

Gas NZ Industry Forum

8 November 2017



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Outline

1. The big New Zealand energy picture
2. 2017 as generational change
3. NZ gas sector status & outlook
4. NZ LPG sector status & outlook

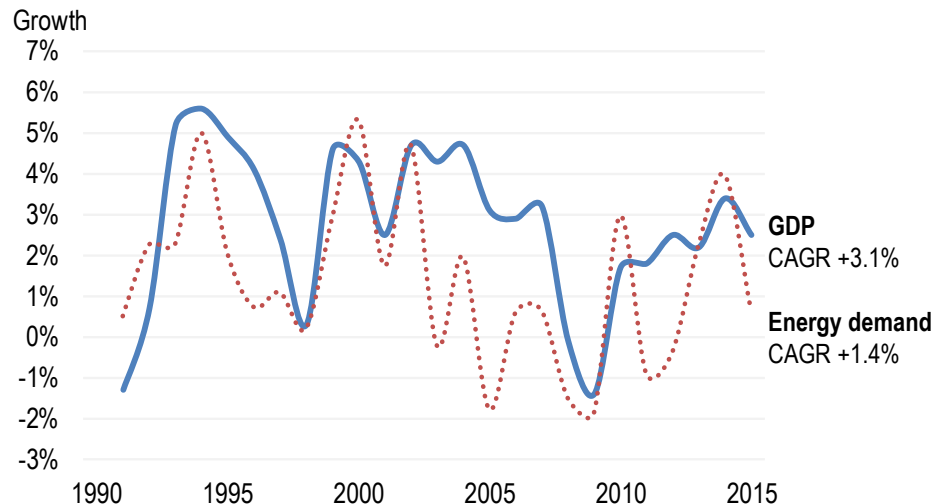
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The New Zealand energy context

Low underlying domestic demand growth now seemingly structural

NZ GDP vs energy demand



Source: MBIE, RBNZ, Woodward Partners

- Decoupling of energy demand & GDP growth a firm trend that pre-dates GFC
- Energy intensity of NZ Inc has fallen >25% since 1990
- Domestic market now defined by low underlying demand growth, with few material exceptions

The New Zealand energy context

Low underlying domestic demand growth now seemingly structural

NZ energy demand CAGR horizons

Sector	1990-2000	2001-2010	2011-2015
Primary	+2.7%	+1.5%	+2.4%
Industrial	+1.8%	+0.1%	+2.3%
Commercial	+1.4%	+2.0%	+2.6%
Transport	+3.3%	+1.2%	+1.1%
Residential	+0.9%	+0.3%	+0.2%
Total	+2.2%	+0.8%	+1.6%
GDP	+3.1%	+2.5%	+2.6%
Diff.	+0.8%	+1.8%	+1.0%

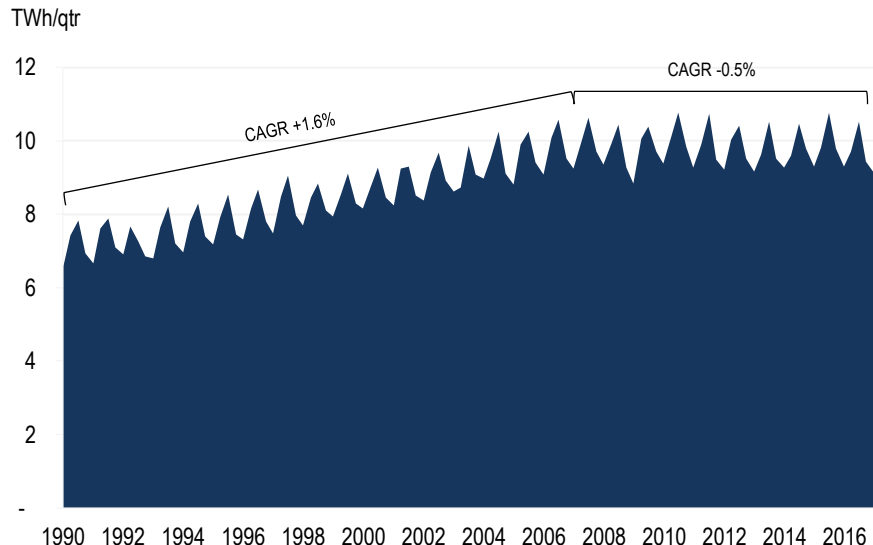
Source: MBIE, RBNZ, Woodward Partners

- Demand has seen substantial recent change as load growth has re-centred from mobile towards stationary energy.
- Agriculture and chemicals the largest contributors to underlying demand growth over the past decade. Growth in each however now appears increasingly constrained.

