



New Zealand Business Council  
for Sustainable Development

# NZBCSD Project

## Sustainable Energy Futures - Outlook 2050

Draft Project Charter

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# Project Objective

To work collaboratively and go beyond current thinking to develop an understanding of the energy options for New Zealand out to 2050 which would be sustainable.

The project will provide a number of scenarios which will allow Government, companies and people to make informed choices about what they want to happen and will provide future generations with comparable or greater options than we have today.



# Background to the Project

Around the world the supply of energy is challenged and demand is increasing.

New Zealand like countries around the world is facing a significant challenge - finding the energy needed to power the economy and transitioning to a more sustainable energy future



# The Overseas Experience

WBSCD Facts & Trends - Published September 2004

The WBSCD defines the global issue in terms of four dimensions:

1. Growth, development and energy demand
2. Energy use and climate impacts
3. The dynamics of technological change
4. Reshaping our energy future

The 7 future scenarios suggested by the WBSCD report are:

- A further shift to natural gas
- Nuclear energy
- Renewables
- Bio-products
- Carbon capture and storage
- Advanced vehicle technologies
- Other energy efficiency measures



# The Overseas Experience

The WBCSD defines the global issue in terms of four dimensions:

1. Growth, development and energy demand: By 2050 energy demand could double or triple as population rises and developing countries expand their economies and overcome poverty. The world population could rise to 9 bn by 2050.
2. Energy use and climate impacts: CO<sub>2</sub> emissions have risen over the last century and coincident with this the global average temperature is up by nearly one degree Celsius. CO<sub>2</sub> emissions will increase with energy increase therefore we will need to find ways to live in a carbon constrained world.



# The Overseas Experience

3. The dynamics of technological change: major transitions take decades to implement for example transport and energy infrastructures can take up to a century to develop fully. Typical infrastructure lifetimes, which are a factor in the rate at which new technologies enter the economy are:

a) Hydro station = 75 years plus

b) Gas turbine = 25 years plus\

c) Motor vehicle = 12 – 20 years plus

Technological change anticipates development of products which are inherently more sustainable (current examples: hybrid car) and the introduction / deployment of carbon neutral technologies in the power sector.



# The Overseas Experience

4. Reshaping our energy future: A reduction in growth is not an acceptable path to a lower carbon world. Rather we need a decoupling of the current direct link between standards of living and energy consumption. The developing world has the right to aspire to the levels enjoyed in OECD countries and improved efficiency, diversity and technological developments in our energy systems will be the keys to achieving this without escalating emissions unsustainably.



# Why do we need a NZ Study?

NZ has unique issues which require their own distinct set of scenarios

However whilst New Zealand's issues in terms of energy supply and demand may be similar to those of countries around the world, this country has a number of unique issues which mean its starting point is different. Specifically:

1. The Maui Gas supply will be depleted within the period
2. Oil production is expected to peak during this century and NZ is highly dependent on its availability and price for its transport industry
3. In terms of the traditional renewable energy sources cheap hydro electricity can no longer be relied on for future growth
4. Strong historical aversion to nuclear energy



# “Why” should this group address the future energy provision for NZ?

The overwhelming view of industry participants is that there is an absence of coordinated thinking to ensure a sustainable balance of future energy supply. This would appear to be supported by the public perception.

Research conducted by Colmar Brunton on behalf of Solid Energy found:

- Seven out of ten New Zealanders believe that there will be an electricity shortage in the next 5 years
- Nine out of ten believe that NZ does not have a long term energy plan to ‘keep the lights on’.



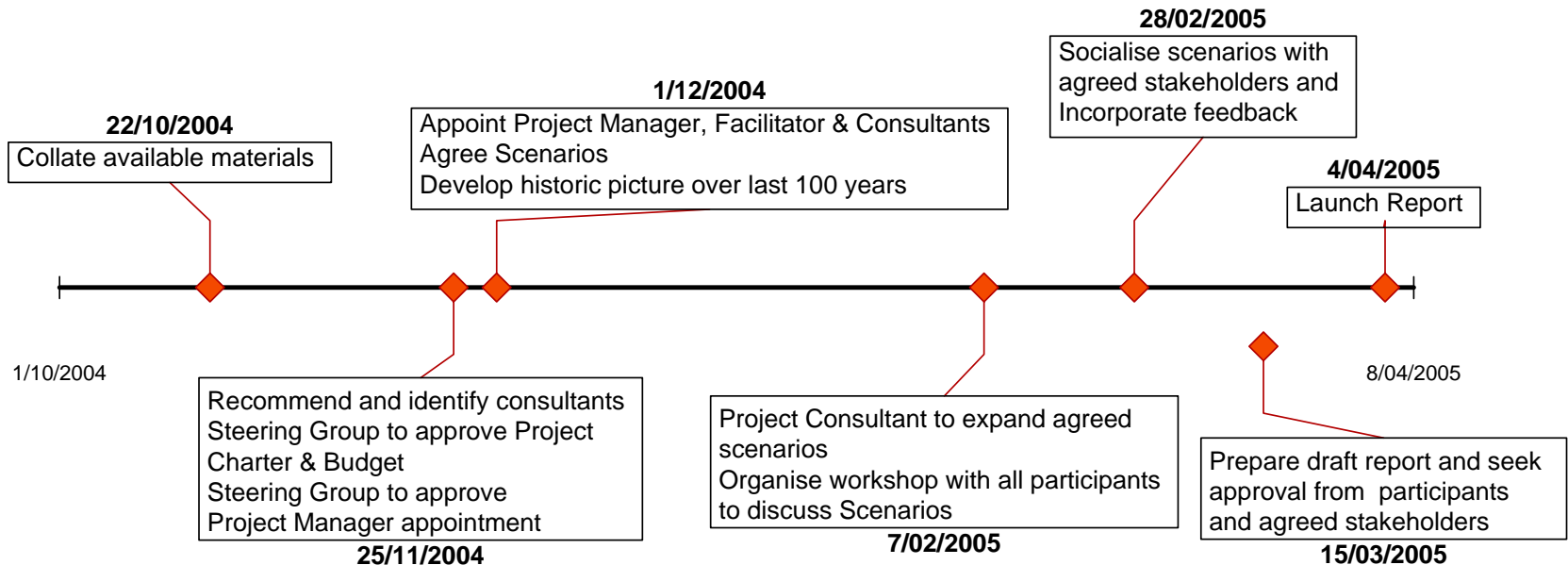
# What are the Project objectives?

