

Geothermal: Beyond Business as Usual



Kawerau Geothermal Plant (MRP)

Business as Usual

- EPC contract
- Mix of Overseas & NZ suppliers
- Most high value plant comes from overseas
- Most NZ suppliers are third and fourth tier

Business as Usual

- EPC = Engineer, Procure, Construct & Commission (they control everything!)
- Because the EPC contract is typically for a fixed price there is a heavy drive to lowest possible cost (high price sensitivity)
- This is reducing work for NZ suppliers
- Edging them out of the supply chain

Geothermal Costs: Steamfield Development (20MW)

| Description | Overseas Cost | NZ Cost |
|---------------------------|---------------|---------|
| Preliminaries | 0% | 100% |
| Civil / Structural Works | 0% | 100% |
| Mechanical Works | 40% | 60% |
| Control & Instrumentation | 80% | 20% |
| Electrical Works | 0% | 100% |
| Miscellaneous | 10% | 90% |
| Engineering & Design | 20% | 80% |

Geothermal Costs: Steamfield Development (20MW)

| Description | Overseas Cost | NZ Cost |
|---------------------------|---------------|---------|
| Preliminaries | 0% | 100% |
| Civil / Structural Works | 0% | 100% |
| Mechanical Works | 40% | 60% |
| Control & Instrumentation | 80% | 20% |
| Electrical Works | 0% | 100% |
| Miscellaneous | 10% | 90% |
| Engineering & Design | 20% | 80% |

Geothermal Costs: Steamfield Development (20MW)

| Description | Overseas Cost | NZ Cost |
|---------------------------|---------------|---------|
| Preliminaries | 0% | 100% |
| Civil / Structural Works | 0% | 100% |
| Mechanical Works | 40% | 60% |
| Control & Instrumentation | 80% | 20% |
| Electrical Works | 0% | 100% |
| Miscellaneous | 10% | 90% |
| Engineering & Design | 20% | 80% |

Geothermal Costs: Steamfield Development (20MW)

| Description | Overseas Cost | NZ Cost |
|---------------------------|---------------|-------------|
| Preliminaries | 0% | 100% |
| Civil / Structural Works | 0% | 100% |
| Mechanical Works | \$2 480 000 | \$3 720 000 |
| Control & Instrumentation | 80% | 20% |
| Electrical Works | 0% | 100% |
| Miscellaneous | 10% | 90% |
| Engineering & Design | 20% | 80% |

Geothermal Costs: Plant (20MW)

| Description | Overseas Cost | NZ Cost |
|--------------------------|---------------|-------------|
| 20 MW Single flash plant | \$24 600 000 | \$8 800 000 |

SKM Costs of Geothermal Power Report (2007)

Geothermal Costs: Plant (20MW)

| Description | Overseas Cost | NZ Cost |
|--------------------------|---------------|-------------|
| 20 MW Single flash plant | \$24 600 000 | \$8 800 000 |
| 20 MW Single flash plant | 74% | 26% |

SKM Costs of Geothermal Power Report (2007)

Pipe Spooling

- 30% of cost is typically materials come from overseas
- 70% of cost is installation etc



