EnergyWatch

The Journal of the Sustainable Energy Forum

"Facilitating the use of energy for economic, environmental and social sustainability"

Issue 39, January 2006

Published by The Sustainable Energy Forum Incorporated, PO Box 11-152, Wellington
Email: info@sef.org.nz
Web: www.sef.org.nz
Editor: John Blakeley
ISSN: 1173 5449

Where is the Leadership?

A question being asked more frequently these days is whether or not energy markets (especially in electricity) are capable of delivering the desired outcomes in NZ of affordability brought about by true competition, with sufficient security of supply at all times and in all seasons, and with the desired environmental outcomes.

As noted in this issue there are mutterings being heard about the Government needing to show some leadership in the area of NZ's energy future, especially in regard to sustainable energy, when we all know that NZ is facing significant future problems in the area of availability of some energy sources (paticularly natural gas); the increasing cost and potential future scarcity of crude oil internationally and consequent economic impact on our nation; and, most especially, climate change and the need to limit our greenhouse gas emissions.

The *Sustainable Energy* discussion document (October 2004) produced by the Ministry of Economic Development (MED) on behalf of the Government is very good at analysing the present NZ energy situation, but does not suggest what might be the way in which to take the future action which is clearly necessary if we are to meet its stated objective of "creating a sustainable energy system for NZ". Is that because of the present dogma in political and bureaucratic circles that "the market knows best and we must not interfere with it in any way"?

In this Issue

Problems have recently become apparent in the electricity market model in considering alternatives to upgrading transmission lines. An economist, Alex Sundakov, has noted that there is a danger in the transmission area, of the Electricity Commission trying to impose a central planner model on top of an industry structure that is decentralised and market-based.

The NZ Business Council for Sustainable Development (NZBCSD) has recently released (September 2005) its report on *A Sustainable Energy Future for NZ by 2050*, which states that the Government needs to decide on a long-term energy strategy so that businesses can have greater certainty when making investment decisions. "If the Government doesn't indicate which pathway it wants to go on, there's a problem for people in the market place who have to make investment decisions" said the chief executive of NZBCSD, Peter Neilson.

"Once you've built a plant, it might be there for 50 or 100 years and deciding whether to build such a plant is difficult if the Government policy changes every three years. Once such decisions are made, the high capital costs mean that it's difficult to reverse them".

A similar view was also stated by the PCE, Dr Morgan Williams, at the time the report *Energy Electricity and the Environment* was tabled in Parliament in July 2005. It chided the Government for an "apparent" lack of an overarching framework or strategy on energy policy and direction in NZ.

"Since the Government's October 2000 energy policy framework, no cohesive strategy has been built on" the PCE report said. "This meant that energy sector initiatives were being conducted independently of each other, with no single document offering an insight into the direction in which the Government wants the sector to go".

However I am pleased that just recently, there have been some encouraging signs. The Speech From the Throne at the opening of the new Parliament on Tuesday 8 November noted that during this coming three-year term, "The government will explore a wide range of potential energy scenarios in order to develop a National Energy Strategy. Priority will be given to renewable energy sources".

The speech also noted that "A more aggressive approach will be taken with regard to energy efficiency in order to reduce the growth in demand, while also meeting the needs of households and businesses".

In this regard, the present development of a new National Energy Efficiency and Conservation Strategy is warmly welcomed, with the hope that it will set some challenging targets which will be accepted and "owned" by the NZ energy community.

The new Minister of Energy, David Parker, in a letter sent to SEF on 22 December made specific mention of the development of a National Energy Strategy and said that it would enable the Government to identify what, if any, additional initiatives are required to achieve economic and sustainable energy objectives and surmount key challenges including those posed by oil security and depletion. He noted that the Strategy, which is still in its "conception" phase will likely be developed by a working group led by the Ministry of Economic Development and comprising other relevant departments.

However, in his first in-depth interview (with John Campbell of TV3) on 14 November, three weeks after taking office, I sensed that the Minister had a disinclination to take a more "hands on" role with the energy sector, but he did express some concerns about the competition (or lack of it) in the electricity market place.Perhaps most significantly (and encouragingly) he also said in this interview that he did recognise that as Minister of Energy he has a responsibility to consumers both for ensuring security of supply (i.e. "keeping the lights on"), and to ensure that power is provided at affordable prices without causing too much environmental damage.

A key question which the jury is still out on is whether or not under the present market model, the Minister is able to live up to that admitted responsibility so that consumers receive an affordable and secure energy supply in an environmentally sustainable way.

John Blakeley

ERRATA Issue 38
Your editor regrets that some minor typographical errors were made in Issue 38 and in three cases, this affected the sense of the sentence involved.

- On page 5, column 1, paragraph 3 the sentence should read "However inquiries indicate that all US and many other naval warships generate electricity at 60Hz, …."

- On page 12, column 2, final paragraph, "carbon monoxide" should read "carbon dioxide".

- On page 21, column 2, paragraph 3 the sentence should read "Compared with an 'average' conventional car in NZ, the hybrid car can cut fuel use by up to one half in stop-start city driving, ….."

The statement on page 24, column 1 that "*Also, diesel is significantly cheaper at the pump in Europe, thanks to lower taxation"* needs clarification. Each country in Europe has its own policies on fuel taxation with widely varying results. Most countries in continental Europe do tax petrol more than diesel, but in the UK, the tax is a little higher on diesel. The sentence should therefore be changed to read:

"Also, diesel is cheaper than petrol at the pump in most European countries, thanks to lower taxation".

Letter to the Editor

In all the hype about hybrid cars, one fact is forgotten: About 40% of the fuel savings over the lifetime of the car are negated by the energy used to produce the additional components of the hybrid car.

Furthermore, when driven on a motorway, the hybrid does not have an advantage over a conventional car. This is because its main fuel savings come from re-using the brake energy - otherwise lost as heat at the brake pads, and the savings from not using any fuel when stopped in traffic.

For a car which is used in city traffic and highway combined, the turbo-charged diesel is the more frugal car overall. In particular, when the engine has an automatic stop and re-start facility. This is a combined generator/starter, integrated into the flywheel. It brings the motor to idle speed in a fraction of a second, at which time the fuel is injected and the engine is ready to accelerate. The technology is over 60 years old and has been pioneered by DKW, a German company which was later assimilated into the Audi brand. This device also, very neatly, avoids the asthmatic rattle of a conventional starter motor.

Such a car would be made of light-weight material. Yes, aluminium is energy intensive - however, the additional energy (over using steel) is recovered through fuel savings after three years of driving. The aluminium can later be recycled without needing much energy.

Applying these principles will give us a versatile, reasonably priced fuel saving car until the hydrogen fuel cell becomes economically viable.

K H Peter Kammler
RD5, Warkworth

(Received in response to the feature on Hybrid Cars in EnergyWatch Issue 38, pp 21-26. Peter Kammler's views on hybrid cars are further detailed in an article in this issue, pp15-16).

Peak Oil and Climate Change

On page 18 of this issue, Tim Jones raises the matter of the relationship between Peak Oil and climate change (specifically carbon dioxide emissions from burning fossil fuel).

Tim has stated his own view (Posting on SEF News, 1 December 2005) that these are two sides of the same coin and shouldn't be competing with each other for attention.

Peak Oil

Transport System Changes Essential to Avoid Chaos

"The land transport system in New Zealand is heading for chaos unless we start making major changes now" said Tim Jones, spokesperson on transport issues for The Sustainable Energy Forum (SEF).

SEF has released a report which recommends rapid changes to New Zealand's land transport system to help mitigate the inevitable severe disruption to society once world oil production peaks, and prices rise alarmingly.

"Our land transport system is almost totally dependent on oil, and New Zealand's oil usage is growing rapidly. In 2004, New Zealand used 150% more oil than we did in 1990. With world oil production predicted to peak and then decline early in the 21st century – and possibly very soon – this has got to change" said Mr Jones.

The SEF report, entitled "New Zealand's Response to Peak Oil: Land Transport", (available at www.sef.org.nz) outlines the issues, and recommends changes in three areas: less use of private transport, more efficient use of transport energy, and growth of other forms of energy for transport.

"Our dependence on oil is a big problem," said Tim Jones, "and it's not going to be easy to solve. The key thing is to start now. Government, the private sector, and every individual, should be taking a close look at how they use oil, and make plans for a future in which oil will be a lot more expensive, and possibly harder to obtain".

Key recommendations from the report are that the Government should:

• develop an integrated national strategy to model the effects of Peak Oil on New Zealand under various conditions, and develop the appropriate strategies to prepare for and respond to a range of Peak Oil scenarios.

• develop policies to integrate the present range of vehicle use charging measures, and introduce new measures, to create a consistent, effective taxation and charging regime which rewards low fossil fuel use and low emissions, and penalises high fossil fuel use and high emissions, in the New Zealand vehicle fleet.

• commence research programmes that investigate the potential interactions between the effects of Peak Oil and the effects of climate change.

• create and implement a national strategy to integrate all modes of transport into a system in which fossil energy use is minimised, and lowered over time.

Source: SEF Press Release, 20 October 2005.

Australian Senate Establishes Inquiry

The Australian Senate has established a future oil supply inquiry.

Senator Christine Milne, Australian Greens energy and transport spokesperson (who initiated the proposal) said that the inquiry would provide an opportunity for thorough consideration of a crucial issue for the nation.

"World oil supply is not keeping pace with demand, which means that the days of low petrol prices are over" Senator Milne said in Canberra. "This inquiry will provide an important opportunity for the community, business and experts to participate in developing a strategic plan for the transition towards a more sustainable future".

The Rural and Regional Affairs and Transport Committee will conduct the inquiry into Australia's future oil supply, with particular reference to:

a. Projections of oil production and demand in Australia and globally and the implications for availability and pricing of transport fuels in Australia;

b. Potential of new sources of oil and

alternative transport fuels to meet a significant share of Australia's fuel demands, taking into account technological developments and environmental and economic costs; flow-on economic and social impacts in Australia from continuing rises in the price of transport fuel, and potential reduction in oil supply;

c. Options for reducing Australia's transport fuel demands.

