EnergyWatch

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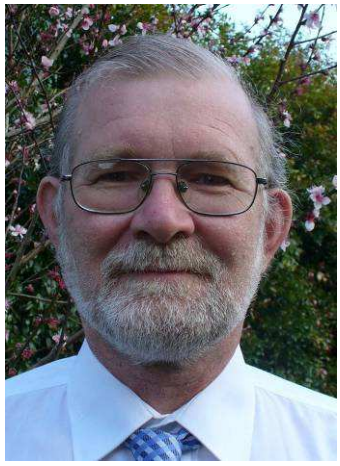
EDITORIAL

Asleep at the wheel?



Steve Goldthorpe - Editor

Imagine sitting comfortably on a bus on a straight road when you see that there is a bend in the road ahead and the bus is going straight on, starting to get closer to the side of the road. You then realise that the steady droning of the bus engine has apparently caused the bus driver to fall asleep. What do you do?

A) Risk making a fool of yourself by getting up from your seat and going to wake up the bus driver;

B) Sit tight and pray that the driver will wake up in time to avert disaster;

C) Relax and sit back confident in the knowledge that the bus company is well insured and will look after your successors.

This scenario has strong parallels with the twin threats to our comfortable business-as-usual way of life in New Zealand; Peak Oil and Climate Change, and the current official response to them. These threats are interrelated, albeit on different time frames.

In the last issue of EnergyWatch the Government's draft Energy Strategy was discussed. It was established that that NZ energy policy is founded on the expectation that sufficient oil resources, conventional and high-cost resources, will be available to meet NZ demand for at least 20 years, and that NZ can play its part in meeting growth in demand by ensuring sufficient supplies of oil via increased fossil fuel drilling and exploitation.

In contrast, a study of Peak Oil scenarios, recently been published by the Parliamentary Library tells a more cautionary tale. It acknowledges that the potential sources of hydrocarbon liquids, including oil shale, tar sands, gas to liquids and coal liquefaction are several times larger than the low-cost conventional oil resources produced to date.

However, the report identifies that it is the rate of oil production that is the limiting factor. It is not the size of the tank that is the problem but the size of the outlet tap. The report signals destabilising economic consequences from a repeated growth/shock/recession cycle with a frequency of a few years. The summary of the Parliamentary Library report is included in this issue with a weblink.

Subsequent discussion on SEFnews focussed on the question: "What if our little islands at the end of the supply lines in the South Pacific end up at the back of the queue for the next ship-load of oil now and again?" The Government strategy, which is to delay working out exactly how to deal with that scenario until it happens, is not reassuring.

The other downside of unswerving reliance on unconventional oil supplies is the impact on CO_2 emissions. The report only makes passing reference to the impact of carbon charges.

A curious public claim was made by Don Elder, CEO of Solid Energy that making liquid fuels from South Island lignite would somehow benefit the global climate. I refuted that claim in a radio interview. I include in this issue some simple calculations of the consequences of maintaining business-as-usual by exploiting tar, shale, gas and coal liquids to keep us supplied with transport fuel in the manner to which we have become accustomed, which shows that liquid fuels from lignite is by far the most climate unfriendly of the unconventional oil manufacturing technologies.

Following the SEF seminar on Feed-in-Tariffs after the AGM, there was some discussion on SEFnews, which I think made some progress towards identifying a practical FiT scheme that might be workable in New Zealand. That discussion is reported here.

Finally, on a personal matter, I have thrown my hat in the ring to stand for election as a Trustee for Northpower Electric Power Trust in the forthcoming elections. I am seeking the opportunity to play a part in ensuring that our local lines company in Northland plays an active part in future-proofing the essential community service, which is our electricity supply. If you feel that my approach to our energy future would be useful to Northpower then please ask your friends and relatives in the Whangarei area to cast a vote in my direction. Thank you.

Steve Goldthorpe, Editor

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PEAK OIL

A Parliamentary Research Paper, written by Clint Smith, Research Analyst, Economics and Industry Team, has been published by the Parliamentary Library

The full paper can be downloaded via http://preview.tinyurl.com/2eqj8w4

The summary is reproduced here.

The Next Oil Shock ?

Oil is "the lifeblood of modern civilisation". This paper provides an overview of the global oil market. In particular, it examines the outlook for oil supply and demand over the next five years, and the economic consequences.

Low-cost reserves of oil are being rapidly exhausted, forcing oil companies to turn to more expensive sources of oil. This replacement of low-cost sources of oil with higher-costs sources is driving the price of oil higher.

