EXECUTIVE SUMMARY

ASSESSMENT OF OPTIONS FOR THE ESTABLISHMENT OF A NATIONAL RESOURCES COMPANY

Prepared by Solid Energy New Zealand Ltd, May 2010

1 BACKGROUND

Over the past 12 months Solid Energy has investigated a number of options to deliver an economic step change for New Zealand by utilising New Zealand's vast, abundant and readily available natural resources. The opportunity to add economic value through extraction has never been greater due to recent changes in global supply and demand for commodities and the accessibility to growth markets in Asia – which are now widely recognised as the growth engine for the global economy.

To successfully accelerate development of mineral resources Government must attract and/or supply significant investment capital into the resources sector, but in doing so must also ensure that this maximises value for New Zealand from the resources. This is a significant challenge.

In attempting to accelerate development and wealth creation from resources, Government can provide leadership in many ways with varying levels of direct participation: these ranges from only limited involvement through to very active participation.

The benefits and risks accruing from the various Government leadership models and participation levels also differ significantly and therefore it is important to analyse these models on a relative basis to determine which is the best 'risk weighted' approach for Government progress in order to grow the resources sector and create maximum wealth for New Zealand.

2 OPTIONS FOR ACCELERATING INVESTMENT IN NEW ZEALAND RESOURCES

New Zealand resources policy and the Government's role and level of participation in accelerating investment in New Zealand's natural resources needs to be designed to meet the following key objectives:

- Stimulate and accelerate the extraction of value from natural resources in New Zealand; and
- Capture maximum value for New Zealand; while
- Maintaining New Zealanders expectation for protection of our unique environment.

Although there are many potential models and options that could be applied to the New Zealand resources sector to accelerate investment they principally fall into two categories being limited State participation and a more active State participation

Having identified and analysed a range of potential models available to Government to meet the objectives above, the table below summarises Solid Energy's assessment of the most likely options for implementation of a strategy to deliver the objectives

Limited State Participation	Active State Participation
Business as Usual No current change to the existing policy and regulations	**Farm In to Private sector projects** Government making investments into private sector resources projects
Modification of the existing regime Modification of the existing policies and regulations to encourage private sector investment	**Existing SE and stand-alone NOC** The Government continues to allow Solid Energy to grow its business into the coal and coal related opportunities while establishing a separate Government owned National Oil Company
	Expanded SE and stand alone NOC The Government continues to allow Solid Energy to expand its business into the coal and coal related opportunities along with other mining opportunities while establishing a separate Government owned National Oil Company
	NRL (single Entity) The Government establishes a single entity to consolidate all of the mining and energy related activities available in New Zealand

The table below summarises Solid Energy's assessment of the relative benefits, risks and costs for each option. Each option has been compared against four categories of benefits and four categories of risk and ranked relative to the range of measures.

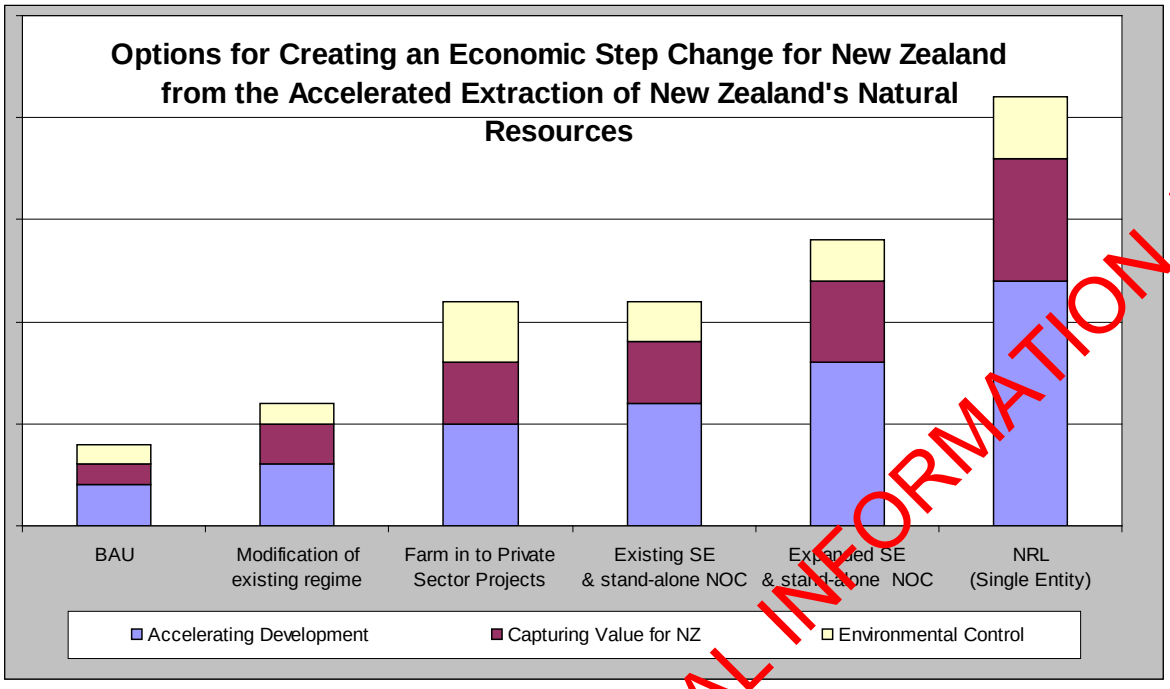
- The colour codes represent the ranking applied on a low to high basis;
- The higher the relative benefits against the range of measures the higher the score
- The lower the relative risks against the relative measures the higher the score;
- The sum of the benefits and risks for each options provides a ranking based on benefits and risks where the higher the number the better the ranking.