Note: Sweden has also recently announced such an inquiry but there is no sign of one happening in NZ as yet.

Source: Posting to SEF News by Tim Jones, 30 November 2005.

The End of Suburbia?

On Wednesday 9 November I attended a screening of this 78 minute long documentary film at the University of Auckland, arranged as a fundraiser by the NZ Leadership Institute. For about six months now, this film has been "doing the rounds" of Green Party branches but to date it has not been shown at mainstream media outlets, although it is available on DVD.

The film was produced in Canada and refers to North America as a whole, but it is clearly directed mainly at the USA.

I found the camera work to be unimaginative which probably reflected the fact that it was made on a low budget. It developed its theme showing archival footage of subdivision developments mainly from the 1950's, together with most of the film being "talking heads", much of it rather repetitive.

It opened by stating that half of the North American population live in suburbia and it asked whether the suburban dream now has a future with rising energy prices and possible future oil scarcity.

The theme was that during the whole of the 20th century a new system of habitation was developed where people lived many miles from where they worked. A common notion was that this enabled people to escape from the pressures of employment when they returned to their home, but it was only possible on the back of cheap and plentiful energy supplies.

The suburban expansion has been extremely wasteful of resources – land, streets and motorways and services required, and especially of energy required for transportation.

As prices of energy are now being seen to rise quite steeply and with concerns over future availability, there are likely to be continuing times of economic recession eventually turning into an economic depression. Easy availability of resources to facilitate their way of life is something that Americans have become very used to. This has the potential to translate into political upheavals and unrest as people lose their sense of security about the future.

There is strong resistance to communicating to voters the need to change their energy (and resource) consumption habits. Reality is bad for business. What is good for business is fantasy.

The issue of oil depletion has been glaringly absent from the American news media. Americans are deeply addicted to oil and don't want to know that it is going to run out.

The film suggested that if the US wishes to continue to dominate the world, this will first require domination of the world's major energy resources. The US would not be in Iraq if that country didn't have any oil. Now we know that weapons of mass destruction did not exist, and Iraq and Afghanistan are the "opening rounds" of a continuing war to control resources. However, fighting this war is already having a draining effect on the US economy.

Also, the amount of public dissent in the US over the Iraq war is growing, along with concern over moves to restrict civil liberties, including the US Patriot Act.

What are the alternatives to continuing reliance on fossil fuels? Possibly these alternatives might be in place 50 years from now but certainly not 5-10 years from now when they are likely to be needed. **No combination of alternative fuels will in the near future prevent the US from running low on fossil fuels.**

The future prospect of hydrogen as a transport fuel is often used to allay public concerns, but hydrogen is not a form of energy but an energy carrier. There will be major infrastructure issues to be addressed before hydrogen can come into widespread use. Also, there are 600 million cars on the planet with 200 million of them being in the USA and who would pay for all of these to become hydrogen cars?

Ethanol from crops is a net energy loser (i.e. it takes more energy to produce than it contains) and there is not enough available land on the planet for crops to replace oil as a transport fuel.

One solution which must be looked at is "new urbanism" – a return to the type of "walkable communities" which existed before the advent of the motor car in the early 20th century, where people were more in contact with their neighbours and lived in much closer proximity to others. Also, people are going to have to live more locally and ask themselves, what sort of job they will have in 10 years' time. New technology will enable many more people to work from home.

There will need to be a greater sense of community and of people being neighbours again. Peak oil may lead to a reverse of globalisation with local communities having to look after their own energy and other needs.

Energy scarcity will be one driver of this process and climate change may well be another.

The "suburban ideal" as it existed during the 20th century is now coming to an end. New types of denser housing development will have to be created and with the great sprawling suburban shopping malls being converted to mixed use developments including office blocks and other local employment-generating activity.

Although many people will regard this film as being controversial and disagree with some or many of its statements, it is certainly thought provoking.

John Blakeley

World Dependent on Saudi Oil?

Background

In November the IEA "World Energy Outlook 2005" (WEO 2005) was released. Amongst its key conclusions are the following:

- Global energy needs will continue to grow steadily for at least the next 25 years.

- The oil and gas reserves in the Middle East and North Africa are relatively under-exploited and will be sufficient to meet growing demand during that period.

- A key challenge will be to ensure that sufficient energy infrastructure investment takes place to enable production and refining to keep up with demand.

- It is possible to somewhat reduce future fossil fuel demand below the projected amount via appropriate national energy policies.

- Global greenhouse gas emissions will rise by 52 percent by 2030 unless the world takes action to reduce energy consumption.

- Two thirds of a more than 50 percent rise in energy demand over the next 25 years will come from developing countries.

The IEA forecasts that the crude oil price for its 26 member countries should fall back to US$35 per barrel in 2010, before edging up to US$39 per barrel in 2030. It says that the world has seen years of under-investment in both oil production and the refinery sector, but it concludes that the world has enough energy until 2030 based on current trends, despite an expected surge in demand, on condition that there is sufficient investment in the supply chain.

The Saudi Arabia Situation

Much of the existing information on Saudi oil reserves is based on very old exploration data. Very substantial investment will be required both in further investigation and subsequent drilling in opening up new oil fields in order that the IEA forecast can be realised.

There is a possibility that the supposed Saudi reserves that are still undiscovered to replace the present 40 year old oil fields just may not exist, no matter how many physical holes are drilled by engineers on the advice of the international petroleum geologists, who have not looked for oil in Saudi for 30 years or more.

A key underlying assumption in the WEO 2005 report is that Saudi Arabia can increase oil production from the present figure of a little over 10 million barrels per day to between 14 and 18 million barrels per day in 2030.

Saudi Arabia's own projections are apparently to increase production to 15 million barrels per day and hold that output level for 50 years. The IEA report states that its Chief Economist has the view that the question is whether the necessary investments are made, not whether the physical reserves exist. (Commentators who base their projections on physical outputs would probably have rather more conservative views).

The Global Saudi Energy Contribution

At present oil accounts for about 35 percent of the world's primary energy supply. The WEO 2005 report states that global energy demand is expected to rise from 10.8 billion tonnes of oil equivalent in 2005 to 16.3 billion tonnes in 2030 (an increase of 51 percent).

Current world oil production is about 82 million barrels per day. At a conversion rate of 0.127 tonnes per barrel this equals 10.41 million tonnes per day or 3.8 billion tonnes per year, which is 35% of present total global energy demand (10.8 billion tonnes).

With the IEA's assumed projected increase to 2030, global oil supply would need to rise from 3.8 to about 5.7 billion tonnes per year (out of a total primary energy supply of 16.3 billion tonnes per year of oil equivalent).

In 2030, the assumed Saudi oil output of 15 billion barrels per day converts to 0.7 billion tonnes per year, **which would then be 12.2 percent of total global oil supply and 4.2 per cent of total global energy supply.**

Conclusion:

• The assumed global energy contribution of the oil fields in Saudi Arabia in the year 2030 is rather less than I expected, but very significant nevertheless.

• If oil demand grows at the rate being forecast by IEA to 2030, then proportionately the global contribution of Saudi Arabian oil will probably diminish from the present, but this will mean a greater reliance on other oil fields, especially in the Middle East and North Africa which IEA considers to be "relatively under exploited and sufficient to meet growing demand during that period".

• It is to be hoped that IEA data on those other oil fields is rather more conclusive than the data on which future oil production projections for Saudi Arabia appear to be based.

• The WEO 2005 report is widely at variance with the now commonly held view that Peak Oil may occur well before 2030.

• If there is not "sufficient investment in the supply chain", then the IEA suggested figures for oil price of US$35 per barrel in 2010 and US$39 per barrel in 2030 may be gross under-estimates.

John Blakeley

Source: Various SEF News postings on 8 Nov 2005 & 18 Nov

Footnote: The world presently uses around 80 million barrels of oil per day. The American Petroleum Institute says of those 80 million barrels, the USA consumes 20 million barrels, about 25 percent of global usage in a country that has less than 5 percent of the world's population.

Approximately half of the US oil consumption is imported oil (10 million barrels per day) meaning that out of total daily world oil production, 12.5 percent is imported to the US from other countries. At a price of US$60 per barrel, this would mean that the daily US bill for imported oil is now around US$0.6 billion.

Source: NZ Herald, Saturday 29 October 2005, pg G 1.

Oil at US$63 per Barrel

At the beginning of 2006, light crude oil for February US delivery was just above US$63 per barrel on Wednesday 4 January, holding most of the US$5 per barrel gains made in the previous week.

The gains had occurred during the row between Russian and Ukraine over natural gas supplies, now resolved.

Russia and Ukraine agreed to a five-year deal on 4 January after a row over prices which had temporarily disrupted supplies to an anxious Europe, which depends on Russia for a quarter of its gas.

Analysts said that tight supplies and an expected heavy US refinery maintenance schedule might heighten concerns over gasoline supplies, which were stretched thin in recent months after hurricane-related outages in the Gulf coast.

US refineries have been running at close to full capacity to boost winter fuel supplies and top up gasoline stocks, with some postponing of planned maintenance until later in 2006.

Source: NZ Herald, Friday 5 January 2006, pg C3

Higher Oil Prices Would Hurt NZ

NZ would be one of the hardest-hit nations in the Asia-Pacific region if crude oil again hits US$70 (NZ$101) a barrel, an Australian study has found.

Crude oil hit an all-time high of US$70.85 a barrel on 31 August 2005, in the aftermath of Hurricane Katrina, but has since settled below US$61.

The Australian Bureau of Agricultural and Resource Economics, in a report into the impact of higher oil prices on the Asia-Pacific region, found China and NZ would be among the biggest losers if higher oil prices continued.