The New Zealand energy context

Low underlying domestic demand growth now seemingly structural

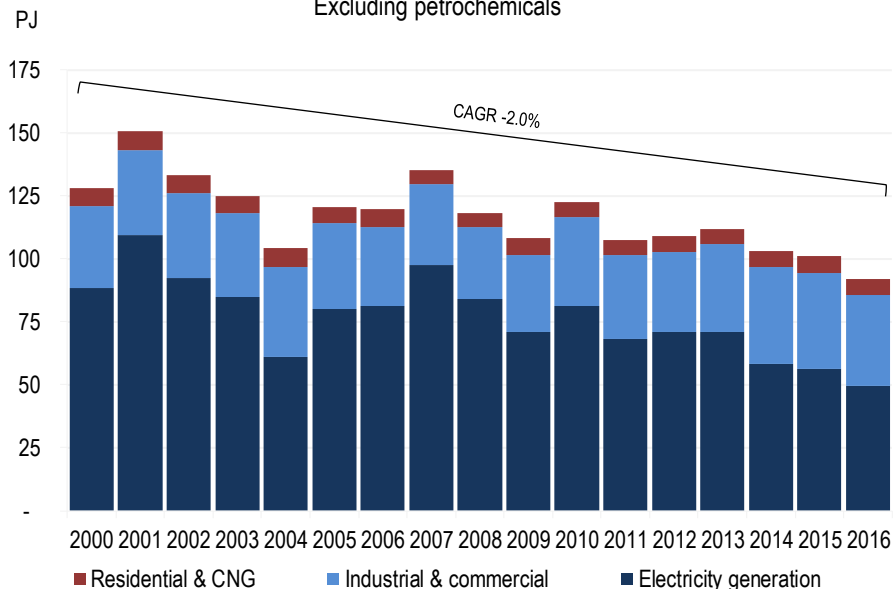
Electricity system demand



Source: EA, Woodward Partners

Gas system demand

Excluding petrochemicals

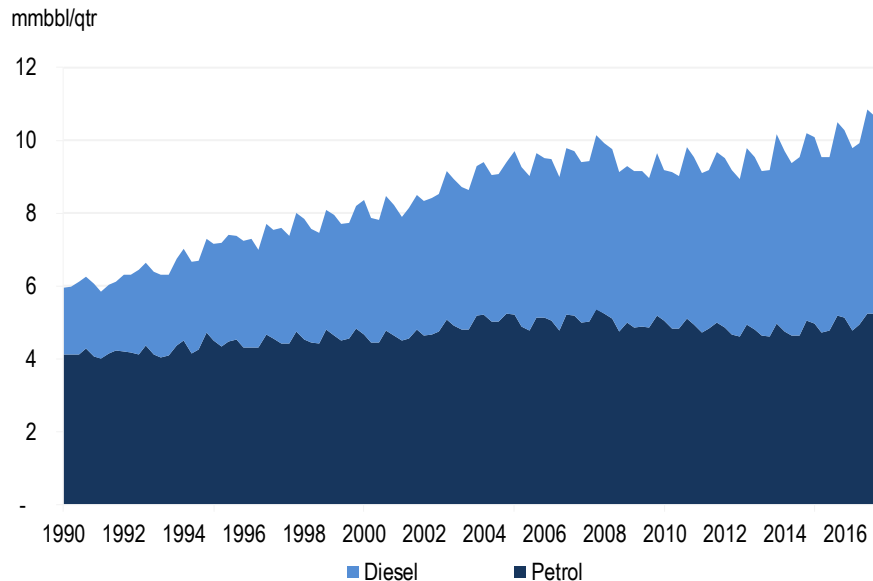


Source: MBIE, Woodward Partners

The New Zealand energy context

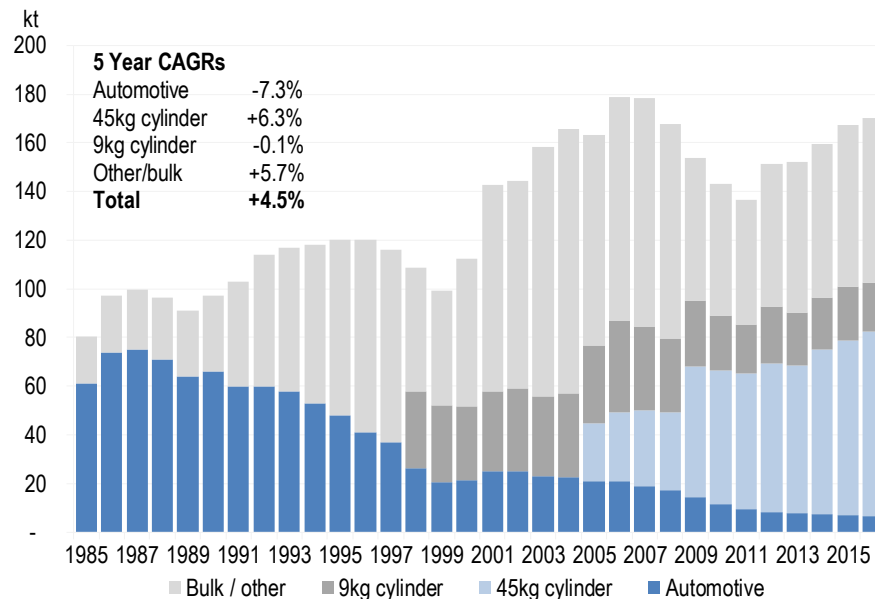
Low underlying domestic demand growth now seemingly structural