While the world will not run out of oil reserves for decades to come, it cannot indefinitely continue to produce oil at an increasing rate from the remaining reserves. Forecasts indicate that world oil production capacity will not grow or fall in the next five years while demand will continue to rise.

If oil production capacity does not rise as fast as demand, the buffer of spare production capacity disappears. In such a 'supply crunch' the price of oil 'spikes' to high levels. High oil prices can induce global recessions.

Organisations including the International Energy Agency and the US military have warned that another supply crunch is likely to occur soon after 2012 due to rising demand and insufficient production capacity

There is a risk that the world economy may be at the start of a cycle of supply crunches leading to price spikes and recessions, followed by recoveries leading to supply crunches.

New Zealand is heavily dependent on oil imports and will remain so for the foreseeable future. While there is potential to substantially increase domestic production, domestic oil production cannot insulate New Zealand from global oil price shocks because New Zealand pays the world price for goods like oil.

Key export-generating industries in the New Zealand economy including tourism and timber, dairy, and meat exports are very vulnerable to oil shocks because of their reliance on affordable international transport.

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Comment

The analysis in this report clearly sets out what the phenomenon of Peak Oil is likely to look like over the next 5 years. It paints a credible picture that steers a middle course between the entrenched positions that have characterised the Peak Oil debate thus far.

On the one side the business-as-usual view is that an increasing oil price will make unconventional fossil fuel sources economic and they will be rapidly exploited so as to keep pace with increasing demand.

In contrast, the doomsters, looking only at the easily accessed conventional oil, see only the prospect of shortages and market failure.

This report describes an unstable future oscillating uncomfortably round a cycle of growth, oil shock, recession and recovery.

However, the report does not explore carbon emission consequences. - See page 12. *Ed.*

Analysing Impacts of Fuel Constraints on Freight Transport and Economy of New Zealand: an Input-Output Analysis

A Study from Canterbury University looks at the economic impacts of Peal Oil on NZ.

http://ir.canterbury.ac.nz/bitstream/10092/4210/1/12626234_58_20100506101_LangandDantasIOconf.pdf

The abstract of this paper is: -

Our society is dependent on enormous amounts of energy, which maintains every aspect of our extraordinary way of living. However, in the past few years, there has been convincing evidence of future fuel constraints due to supply limitations ("Peak Oil"). Various governments have admitted the probability of fuel restrictions in the future and others have also forecasted high likelihoods of increases in fossil fuel prices.

The consequences of shortages or large price increases may include major disruptions to essential and vital systems to society (i.e. industrial, health, agriculture, etc.). Freight transport systems are a special case because they are responsible for making available absolutely everything people buy and sell. Nevertheless, there is limited knowledge about the impacts of reduced fuel availability to the economy and freight transport.

In this research, an Input-Output analysis is used to model the relationship between future fuel constraint scenarios and economic impacts to New Zealand. The results revealed that if no actions are to be taken to mitigate impacts of fuel constraints, and if they persist for several years, the total impacts would greatly affect the New Zealand economy.

Some may argue that there are options to reduce impacts of fuel constraints. Probably the most widespread solution is to enhance the use of alternative and clean energies and reduce fossil fuel exploitation. Even though New Zealand government has been intensively encouraging sustainable research and practice, there is still a long journey to achieve more sustainable freight transport. In order to lead New Zealand towards this path, several mitigation options to reduce fuel consumption of freight transport are investigated. Amongst numerous alternatives, new technologies such as regenerative brake systems, wheel motor technology and the skysail had promising results. Conversely, popular technologies used nowadays and labeled as sustainable (e.g. biodiesel and electrification) did not perform as well as normally expected.

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How Secure is NZ's Short Term Oil Supply?

Subsequent discussion on SEFnews explored the question of the potential practical impact on New Zealand of the suppliers of crude oil being unable to meet orders for shiploads of crude oil to be dispatched to the New Zealand Refining Company as required. This discussion was in the context of the September 2000 blockade of shipping lanes in the English Channel by French fishermen, which created havoc with the UK oil supply lines and retail fuel operations. The question and answer discussion may be of interest to EnergyWatch readers in the context of how consequences the Peak Oil scenario might initially be manifest.

Q – How many ships a week does NZ need to sustain our supply?

A – A tanker of crude oil is delivered to the Refinery at Marsden Point every 2-3 weeks.

Q – Who orders that oil?

The crude oil is ordered by the oil companies on a just-in-time commercial basis.