The NZ gross national product would be reduced 1 percent in 2006 if oil hit US$70 per barrel. GNP in China would fall 1.1 percent in 2006, and 2.7 percent at US$85 per barrel.

Australia would fare better, as high oil prices would boost prices for key exports such as liquefied natural gas and coal.

Across the Asia-Pacific region, oil at about US$70 per barrel would cut 0.5 percent from GNP next year and 1 percent by 2010. If the oil price rose to US$85 per barrel these figures would increase to 0.9 percent in 2006 and 1.4 percent in 2010.

A recent poll of ten local economists found that the NZ economy is expected to grow 2.5 percent in 2005 in gross domestic product terms, well off the 4.4 percent growth recorded in 2004.

Source: NZ Herald, Thursday 3 November 2005, pg C2

Europe's Dependence on Russian Energy

A fight over natural gas prices between Russian and Ukraine has given the European Union a rude New Year's warning about energy dependency and opened up worrying questions about the EU's relationship with Moscow.

The dispute seems to have been settled, thanks to a complex deal by which Ukraine will pay more for its imports of Russian gas but not the immediate quadrupling that Moscow had demanded.

As well as its gas reserves, Russian is the world's second largest producer of petroleum.

Mingled with relief in European capitals at the resolution of this crisis is the shuddering realisation that, little by little, Europe has allowed itself to become dependent on an authoritarian country, creating a "Saudi-style" relationship in which shortcomings on democracy and human rights are overlooked in exchange for vital energy supplies.

Russia turns out about 8 million barrels of crude oil each day (about 10 percent of total world production). It exports 6.11 billion barrels of crude each day, plus 171 billion cubic metres of gas and 20.7 million MWh of electricity.

Despite its economic power, the EU has scant reserves of fossil fuels – Britain became a net

importer of gas in 2004, and will follow suit in oil a few years from now (resulting from the running down of the North Sea oil and gas fields).

Forty percent of the EU's gas needs are met by imports, with 25 percent coming from Russia alone, via pipelines that cross Eastern Europe. The dependence varies widely from zero for Denmark and Ireland to 36 percent for Germany, the biggest European economy, and 100 percent for Estonia, Latvia and Lithuania, the Baltic states that were once part of the Soviet Union and joined the EU in 2004.

On present trends, imports will account for 70 percent of EU gas supplies by 2020 and Russia through its state monopoly, Gazprom, which controls a third of global gas reserves, is likely to be a key provider.

A study commissioned by the EU last year warned "the vulnerability of the EU to a disruption of gas supplies is growing, partly because of the increased gas imports in general and partly because of the high dependence on a single source, Russia, of the new EU member states".

Analysts say that if Russia continues to be seen as unreliable or a bully, Europe could enact far-reaching changes in its energy policy.

The beneficiaries would be likely to be – Algeria, Egypt and Libya, which export natural gas in liquid form (LNG) by tanker; renewable energy sources; and even the nuclear industry which with the exception of France has been on the skids across Europe since the Chernobyl disaster in 1986.

Russians hardball tactics are timely for the nuclear lobby. Britain has to make a decision in the next six months about whether to follow France in building a new generation of nuclear power plants, while Germany's new left-right Coalition government may be tempted to extend the life of its reactors beyond 2020, the date when the previous government, in which the Greens were prominent, promised to phase them out.

Source: NZ Herald, Friday 6 January 2006, pg B3

Potential of Alberta's Oil Sands

The Canadian Energy Research Institute estimates that the oil sands in the province of Alberta contain reserves of 175 billion barrels of oil, surpassed only by Saudi Arabia and that it will generate C$634 billion (NZ$808 billion) in additional income over the next 20 years.

Increasing world energy prices are making it more economical to develop this resource. At the current world production rate of about 82 million barrels per day, annual world oil production is around 30 billion barrels.

So if it does become economically feasible to utilise all the oil sands resources in Alberta, then it is equivalent to nearly six years of present-day world oil requirements.

Alberta's 3 million residents are about 10 percent of Canada's population. It is the lone region in Canada with no debt and its budget surplus of C$5.9 billion this year is expected to be four times the original estimate.

Such riches are causing resentment in the rest of Canada. A recent poll found that 66 percent of Canadians want a greater sharing of Alberta's surpluses. Another recent poll found that one in two Canadians want the government to nationalise the oil industry and impose price ceilings.

Canada's Industry Minister, David Emerson, said "There's always tension in terms of people who would like to see some of the wealth that's created in the west transferred to the east".

Fuelling that tension is the recognition that oil has helped lift the Canadian dollar to a 14 year high against the US currency, making it harder for manufacturers to compete in global markets.

Source: NZ Herald, Monday 26 December 2005, pg C26.

Energy Conservation

Demonstration Sustainable Homes

Preamble

As described below, last August I attended the opening ceremony of a demonstration sustainable house in Waitakere City. Although projects such as this are good for promoting the sustainability cause (and there is very definitely a "feel good" factor involved), and they may provide useful information for the house building industry, I do question whether they provide value for money in relation to the research funding required.

In this particular case, although information on the overall cost of the house was available and estimates of potential savings in energy and water consumption, **what was not yet available was any information on the likely cost-benefit of the cost of additional features provided in this house versus the likely savings over a period of several years.** That is essential information for private buyers who may be considering building a more sustainable home and who need to be convinced that it is economically worth their while to do so.

The Beacon NOW Sustainable Home

On Friday 12 August I attended the opening by the Prime Minister of this first NOW home in Olympic Place, New Lynn on land provided by the Waitakere City Council. It is designed to minimise energy use, waste production and water consumption.

The NOW Home Concept

The Beacon NOW home project is the first step in a much larger project, focussing on enhancing the quality of life for residents and at the same time minimising the use of natural resources such as land, water and energy. The first NOW home has been built to put sustainable living theories into practice.

Background

The NOW home project is a partnership involving a consortium of research and energy shareholders, including Scion (formerly Forest Research), Waitakere City Council, Building Research, Fletcher Building and NZ Steel, with expertise and input provided by EECA. Government funding for the project is provided by the Foundation for Research Science and Technology (FRST). The New Lynn home is the first of a number to be constructed around New Zealand. The next one is to be in Rotorua, close to the forest research campus.

The home has been designed to reduce energy and resource use (including ongoing running and maintenance costs), using readily available materials and technology. It will be tenanted for two years in a real-life experiment to better understand how sustainable living can be made a reality for all NZ households. It will provide valuable insights into how NZ homeowners can balance sustainable living against cost, and how NZ industry can benefit from new opportunities provided by regulatory change.

The NOW home is one of many initiatives associated with the Year of the Built Environment to raise awareness of how the built environment can be designed to create more liveable, sustainable urban environments.

The Opening Ceremony

The Chair of Beacon Pathway Ltd, Andrew Reding, who is also CEO of Fletcher Building Ltd, said that although he is a "dyed in the wool capitalist", he does see the need to conserve resources and this project is about people being sustainably and affordably housed and the design of the house is intended to fit around a family's needs.

He said that "being green is not necessarily being strange" and if all the people in Auckland could be more sustainably housed, there would be no need for a big increase in resources consumed associated with Auckland's increasing population.

The Prime Minister Helen Clark said that this had been a "sustainable day" for her, starting on the North Shore with a school "walking bus" travel project. She noted that 40% of peak hour traffic in Auckland is tertiary and school-related education traffic that stops in the holidays, with such a difference in daily traffic congestion.

She congratulated Mayor Bob Harvey of Waitakere City on his "eco-city concept" noting that he had brought back such ideas from his attendance of the Earth Summit Conference in Rio de Janeiro in 1992. The project is in accord with the Year of the Built Environment and highlights the need to create more healthy and sustainable communities. The three bedroom house has been built on a budget of $180,000 (excluding land cost) and it will be tenanted for two years, to test the home under normal living for water and electricity usage.

She noted that this project is only a small part of what Beacon is planning to do in various parts of the country and the lessons learned will be used in the upcoming revisions of the Building Code. Lessons learned from projects such as this will introduce into the housing market more affordable and healthy homes, based on the principles of sustainability, affordability and environmental responsibility.

The House Itself

During the tour that followed, I noted that the house was well oriented to the sun for passive solar design. It had a large external water tank which collected water off the roof to be re-used for the toilet, laundry and for watering the garden. There were minimal paved areas, to reduce stormwater runoff. The house was designed to look very normal on the exterior, in spite of the additional features which it contains.

As noted above, the building cost $180,000 (excluding land) which is a usual budget in Auckland for a three bedroom home. When I asked the tour guide what the cost of the additional features was in relation to the likely economic benefit of these features, I was told that this information is not yet available.

I noted that the windows are all double glazed to reduce energy loss and ingress of external noise, but I doubt whether this is economic in terms of reduced energy loss in the Auckland climate, although it may well be in more southern parts of NZ. The interior has been designed with a very open plan and had a concrete floor slab throughout, covered with a dark coloured textured finish (rather than carpet) which I found to be rather unattractive. Appliances and fittings were designed to be water and energy efficient, including low flow shower heads, energy efficient light bulbs etc.

A near-new Toyota Prius hybrid car was rather ostentatiously parked in the (single) garage, although the tenants had not yet moved in.

Concluding Comments

Although overall this is an attractive project, unless convincing information can be produced at the end of the two year monitoring period of the net financial benefit in terms of savings in energy and resource use (electricity bills, water consumption etc.) over what would otherwise be the case, versus the additional investment costs involved, I do not see projects such as this leading to a large "buy in" to the concept by people contemplating building new homes.

Also, I believe that there is a significant problem in that while the new home buyer will have to "stump up" the full costs of building a more sustainable home, a lot of the benefit actually accrues to the wider community and to local/central government, because of a lesser need to provide more infrastructure/services in coping with urban growth if the sustainable home concept becomes widely adopted.

It was also pointed out during the tour that although within urban Auckland, many people are now charged water rates, in may other parts of NZ people do not yet have water meters/water rates, so do not see any financial benefit from achieving more efficient usage of the local water supply.

