The Future of Energy Intensive Industry

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CEO Refining NZ
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KEY INFRASTRUCTURE ASSET

Supplies 70% of the country’s refined fuel products

Operates the multi-product pipeline supplying Auckland

Established 1961

- 396 employees
- 200 contractors

Only oil refinery in New Zealand

Processes crude oil on behalf of BP, ExxonMobil and Z Energy (who are also shareholders) to produce petrol, diesel, jet fuel, and bitumen

REFINING NZ
Your Energy Hub
KEY INFRASTRUCTURE ASSET

Only oil refinery in New Zealand

~9% of Northland’s GDP

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58% of the country’s petrol

67% of the country’s diesel

85% of the country’s jet fuel

Refining Capacity

- Reliance India: 1,159 kbd/day
- ExxonMobil Singapore: 656 kbd/day
- Shell Singapore: 465 kbd/day
- Refining NZ: 135 kbd/day
DESPITE OUR SIZE WE DO COMPETE

If RNZ improves its energy performance by 5% and the electricity available is 100% from renewable sources, RNZ will have a carbon intensity 2% lower than a modern Asian refinery.

*100% renewable electricity supply and 5% improvement in energy efficiency*
MY BACKGROUND

30 Years experience

• 20 years Shell International
• COO Genesis Energy
• CEO Pacific Hydro 2014 to 2018– renewable developer and operator Chile, Australia and Brazil now 100% owned by State Power Investment Corporation
• CEO Refining NZ August 2018 till now
ENERGY INTENSIVE INDUSTRIES IN NZ

• Includes Refining NZ, NZ Steel, NZ Aluminium Smelters, Fonterra, Methanex

• Significant direct employment
  • Every Refining NZ FTE creates another two in Northland, another six across NZ**

• Support for local suppliers
  • e.g. Culham Engineering (RNZ supplier since 1964)


EITE* Locations

30,000 EITE FTE employees

$2 bn Annual employee wages

* Energy Intensive Trade Exposed
SO WHAT ARE WE GOING TO DO?
DON’T LOSE FOCUS: DELIVER THE CORE

Continue to deliver for investors, employees, customers:

• Outstanding Health and Safety Performance
• Outstanding Environmental Performance
  • Climate change isn’t the only issue we face
• Operational excellence
• Strong LEAN culture
CREATE A FUTURE

Invest for revenue growth with increased focus on energy efficiency

Te Mahi Hou

120,000 tonnes/year CO₂ reduction

= 60,000 Toyota Corollas

Te Mahi Hou

$365 million

= $4.6 billion spent on Tesla Model 3s

TOYOTA COROLLA 2017 – 2018
Small Car: Saloon

TESLA MODEL 3

CO₂ emissions

This vehicle emits a small amount of CO₂ gas. 147 gram/km = 2.06 tonnes/year based on driving 14,000 km per year.
CREATE A FUTURE

Sulphur solidification – keeping NZ fuels clean
CREATE A FUTURE

Bitumen expansion – carbon and sulphur capture in a MARPOL world
CREATE A FUTURE

Dredging – allowing more efficient transportation of crude
FIND NEW BOUNDARIES

Electricity
Biofuel
Hydrogen
BIOFUELS

1st Generation
Wheat, Sugarcane,
Corn, Tallow

2nd Generation
Wood, Waste
Grass, Algae

Biodiesel Production
Transesterfication

Ethanol Production
Fermentation/Distillation

“Drop-In” Fuel Production
Pyrolysis / Hydro-processes
Gasification / FT etc

Biofuels plant would require

• Investment in the region of $500m
• An oil price 2-3 times higher than what it is today
To produce 100% of NZ’s jet and diesel fuel needs would require:

- ~2,000,000 Ha of forests (115% of NZ’s current plantation)
- Or, 70 million m$^3$ of logs, (equivalent to 4x NZ’s 2016 log exports)

Note: to meet our jet fuel needs alone would require:

- ~750,000 Ha of forests (45% of NZ’s current plantation)
- Or, 26 million m$^3$ of logs, (equivalent to 1.5x NZ’s 2016 log exports)
We are New Zealand’s largest producer of purified hydrogen and have the capability to produce more…
WHATEVER WE DO… WE DO NEED

Consistent and bipartisan policy settings that can sustain 30 year investment cycles

- Chile a good case study
  - Consistent energy policy settings for over 40 years
  - Renewable energy projects under construction*:
    - Solar: 1,151 MW
    - Wind: 508 MW
    - Hydro: 962 MW
    - Thermal: 1,441 MW
- A lot of electricity
- Heaps of bio feedstock (it’s not a hobby)
- And it has to be cheap

A low carbon economy will require a mix of energy sources and investment in new technologies

- But, cost of wind power per kW (for example) has reduced significantly and will continue to fall
- Further technology advances will allow EITE to adapt…
- …and continue to support jobs, national and regional growth, contribution to NZ’s emissions reduction targets
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