Liquid fuels demand



Source: MBIE, Woodward Partners

LPG demand



Source: LPGA, Woodward Partners

Energy policy

A new government with new priorities

Labour + **energy-relevant policy agreements**

Energy-relevant policy agreement

- The government's vehicle fleet, where practicable, to become emissions-free by 2025/26
- Introduce a Zero Carbon Act and an independent Climate Commission, based on the recommendations of the Parliamentary Commissioner for the Environment
- Hold a full-scale review into retail power pricing

Source: NZ Labour Party + NZ First Coalition Agreement, 24 October 2017

Energy policy

A new government with new priorities

Labour + Green energy-relevant policy agreements

Energy-relevant policy agreement

- Adopt and make progress towards the goal of a Net Zero Emissions Economy by 2050, with a particular focus on policy development and initiatives in transport and urban form, energy and primary industries in accordance with milestones to be set by an independent Climate Commission and with a focus on establishing Just Transitions for exposed regions and industries.
 - a. Introduce a Zero Carbon Act and establish an independent Climate Commission
 - b. All new legislation will have a climate impact assessment analysis.
 - c. A comprehensive set of environmental, social and economic sustainability indicators will be developed.
 - d. A new cross-agency climate change board of public sector CEOs will be established.
- Request the Climate Commission to plan the transition to 100% renewable electricity by 2035 (which includes geothermal) in a normal hydrological year. Solar panels on schools will be investigated as part of this goal.

Source: NZ Labour Party + NZ Green Party Confidence & Supply Agreement, 24 October 2017

Energy policy

A new government with new priorities

Labour residual energy policy platform

Policy objectives	Actions
<ol style="list-style-type: none">1. Plan for the clean energy revolution and a just transition to a sustainable low-carbon economy2. Promote energy efficiency, and ensure that at least 90% of New Zealand's electricity is generated from renewable sources by 2025, with close to 100% by 20403. Ensure all future purchases of Government vehicles are electric (including the Crown ministerial cars) unless there is an exceptional reason not to	<ul style="list-style-type: none">• \$700/household winter energy payments to beneficiaries & superannuitants (a "First 100-days" priority)• 10-year moratorium on build of new baseload thermal generation• Add climate change mitigation and emissions reduction to the objectives of the Electricity Authority, in order to promote an increased uptake of renewable electricity• Implementation of PCE 2014 recommendations including NPS on onshore oil & gas exploration

Source: Labour Party 2017 policy manifesto

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2017 as generational change

~\$1 bln of E&P deals inked to date in 2017...

Upstream producing asset deal completions -12 months

Announced / Completed	Asset	Stake	Vendor	Acquirer	Value	Status
Nov-2016	Rimu/Kauri	100.0%	Origin	Westside Corporation	~NZ\$10m	Completed
Jan-2017	Tui	57.5%	AWE	Tamarind Energy	-NZ\$9m ¹	Completed
Jan-2017	Tui	27.5%	NZOG	Tamarind Energy	-NZ\$5m ¹	Completed
Jan-2017	Tui	15.0%	Pan Pacific Petroleum	Tamarind Energy	-NZ\$5m ¹	Completed
Jan-2017	Kupe	15.0%	NZOG	Genesis Energy	NZ\$168m	Completed
2Q 2017	Kapuni	50.0%	Shell	Todd Energy	?	Completed
2Q 2017	Kupe	4.0%	Mitsui	NZOG	\$35m	Pending NZP&M/OIO approvals
4Q 2017	Kupe	50.0%	Origin	Beach Energy	A\$1.6bln ²	Pending NZP&M/OIO approvals
4Q 2017	Maari	16.0%	Todd	Horizon Oil	US\$18m	Pending NZP&M/OIO approvals

Notes:

1. Negative as after accounting for inventory, the structure of the deals under which Tamarind acquired the Tui interests of AWE, NZOG and PPP resulted in the vendors paying the equivalent of \$20m to Tamarind.
2. Origin Energy's Kupe stake formed part of a broader asset portfolio held by Lattice Energy, sold by Origin to Beach in October 2017.

2017 as generational change

With perhaps another ~\$1 bln to come?