Options

- Status Quo
- Reduce costs
- Reduce margins
- Become part of the supply chain

Options

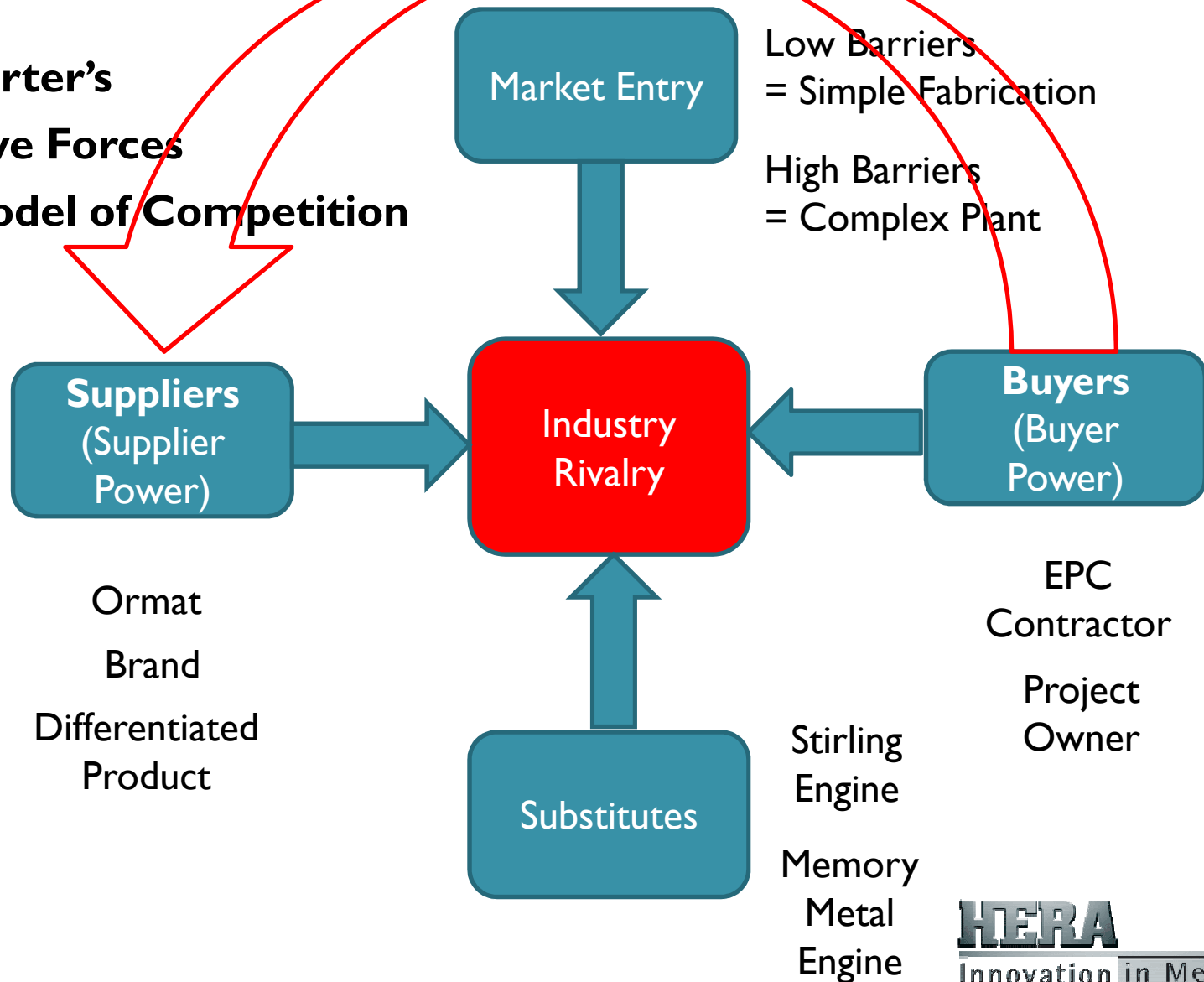
- Status Quo
- Reduce costs
- Reduce margins
- Become part of the supply chain