John Blakeley

Sequel

The house has since been tenanted. It has been designed to reduce water, energy and resource use and is built from materials which exceed code minimums. Features include high levels of insulation, double-glazed windows, siting for natural heat and maximum daylight, solar water heating, good ventilation, insulated hot

water pipes and energy efficient lighting and appliances. Quality plumbing and rainwater will cut reticulated water use.

The family of four after just a month in the house report "It's warm, very quiet and much cheaper. Our last power bill was $130 compared with our usual bills of up to $180."

Source: Herald on Sunday, 23 October 2005, p 15.

Ecobulb Project Give-Aways

In Christchurch on Friday 9 December 2005, Green Party Co-leader and Energy Spokesperson, Jeanette Fitzsimons joined Ecobulbs Project Manager, Natalie Cutler-Welsh, to give away hundreds of "Ecobulbs".

The nationwide goal of the Ecobulb projects is to install five energy-saving 'Ecobulbs' into 55 percent of NZ homes, resulting in a saving of over $400 million in consumer power bills and essentially taking a city the size of Dunedin 'off the grid'.
Ms Fitzsimons says "low water levels in South Island hydro lakes highlight the need for energy efficiency measures".

Ms Cutler-Welsh says "more and more people are realising that a simple thing like changing their light bulbs can save them hundreds of dollars, increase energy efficiency, reduce waste to landfills and reduce CO_2 emissions".

"In the eight Ecobulb projects in New Zealand so far, over 500,000 Ecobulbs have been sold. That equates to $50 million saved on consumer power bills over the life of the Ecobulbs and enough electricity saved to power 36,750 homes for a year. It will also prevent 1750 tonnes of ordinary light bulbs from going to the landfill and in terms of reducing CO_2 emissions, is equivalent to taking 50,000 cars off the road", Ms Cutler-Welsh says.

Source: SEF News posting, 8 December 2005 (based on Green Party media statement of 7 December)

Car Sales/Production

New Cars in NZ Getting Smaller?

It appears that the increase in the price of fuel during 2005 has pushed down the demand for the traditional large six-cylinder car in NZ.

Comparing the sales of new cars in the third quarter of the year with the second quarter, total passenger car sales increased by 8.8 percent.

However, there has been a considerable shift between segments of the market. The smallest (mini) car segment had sales increasing by 47.7 percent between the second and third quarters (although from a low base), and the medium car segment was up 10.9 percent.

The large car segment was down 4 percent and the SUV segment by 6 per cent.

The shift to more economical cars is also expected to affect the used car market where buyers are generally more sensitive to the impact of fuel prices on the household budget. Prices at auction for large six and eight cylinder cars have declined by up to 20 percent over the last three months, reflecting lack of demand at retail.

Source: NZ Herald, Thursday 24 November 2005, pg D3

NZBCSD Seeks Incentives for Fuel Efficient/Low Emission Vehicles

On 15 November, to a fanfare and parade of "green vehicles" in Aotea Square led by the Mayor of Auckland Dick Hubbard, the NZ Business Council for Sustainable Development (NZBCSD) released a report calling for cash incentives to encourage and enable private motorists and businesses to purchase more fuel efficient/low emission passenger vehicles.

As most cars first registered in New Zealand each year are used imports, the report recommends action that addresses both new cars and used imports, including a higher emissions standard and incentives to purchase used imports that are seven or less years old.

The report also recommends paying purchasers of **new vehicles** a grant of $3,000 for vehicles with fuel economy of 6.5 litres/100km (43.5mpg) or better, a smaller grant of $1,500 for vehicles achieving 6.6-8.5 litres/100km (33.3-43.5mpg) and charging a penalty of $2,000 on first registration of passenger vehicles with fuel efficiency worse than 12 litres/100km (23.6mpg)

For **used vehicle imports** seven years old or less, the report recommends paying a rebate on first registration of $1,000 for vehicles with fuel economy 6.5litres/100km or better, or $500 for vehicles with fuel economy between 6.6-8.5 litres/100km and a penalty of $1,000 on a first registration for vehicles with fuel economy worse than 12 litres/100km.

The above are the classifications for petrol vehicles and equivalent classifications are recommended for diesel passenger vehicles.

The report also recommends promoting the replacement of existing central and local government vehicles with fuel efficient/low emission vehicles where fitness for purpose options exist, and allowing the most fuel efficient/low emission vehicles with identifying markings, to use bus only lanes.

Source: SEF News posting on 16 November 2005

Comments by John Blakeley

Using "old fashioned terminology," in the case of new cars this is saying that if your new car does 43.5mpg or better, you get a grant of $3,000 and if it does between 33.3-43.5mpg you get a smaller grant of $1,500, and if its fuel consumption is worse than 23.6mpg, you get a penalty of $2,000.

This sounds a bit like differential taxation based on engine cubic capacity, introduced into NZ after the first oil shock in 1973 which I recall did have some effect in encouraging smaller engine size in new cars, but not necessarily better fuel economy, as owners of 2 litre 4 cylinder Holden Commodores will probably testify!

The NZBCSD proposals do have the advantage of being performance-based (on achieved fuel consumption/emission requirements), rather than being arbitrarily based on engine size.

What I believe is missing from the NZBCSD media release is that to me, its emphasis seems to mainly relate fuel economy to better technology, rather than to the size and weight of the vehicle.

As noted on page 21 of EnergyWatch Issue 38 (as an example), "The Honda Civic hybrid at $33,000 has similar fuel consumption to the smaller and lighter conventionally powered Honda Jazz at $20,500, so if an owner is prepared to accept the smaller interior space of the Jazz, there would be no saving in purchasing the Civic hybrid at a considerable higher price" (but I am unsure about their relative emissions of other pollutants apart from carbon dioxide).

It appears to me that most people purchase larger cars than they really need, mainly for reasons of social status or perceived greater safety. Perhaps the real message that NZBCSD should be trying to get out there is that it is really "cool" to drive a smaller car and do your bit for the environment at the same time.

In my recent trip around UK and European cities it was really noticeable how few cars you see there of 3 litres engine capacity or more compared with NZ (and also how much more modern the car fleets are without all the second hand imports which we have here).

I was also most impressed with the uptake of 2 door Smart cars in European cities, perfectly adequate for most situations of 1 or 2 person commuting, and in some cities (I'm not sure if it was legal or not) you see them parked nose in to the kerb where everybody else has to parallel park, so you can get two Smart cars into the space of one "ordinary" car.

Source: SEF News posting on 16 November 2005.

Footnote:

Subsequent contributors to SEF News commented on recent news reports that in Christchurch, Smart cars had been issued with parking tickets when parked "nose in" to the kerb!

Other contributors commented on an apparent anomaly that "people mover" vans which carry up to seven persons are actually, when fully loaded, much more efficient in terms of fuel used per person carried, but would probably be charged a penalty under the system being proposed by NZBCSD.

Also, there are social implications in rewarding small cars and penalising big ones. An effect would be to require large families to subsidise single people. Classification of vehicle type is also important. In the USA, light trucks and SUV's used privately are classified as trucks and avoid any penalty for high fuel consumption, the result being a move by private purchasers away from large cars towards these vehicles.

Are Smaller Cars The Answer?

Although the long-term solution for sustainable mobility on Planet Earth will probably be based on hydrogen fuel-cell technology, the widespread commercial availability of these vehicles around the world is likely to be in 2020 at the earliest.

However the global stock of fossil fuel-powered vehicles is likely to double in the next two decades or so, and each of these vehicles will have an economic life of about 20 years.

In launching the Yaris hatchback, Toyota's new small car, the managing director of Toyota NZ, Bob Field, said that we simply can't wait for the "hydrogen solution".

In the meantime, petrol-electric hybrid cars will have an increasingly important role to play, but Mr Field agreed that **there will be a renewed importance of small cars as responsible personal transport, in a world where fuel efficiency and low emissions have moved from being urgent to critical**.

Mr Field noted that new car factories are springing up throughout the Third World and these new factories will build vehicles that will be powered by fossil fuels. He noted that a recent study for the World Business Council for Sustainable Development **suggested that greenhouse gas emissions from transport could triple in the first half of the 21st century**.

"Furthermore the relative inefficiency of the standard fossil fuel-engined car means that only 14 percent of the oil's original energy is applied at the wheels. Twelve percent of its energy value is lost in getting from the oil well through the refining and distribution system to the car's fuel tank, and another 72 percent is lost through heat loss and mechanical friction in converting the petrol in the tank to power the wheels" Mr Field said.

Mr Field said that drivers could make the biggest short-term contribution to a healthier planet by rationalising the daily use of their vehicle and by more carefully considering fuel efficiency when they buy their next vehicle.

Until earlier in 2005, the inflation-adjusted price of oil has been very low compared with the peaks reached in the oil crisis of the 1970's and early 1980's. That is especially true in NZ where pump prices are relatively low in world terms".

"As a result, the past two decades have seen growth in SUV's and larger cars in the NZ market" Mr Field said. "Twenty years ago, 40 percent of sales were vehicles less than 1600cc. Today only 12 percent of vehicles are under 1600cc, and cars close to 4 litres in capacity have held the number one sales spot for the past few years".

Source: NZ Herald, Saturday 3 December 2005, pg G1.

China and India to Dominate Global Car Sales

A research group called Keystone India has predicted that China and India will become the first and third largest markets for motor vehicles by 2030, due to the emergence of "motorisation" in those countries.

The study says that over the next 25 years, emerging markets will replace the mature markets of the USA, Europe and Japan as the primary drivers of sales growth.

According to the report, more motor vehicles will be sold over the next 25 years than in the entire history of the industry to date.

Diminishing populations and already high current ownership rates are expected to cause vehicle sales to decline in developed countries like South Korea, Germany, Italy, Japan and Spain over the next quarter century.