Shell NZ



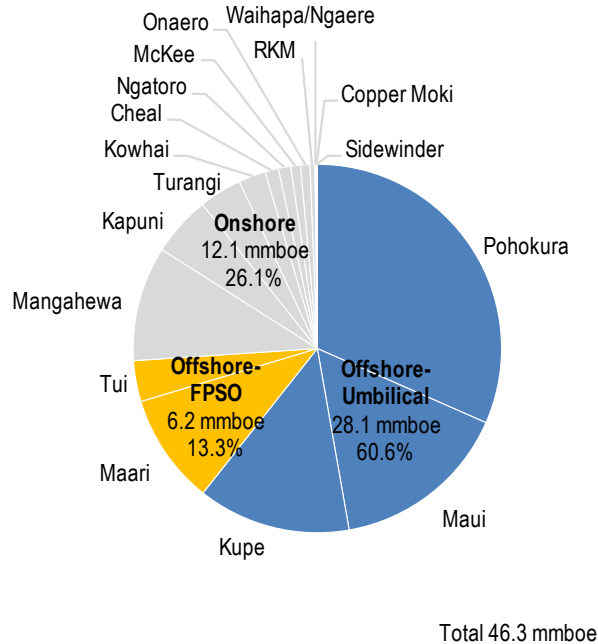
Asset type	Asset	Stake	Status
Production	Pohokura	48.0%	Part of Shell NZ sale portfolio
	Maui	83.75%	Part of Shell NZ sale portfolio
	Kapuni	-	50% JV stake sold to Todd Energy 2Q 2017
Exploration	PEP 50119	61.0%	Retention
Oil services	STOS	100.0%	50% stake previously held by Todd Energy acquired by Shell 2Q 2017 to support sale process
	EIL	100.0%	Part of Shell NZ sale portfolio
	Paritutu tank farm	50.0%	Part of Shell NZ sale portfolio

Source: Woodward Partners

2017 as generational change

Change doesn't come any bigger than this

Oils+LPG+gas field production 2016



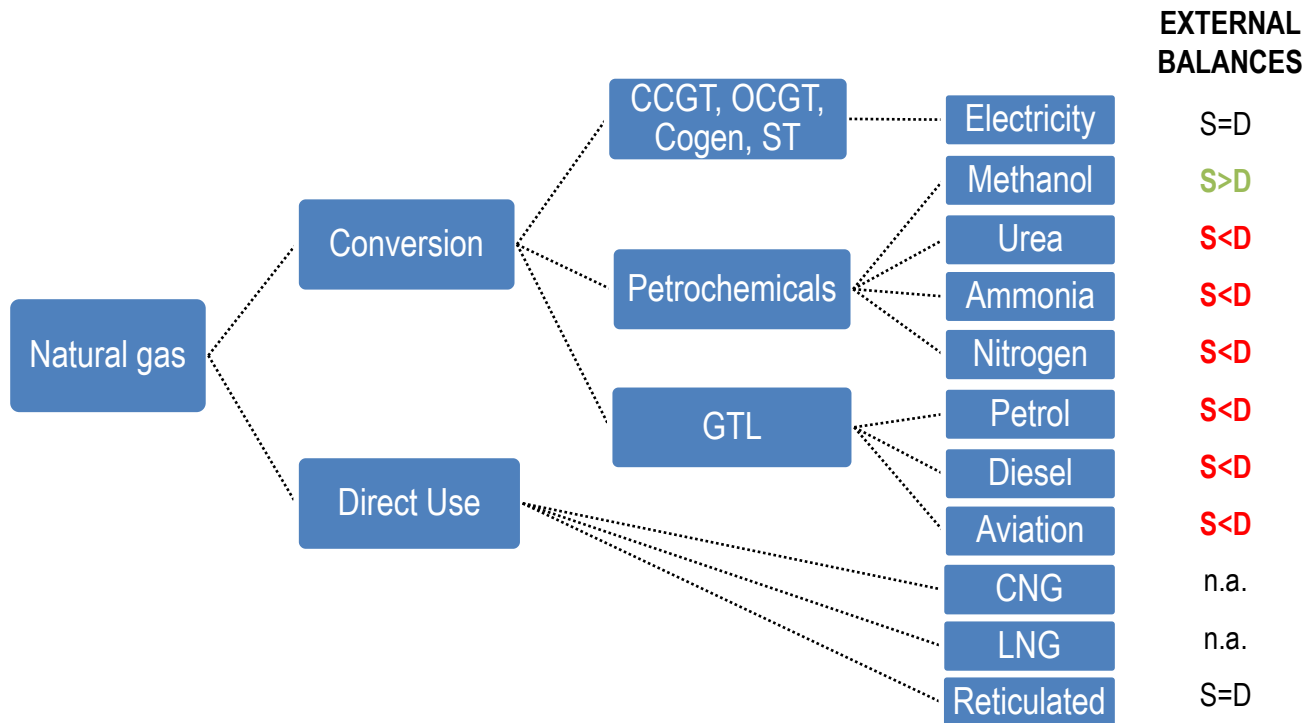
- Controlling stakes in NZ's three largest fields will change hands before the end of 2017
- Market's biggest gas seller looks certain to exit
- Street talk of other NZ E&P interests being marketed
- Farm-out activity also high, both Taranaki and frontier

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NZ gas sector status & outlook

