New Zealand
Natural Resource Development

COMMERCIAL IN CONFIDENCE

Presentation to SMG
8 March 2010
## Opportunity for NZ in Natural Resources is HUGE

### Resource Size

<table>
<thead>
<tr>
<th>Resource</th>
<th>Size</th>
<th>Export Value (pa)</th>
<th>Current Prices</th>
<th>Future Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lignite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Briquette &amp; export</td>
<td>5 Mtpa</td>
<td>$0.4</td>
<td>$0.1</td>
<td>$1.0</td>
</tr>
<tr>
<td>Urea fertiliser</td>
<td>1.2 Mtpa</td>
<td>$0.5</td>
<td>$0.2</td>
<td>$2.0</td>
</tr>
<tr>
<td>Diesel &amp; Jet Fuel</td>
<td>40,000 bpd</td>
<td>$1.0</td>
<td>$1.5</td>
<td>$3.0</td>
</tr>
<tr>
<td></td>
<td>120,000 bpd</td>
<td>$3.0</td>
<td>$5.0</td>
<td>$10.0</td>
</tr>
<tr>
<td></td>
<td>200,000 bpd</td>
<td>$5.0</td>
<td>$8.0</td>
<td>$15.0</td>
</tr>
<tr>
<td>Oil &amp; gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium scale</td>
<td>40,000 bpd</td>
<td>$1.0</td>
<td>$1.5</td>
<td>$3.0</td>
</tr>
<tr>
<td>Large scale</td>
<td>200,000 bpd</td>
<td>$5.0</td>
<td>$8.0</td>
<td>$15.0</td>
</tr>
<tr>
<td>Iron sands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk export</td>
<td>10 Mtpa</td>
<td>$1.0</td>
<td>$5.0</td>
<td>$3.0</td>
</tr>
<tr>
<td>New steel plant</td>
<td>5 Mtpa</td>
<td>$3.0</td>
<td>$10.0</td>
<td>$2.0</td>
</tr>
<tr>
<td>Gas hydrates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium scale</td>
<td>100 P Jpa</td>
<td>$1.0</td>
<td>$1.5</td>
<td>$3.0</td>
</tr>
<tr>
<td>Large Scale</td>
<td>500 P Jpa</td>
<td>$5.0</td>
<td>$8.0</td>
<td>$15.0</td>
</tr>
<tr>
<td>Silicon metal plant</td>
<td></td>
<td>$0.5</td>
<td>$1.0</td>
<td>$1.5</td>
</tr>
<tr>
<td>Other mining</td>
<td></td>
<td>$1.0</td>
<td>$2.0</td>
<td></td>
</tr>
</tbody>
</table>

### NZ Balance of Payments

- Undersea Gold Mining
- Bulk Iron Sand
- Chatham Rise Rock Phosphates
- Crude Oil Sufficiency
- Motuotu Train II Recommendation
- Pike River Coal Duplication
- Waihora Valley Recommendation
- Locally-refuelled Helicopter Pools
- New Coromandel Goldmines
- LPG Sufficiency
- Pike River Coal

**NZ$ Billions**

### NZ Balance of Payments Deficit

- $20.4 of revenue per year
- $60 billion

#### At future commodity prices (US$200+/bbl oil) Natural resource could provide an additional $60B per annum in export equivalent revenue
Development Risks Facing NZ

- Offshore ‘Super Profits’
  - Super normal returns extracted from offshore developers
- Resource Speculators
  - Creates a barrier to resource development
  - Wealth extracted by under-capitalised speculators – Redacted
- Development delays
  - History of limited new resource activity generated based on ‘free market’ philosophy
Solid Energy is well positioned to maximise the value from coal resources for NZ... however ... New Zealand is not set up with the appropriate structures to maximise value from other natural resource opportunities.
The Goal for New Zealand

- To **stimulate development** from natural resources AND capture **maximum** value and wealth for New Zealanders

- NZ needs to achieve the following objectives:
  - $2B of exploration and development capital from 2011 to 2015
  - Access to and management control over world class technology
  - NZ based world class knowledge and experience
  - NZ specific major project development experience and relationships (Stakeholders, Iwi, Environmental, Regulators etc.)