With a projected population increase of 70 million people, annual vehicle sales in the USA are predicted to rise from 16.9 million in 2004 to 23.2 million by 2030, but dropping that country from first to second place in vehicle sales.

In 2017, China is expected to become the world's largest market for motor vehicle sales and the combined share of motor vehicle registrations in China and India will rise seven-fold from 5.3 percent to 37 percent of global sales by the year 2030.

Source: NZ Herald, Saturday 3 December 2005, pg G3

What You Always Wanted to Know about Hybrid Cars

Individual travel by car is shockingly wasteful. Including all losses, beginning at the oil well, less than one percent of the energy spent is used to transport the actual payload, a human being. The economics are equally dismal. In the congested cities the average speed is back to horse and carriage. Even worse, when the time needed to earn the money for the car is added into the journey, the progress through town drops to walking speed. So, there is a lot of room for improvement, to put it mildly.

Hydrogen is touted as the clean fuel, with journalists gushing that "cars will run on water". First of all, water is not hydrogen it merely contains it, tied to oxygen. To separate hydrogen from oxygen, copious amounts of electricity have to be applied, which can later be reproduced in a fuel cell. Hydrogen, therefore, is not a fuel. It merely is a storage medium for energy. It practically acts like a battery, albeit with a very high energy to weight ratio. The drawback is a very complex conversion process back into electricity when it is used with a fuel cell.

Since marginal electricity invariably comes from a fossil fuelled power station, the "clean" hydrogen is a myth. Of course, "clean" electricity, such as from photovoltaic cells, could be used to make hydrogen. While it would make our transport cleaner, the whole process would incur large conversion losses, and would also require large investments. A far better solution for a household would be to feed the electricity from photovoltaic cells into the grid during the day and draw it out at night. No batteries, no conversion losses. The efficiency of transport then, would be improved by other means.

Much is being made of hybrid cars. Although they are of benefit to the environment, there is more to it than meets the eye.

First of all, why is a hybrid saving fuel? A car is wasting fuel in two major ways; when coasting or idling, and when turning kinetic (motion) energy into heat at the brake pads.

A hybrid, i.e. a combination of combustion engine and electric motor, minimises these losses. While idling, the storage battery is being charged, or the car is running on electricity alone, i.e. it does not idle at all. The car is braked by switching the electric motor to generation mode, thus saving the energy for a new acceleration process.

From that, it is immediately clear that a hybrid car is most effective in city traffic. On long highway stretches such as the US Interstates or the German autobahn, cars often are on cruise control, perhaps even automatically keeping a constant distance to the car in front. In such a situation, a hybrid is pretty much a wasted effort.

Hybrids come in many variations, each having different characteristics.

On the one side is the **full hybrid**. In its extreme form, the combustion engine is a very simple turbocharged diesel. It runs at a set speed, therefore avoiding costly engine management systems such as variable valve and injection timing. The flywheel is replaced by a generator, which doubles as a starter motor. The recovered brake energy is stored in a battery which also stores the surplus electricity generated by the diesel. Once the battery is charged, the diesel engine stops until required to again charge the battery.

Four electric drive motors are integrated into the wheel rims. (This does not improve the suspension and road holding but can be tolerated). Motor management, flywheel, clutch, gearbox, drive train, differential, stub axles – all gone. This car is simplicity itself. Since the engine is such a compact unit, it can be very well sound insulated, and can be taken out in minutes for servicing or replacement. The unit can be placed anywhere in the car, allowing a space saving layout.

The **mild hybrid** is something totally different. The main propulsion is still the combustion engine. Its main variance to an ordinary car is the modified flywheel. This is, as above, a combined generator and electric motor which generates electricity when braking the car, and then helps in accelerating the car after a stop. Short term electricity storage is through a smallish battery, or a lightweight capacitor. The generator-cum-starter also allows use of an automatic stop-start system, where the engine is switched off at stops, and is restarted in a fraction of a second by pushing the accelerator. Since there is no mechanical gear involved, it neatly avoids the asthmatic rattle of the present starter motors. This combined flywheel/starter/generator was already used by the German car maker DKW in the early 1940s, so it is hardly experimental.

Between these two extremes we find the present Toyota hybrids. They probably combine the drawbacks of both. Why? These cars are extremely complex, and expensive to build. About 40% of the fuel savings during their life time is negated by the extra energy which goes into producing the hybrid components, and the rather large batteries are not without their environmental problems either.

That said, there are a lot of improvements possible to the motorcar – hybrid or not. Many of these measures have not been cost efficient in the past. Now however, with fuel prices being – and most likely remaining – high, these incremental improvements will pay for themselves. Here are a few examples:

• First of all, diesel engines are more efficient than petrol engines simply because they work with a higher combustion pressure (Thermodynamics 101).

• Raising the operating temperature of the engine above 100 degrees would also help, although this has the problem of dealing with superheated steam escaping from the radiator in case of an accident.

• Lowering the weight of a car helps, too. Admittedly, aluminium components need more production energy than steel but this is recovered through fuel savings in the first three years. When aluminium is recycled, its energy uptake is no more than that for steel.

• A cold engine uses about twice as much fuel, due to incomplete combustion. If fuel prices remain high, there would be a market for pre-heating the engine in the garage prior to leaving, or for an in-built heat retention which keeps most of the cooling water warm for 24 hours. Volkswagen designed such a device five years ago but at the time it was not cost-efficient.

• BMW just announced they are working on a system to recover waste heat from the exhaust, and cooling water, to drive a steam engine which is coupled to the crankshaft.

• Low rolling-resistance tyres and bearings.

• Extremely streamlined car bodies, i.e. side mirror replaced by cameras, wheel wells covered, door handles flush, no large gaps between body panels. **No rear spoilers – they do nothing but create drag up to 100km/h, apart from indicating a low IQ of the car's owner.**

• Using compressed natural gas as fuel if it is produced in this country.

• Most of all, cars should shed excessive horsepower and engine size. There is absolutely no need to have cars which can go at two-and-a-half times the legal limit; there is absolutely no need to accelerate 2 tons of steel from zero to a hundred clicks in 6 seconds. Except to serve our egos, mine included.

Peter Kammler

NZ Energy Futures

Four Recent Meetings/Workshops

Tim Jones reports below on four meetings/ workshops which he attended during November 2005 which are all relevant to consideration of NZ's energy future.

1. MED Workshop on Assumptions and Scenarios for the Forthcoming Publication "New Zealand Energy Outlook 2006", held on 17 November 2005.

The presentations for this workshop are online at:http://www.med.govt.nz/ers/en_stats/projections/events/20051117/index.html

This workshop was attended both by analysts from a number of Government departments – including, I was pleased to see, at least one representative from Treasury – and members of the public, including a number of people active in the peak oil debate. Not surprisingly, the presentation on "Oil Price Assumptions and Scenarios" provoked the most debate. I was pleased to see that the MED are now including a high oil price scenario as well as their "business as usual" scenario, although I challenged the assumption in the "business as usual" scenario that oil futures provide a valid guide to future oil prices.

Nevertheless, the most striking presentation was that on "Heavy Industry Energy Demand" – both the prediction that the Tiwai Point aluminium smelter would close by 2030, and the huge increase predicted in dairy cow numbers and dairy energy demand during that period. Several members of the audience questioned whether this straight-line increase in dairy numbers was realistic; however, this presentation made it clear to me just how much stress dairy conversions of land are placing on both our energy system and our net greenhouse gas emissions.

2. MED Workshop: World Energy Outlook 2005: Middle East & North Africa Insights, by Noe van Hulst, Director, Long-Term Co-operation and Policy Analysis, 23 November 2005.

Presentation available online at:

http://www.med.govt.nz/ers/en_stats/projections/events/20051123/index.html

In this presentation, given in Wellington soon after the release of the IEA's "World Energy Outlook 2005", Noe van Hulst claimed that reports of "Twilight in the Desert" – the current or imminent decline of the Middle East's major oil fields – were wrong. He said that the IEA, having talked extensively with geologists and national oil company representatives in the field, had come to the conclusion that, **with the necessary level of investment**, sufficient production growth is possible in the Middle East and North Africa to meet the expected rise in world oil demand. (In the IEA's Reference Scenario, demand will rise from the present 82 million barrels per day (mbd) to 116 mbd in 2030, by which time the IEA expects the oil price to be US$65 per barrel).

However, the IEA put a couple of caveats on this rosy picture. One is that, in the Reference Scenario, CO_2 emissions are projected to rise from 24 to 37 gigatonnes per annum. The IEA acknowledges that this is not sustainable, and has therefore developed an alternative scenario, in which energy efficiency policies are implemented more fully, and more renewable and nuclear power is used. Under this scenario, 12.1 million barrels per day less of oil are used by 2030.

The second IEA caveat is that, for production to reach 115 million barrels per day by 2030, **massive investment will be needed**: the countries of the Middle East and North Africa would need to invest, on average, $56 billion per year in energy infrastructure. The level of upstream oil investment required will be more than twice that of the last decade. If this investment is not made, then, under the IEA's Deferred Investment Scenario, oil prices would rise to US$86 per barrel by 2030, and gas, coal and electricity prices would be higher as well.

I want to add a couple of caveats of my own. Firstly, the steep rises in production forecast in the Reference Scenario depend upon

"reserve additions and new developments" – **in other words, upon fields that haven't been discovered yet, and additional reserves as yet unknown**. Secondly, the IEA's production graphs for various countries often have a similar pattern: past production has risen and fallen; future production is shown as climbing steeply and steadily. **The very shape of these graphs suggests that there is a strong component of wish-fulfilment in the IEA's projections.**

3. Oil Depletion Workshop at Australian New Zealand Solar Energy Society (ANZSES) Conference 2005 "Renewable Energy for a Sustainable Future: A challenge for a post carbon world", Dunedin, 28-30 November 2005.