Market Reality



Competitive Environment

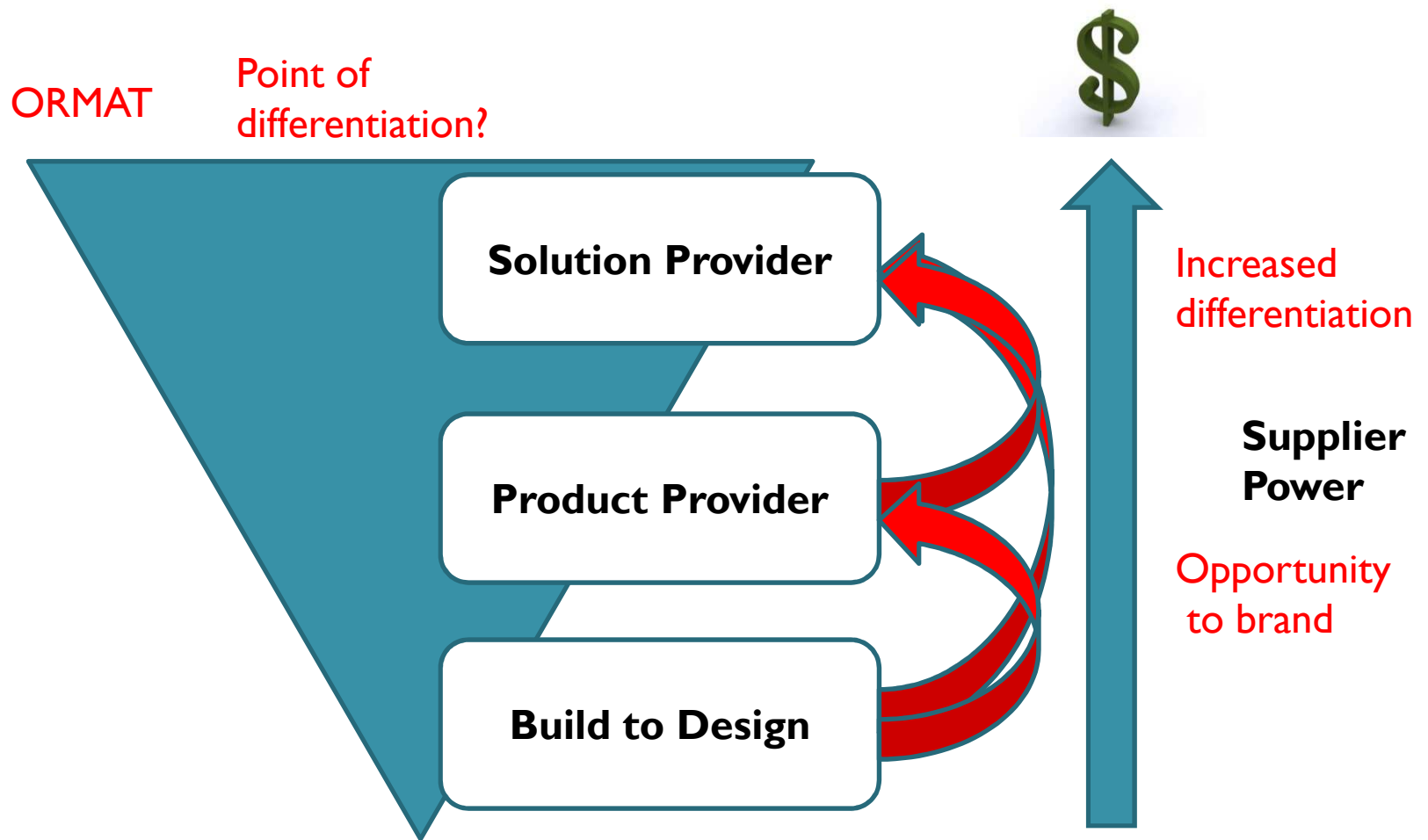
Porter's Five Forces Model of Competition



Supplier Power

- Determinants:
 - Supplier concentration
 - Availability of substitutes
 - Importance of supplier input to buyer
 - Supplier's product differentiation
 - Importance of industry to suppliers
 - Buyer's switching cost to other input
 - Supplier's threat of forward integration
 - Buyer's threat of backward integration