- Various options could be proposed

The **only** option that can achieve these objectives and deliver the national goal is a NZ owned/controlled entity to lead this development
- National Resource Limited (NRL)
NZ National Resources Limited (NRL)
Oil and Gas

- Stimulate and control development – maximize value for NZ

Current Status
- Production dominated by 5 - 10 companies – majority offshore owned (Shell, Origin, OMV, Mitsui, AWE)
- Further 5 - 10 medium to large explorers - majority offshore owned
- Significant unallocated prospective petroleum acreage (East Coast, Northland, Southern Basin)

What NRL needs?
- Compulsory allocation of new prospective acreage
- Automatic allocation of existing permits not in compliance with agreed work programmes
- Roll-up of existing SOE petroleum permits into 1 portfolio
  - GEL – 31% Kupe, 55.1% Cardiff, 100% Mangatoa
  - MRP - 50% Taranaki, 50% Southland

What would NRL do?
- Undertake extensive E&P programme
  - $500M - $1B (3 – 5 years)
  - 10 – 20 Onshore wells, 5 – 10 Offshore wells
  - Exploration resource proving in frontier basins
- Resource with world class staff and technology providers
- Bring production of 50,000bbl/d to market

Funding
- ~$100Mpa free cashflow from Kupe
- Other available free cash flows
- Consider farm-in or low % external equity following exploration success
Iron Sands
- Path to world scale resource development

- Current Status
  - 40,000+km² of prospective iron sands resources currently permitted by 6 offshore companies (FMG – 14,000km², Seafield – 10,000km², Trans-Tasman – 8,500km², Simoesteel – 4,800km², Sericho – 3,200km², Iron Sands off-shore Mining – 2,300km²)
  - All resources held under prospecting permits expiring between Mar 2010 and Dec 2011

- What NRL needs?
  - Automatic allocation of existing permits not in compliance with agreed work programmes
  - Allocation of current prospecting permits at termination (most 2010 and 2011) – directly or through onerous exploration permit conditions

- What NRL would do?
  - Undertake extensive exploration programme
    - $500M (3 – 5 years)
    - Resource with world class staff and technology providers
    - Prove resource and complete commercialisation plan
    - Prove value-add opportunities for Iron and steel production utilising leading edge technologies (e.g. UCG) – stage gate development
    - Commence global scale iron sands development – 12Mtpa

- Funding
  - Initial exploration – From available free cash flow
  - Consider farm-in or low % external equity following exploration success
Steel Production

- Become the world leader in new ultra low cost steel production

**Opportunity**
- Add significant value to NZ resources by applying leading technologies to produce [ultra low cost Steel](#) from in [Redacted](#)
- [Redacted](#)

**What NRL needs?**
- Iron sand resource allocation per previous slide

**What NRL would do?**
- Undertake detailed a feasibility programme to confirm technical and commercial viability
- Feasibility programme $200M (3 – 5 years)
- Seek market/funding partners from SE extensive Steel Customer network
- Develop and commission project through stage gate development - similar to lignite conversion process

**Funding**
- Initial feasibility – Available free cash flow
- Consider market partner/equity following confirmation of project viability
Methane Hydrates

- Develop as the world leader in the next great energy source

● Current Status
  - Large methane hydrate deposits
  - 20+ tcf recoverable (150 years of resource)
  - Prospective Methane Hydrate acreage currently unallocated

● What NRL needs?
  - Compulsory allocation of new prospective acreage

● What NRL would do?
  - Undertake extensive exploration programme
    ➢ $10 - $50M (3 – 5 years) exploration programme
    ➢ Engage leading technology providers and suppliers (GNS/Schlumberger)
    ➢ Establish global leadership position in methane hydrate development
    ➢ Produce up to 300PJpa of gas
    ➢ Position to leverage skills offshore

● Funding
  - Initial exploration - SE free cash flow
  - Consider farm-in or low % external equity following exploration success
Silicon Metals

- Produce the world's purest silicon metal

---

**Current Status**
- Very high quality quartz deposits in Southland
- 2 large permit holders
- Synergies with lignite development

**What NRL needs?**
- Compulsory allocation of new prospective acreage
- Automatic allocation of existing permits not in compliance with agreed work programmes