I was unable to attend the conference but on Tuesday 29th November, I facilitated a conference workshop on oil depletion. This was a major theme of the Tuesday; the day started with presentations by Albert Bartlett on "The Exponential Function" and its implications for human energy use and human society, followed by Kjell Akellett of the Association for the Study of Peak Oil (ASPO) on the current state of oil depletion and the Peak Oil debate. At the end of the day, Brenda and Robert Vale of the University of Auckland gave an excellent and entertaining presentation which looked at housing and transport in the post-abundant-oil era.

The workshop session I facilitated started with a couple of papers. Jurgen Heissner of ASPO New Zealand, which is currently in formation, spoke on "Implications of Global Peak Oil Extraction for the New Zealand Economy", looking at existing proposals on how to mitigate the effects of Peak Oil on New Zealand, and ways in which these could be improved, notably a move towards localised economies. For copies of this paper, please contact Jurgen at jurgen@ts.co.nz

Next, Leah McBey, a third-term Dunedin City Councillor who chairs the Finance and Strategy Committee of the Dunedin City Council, gave a presentation on "Peak Oil: The Role of Local Authorities in Powering Down to the Solar Age". Drawing on her experience in local government, Leah's presentation gave practical advice for local governments, and those seeking to lobby them on Peak Oil, on ways to prepare for the impact of Peak Oil. For copies of this presentation please contact Leah at: lmcbey@dcc.govt.nz

After these two papers, about fifty minutes were available for general discussion. The issues discussed included agricultural production in the post-Peak era, and the vital role which organic agriculture, with its comparatively low oil inputs, could play.

Jeanette Fitzsimons, who attended the workshop, said that she was not optimistic that central government would be very responsive to oil depletion and climate change during the term of the current government. As she described it, "the rudder has been set on a different course, but the ship has barely started turning yet". Therefore, action at all levels – personal, community, local authority and national – is needed.

Towards the end of the workshop, an interesting discussion developed on the relationship between Peak Oil and climate change. Kjell Akellett of ASPO argued that there wasn't enough oil available to be burnt to lead to the increases in CO_2 emissions projected by the IPCC; in contrast, Ralph Sims of Massey University and others pointed out that it was highly likely that there would be a great increase in the consumption of coal, including coal-to-oil projects, to make up the shortfall caused by oil depletion. Thus, oil depletion might lead to a more rapid increase in greenhouse gases. The debate over the relationship between Peak Oil and climate change has been made more pointed by reports that one or more lignite-to-diesel plants are under investigation in Southland. This is an issue that will need more attention in 2006.

4. Joint IPENZ/ESR Meeting "The Coming Emergency: coping with oil depletion", Wellington, 21 November 2005.

The three speakers at this meeting were: Professor Ralph Sims, Professor of Sustainable Energy and Director, Centre for Energy Research, Massey University; Tim Jones, Convenor of the SEF working group on transport and Peak Oil; and

Gerry Te Kapa Coates, Engineering Consultant and board member of Land Transport New Zealand.

Ralph, who was a lead author for the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report covering energy supply, renewable energy and agriculture, outlined the IPCC position on the likely future of the Earth's climate, and looked at whether Peak Oil was likely to have any significant effect on these projections.

I outlined some of the key implications of oil depletion and sustained high oil prices for New Zealand in areas other than transport – along similar lines to those laid out in the SEF document "Peak Oil: An Urgent Issue for New Zealand", available at:

http://www.sef.org.nz/papers/peak_oil_info_sheet.pdf

Gerry Coates focused on the transport implications of Peak Oil, covering the history of transport, the historically rapid rise and future decline of oil, and the range of alternatives potentially available. A number of the issues Gerry raised are canvassed in the SEF document "New Zealand's Response to Peak Oil: Land Transport", available at http://www.sef.org.nz/papers/peak_oil_land_transport.pdf

The meeting was well-attended, with an audience of about 100 people. Questions revealed a wide range of viewpoints, with one audience member commenting that only price increases and shortages would drive change, and that there was little point in attempting to do anything until these occurred – a point disputed by panel members.

A number of other audience members felt that the presentations were too sanguine about the impact of Peak Oil, and that we were heading for major economic and population collapses world-wide, and that humanity would not or could not take the necessary steps to adapt to oil depletion.

My personal view is that it's much too early in the game to assume defeat and that in any case, adopting such a defeatist attitude is unlikely to convince politicians and the public both that the issue is worthy of concern, and that there are steps which, as a country, we can and should be taking now.

All four reports by Tim Jones

NZBCSD Report on "A Sustainable Energy Future for NZ by 2050".

The work described in this report released in September 2005 was facilitated by the NZ Business Council for Sustainable Development (NZBCSD) to provide better understanding of sustainable energy options for NZ. NZBCSD is made up of 50 businesses dedicated to promoting and practising sustainability incorporating their environmental, economic and social aspirations.

The report discusses energy policy options facing New Zealanders up to 2050. NZBCSD says that the Government needs to decide on a long-term energy strategy so that businesses can have greater certainty when making investment decisions. "If the Government doesn't indicate the pathway it wants to go on, there's a problem for people in the market place who have to make investment decisions", says the council's chief executive, Peter Neilson.

"Once you've built a plant, it might be there for 50 to 100 years".

Deciding whether to build such a plant is difficult if Government policy changes ever three years. Once such decisions are made, the high capital costs mean it's difficult to reverse them.

Neilson says the council is not trying to go back to a 1960s style energy plan. "Businesses have got to accept that they will take most of the risks because that's what they get rewarded for".

The study outlines four possible paths the Government could choose. It could opt to continue with current patterns where energy consumption has outstripped growth in the economy since 1970 which would require gas discoveries and the use of coal.

The study found 70 percent of New Zealand's energy supply in 2003 came from fossil fuels, oil, gas and coal.

The Government could choose a shielded approach where security of supply is the primary driver to the detriment of economic growth. Or it could choose a conservationist approach which would involve accepting lower economic growth.

But the council's preferred option is what it calls the "transformation" path which aims to de-couple the traditional link between economic growth and energy usage. This would mean a largely service-based economy combined with producing higher-value products, and energy-intensive industries declining.

The Government would encourage this transition by helping with extensive research and development and by setting stringent energy efficiency and environmental standards. That scenario also involves first class transport in urban areas and encourages households to use less energy or even generate their own through the use of such things as solar panels.

The council also favours keeping as many options open as possible and stresses that an increased use of renewable energy such as wind, hydro, solar and geothermal will not be enough to meet the country's needs.

Both the growth and transformation scenarios would depend heavily on technological developments.

Neilson says the study was commissioned **"as a result of overwhelming concern expressed by its members that successive governments had failed to put in place a long-term sustainable energy plan".**

Members involved in preparing the study included BP, Shell and the Government-owned energy companies.

Energy Options

- Continue current patterns – will require gas discoveries and the use of coal.
- Shielded approach – where security of supply is the primary driver to the detriment of economic growth.
- Conservation approach – involves accepting lower economic growth.
- Transformation approach – aims to decouple the traditional link between economic growth and energy usage.

Source: NZBCSD Media Statement, 26 Sep 2005

"Future Currents" Presentation and Discussion

Dr Morgan Williams, the Parliamentary Commissioner for the Environment (PCE) and an assistant, Nick Potter, addressed a breakfast meeting of the Sustainable Business Network in Auckland on Friday 18 November.

The meeting involved a presentation of the "Future Currents" report – Electricity Scenarios for NZ 2005-2050 (published earlier in 2005 by the PCE), followed by discussion. As the report is readily available in either electronic or printed form, the presentation is only briefly summarised below, followed by a much more detailed summary of the discussion (a free electronic copy of the report is available at www.pce.govt.nz).

Presentation

There is a need to have a much wider dialogue about the journey this century towards meeting the energy needs of NZ as a small nation.

NZ's electricity system is at a "fork in the road" and decisions made over the next 5-10 years will affect the path we take for the next 50 years or more. The "electricity reforms" implemented from the mid-1980's up to 2000 were deeply idealogically driven. There has been a lack of futures thinking and strategic planning for electricity and energy issues at an official level in NZ since the 1980's.

The key energy issues now facing NZ are availability of resources and security concerns and global "mega issues" (climate change and peak oil). Also there is limited capability and will in NZ for strategic (long term) planning. It is clearly shaping up to be a "rough ride" century ahead and the place to begin is not with supply but with demand.

Electricity in the Twentieth Century

1900-1950	• Initially small-scale electricity systems (local) • Then Govt. starts fostering national development and takes over most of electricity generation and transmission
1950-1960	• Govt. encourages more demand and supply • Network expansion to rural communities • First NZ geothermal power plant at Wairakei
1960-1970	• All-electric home now the norm. • Major expansion of large hydro projects • Cook Strait power cables laid and HVDC link • Massive public protests over Lake Manapouri development
1970-1980	• Energy efficiency and conservation become more important during "oil shocks" • Royal Commission dismisses nuclear power as an option. • Govt. pursues "Think Big" programme with major energy projects • Maui gas field developed with gas sold under "take or pay".
1980-1990	• Huntly power station opens in 1983 (coal or gas) • Shift from central planning to a deregulated market-based system • Ministry of Energy abolished and Electricorp established
1990-2000	• Further major "reforms". Local power boards/MED's replaced with electricity companies. • Electricorp split up • Transpower established as a separate company • Wholesale electricity market set up • Major drought affects SI hydro lakes, leading to a major electricity shortage in 1992. • NZ's first wind farm opens in 1996 • EECA established • Auckland CBD hit by major power blackout in 1998 • Ministerial inquiry established – leading to further "reforms".

Rising Consumption
NZ Trends 1981-2001

• **Population**	**+19%**
• GDP	+55%
• Energy Use	+61%
• Electricity Generation	+65%
• Waste (Auckland only)	+131%

The two scenarios studied were entitled "Fuelling the Future" and "Sparking New Designs" spanning over the next 50 years with particular reference to NZ in 2015, 2030 and 2050.