Q – On whose behalf?

The oil companies own the oil, which is processed under contract by the New Zealand Refining Company. The products remain the property of the oil companies.

Q. – What is our normal/typical landed supply-in-tanks of processed oil (expressed in days supply)?

A – The in-country stocks of oil products are commercially confidential to the retailers.

At the NAaN enquiry into the security of electricity supply into Northland, it was reported that an unexpected forced shutdown of the refinery and disabling of the pipeline to Auckland could, in combination with panic buying, result in dry petrol stations after three days.

However, at present a planned 4 week shutdown of the refinery for routine maintenance is in progress with adequate stocks in place to meet normal demand.

3 months emergency reserve of crude oil has to be held by New Zealand. In 2008 this was mostly held as options to buy oil in Singapore, Japan, Australia and Netherlands.

The purpose of the 3 months reserve, required by the IEA, is to stabilise the oil price by overcoming temporary upsets in the supply chain. This reserve is not designed to address long term issues.

Q – Is the Minister of Energy kept appraised of our Fuel Security Status?

A – Probably

Summary of SEFnews contributions

Government Fuel Security Strategy

Kerry Wood reported the Government position on fuel security to SEFnews: -

The government published a strategy in July 2008, which is available on the MED website, www.med.govt.nz/oers

It was mainly to fulfill treaty obligations to hold oil stocks, which the EIA had upped to 90 days. From memory it was upped from 30 days and compliance was already iffy. The government response was to tender for commercially-held stocks. No local tenders were received and in 2008 there were stocks held in Australia, Japan and the Netherlands. I don't know if anybody wondered if a tanker from Rotterdam could arrive in 90 days, or at all in a world-wide emergency.

The strategy also talks about emergency response, and to me it looks scary. It is mainly about administration (necessary but not sufficient). Rationing text is below. The key question is, has more work been done, and when I asked I gathered not. I understood that the only immediately available measures are car-less days and quantity-per-purchase rationing. There are statuary powers but a footnote says:

"The government recognises that mandatory demand restraint options are complex and there are many details that will need to be thoroughly worked through. This work will be undertaken as part of the ongoing work programme."

Note the complacency in paragraph 10.10.

Kerry Wood

There follow some paragraphs from the MED Oil emergency response strategy.

www.med.govt.nz/oers July 2008

9. Measures to improve supply

9.3 In the event of an IEA declared emergency, in addition to a commercial stock drawdown, the government may be required to release its reserve stock onto the international market as part of a concerted IEA response to improve global supply.

9.4 In an oil supply disruption, New Zealand could respond by relaxing specific parameters within the Engine Fuel Specification

Regulations 2008. The relaxation of specifications has the potential to improve the availability of oil supplies by increasing the likelihood of oil from offshore being acceptable for sale in New Zealand, or to provide greater scope to alter the composition of refined product produced from the New Zealand refinery.

9.5 Options to relax fuel specifications would be investigated at the time of an oil supply disruption…..

9.7 Options to 'surge production' would be investigated at the time of an oil supply disruption in consultation with the oil production industry. Full consideration would be given to the physical, financial and contractual implications of this measure. A voluntary market response would be preferred.

10. Measures to restrain demand

10.2 It is intended that measures that encourage voluntary restraint are introduced initially, moving to mandatory requirements only if the severity of the situation required it. The main exception to this is that an immediate requirement for quantity rationing scheme could be considered if there was a risk of panic buying causing a supply disruption to escalate into severe physical shortages.

10.9 If the decision were made to implement any mandatory measures, these would most likely be in the form of rationing – either by quantity, or in extreme circumstances, by allocation. Although unlikely, the government could also respond by reducing the speed limit on the open road.

10.10 In the event of an oil supply disruption, the government could respond by reducing the speed limit on the open road to reduce demand for oil. The rationale for reducing the open road speed limit is that vehicles are more fuel efficient at speeds lower than 100km/h (by about 11 percent for 90km/h). Because this measure involves relatively high administration costs compared to the expected benefits, it is likely that the government would only encourage a reduction of speed on the open road via the voluntary information campaign. The government would, however, consider this as a mandatory measure, if the situation warranted it.

10.11 In the event of an oil supply disruption, the government could respond by restricting the quantity of oil that can be purchased at any one time. This section outlines the broad framework for a quantity rationing scheme and will be further developed.