Benefits	**Low to High**	1	2	3	4	5	6
Costs and Risks	**Low to High**	6	5	4	3	2	1

		Range of Measures	Limited Participation		Active State Participation			
			BAU	Modification of existing regime	Farm in to Private Sector Projects	Existing SE & stand-alone NOC	Expanded SE & stand-alone NOC	NRL (Single Entity)
Benefits	**Total Additional Revenue** (Activity by 2025)	**Revenue NZ$0 - $30B pa.**	1	2	3	3	4	6
	Total Annual Government Revenue by 2025	**NZ$0 - $15B pa**	1	2	3	3	4	6
	Speed of Initial Development (Time to achieve additional Government revenue >$1B)	**Immediate -Never**	1	1	2	3	4	6
	Level of Development Control (Managementof resource depletion, security of supply, standards of operation, environmental and social impacts)	**0-100%**	1	1	3	4	5	6
Risks & Costs	**Total Government Capital Investment**	**NZ$0 - $30B**	6	6	3	2	1	3
	Financial and Commercial Risk (Incl. efficiencies and synergies)	**Operating Costs NZ$0-$10B pa.**	6	6	1	3	2	4
	Operational and Environmental Risk	**Low-High**	4	4	3	3	3	4
	Concentration Risk (Domestic market and management risk)	**Low-High**	6	6	5	4	4	3
	Political Risk (Incl. Political, Regulatory, annd Trade and Treaty issues)	**Low-HIgh**	5	4	2	4	4	4
TOTAL			**31**	**32**	**25**	**29**	**31**	**42**
RANKING			**3**	**2**	**6**	**5**	**3**	**1**

This table does not tell the full picture as it needs to be taking in context to the objectives. This analysis is shown below where only those benefits and risks are considered relative to the objectives. The results are shown below as a table and then as a graph showing the relative difference between options.

		Range of Measures	Limited Participation		Active State Participation			
			BAU	Modification of existing regime	Farm in to Private Sector Projects	Existing SE & stand-alone NOC	Expanded SE & stand-alone NOC	NRL (Single Entity)
Key Objectives	**Accelerating Development** (Speed of Additional Development+Total Revenue)	**Immediate -Never**						
	Capturing Maximum Value for New Zealand (Total Govt. Revenues)	**NZ$0 - $15B pa**						
	Meeting New Zealanders expectations for our Environment	**Low-High**						



There are a number of clear conclusions to be drawn from the analysis:

1. The existing regime (business as usual) is not maximising New Zealand's natural resource opportunities. The existing regime is biased towards speculative positions in resource permits, rather than investment in development. All the value upside from international price improvement goes to the speculator with very limited investment.
2. It is unlikely that policy changes (modifying the existing regime) will deliver significant acceleration in activity and capture more value concurrently. Any increase in royalty or tax rates implemented to capture more value for New Zealanders'– such as the introduction of a "super profits tax", is likely to create a disincentive for investment.
3. Farm In options with private sector projects rank lower than more active participation and can be achieved under any of the other three active participation options as long as the mandate is made flexible enough to invest in privately held projects.
4. To meet the core objectives Government must be prepared to take additional risk through active participation in investment and development of New Zealand natural resources.
5. The most effective path forward for Government to meet key objectives is an integrated National Resources Company. A secondary option is an expanded Solid Energy business scope with a stand-alone National Oil Company.