What do we now know?
- A long-term view is vital
- We live in a carbon-constrained world
- Energy prices are rising globally
- There are benefits in "future proofing" our energy sources
- Energy efficiency investment is often cheaper than providing more energy (Roy Hemmingway of Electricity Commission says 2 or 3 times cheaper).

Both scenarios assume a growing demand for energy services (2% per year). Energy services are what we want (warmth, light etc). Electricity is one form of utility which can provide these services.

Distinction between "growth" and "development". Much confusion could be avoided if we could agree to use the word "growth" to refer only to the quantitative scale of the physical economy: Qualitative improvements could be labelled "development".

Growth of the economic organism means larger jaws and a bigger digestive tract. **Development** means more complete digestion and wiser purpose.

Energy Innovation
Present day examples in NZ include:

- Landcare Research office building, on the University of Auckland Tamaki Campus.

- Beacon pathway demonstration sustainable houses (see pp10-12 of this issue).

- Whispertech – combined heat and electricity for houses.

- Eco bulb project – if every home in NZ had energy efficient light bulbs, the electricity saving would be the equivalent to powering a city the size of Hamilton (see page 12)

- NIWA: Rural Maori communities project
  - and many more.

Winding up
- The foundations of our present electricity system were laid during the 20th century.

- Today's problems provide NZ with an opportunity to shift direction.

- There is a huge potential to use energy more efficiently and to develop renewable resources.

Opportunities for NZ
- Energy efficiency benefits (social, economic and environmental)

- Already about 70% renewable energy for electricity

- World leading renewable energy resources

- Regional developments and jobs - take innovations global (e.g. Whispertech).

- More secure future (energy without a fuel bill) from a mix of renewable resources incl. hydro, wind, geothermal, solar and wave power.

Where To From Here?
- Need better dialogue and action with a "joined up" long-term view (PCE will keep participating)

- Useful set of resources now available
  - Sustainable Energy (MED document October 2004)
  - FRST Scenarios
  - NZBCSD Scenarios (September 2005)
  - Future Currents (PCE 2005)

- A NZ energy roadmap?
  - And regional strategies (Canterbury)

Discussion
I observed that there had been no mention made of the "dry year" electricity problem. It had been noted that NZ has 65 per cent of its electricity coming from renewable energy sources which is one of the highest percentages in the world (exceeded only by Iceland?) However the "down side" of that is fluctuations in energy supply between a "dry year" and a "normal year".

I also noted an earlier slide shown which had been taken from Electricorp Marketing promotional material, November 1988, stating that NZ had abundant supplies of electricity from clean renewable energy sources. At that time ECNZ used to claim they had 40 per cent surplus capacity due to overbuilding in the past, and they were doing their best to promote greater use of electricity, but within five years of ECNZ being established, in 1992 NZ had its worst winter electricity shortage since the 1950's (and the first serious shortage since the mid 1970's).

Also I noted very recent publicity about a potential electricity shortage in the 2006 winter because of the present low storage levels in Lakes Pukaki and Tekapo, and that at present most of NZ's thermal power stations are running flat out so as to facilitate building up the hydro lakes (with current spot prices of 13 to 14 cents per kWh compared with 3 or 4 cents at the same time last year).

In response Dr Williams first noted that climate change could exacerbate this problem with

possible greater variation between a "dry year" and a "normal year".

He noted that it is desirable that hydro be complemented with more renewable energy for electricity generation from other sources, that geothermal energy is used for steady-state electricity generation and that wind energy is very compatible with hydro for electricity generation (as Meridian Energy in particular fully appreciates).

Dr Williams also noted that a key issue in grappling with the "dry year" electricity problem is how to more closely inter-link the various parts of the electricity system so that it can better anticipate and cope with the situation as a dry year shortage is developing.

A question was asked about whether the scenarios had considered hydrogen fuel cells coming online over the next 20 years or so?

In response, Mr Potter said that the scenarios did consider the possible future role of fuel cells, but bearing in mind that hydrogen is not an energy source but an energy carrier.

A questioner noted that if NZ wants to do something on the demand side, then we need to look at more suitable product design and building design?

In reply, Dr Williams said that we seem to have a real problem in NZ in setting standards and lifting standards, but if we can, for example, raise building insulation standards, we will get very good health and social benefits as well through warmer homes in winter. This may be a more effective way of promoting energy efficiency than emphasising cost savings to be achieved.

By way of analogy, he noted that congestion charging had been raised for years as a way of reducing traffic congestion and pollution, but it wasn't until good data was obtained on the human health aspects of traffic pollution, that congestion charging became a serious issue for consideration.

Similarly in promoting energy efficiency measures, we may need to focus attention on health issues and equity issues (the poorest people have the worst insulated homes) before progress is made in this area.

A questioner from Waitakere City Council noted that a lot of his work is to help individual households and small businesses understand how they can make energy efficiency gains and that significant gains can be attained at relatively modest cost.

In response Mr Potter noted that when he visits his parent's home in Auckland he always turns off the heated towel rails, which creates lively debate within the household.

A questioner asked about the relationship between the office of the PCE and Treasury, especially over the “Future Currents” report, and noting that the focus of Treasury seems to be on more coal-fired power generation.

In response, Dr Williams and Mr Potter said that there had been no high level interaction with Treasury officials over the “Future Currents” report, but they had discussed the scenarios with Treasury staff at a much more junior level. Also it was true that the official NZ Government response (through MED) was strongly supportive of the proposal to convert the Marsden B power station to coal-fired generation.

A questioner asked whether energy conservation and efficiency measures were at variance with competing electricity generators and retailers trying to make greater profits?

In response, Dr Williams said that the next piece of work for the PCE Office is looking at distributed generation and the elasticity of the present electricity system to accommodate such developments. A key element here is the relationship between lines network companies and energy companies and the ownership of meters, and how to introduce “time of day” (smart) metering.

Dr Williams said NZ must try and sort out the road blocks, trip wires and barriers which have been created in the "restructured" electricity system in NZ as a result of the "electricity reforms" which are blocking the more efficient use of electricity. Clearly incentives to sell more of the product are disincentives to actively promote and support energy efficiency measures.

The alternative to sorting these problems out will be a "disintegrated" electricity system with lines companies and energy companies each "doing their own thing".

Dr Williams quoted as an example the state of California where in response to power cuts around the year 2000, a state-wide project had been initiated to find the most effective ways of limiting growth in electricity demand, and one of these measures was to carefully examine incentives to generators and retailers to sell more of the product, and to change those incentives. The result is that growth in electricity demand in California is now much lower than in other states within the USA (Note – California has had no change in electricity use per person since 1975, whereas the rest of the USA is up by around 50%).

A questioner presented a more optimistic view that eventually electricity consumers will realise the plain common sense of achieving greater efficiency in electricity use at very modest cost.

In response, Dr Williams said that for this to be achieved, it will be necessary to ensure that our rather crazy electricity sector is reformed in ways to make energy efficiency gains easier to obtain by consumers. However he is impressed by the amount of effort being put in by individuals around New Zealand in thinking about ways to make the system more efficient and to eliminate impediments to greater efficiency of electricity use.
He had recently visited two dairy farmers in Southland to discuss greater efficiency in the dairying sector, but it turned out that both were directors of the local electricity lines network company and he spent most of the time talking with them about ways to reform the relationships between lines companies and energy companies to facilitate the more efficient use of electricity. It seems the way in which the separation of lines companies and energy companies was implemented, almost ensured that efficiency gains were prohibited!

Finally I raised the question of the role of the Electricity Commission and whether the way in which it has been set up will enable it to get to grips with these problems.

In response, Dr Williams said that he will have to reserve judgment on this until the PCE office has done further work on auditing the Electricity Commission.

Dr Williams and Mr Potter were thanked for their presentation and in response, Dr Williams said that the PCE office sees its work in this area as like creating ripples on a pond, but it needs the help and support of many other organisations to get those ripples to travel right across the pond to the other side.

Footnote: SEF member Steve Goldthorpe has noted that he attended the same presentation in Rotorua the previous day and during discussion, he raised the issue of **whether the competitive electricity market model that we have in NZ was necessary to facilitate change to a more innovative pathway, or whether it was a barrier to that change.** While not directly addressing that issue, Dr Williams did refer to a conversation with Duke Energy, a US company which had looked to establishing in NZ and had then concluded that our electricity market was so flawed that they wanted nothing to do with it!

John Blakeley

Comment: The main reason why California has had no growth in per capita electricity demand is not that Californians have become more parsimonious in electricity use (although this has happened), but that the high electricity prices in California have systematically persuaded electricity intensive manufacturers to relocate elsewhere, presumably to states showing higher consumption increases.

New Minister's View on Coal-fired Electricity Generation

Having recently returned in mid-December from the UN Climate Change Conference in Montreal, the new Minister of Energy, David Parker, was asked to comment on whether a lot of NZ's new electricity generation requirements would come from coal-fired thermal power stations.

The Minister responded that he did not believe that this would be the case, and that most of NZ's future additional electricity generation requirements will come from renewable energy sources "and a little gas".

Source:"Focus on Politics" programme (on carbon tax issues). RNZ National Programme, Saturday 17 Dec 2005.

Note: the Minister's view, as stated above, seems to be somewhat at variance with the position of Treasury and the Ministry of Economic Development on future coal-fired power generation, as presented in evidence to the resource consent application for the conversion of the Marsden B power station to coal-fired electricity generation.

PCE says Government "All Talk" on the Energy Sector

The report by the Parliamentary Commissioner for the Environment (PCE) on *Energy, Electricity and the Environment* was tabled in Parliament in July 2005 and chided the government for an "apparent" lack of an overarching energy policy.

"Since the Government's October 2000 energy policy framework, no cohesive energy policy has been built on", the PCE report said.

This meant that energy sector initiatives were being conducted independently of each other, with no single document offering an insight on what the government wanted.