**What NRL would do?**
- Undertake exploration programme
  - $500M (3 – 5 years)
  - Prove resource and complete commercialisation plan
  - Commission silicon metals plant – 100+ktpa
  - Establish synergies with existing projects

**Funding**
- Initial exploration - Available free cash flow
- Consider farm-in or low % external equity following exploration success
Other Minerals
- Unlock NZ mineral potential

• Current Status
  - Very small contributor nationally
  - Known existence of copper, nickel, ilmenite, rare earth minerals, bentonite etc
  - Resource largely under explored
  - Large permits held by off-shore companies

• What NRL need?
  - Compulsory allocation of new prospective acreage
  - Automatic allocation of existing permits not in compliance with agreed work programmes

• What NRL would do?
  - Undertake extensive exploration programme
    ➢ $50M (3 – 5 years)
    ➢ Identify key resource targets and optimal locations
    ➢ Utilise world class technology providers and suppliers
    ➢ Undertake extraction of high value minerals
    ➢ Optimise exploration programme across all minerals

• Funding
  ➢ Initial exploration - Available free cash flow
  ➢ Consider farm-in or low % external equity following exploration success
Related Industry
- Opportunities Today

• Global Research Centres
  - Establishment of global research centers will support our global aspirations in a range of technologies - Gasification, underground gasification, Methane Hydrates
  - This will be done in association with technology leaders (e.g. Sasol, Ergo, Shell etc)
  - A necessary step in providing support to NZ and international industry
  - Provides key partners with a solution to managing resource drain from less desirable locations (for example South Africa, Russia)
  - Attracts highly skilled, highly paid workforce from offshore and creates excellent employment opportunities for NZ resource
  - Generates significant direct and indirect economic returns for NZ

• Global leadership in niche skills development
  - Create global centers of excellence in niche areas will be done in association with key University and tertiary training organisations
  - Is critical to manage resource constraints by creating supply of highly skilled resource to support ongoing development (directly or through the research centers)
  - Arrests the ‘Brain Drain’ to Australia and abroad by creating opportunities for education and highly paid employment
Opportunities for NZ from this picture
- Intergenerational step change for the future

• Environment
  - Wealth available for environmental funds extending NZ conservation values – e.g. enhancement of bio-diversity, protection of native animals, flora and fauna, extension of conservation land and facilities etc.

• Living standards for future NZers
  - Wealth
    ➢ Social welfare
    ➢ Education
    ➢ Health
    ➢ Retirement funding

• Opportunities for future NZers
  - Employment – highly skilled/highly paid

• Smoothest transition to ‘post fossil fuel’ world
  - Create a leadership position in transition technology
Solid Energy provides the foundation for NZ National Resources Limited

<table>
<thead>
<tr>
<th>Development Component</th>
<th>SE capability</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Exploration cashflow          | ✔️            | • Solid Energy free cashflow - $40M a (2009)  
  • Already investing $30 – 50Mpa in exploration and development projects |
| Development Capital           | ✔️            | • Proven ability to access capital (e.g. Cargill)  
  • Already strong interest from offshore capital markets – turning down capital and partnership offers weekly  
  • Issue is not in raising the capital, but in structuring this to maximise/retain value for NZ |
| Technology                    | ✔️            | • Strong track record in accessing/securing world class technology. Ergo (UCG), GTLE (Gnite), Shell, Siemens, Uhde, Sasol (ignite gasification). Experience with commercialising new and developing technologies. |
| Knowledge/Expertise - People  | ✔️            | • Successfully recruited world class in-house process engineering capability (senior ex-Sasol engineers), working/partnering with global leaders in resource development expertise Schlumberger, Worley Parsons, Shell |
| New Zealand development       | ✔️            | • Long history (100 years) of successful NZ extractive resource development expertise working with regulators, stakeholders, Iwi, landowners etc. |
| experience                    |               |          |
| NZ owned/controlled entity    | ✔️            | • SE fully NZ owned |
| to lead                       |               |          |

Solid Energy is already well advanced in delivering the key development components (above) for coal based New Energy opportunities ...
NZ National Resources Limited

Supported By
- Global Research Centers
- Centers of Excellence (University)
- Proving Funding to
  - Environment fund
  - Regional Development funds
  - Social Services (Healthcare, Education)