More detailed analysis and comparison between the 2 highest ranking options – An integrated National Resources company and a separate stand-alone National Oil Company is provided in the following section

3 SHOULD A NATIONAL OIL COMPANY BE ESTABLISHED ALONGSIDE A NATIONAL RESOURCES COMPANY?

Over the past 12 months there have been a number of suggestions that the Government take a more active role in the Oil and Gas sector. The success of Petrocorp in the 80's of accelerating exploration activity has been used as an example of effective Government participation in the sector and the concept of "Petrocorp 2" is being considered.

By taking an active role in the development of the sector the Government will help stimulate activity and may lead to a discovery. However what is the best way to stimulate activity, manage risk and capture value for New Zealand?

Since the formation of Petrocorp in the mid 70's the oil and gas markets have undergone significant change. Some of these changes include;

- The recognition of $C0_2$ as a major pollutant and one of the major causes of global climate change;
- Oil supply issues identified and expectations of peak oil within the next decade;
- Significant increases in demand from non-OECD countries for crude oil, particularly China;
- The development of transportable natural gas via LNG technology and the growth in LNG markets;
- The growth in alternative or non-conventional energy resources such as Coal Seam Gas and Shale Gas;
- The growth in technologies for the conversion and upgrading of lower ranked energy resources, such as biomass to bio fuels; and
- A change in focus by Oil and Gas majors to upstream resource proving through conventional E&P and by proving unconventional resources using conversion or processing technologies

The identification and development of non-conventional energy resources and the development of new technologies to unlock those resources is now a key strategy in the developing resources and creating shareholder value. Shell's recent acquisition of Arrow Energy in Australia highlights this point.

There are now many product paths for oil and gas utilising a variety of feedstocks. These include the conversion of lignite to crude oil, conversion of biomass to crude, specialised techniques in the extraction of natural gas from coal seams and from deeper shale's. More recent advancements include the thermo chemical conversion of lignite and biomass to coal oil and bio oil, and underground coal to gasification.

Solid Energy has been developing a non-conventional oil and gas program for the past eight years and has established itself as an energy provider through the conversion of natural resources into energy products.

An integrated approach between a NOC and Solid Energy's non-conventional oil and gas program is required to maximise the value and minimise risk for New Zealand. The advantages of an integrated approach include:

- Coordinated allocation of investment funding;
- Not replicating Solid Energy's non-conventional oil and gas expertise;
- Maximum use of conversion infrastructure developments by Solid Energy;

- Integration of conversion technologies infrastructure to maximise value of any investment.
- Coordination of exploration programs to match timing of non-conventional oil and gas investment decisions reducing delays and commercial tension;

A deep understanding of the non-conventional oil and gas opportunities are a prerequisite for the efficient allocation of capital and the market

The table on the following page demonstrates the broad scope of business for a typical NOC's and a typical IOC and compares that to the traditional NOC and to Solid Energy's current portfolio of activities.

Capabilities and Scope of Business Assessment		Typical Oil & Gas Majors		NZ Govt. Oil & Gas Options		
		Typical IOC (2010)	Typical NOC (2010)	Solid Energy (2010)	Traditional NOC (1980's)	New NZ NOC (2010+)
Governance and Support Services	Board					
	CEO					
	Senior Executives					
	Health & Safety					
	Human Resources					
	Legal					
	Financial					
	Systems					
	Infrastructure					
Conventional O&G Operations	Seismic Interpretation					
	Economics EMV/Risk					
	Exploration Drilling					
	Patrners/JV's					
	Commercial					
	Production of Oil and Gas					
	Sales and Marketing					
	Knowledge of International Liquids					
	Knowledge of Local Gas					
	LNG Import/Export					
Non-Conventional O&G Operations	Coal Seam Gas					
	Shale Gas					
	Lignite Gasification					
	FT/MTG					
	CCS					
	Thermochemical Processes					
	Hydrogen - Fuel Cells					
	Chemical Production (eg. Urea)					
	Methane Hydrates					
	Syngas					
Renewables	Biomass Gasification					
	Biomass Thermal					
	Biomass Enzymatic					
	Bio Oils					
	Solar PV					
	Algae					
Other	Carbon Emissions and Trading					
	Climate Change					
	New Zealand Government Relationships					
	New Zealand Permitting Regime					
	New Zealand Specific Regulations (RMA)					

From this analysis we can draw the following conclusions:

1. The scope of business for a typical major Oil and Gas player has changed since the early 80's; due to changes in the market;
2. There are complex global issues that the oil and gas sector need to address;
3. Conversion technology knowledge, understanding and capability is a key requirement in the oil and gas sector;
4. Solid Energy is in a unique position to accelerate exploration and at the same time leverage its knowledge of conversion technologies and processes from its non-conventional oil and gas business;
5. The fastest and least risk way to deliver a credible oil and gas player for New Zealand is to utilised Solid Energy's existing business structure and expertise;
6. An integrated approach is the best way to deliver value and minimise risk for New Zealand

The following section provides a detailed analysis of why and how an integrated single National Resources Company using Solid Energy existing business is the best solution to deliver value for New Zealand.