One report *"Sustainable Energy"* (October 2004) had been issued by the Ministry of Economic Development, but it was all talk and no action, the PCE said. "It focuses on discussion and offers no indication of what direction, if any, the government intends to pursue. It offers no details of time-frame for developments the NZ energy sector will be expected to take part in or deliver over the next 5, 10 or 50 years. These details are necessary for planning how to deliver on the Government's commitment to a sustainable energy future. The next steps must focus on *outcomes* rather than more *discussion*".

The PCE report said that the NZ energy sector needed to know what the government wanted so it could take decisions on what it had to deliver in the next 50 years.

"This lack of vision, is of considerable concern, particularly given that the energy sector now has to make a number of major decisions, the outcomes of which will determine the shape of the sector for decades to come".

The PCE report, which is an initial stocktake of the NZ energy sector, also raises concerns that the Electricity Commission (EC) and the Energy Efficiency and Conservation Authority (EECA) are doubling up on work.

The PCE report states that the EC was generally doing a good job, but needed to increase its emphasis on renewable energy and get the public, as well as small and medium businesses, more involved in the sector.

The PCE report also criticised the EC's method of weighing up whether investment was needed in transmission lines – the Grid Investment Test (GIT), stating that the test was too narrow, and focused on benefits to electricity market participants rather than on the cost and benefits to the whole NZ economy. Such an approach disadvantaged alternative energy sources and demand side savings.

Source: The Dominion Post, Wednesday 13 July 2005, page A5

A Meridian Energy View on "A Renewables Future for NZ"

On Thursday 21 July 2005, Dr Keith Turner, CEO of Meridian Energy addressed a combined meeting of the Auckland branches of Engineers for Social Responsibility (ESR) and the Institution of Electrical Engineers (IEE). Some key points from this address are summarised below.

Economic Growth and Electricity Supply
There is much debate about our energy situation, as to whether markets can meet growing supply requirements but NZ is fairly close to the brink of serious electricity shortages.

NZ has been growing strongly over the past four or five years with economic growth rates of 3.5 to 4.0 percent. Economic growth drives demand for electricity.

Historical trends show electricity growing at about 2.0 percent per annum but there have been periods when it has grown as much as 6 or 7 percent in one year. Annual growth at present needs enough electricity to supply about 150 MW, the equivalent to a city about the size of Hamilton.

Over the last 4-5 years, a few power plants have come on stream at a time when the economy has been growing strongly, but nowhere near enough to meet the growth in electricity consumption being driven by our economic performance.

In the same period we have had shortages in 2001 and 2003. Looking at data for these years when shortages depressed demand, it took about 18 months to get accurate annual growth data. We are running a very fine line by not adding electricity production to match that growth.

Security of Supply and Electricity Prices
The next major increment to come on stream (in December 2006) will be the 400MW gas combined-cycle plant being built by Genesis at Huntly, capable of about 3,000 GWh of production per year, but that energy will only restore the security of supply NZ had three years ago.

We are facing a significant change in our electricity supply options. The price rises we have all experienced are a symptom of a change in cost of resources.

Our electricity prices are low by international standards, although not as low as they used to be. We were one of the cheapest countries in the OECD five years ago, but are now about eighth or ninth, but NZ is still relatively cheap. We pay 16 to 17 c/kWh in NZ but in Japan they pay over 50 c/kWh for domestic supply.

Our migration patterns are a major uncertainty for planning electricity supply. The RMA has a very important influence on future development.

Future Electricity Supply Options

What are the options? The cost of using **coal**, excluding a carbon tax is in the range of 7 to 9 c/kWh at the power station. With a carbon tax added, it is probably over 10 c/kWh. To make it a clean burning plant, another 1c will be added.

Gas has been a mainstay of NZ energy since 1973. Gas is relatively short in NZ now and consumption will outstrip supply between 2010 and 2013, depending on economic growth. Of all the fossil fuel options, gas is by far the cleanest, by far the most flexible, and a plant can be built relatively quickly.

We already have a significant dependence on gas with the Otahuhu B station, the Taranaki combined-cycle plant, and the Southdown combined-cycle plant, all dependent on gas. Together they produce about 7,500 GWh per annum.

We see debate about importing **LNG**. The debate has shifted from importing for new supply, to the need to import LNG to keep existing plants running. Importing LNG is an option, but in my view a very dangerous option for NZ.
To build new plants to generate on LNG, electricity would probably cost 10 c/kWh at

the power station. It would require between $0.5 to $0.75 billion in investment for terminal facilities. A long-term contract of 25 years or longer would be needed to secure the supply to the terminal facility. If NZ puts its electricity at risk to LNG, we put our economy at risk to activities and events which are far beyond our shores, over which we have no control.

There are many indigenous energy options. **Geothermal** is under active exploration again with an estimated cost of 6.5 to 9.0 c/kWh but it is not a big resource. We can't therefore depend on geothermal energy for NZ's future electricity supply, although it will have a role to play.

We have depended on **hydro** for a very long time. Hydro with Maui gas has given us our very low electricity prices. There are still undeveloped large-scale hydro possibilities, between 5,000 and 8,000 GWh per annum of underdeveloped hydro potential. We need to preserve our rivers but there is still some potential for hydro. There are competing uses for water and the RMA is not suited to handling the allocation trade-offs, with much debate regarding the role of irrigation versus power.

Wind I rank as a significant energy resource. Recent studies show that our system could absorb 2,200MW of wind energy, but I suspect that it is higher than that, and I am aware of at least 10 projects that could each produce well over 500 GWh per annum.

In my view, there is at least 10,000 and possibly 15,000 GWh per annum of new electricity from renewable energy sources that can be developed and permitted, enough to keep us going for another 15 to 20 years. We have a unique opportunity to use wind in NZ, and we have 4,000 MW of existing hydro, a lot of plant to back up wind when it is not blowing. It is very economical.

What are we going to do? In my view we should focus first on indigenous energy so as not to have the risks we might face if we became dependent on LNG. I see indigenous energy as the top priority.

Having made that decision, although we have vast coal reserves and we may discover gas, we can't sit around waiting to discover gas before we build the next power station.

Do we develop coal? I believe using coal would put prices up to 30 to 40 percent and the incredible competitive advantage that we have in renewable energy will gradually leak away, **and if we enter a carbon constrained would, we have to recognise that NZ will have to take its place in that world.**

Looking at this I believe NZ should adopt a "least regrets" strategy in its energy supply. I cannot escape the thought that carbon must be priced, or we will see very significant change in climate and the way in which we live.

Conclusion

- My assessment of renewable potential in NZ is that NZ has 15 to 20 years before we have to engage in wholesale utilisation of fossil fuels. It could be much longer.

- What energy source should have priority? We need to buy time, protect our competitiveness and protect our environment, so I come out strongly in favour of renewables. It is a least regrets strategy from an action point of view, but from an electricity point of view it is both a least cost option and a least regrets option.

- Wind has an important part to play in buying time. A project like Te Apiti has a unit electricity cost of less than 6 c/kWh per annum. It is a 90MW project which produces 360 GWh annually

- We are looking at other projects including White Hill Southland which is a 58MW project (250 GWh per annum) and West Wind near Wellington which could be 210MW (850GWh per annum), providing one years national demand growth from one project at a cost of $400 million.

Source: The complete text of Dr Turner's address can be found in the ESR Newsletter, September 2005, Vol 21, No 4, pp5-10.

Join our sustainable energy news & discussion group!

SEF Membership provides discounted access to the annual SEF conference, and a copy of our quarterly EnergyWatch magazine. However many members find the SEF email news and discussion facility an easy way to keep up to date with news and views as it happens. And the discussion by the 200 sustainable energy "experts" who have joined the service offers an interesting perspective.

Non-members are invited to join the SEFnews email news service for a trial. To do this send a blank email to: <SEFnews-subscribe@yahoogroups.com>. To help us stop spammers, non-members need to supply a name and contact details before their trial is approved.

As with all Yahoo groups, SEFnews emails can be received "individually" (as they are sent) or as a "daily digest" (grouped into one email per day). If you have a Yahoo ID you can also switch emails on and off, or read the news on the web – a handy option for travelling Kiwis. And YahooGroups saves all of our text emails for later reference, and there is a search function so that you can review the thousands already stored over the last 5 years.

Some busy people using a work address prefer to use the Rules function in their email software to automatically save SEFnews emails to a separate folder for later reading. If you do not want a Yahoo ID, the SEF Office <office@sef.org.nz> can select the 'daily-digest' option for you.

For climate change news, join the Climate Defence Network email news group: climatedefence-subscribe@yahoogroups.com

EnergyWatch

Permission is given for individuals and educational or not-for-profit organisations to reproduce material published here, provided that the author and EnergyWatch are acknowledged.

While every effort is made to maintain accuracy, the Sustainable Energy Forum and the editor cannot accept responsibility for errors. Opinions given are not necessarily those of the Forum.

Publication is normally early in March, June, September and December, and material is posted on the SEF website (www.sef.org.nz) a PDF file, three months after publication.

Contributions Welcomed

Readers are invited to submit material for consideration for publication.

Contributions can be either in the form of Letters to the Editor or short articles addressing any energy-related matter (and especially on any topics which have recently been covered in EnergyWatch).

Material can either be sent to the SEF Office at PO Box 11-152, Wellington, or by email to editor@sef.org.nz, or by directly contacting the Editor, John Blakeley, care of School of the Built Environment, Unitec New Zealand, Private Bag 92-025, Auckland.

SEF membership

Memberships are for twelve months and include four copies of EnergyWatch. Membership rates, including GST, are:

Unwaged/student	$27.00
Individual	$45.00
Library	$56.25
Corporate	$225.00

Mail the form below, with your payment or order, to The Sustainable Energy Forum Inc, P O Box 11 152, Wellington. A GST invoice or receipt will be sent on request.

Name: .....

Organisation: .....

Address: .....

.....