Strong energy conversion end-bias

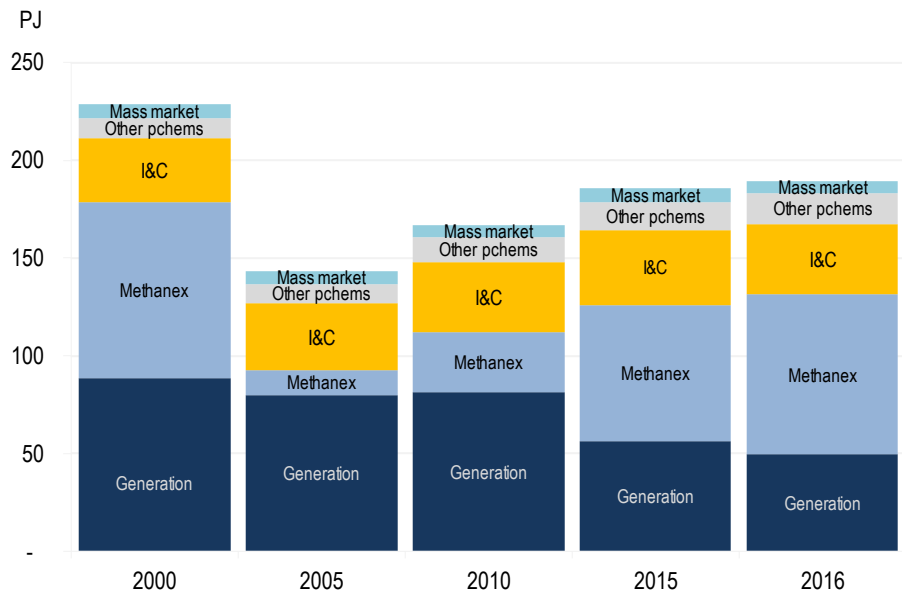


Source: Woodward Partners

NZ gas sector status & outlook

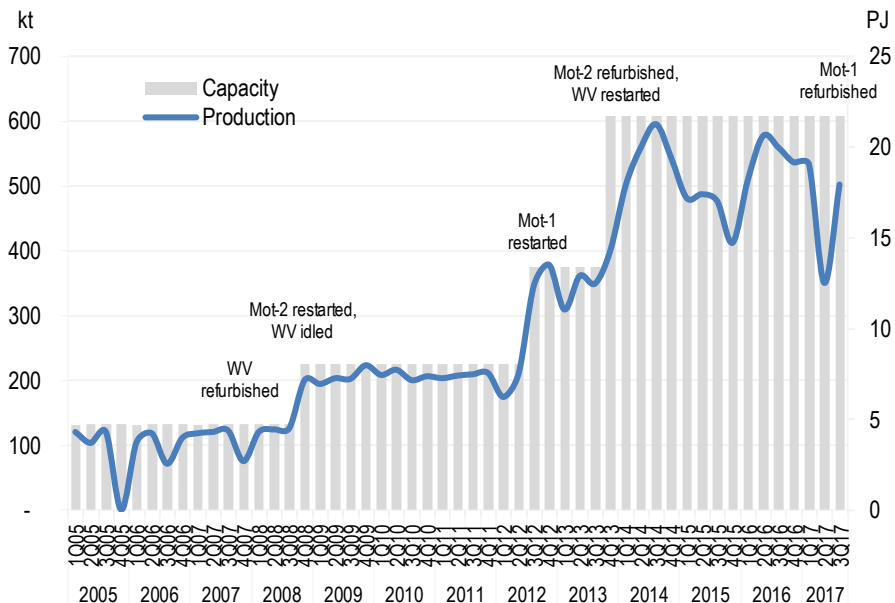
Demand substitution of generation gas for methanol continues