10.12 Quantity rationing restricts all individual sales of oil to a specific or restricted amount. This restriction can be measured by either; quantity (e.g. 25 litres) or price (e.g. $25) and could be restricted in the form of a maximum amount (e.g. no more than $25 or 25 litres) or a specific amount (e.g. exactly $25 or 25 litres).

10.13 Depending on the size and type of the oil supply disruption, the government could set the quantity or price as well as the type of restriction. As the situation changes, the government could adjust these restrictions.

10.14 The purpose of quantity rationing is to reduce the demand for oil and discourage hoarding behaviour. This would help to prevent a supply disruption from escalating into physical shortages. It may also ensure a more equitable fuel supply to consumers.

10.15 A quantity rationing scheme would almost certainly be introduced as an interim measure if the government planned to implement an allocation rationing scheme. An allocation rationing scheme would need to be advertised in advance and would take time to roll-out, necessitating the immediate introduction of a quantity rationing scheme to prevent customers from hoarding petrol.

10.16 A quantity rationing scheme would need to be implemented very rapidly with little or no advanced warning to the public because advance notice would create incentives for customers to fill-up quickly and

hoard oil before the scheme entered into force.

10.17 A rationing scheme would likely include a complete ban on sales of oil in containers. This would prevent customers filling up containers and then using that fuel to top up their vehicle tanks. It would also help to minimise hazards arising from oil being stored in unsuitable containers.

10.18 To ensure that essential social services could continue to function, it might be necessary to implement a priority users' mechanism as part of the quantity rationing scheme. This is likely to be in the form of exemptions.

10.19 In extreme circumstances the government could introduce an allocation rationing scheme in response to a prolonged oil supply disruption. An allocation rationing scheme restricts both the amount of fuel that can be purchased, and the frequency of purchase. The information here provides the broad framework for an allocation rationing scheme, which will be further developed.

10.20 An allocation rationing scheme would restrict both the amount and frequency of oil purchases. This type of rationing scheme would probably require the government to allocate coupons to oil users. Each coupon would enable the recipient to purchase a specified amount of fuel over a specified period of time, such as 25 litres of oil per week.

10.21 Generally, allocation rationing has a much greater ability to reduce oil demand than quantity rationing. Benefits would be limited by the time taken to implement the scheme and the costs involved in its implementation.

10.22 The purpose of an allocation rationing scheme would be to prevent oil products from running out and/or to distribute a limited supply of oil. Allocation rationing would only be considered if; there was a real threat of widespread and prolonged physical shortages; other measures, including price increases, were socially or economically untenable; and quantity rationing was considered insufficient to manage this threat.

10.23 For allocation rationing, the government would need to restrict the frequency with which individuals purchased oil probably through a fuel coupon scheme. Possible tools to identify users include the electoral roll, the motor vehicle registration list, or the postal addresses of each household.

10.24 A decision would have to be made on whether homogenous coupons or person-specific coupons would be used. Person-specific coupons would reduce the risk of theft whereas homogenous coupons would be cheaper and allow trading.

10.25 Tradable coupons would allow those who value oil highly the ability to purchase coupons from those who place a higher value on money. This would ensure a more efficient use of oil and minimise the economic and social impacts of an allocation rationing scheme.

10.26 To ensure that essential social services are able to continue, it is likely that a priority users' mechanism would accompany the allocation rationing scheme. This is likely to be in the form of extra coupons, exemptions or both.

10.27 As stated above, rationing would only be considered where there is a real threat of widespread and sustained physical shortages and all other approaches are considered insufficient to manage this threat.

10.28 There would be significant administrative costs associated with setting up and running an allocation rationing scheme. For example, administrative costs could include coupon printing, distribution publicity and information provision, as well as costs of increased petrol station security. There may also be an economic cost to consumers who would otherwise choose to consume more oil than their allocation. This cost would be much higher if the rations could not be traded.

Have We Lost the Plot ?

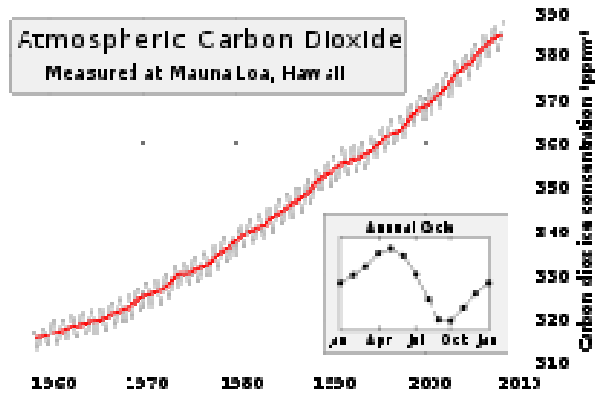
Observations on the status of responses to Climate Change

by Steve Goldthorpe

In the beginning there was a theory that the thermal balance of Planet Earth depends on the concentrations of CO_2 in the atmosphere. The impact of CO_2 and other greenhouse gases on the global energy balance is due to the phenomenon of radiative forcing that makes our planet a hospitable temperature rather than much colder.