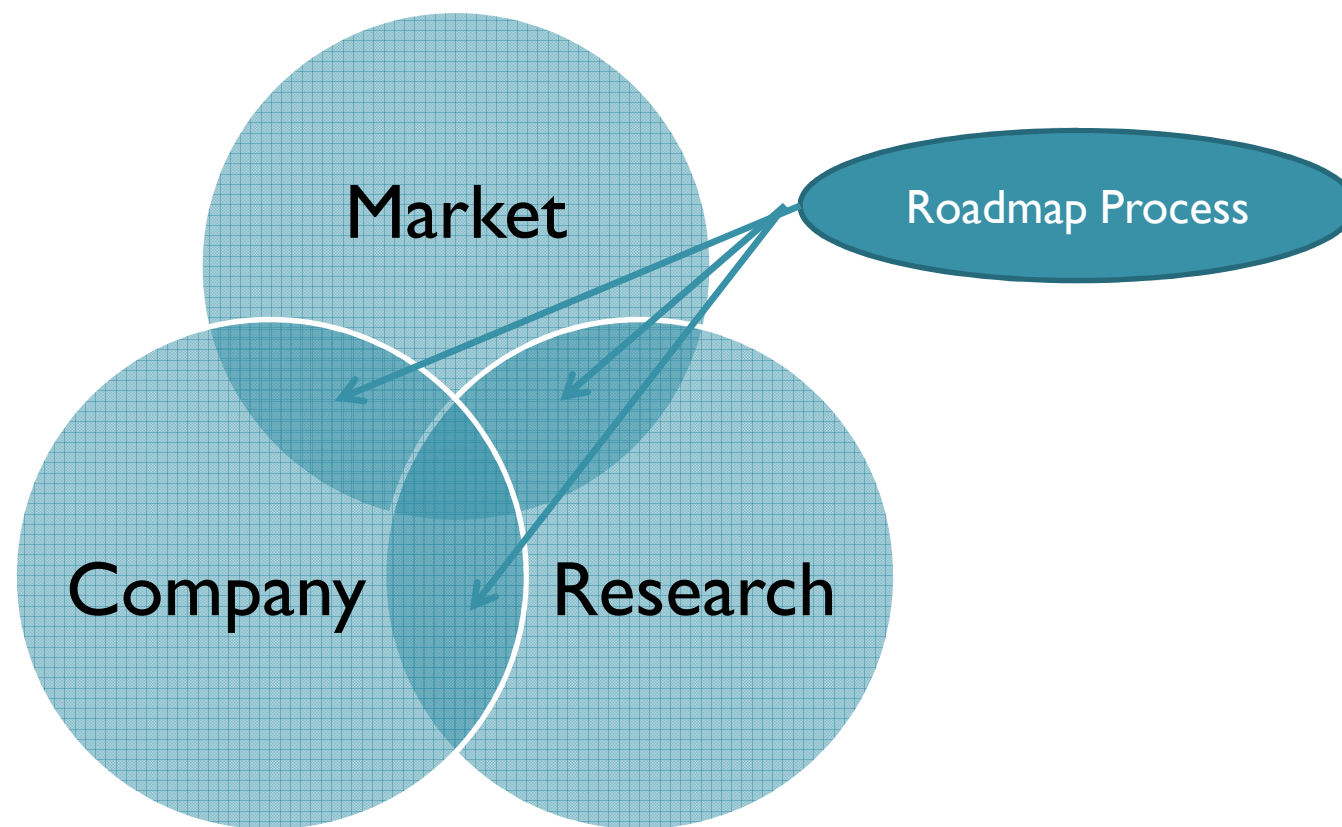
Supplier Power



Build > Product > Solution



An Integrated Approach



PROCESS

Industry Development Roadmap Process



Development Support

Market Development

Geothermal New Zealand



An evolving collaboration that extends the diverse skills of New Zealand's geothermal expertise to countries exploring their geothermal potential.

Technology Development

**Above Ground Geothermal
& Allied Technologies**

AGGAT

An industry development initiative fostering the establishment of a science base to support technology development by industry.