Up to $20B pa revenue in 10 years
There are risks…

<table>
<thead>
<tr>
<th>Risk/Threat</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accusations of using political ideology to control market or favour particular party;</td>
<td>Global drivers have changed and strong leadership is required</td>
</tr>
<tr>
<td>Political interference will not allow NRL to make economic decisions</td>
<td>Govt has operated as SOE model for 20 years without limited intervention Partial privatisation options</td>
</tr>
<tr>
<td>Existing resource owners may promote SOE as Bureaucratic and poor allocators of capital</td>
<td>SE has a track record of building a business that was ready for liquidation into a $2.5b business in 10 years</td>
</tr>
<tr>
<td>Corporate Governance</td>
<td></td>
</tr>
<tr>
<td>Funding strategy</td>
<td>The NZ government has the assets to seed this opportunity therefore can be undertaken with little capital in the first few years</td>
</tr>
<tr>
<td>Conflict of Interest and balance of control</td>
<td></td>
</tr>
</tbody>
</table>

... but the prize more than justifies taking them!
Is this out of step with the world?

- No! it is more consistent
- Global trend to more countries looking to nationalise natural resources after a period of privatisation in the 90's
  - Petroleum industry too important to economy
  - Nations looking to extract higher rent for their natural endowment
- National Oil Companies (NOC's) now control 78% of worldwide oil and gas (Kretzchmar, 2009)

<table>
<thead>
<tr>
<th>Enterprise Name</th>
<th>State Ownership</th>
<th>Country</th>
<th>Oil &amp; Gas Reserves (Bboe)</th>
<th>Liquids (1000 bpd)</th>
<th>Gas (MMcf/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Aramco</td>
<td>100%</td>
<td>Saudi Arabia</td>
<td>300.9</td>
<td>9,045</td>
<td>6,900</td>
</tr>
<tr>
<td>Pemex</td>
<td>100%</td>
<td>Mexico</td>
<td>18.7</td>
<td>3,723</td>
<td>3,244</td>
</tr>
<tr>
<td>Petrobras</td>
<td>51%</td>
<td>Brazil</td>
<td>11.1</td>
<td>1701</td>
<td>2010</td>
</tr>
<tr>
<td>Petronas</td>
<td>100%</td>
<td>Malaysia</td>
<td>24.9</td>
<td>731</td>
<td>4,172</td>
</tr>
<tr>
<td>Pertamina</td>
<td>100%</td>
<td>Indonesia</td>
<td>21.0</td>
<td>1139</td>
<td>2562</td>
</tr>
<tr>
<td>Petroecuador</td>
<td>100%</td>
<td>Ecuador</td>
<td>4.6</td>
<td>204</td>
<td>10</td>
</tr>
<tr>
<td>Statoil</td>
<td>82%</td>
<td>Norway</td>
<td>4.3</td>
<td>740</td>
<td>1921</td>
</tr>
<tr>
<td>CNOOC</td>
<td>71%</td>
<td>China</td>
<td>2.2</td>
<td>306</td>
<td>291</td>
</tr>
<tr>
<td>PTT</td>
<td>100%</td>
<td>Thailand</td>
<td>1.0</td>
<td>19</td>
<td>555</td>
</tr>
</tbody>
</table>

- International Oil Companies (IOC's) have underperformed the NOC's due to falling access reserves
- Petronas and Vale examples
### Milestones

- To achieve maximum success

<table>
<thead>
<tr>
<th>Action</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decision in principle subject to business case</td>
<td>Mar 2010</td>
</tr>
<tr>
<td>2. Business case approval decision to proceed</td>
<td>Jun 2010</td>
</tr>
<tr>
<td>3. Set up Natural Resources Limited</td>
<td>Dec 2010</td>
</tr>
<tr>
<td>- Allocate permits</td>
<td></td>
</tr>
<tr>
<td>4. Exploration</td>
<td>2011/12</td>
</tr>
<tr>
<td>5. New equity/funding for commercial development</td>
<td>2012/13</td>
</tr>
<tr>
<td>6. First new revenue</td>
<td>2014</td>
</tr>
<tr>
<td>7. Revenue $15 - $30B</td>
<td>2020 onwards</td>
</tr>
</tbody>
</table>