4 HOW AND WHY A SINGLE INTEGRATED NATIONAL RESOURCES ENTITY USING SOLID ENERGY'S EXISTING BUSINESS IS THE BEST SOLUTION FOR NEW ZELAND

Solid Energy Strategy

Solid Energy has been diversifying its activities into the energy sector for the past 8 years with investments in renewable energy and new energy technologies. These strategic investments will allow Solid Energy to maximise the value of New Zealand's coal and renewable energy resources while providing a secure energy future for New Zealand.

The table below demonstrates Solid Energy's activities by market segment, resource, technology and markets. These activities are all interrelated and form a core of activities where technology links all the energy projects and mining is linked to energy due to requirements to mine thermal coal and lignites.

<table>
<tr><td></td><td colspan="10">SOLID ENERGY</td></tr>
<tr><td>Strategies</td><td colspan="5">← Energy Strategy</td><td>Mining and Energy</td><td colspan="4">Mining Strategy →</td></tr>
<tr><td>Segment</td><td>Methane Hydrates</td><td colspan="2">Conventional Oil & Gas</td><td colspan="3">Non-Conventional Oil & Gas</td><td>Thermal Coal</td><td>Coking Coal</td><td colspan="3">Other Minerals</td></tr>
<tr><td>Resource</td><td>Hydrates</td><td colspan="2">Petroleum</td><td>Biomass</td><td>CSG & UCG</td><td>Lignites</td><td>Sub-bituminous</td><td>Coking Coal</td><td>Iron Sands</td><td>Silica</td><td>Other</td></tr>
<tr><td>Technology</td><td colspan="2"></td><td colspan="5">Conversion & Process Technologies</td><td colspan="3"></td></tr>
<tr><td>Markets</td><td colspan="6">Liquid Fuels, Gas & Chemical Markets</td><td>Stationary Energy</td><td colspan="3">Steel Markets</td></tr>
</table>

Separation of any of these existing activities risks destroying value by replicating scarce human resource, knowledge and markets.

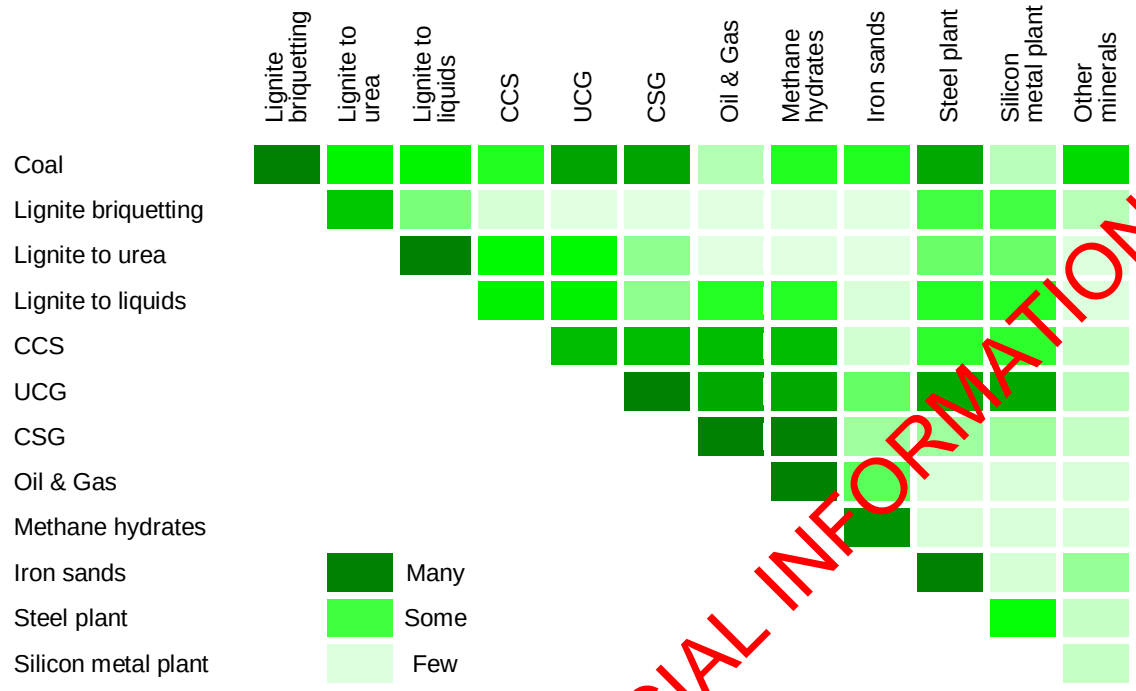
There are natural growth opportunities for Solid Energy to extend its core business portfolio and with the support of Government provides an excellent opportunity to create value and diversify its portfolio of activities into the following areas