NZ gas market demand-side time-lapse



Source: Woodward Partners

Methanex NZ production vs capacity

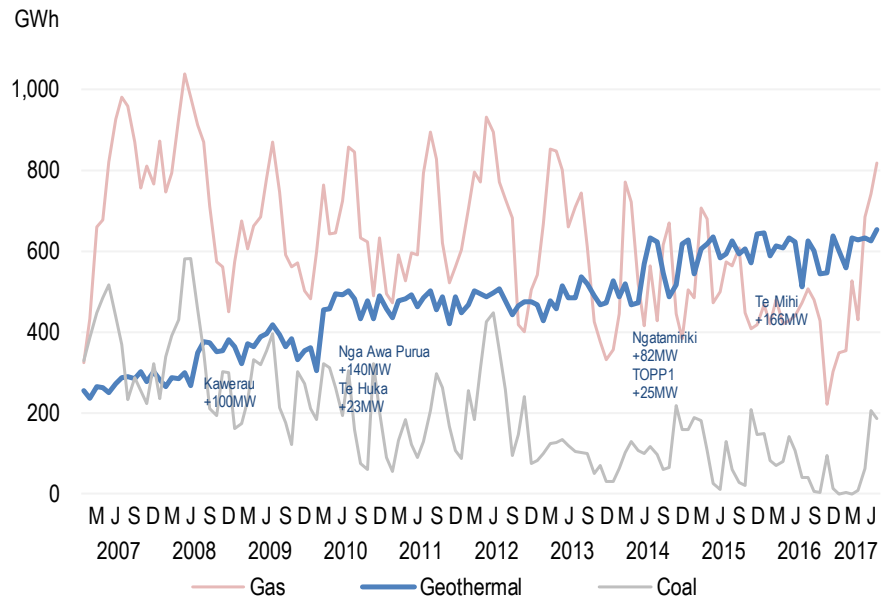


Source: Methanex, Woodward Partners

NZ gas sector status & outlook

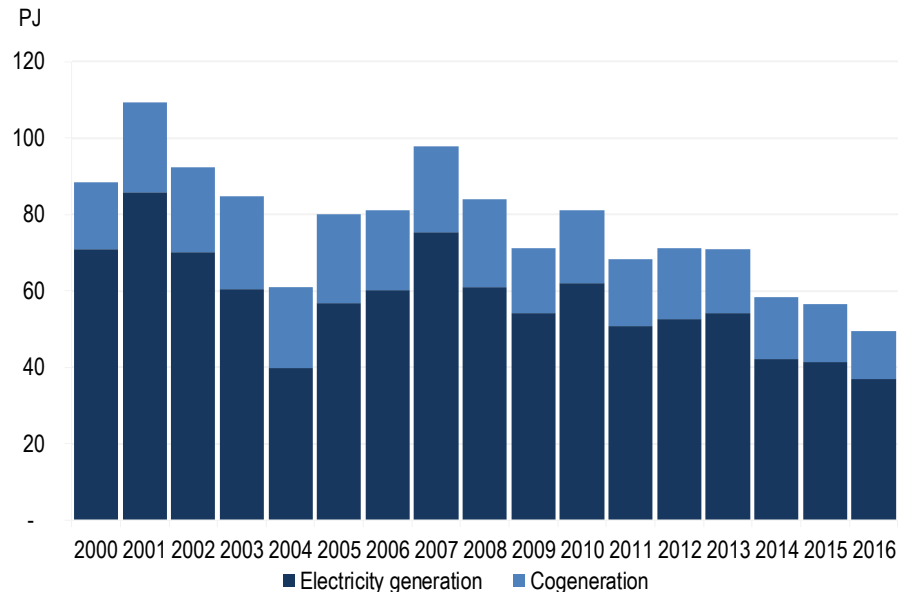
Demand substitution of generation gas for methanol continues

Thermal vs geothermal generation dispatch



Source: EA, Woodward Partners

Generation gas demand

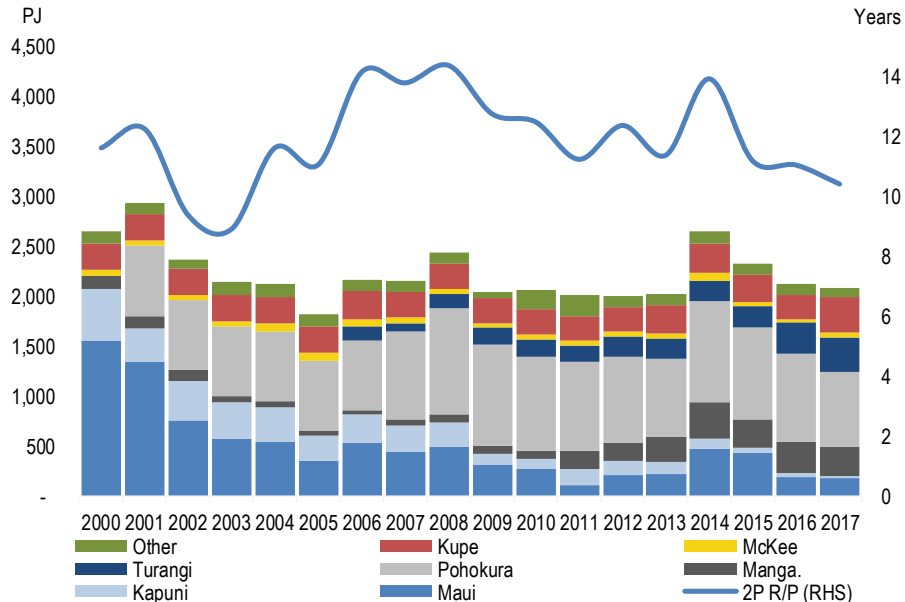


Source: MBIE, Woodward Partners

NZ gas sector status & outlook

Gas y/y 2P gross decline, but stable on net basis

2P gas+LPG R/P coverage



Source: MBIE, company disclosures, Woodward Partners

- Total gross remaining 2P gas+LPG reserves fell -1.7% to 2,079 PJ
- Net (post-production) 2P gas+LPG upgrade +8.5%
- R/P coverage falls to 10.4 years, the lowest since the Maui redetermination, but heavily leveraged to Methanex demand
- Gross 2P still >2,000 PJ

