Insufficient reserves to underpin 15 year investment
     - But required new reserves $\approx \frac{1}{3}$ smaller than for a methanol train
  2. Efficient scale of modern urea plant is greater than NZ requirement
     - However, a NZ plant may be able to export to Australia.
Australia’s pain may be New Zealand’s gain

- Historically Australia has enjoyed low gas prices
- Recently, it has had even greater exploration success than NZ...
- ... but by exporting gas as LNG, it is *importing* world LNG prices
As an aside... what about the risk of NZ catching the “LNG disease”?

- Major exploration efforts in South Island, E. Cape & Taranaki
- Might an LNG-scale find mean we import LNG prices?
  - Although LNG probably good for overall economy, higher gas prices not good for NZ gas consumers
- But technology changes mean floating LNG production offshore is often now a preference
  → LNG-scale gas find (and associated prices) may never be connected with existing NZ gas market
- Even if LNG-scale gas is connected to onshore S. Island, unlikely to be economic to build a pipeline from Taranaki to S. Island
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  – **Power generation**
  – Industrial, commercial, and residential energy
Electricity demand has been in decline...

- The Christchurch earthquake, GFC, and closure of the Norske paper mill have all impacted on electricity demand from 2011.
- The future of the Tiwai smelter is casting a significant shadow on the sector.
There has also been significant growth in renewable generation.
Low demand + high renewables = the residual demand for thermal generation is reducing

Projection
The further displacement of Huntly coal may not be possible... ...because of our hydro stations!

- Might Huntly coal absorb further drops in demand for thermal gen?
- But extreme dry to wet hydro variation \( \approx 6,400 \text{ GWh} \) \( \approx \pm 8\% \) of demand \( \approx \pm 22 \text{ PJ of gas / coal} \)

- Swing of this magnitude would be expensive for the gas sector to provide... ...whereas a coal stockpile is comparatively ‘cheap’

→ Future thermal re-balancing may progressively fall on gas-fired plant
Reduced demand for thermal, and changing gas contract positions, means thermal generators are re-assessing their thermal fleet.

- Contact’s Gas ToP commitments are falling off.
- Increased contractual flexibility + increased physical flexibility from gas storage →
  - temporarily withdrawing its TCC CCGT; and
  - considering re-configuring its Otahuhu B CCGT to OCGT mode.
- MRP has also announced it is reviewing the future of its Southdown CCGT.
The current state of the NZ electricity market means Rio is effectively NZ’s second largest gas consumer.

Flat electricity demand + generation oversupply $\rightarrow$ 
$\Delta$ Rio demand $\approx \Delta$ gas demand

<table>
<thead>
<tr>
<th>Tiwai future</th>
<th>Reduced electricity GWh</th>
<th>Approx reduced powergen gas consumption (PJ)</th>
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<tbody>
<tr>
<td>Reduces to 400 MW</td>
<td>1,500</td>
<td>13</td>
</tr>
<tr>
<td>Completely exits</td>
<td>5,000</td>
<td>43</td>
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$\approx 25\%$ of 2013 gas production

- Reduced Tiwai output not only adverse for NZ economy in own right, but would materially affect NZ revenue from oil exports
- An opportunity for a deal to be done...?
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Other industrial, commercial and residential

• Slow rate of historic and future change.
  – Fuel switching driven by capital asset replacement cycles

• Future prospects generally good:
  – Dairy, horticulture, refinery, and steel
  – Gas generally best for process and water heating
  – GDP & population growth should increase gas demand

• Longer-term might other gas-intensive industries re-locate from Australia?
Summary – Generally positive outlook, but risk of some value being locked in?

- Petrochemical & power-generation sectors have been key enablers of NZ’s oil & gas sector, but...

- Methanex may be reaching its ability to take much more gas

- Power-generation consumption flat, or declining

- Insufficient reserves to justify new methanol or urea plant

- Soft prices for short-to-medium term

- Good for gas consumers...

- ...but, constraining future upstream production

  → Significant lost receipts to the NZ Treasury

What new options are there to unlock this value to NZ?
Thank you
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