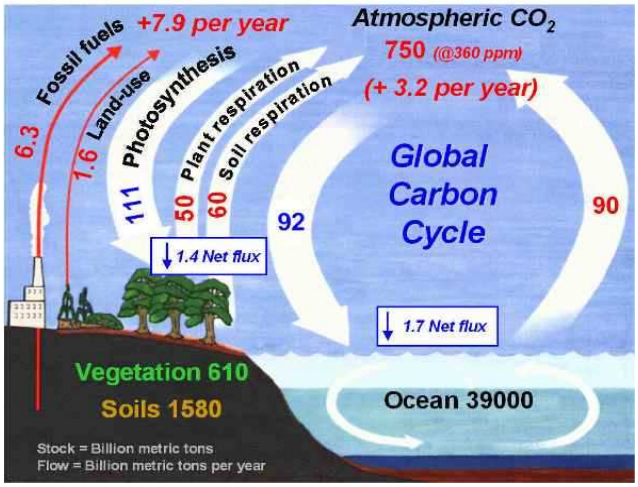
Then, unlike previous civilizations, nineteenth century man discovered fossil fuels as a vast store of energy on which to base a global technological evolution. For the first century or so of fossil fuel exploitation, until well into the second half of the 20th century, the receiving capacity of the atmosphere for the products of fossil fuel combustion was generally thought to be effectively unlimited.

Then careful monitoring in Hawaii of the CO_2 content of the atmosphere revealed a steady year-on-year increase in its CO_2 above the preindustrial level of 280 parts per million.



Source:- The Keeling Curve – Wikipedia

This observation brought the scientific curiosity into the real world with the realisation that the atmosphere was not an unchangeable constant, but that mankind had the capability to influence the thermal balance of the planet. The use of fossil fuels was shown to result in carbon transfer from the lithosphere (solid surface layer) to the atmosphere at a faster rate than the net transfers back into the lithosphere or into the hydrosphere (oceans). A global carbon cycle was determined showing an atmospheric net gain of about 3 gigatonnes of carbon per year.



Source:- TheScienceForum.com – Google Images

Responses to the Climate Change problem were identified at an early stage as:-

- Reduction in emissions of CO_2, CH_4, N_2O and fluorinated compounds
- Replacement of fossil hydrocarbon fuel by renewable energy sources
- Capture and storage of CO_2
- Conversion of pasture into permanent forest in perpetuity

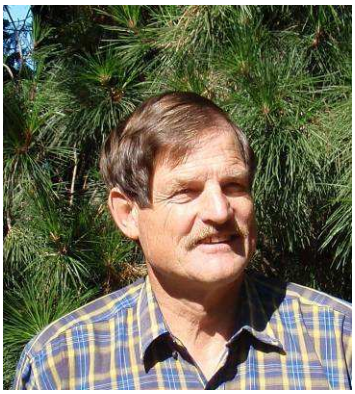
Whilst all these measures and more would be required to solve the problem, some measures are more costly than others. So the idea evolved of a global Climate Change response strategy based on offsetting emissions by paying for some other cheaper measure to be carried out. That was where we lost the plot.

In practice this strategy has resulted in 30 years during which industrial emission reduction action is not taken where there is potentially a cheaper way, such as conversion of pasture to forest, of achieving the same outcome. But have the trees been planted?

SEF member Piers Maclaren explains what has happened to the simple concept of permanent conversion of pasture to forest as a means of slowing and reversing the year-on-year increases in atmospheric CO_2.

Give Forestry the Credit?

by Piers Maclaren



When I first started researching carbon credits (1988) my colleagues seemed to think it was an interesting but quirky sideline – and of little consequence to mainstream forestry.

Now carbon seems to be the Great Black Hope that promises to hoist the industry from the trough of despair.