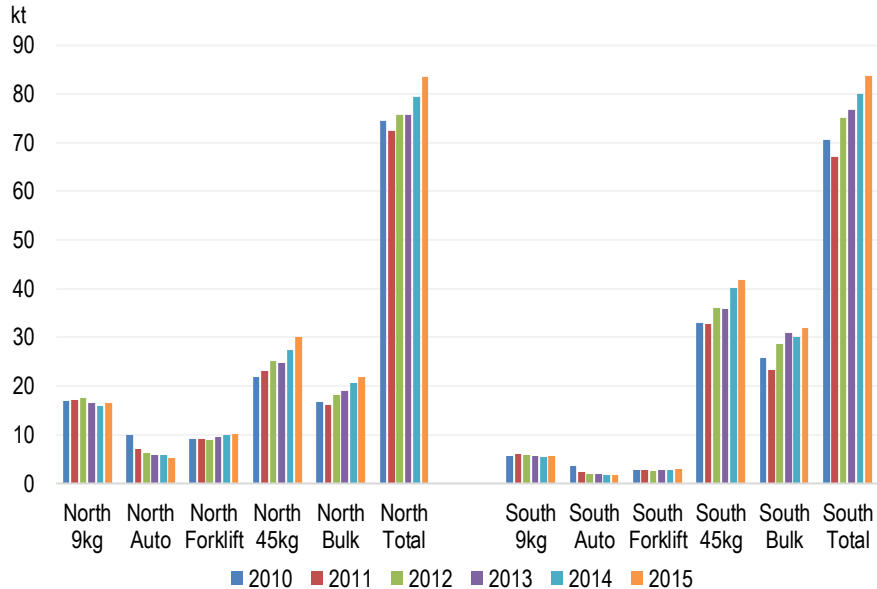
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NZ LPG sector status & outlook

High-growth with still firm South Island bias

NZ North/South LPG demand



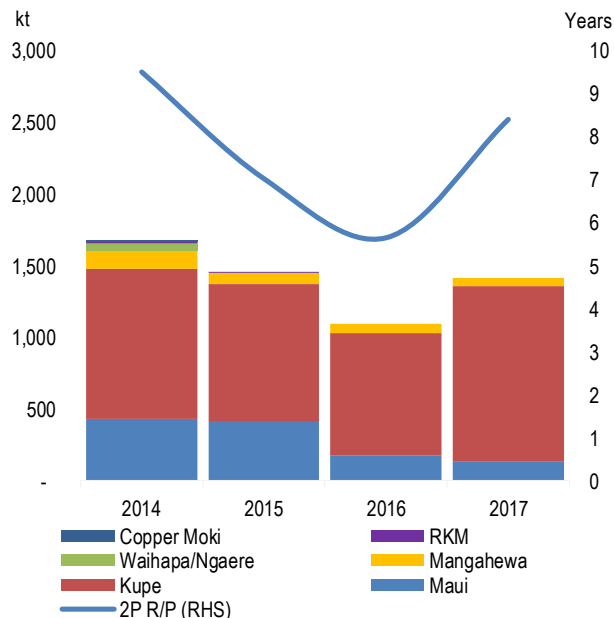
Source: LPGA, Woodward Partners

- South Island accounts for <25% of NZ population but >50% of LPG market demand
- 45kg and bulk the strongest growth segments with CAGR ranges of 3.5 - 5.5% across both Islands
- 9kg segment flat in both Islands
- Auto segment in terminal decline

NZ LPG sector status & outlook

Kupe domgas supply-side dominance continues to grow

LPG gross remaining 2P, 2014-17



Note: there are significant interpretation caveats that apply in reconciling 2P LPG reporting with production data due to treatments of entitlements by field owners to Pohokura and Kapuni LPG within raw gas streams.

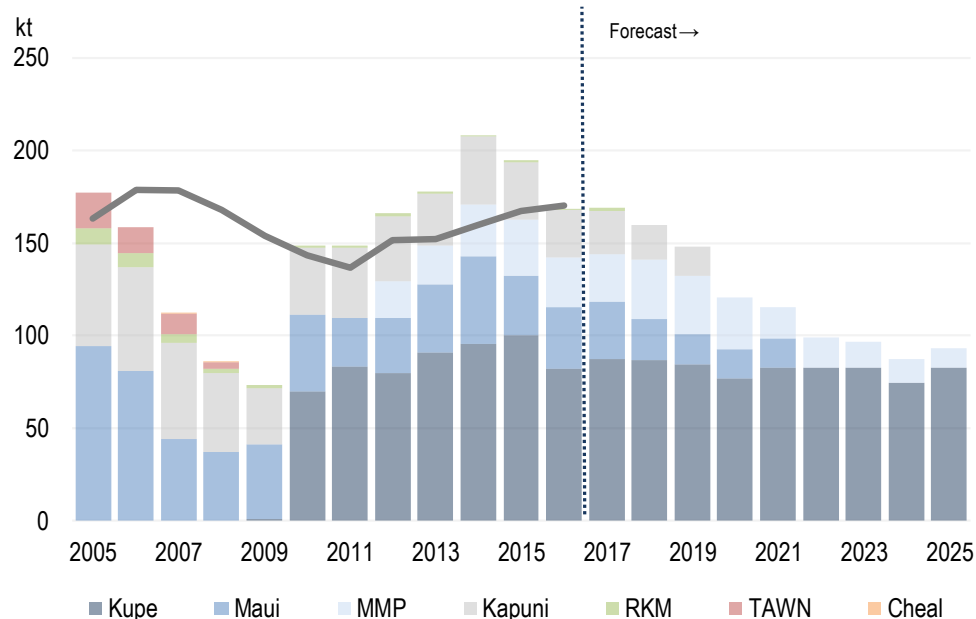
Source: MBIE, company disclosures, Woodward Partners