**Renewable
energy**

Technology concepts

Control Systems

AGGAT

Binary fluids

**Heat Transfer
& Design**

**Turbine design &
performance**

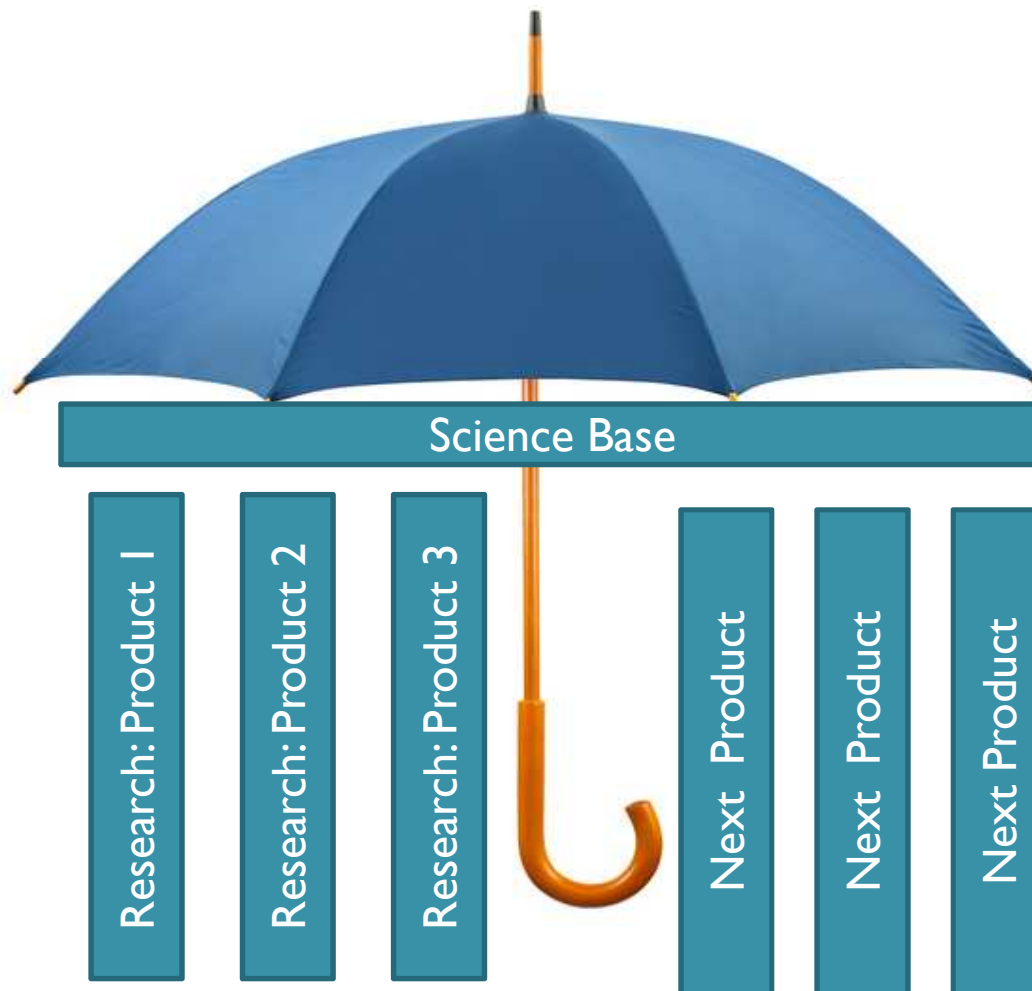
**Scale of
operation**

**Technology
integration**

**Conversion
technology**

Above Ground Geothermal & Allied Technologies

AGGAT

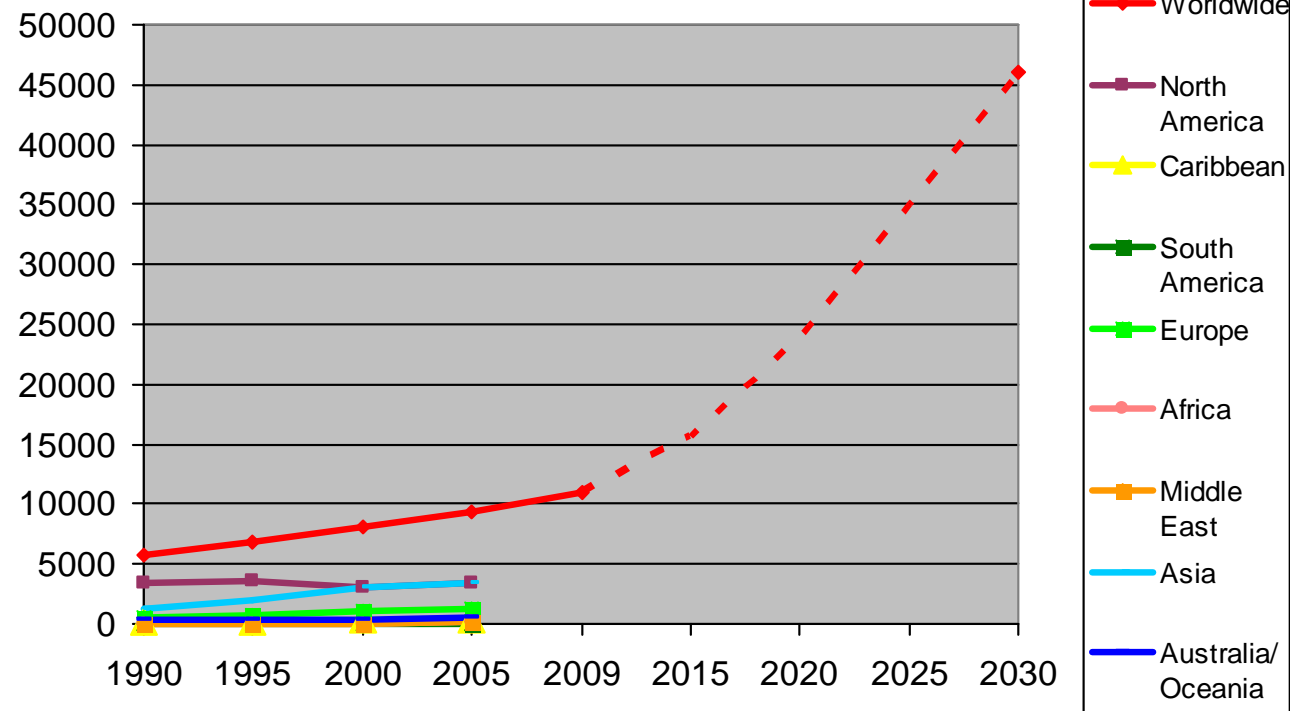


Geothermal: a good market?

- Growing market
- Broadening from steam to lower temperature resources and EGS
- Many countries are opening areas for geothermal exploration
- High value products
- Readily transportable

Geothermal Power Generation

Power generating installed
capacity in MW



**Global
Growth
Prediction**

**Year 2020:
24 000 MW**

**Year 2030:
46 000 MW**

Ref: internal geothermal association, geothermal energy association, Geothermische Vereinigung – Bundesverband Geothermie e.V.,...





Thank You

Nick Inskip
General Manager Industry Development
HERA
nick.inskip@hera.org.nz
09 262 4750