1. Expansion in the energy business horizontally into conventional oil and gas.
2. Expansion in the mining business is horizontally into iron sands extraction

To understand why these are logical expansion opportunities it is important to understand the interdependencies and synergies between Solid Energy's business and the expansion opportunities.

Expansion Opportunity	**Interdependencies**	**Synergies**	**Independent Activities**
Oil and Gas	Efficient capital allocation – management of investment in competing resource projects (CTL, UCG, CSG) Duplicate exploration rights for CSG and O&G	Leverage drilling and exploration in unconventional oil (UCG, CSG, CTL) to generate economies from scale and onshore exploration expertise. Leverage SE relationships with reservoir and exploration experts	Offshore exploration and production. Gas processing. Shipping and logistics infrastructure. Crude oil marketing and trading
Iron Sands	Core Solid Energy UCG technology and/or coal resource to provide the reductant required for steel to upgrading process to unlock value. Leverage Solid Energy's 25 year relationships in the International and NZ steel markets to access operational knowledge, market off-take and investment capital for steel plant.	Leverage SE core resource exploration, consenting, mining shipping and market skills. Application of SE technology development team, systems and process (similar lignite technology play) Leverage Iwi relationships and credibility to achieve access	Raw iron sands production and transport
Silica		Integration with Southland Lignite projects to source electricity, carbon reductant and CCS opportunities. Leverage SE core resource exploration, consenting, mining, shipping and market skills. Leverage Solid Energy's relationships in the International silicon markets operational knowledge, market off-take and investment capital	Silicon metal production Silicon marketing and trading

The synergies across business areas are highlighted in the table below:



Business Principles

The following table identifies the business principles that must be satisfied to provide the Crown with the highest probability of success:

Business Principal	Least Effective Outcome		Most Effective Outcome
Speed of implementation from start up	Slow, delayed implementation while non-core systems are developed	→	Established systems and people
Investment allocation	Unintegrated investment allocation based on narrow focus - lacking strategic vison	→	Fully integrated merit order of investment opportunities with intimate knowledge of long term market dynamics
Ability to attract the best partners	Small and unknown entity with low profile	→	Large and known entity, with credible track record
Ability to attract best people	Small Entity, smaller job sizes with less job specialisation	→	Large entity, larger job sizes, increasing job specialisation
Robust governance	Unknown Board and Management, strategy, new systems	→	Established Board, known strategy, established systems, policies and procedures
Stable earnings and ability to attract funding	Small and narrow entity, single commodity or single customer risk	→	Large entity, multiple products, markets and customers
Specialisation (Business focus)	Conglomerates - two or more entities with entirely different businesses	→	Narrowly focussed entities with high degree of focus
Business Synergies	Independent small entities with no ability to leverage market connections, share services, or pool technical knowledge etc.	→	Collection of businesses that share common services, markets, capabilities and technologies

Expansion of the Solid Energy business delivers value for through diversification and growth opportunities and provides a more stable business model which is able to create significant value for New Zealand through the fast implementation of a National Resources Company.

Using Solid Energy as the entity to expand the Governments portfolio of activities in the resources sector provides the following fundamental business principle advantages in almost all categories identified above.

The advantages of implementation speed, benefits of capital allocation decisions, the ability to attract stronger partners and the best people, the funding advantages and operational synergies need to be weighed against the benefits gained by increased business focus through specialisation. If the diversification risk can be managed through the organisational structure and specialisation created at the business unit level there does not seem to be a logical reason for disaggregating any of the businesses provided there are operational synergies.

5 CONCLUSION

Solid Energy brings immediate scale, critical mass, governance, executive, technical, project development, environmental, health & safety, and management systems capability that are all ready to be extended and built on from day one. It has widespread, diverse and high level international contacts for technology, project and market partnering across the energy, steel and other sectors. It has very strong existing cashflow and funding arrangements, with significant ability to extend these on favourable terms.

For almost every reason, Solid Energy offers New Zealand's easiest, strongest, and fastest path to an integrated national Natural Resources Company while delivering maximum value for New Zealand.