- Indigenous LPG reserves and supply dominated by Kupe, which accounts now for nearly 90% of total remaining 2P domgas
- Post-acquisitions, Genesis now strongly placed leading into 2020s when North Island supply/demand balance mapped (currently) to tip to net-import

NZ LPG sector status & outlook

Domgas supply attrition a central theme ...

NZ LPG supply/demand forecasts



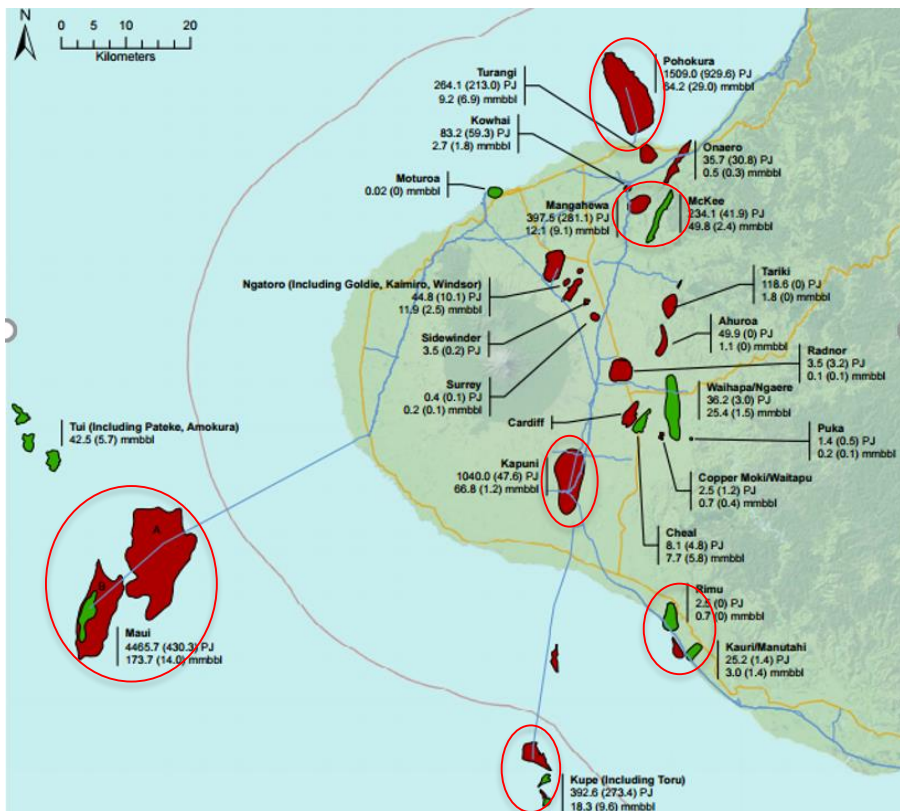
Source: MBIE, company disclosures, Woodward Partners

- Demand growth and decreasing domgas production (particularly from Maui), on a national basis, likely to see the NZ LPG market revert to net-short from as early as 2018
- North Island market mapped to move to net-import from early/mid 2020s
- Kupe likely to remain cornerstone of domgas LPG supply

NZ LPG sector status & outlook

... but with no shortage of supply-side domgas growth opportunities

NZ LPG producing fields



- Clear upside potential beyond existing producing infrastructure:
 - **Pohokura:** Straddle plant a likely post-sale buyer growth project
 - **Maui:** Life extension projects also highly likely post-sale
 - **Kapuni:** Now under new ownership. Has previously produced at >50 ktpa.
 - **Kupe:** high-probability infill drilling to extend plateau
 - **Others:** TAWN, RKM

Bottom lines

We live in interesting times ...

- **Policy** –
 1. Energy *per se*: incremental, not fundamental change
 2. Climate change: much more substantive as formalising long-term direction & objectives
“Just Transition” will form core of policy debate
- **E&P** – 2017 likely to be looked back upon as ‘a new beginning’
- **Gas** – major (and positive) supply-side change nearly complete
- **LPG** – also major change, with likely more to come



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