- To provide a framework to assess future states under which New Zealand will have achieved energy sustainability by 2050.
- To provide scenarios and pathways of how NZ can continue to grow, innovate and develop apace with its OECD neighbours and have sufficient energy to fuel the growth, which is a fundamental requirement for economic and social development.
- To test our scenarios for optionality compared for the optionality which we have today To identify milestones and decision points on the way to 2050 that will allow for a change of direction where necessary.



# What is the timeline?

Project to be completed by March 2005 in order to ensure report is ready to release prior to the anticipated election period and to enable engagement in the Government's own process





# Who are the participants in the Project?

The core group will comprise:

- Energy companies (BP, Contact Energy, Meridian Energy, Mighty River Power, Solid Energy, Shell, Orion)
- Transport providers (Toyota and Honda)
- Lines energy suppliers (WEL Networks)
- Research or business associations (Coal Association, NIWA, PEANZ, Energy Federation (CRL), Business NZ and NZ Business Council for Sustainable Development (Business Council))
- Demand side representative (Bruce Chapman)



# What will be included in the Project?

The group agreed potential chapter headings which will provide the basis for the project work:

1	The History of New Zealand's energy provision	Evolution since 1900 to establish how we got to where we are now. Produce short history of Energy in NZ; BCSD reference documents on History of Sustainable Development.
2	How the international perspective impacts on the NZ context	Refer international papers to identify issues for NZ
3	The Hierarchy of Issues to be Addressed	Using existing materials, eg WBCSD
4	Demographics & Social Trends Driving Energy Use	Ref Growth & Innovation materials
5	The Evaluation Criteria for Pathways	This will comprise multiple pathways. A matrix of options. Provide a consistent way to evaluate all journeys.
6.	Criteria for Assessment of Future States	How does the physical picture, eg demographics and natural resources, relate to energy: Energy refers to fuel, transport and electricity
7	Describe Scenarios	See "what futures should we consider" below
8	Options, Preconditions and Trade offs	Under what conditions does an energy type or scenario become acceptable?
9	Public dialogue and consultation process	How to socialize the findings - obtain public buy in



# What is our ultimate goal for NZ in 2050?

Our goals are:

- World class quality of life with better than average incomes amongst developed countries and for all New Zealanders
- Number 1 worldwide in terms of lifestyle - a clean, green NZ.



# What future transition paths should we consider?

Four scenarios or transition paths are envisaged:

- Technology Transformation Strategy
- Administered Solutions Strategy
- Middle of the Road Adapter Strategy
- Continuance Strategy (Reference)

These are not mutually exclusive options



# 1. Consumer/Market led Reduced Energy Intensity based on a Technological Transformation Strategy:

As a country we would switch to higher tech lower energy intensity industries, producing a step change the GDP/Energy link.

- Energy to Output Switch. NZ goes from having a high energy/GDP ratio to a low energy GDP ratio over time. Production profile changes.
- NZ consumers and business as the leading innovator building on its entrepreneurial skills. NZ become a source of IP in certain niche technologies perhaps built on our existing resource base eg uses its boat building skills to create lightweight car; switching to high value pharmaceutical products from dairy rather than milk powder.
- Consumers would choose more efficient and sustainable energy options even if they weren't economic (eg pay a surcharge for carbon free electricity and vehicle fuels, pay extra to build low energy houses (high insulation, passive solar heating and solar panels)



## 2. Administered Solutions Strategy

Government regulates to drive change to more efficient and sustainable energy options. This scenario might be:-

- Life is grim/ Energy communism: Oil is at \$90 per barrel, hurricanes are frequent; “Day after tomorrow” temperature fluctuations become reality. Highly regulated - car rationing, power cuts. All new cars will be hybrid; all new houses will be solar etc. Objective will be keep industry growing but rest of us will take cold showers.
- The government would intervene to restrict energy use and promote conservation, efficiency and energy switching. This would happen because of external factors such as oil crisis, war and climate change. Could include things like:
  1. carless days
  2. restrictions on vehicle size
  3. energy taxes
  4. mandatory energy efficiency standards.

Consumers would be encouraged by legislation to move to carbon free electricity and vehicle fuels, to build low energy houses (high insulation, passive solar heating and solar panels)



### 3. Middle of the Road Adapter Strategy

New Zealand's economy would continue on its current path of using energy to process its key export commodities - dairy, timber etc. This means we would continue to need globally competitively priced energy.

- We would be world average on global environmental issues (Climate Change) Use available technologies but would not be world leader.
- We would be leaders on local environmental issues (water and air quality) eg solar cells for roofs, car technology
- We would be average on the OECD economic growth tables.
- NB: This scenario isn't business as usual because we will need to deal with the issues of global climate change, and resource depletion with higher imported oil and gas prices.



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## 4. Continuance Strategy: Business as Usual

Repeat our history: Continue on the traditional path of crisis followed by correcting moves. Reactive not strategic.