Gas markets – emerging trends

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2 December 2015
"I see a woman with a very large, round nose ... Oh, wait, that’s my reflection. Let me try that again."
NZ gas sector closely linked to three key commodities
Oil and gas economics in NZ...

P50 Remaining reserves

- Oil
- Gas

$ value assumptions:
Gas price = NZ$6/GJ
Oil price = NZ$16.3/GJ
(@ US$70/barrel & NZ$/US$ = 0.75)
Oil prices are currently weak
Fundamentals point to gradual recovery

2014 - large supply capacity increase & weaker demand growth

2016 – 2020 Demand growth projected to modestly exceed supply expansion

Source: OECD/IEA 2015
Most forecasters predicting gradual price recovery
In the meantime, NZ has strong gas position

Remaining P50 gas reserves through time
~50% of NZ gas used to make petrochem products
Gas demand for petrochem has ramped up strongly
Methanol and oil prices

- USD/tonne Methanol
- USD/bbl Oil
Relative value of oil and methanol

Value of methanol (expressed in numbers of bbl oil equivalent)

- Value = 3.8

Energy equivalent

Meth more valuable

Meth less valuable
Methanol demand outlook

2005 – 2014 CAGR:
Energy: 12.2%
Total: 6.3%

2015 – 2018 CAGR:
Energy: 12.1%
Total: 7.8%

Source: Methanex Oct 2015

Source: Methanex Oct 2015
Methanol supply and demand outlook

- Estimated Demand Growth 2015 - 2018
- Committed New Capacity 2015-2018

New China Capacity (merchant)
- Methanex - G1 & G2
- Other Industry Participants

Sources:
* Demand: IHS Chemical, October 2015. Excludes integrated methanol demand for methanol to olefins and propylene.
** Supply: Methanex. “Other” is net of expected shut-ins outside China of approximately 0.7 million tonnes.

Fairway Methanol: 1.3
OCI: 1.8
Iran: 1.0
Russia, Libya: 0.9
Other, net: 0.5
Total: 5.5
Gas sector also affected by aluminium in NZ

2014 gas usage

- Power generation (attributed to Tiwai smelter): 23%
- Power generation (incl. cogen): 19%
- Petrochem (feedstock + energy) - excl. synfuel: 9%
- Reticulated: 49%

Aluminium production requires thermal fuel ~35 PJ pa
Aluminium prices have been weak since GFC
Aluminium demand outlook

- Demand growing at 6% pa since 2009
- Rising usage in developing economies
- Stricter environmental and energy policies
- Global demand projected to double in next 20 years
Aluminium – price outlook
Now lets take zoom in for some NZ ‘micro’ issues
Gas demand – flexibility matters
Rankine unit closure would increase need for flexibility

Flex from HLY /coal is 120,000 GJ/day

Equiv. to sizeable gas field
Flexibility also needed across dry/wet periods

Rankine-type duty projected at 10-30% capacity factor
Rankine closure – implications

• Sizeable market demand for low CF operation remains post 2018 - barring major demand change

• Multiple options exist to meet market demand

• Cost of options affected by:
  – Base cost of fuel
  – Premium for fuel storage/flex
  – Generation plant costs – opex and capex

• Broker reports indicate HLY+ coal is competitive – we concur

• Loss of HLY+coal would have significant implications for gas market
Residential customers – gas vs electricity

Hypothesis I

“The gas-killing utility is here”

• Increasing trend to all-electric households

Hypothesis II

“Electricity networks facing death spiral”

• Increasing use of solar PV + gas for space/water heating
Hypothesis I

Tech Δ makes power charge structures unsustainable

Higher fixed component in power bills

Dual fuel customers re-evaluate gas
Hypothesis II – gas facilitates new technology uptake

Household Energy Use

- Space Heating, 31%
- Water Heating, 28%
- Cooking, 6%
- Lighting, 9%
- Electronics and Other Electrical Uses, 15%
- Refrigeration, 12%
Typical seasonal shapes – electricity demand and PV

**Seasonal Household Demand & PV Output Profiles**

- **Elec demand (8000 kWh/yr)**
- **3 kW PV system generation**

![Graph](image-url)
Typical PV (3kW) and demand

- 6,600 kWh/year is needed from the grid.
Even larger PV (6kW)

- 81% of PV is exported;
- 6,300 kWh/year is needed from the grid/battery
Even larger PV (20kW)

• 92% of PV is exported, that's 27,000kWh/year, or more than 3 times the annual demand!
6kW PV with gas

Seasonal Household Demand & PV Output Profiles

- Battery required here
- Elec demand with gas (2,400 kWh/yr)
- 6kW PV system generation
- Electricity demand without gas

Illustrative
Conclusions

• Forces shaping the gas are increasingly dynamic

  – Global commodity trends

  – New technology

  – Environmental factors

  – Consumer preferences

“Interesting times”
Thank you
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