An outsider may think that things have come right for forestry. After all, logs are fetching a high price, right? Well, these are unpruned export logs – we are providing raw fibre to Asia in the same way that they once sold us jute and sisal – but the sector as a whole is sick. Few new processing plants have been built in the last two decades, and timber has (unfairly) taken a hiding at the hands of fossil-intensive concrete, steel, aluminium and plastics. The health of the sector can be gauged by the rate of new-land planting: in the last few years we have converted fewer hectares to trees than we did in the Second World War (when we had other things to worry about).

Forestry was first to enter the ETS, with obligations and benefits backdated to January 1st 2008. The argument was that it was "the most advanced", statistically speaking. But a cynic would reply that it was seen as a cash-cow ready for the slaughtering (so where's the milk going to come from now?). The first casualties were the owners of the pre-1990 forests. The ETS allows them to do anything they like with their trees (thin, harvest, etc) with no penalty or even record-keeping – so long as they don't deforest them. In other words, they mustn't convert them back to pasture. If they do that they must buy back all the carbon deemed to be in the mature trees. This is a whopping cost and would nearly always be prohibitive. The "compensation credits" amount to perhaps only 5% of this value. The implications are catastrophic. When pre-1990 forestry land is auctioned, the only bidders must now be other forestry interests. By eliminating other buyers from the market, the price of pre-1990 forested land has plummeted. This is a huge loss to the asset base of the sector.

But, it's all gain for post-1989 forests, right? Not so fast. There was a major planting boom in the 1990s which eventually petered out. All carbon sequestered between 1990 and 2008 is not eligible for credits – it has been a free gift to the government of New Zealand and to the planet. Thank you, O great Cash-Cow! In most cases with trees planted in the 1990s, every last little piddling carbon credit that an owner receives must be repaid at harvest. The only gain is the time-value of money. In effect it's an interest-free loan. But there are catches, including costs (some of which have yet to be quantified) and risks. If there's a catastrophe (fire, wind, disease) the owner can't pass the buck to God but must cough up. Also, the price of credits might be much higher at harvest than when sold.

What about planting bare land right now? Well, things look a lot brighter – at least on paper – but the indisputable evidence will come with sales orders from forest nurseries. Someone who converts pasture or short scrub (including gorse) to trees can obtain carbon credits and get to keep perhaps a quarter of these regardless of any future liabilities. These "safe credits" represent the carbon tied

up in roots, stumps, slash, etc – they are always present on the site and are never lost during a typical harvest. If a forester is particularly savvy, he can swing things so that half of the credits are safe. How so?

A 'forest' is a structure considerably more complex than a 'stand'. Whereas a stand is a block of trees planted at the same time, grown in the same way, and harvested at the same time, a forest can consist of many stands. At the extreme, a 30-hectare forest could consist of thirty one-hectare stands planted in successive years. This is called, in the jargon, a 'normal' forest – and it is a steady-state situation. The carbon it sequesters every year exactly equals the carbon extracted on logging trucks or emitted by microbial decay of rotting material. It is not a carbon sink, it is a carbon reservoir (these words are tightly defined by the Kyoto Protocol). The benefits to the atmosphere arise from converting a low-carbon reservoir (pasture, including the soil carbon) to a high-carbon one. When a normal forest has been achieved, there are no price risks to be feared whatever the fluctuations in the value of carbon. There are, of course, still catastrophic risks – wind, fire, disease (in that order of probability, assuming radiata pine).

When you factor in the sale of carbon credits, and account for the fact that much of the revenue is received early in a crop rotation, the profitability of forestry increases enormously. It is staggeringly high. So why aren't more people rushing to plant trees?

First, land prices in New Zealand have become disconnected from their productive potential. You would think that land would be worth, say, sixteen times the profit you could get from it each year. Not so. A sheep farmer is doing very well if there is 1% return on his capital. Most such farmers could sell their farms, invest the money in the bank and be substantially better off. Traditionally, though, the profitability has been justified by pointing to capital gain. This justification is wearing thin, given that farm prices have fallen for several successive years. Anyway, a typical forestry investor balks at paying $4000/ha for land that would have sold for $1500 only a few years ago.

The second reason for the lack of interest in new-land planting is that small growers in particular don't trust the government not to change the rules at a later date. They don't have confidence in the ETS and stand to lose a lot of money if it collapses. For example, at time of writing, the measurement costs of compliance are unknown. It is like a railway official on a platform asking people to board a train, with the ticket prices to be announced later during the ride. Only a long, stable period of ETS management will engender the confidence the forest sector needs.

Piers Maclaren

Industrial Allocation under ETS

Another example of losing the plot is the scheme introduced by the Government to add to the Emission Trading Scheme (ETS) to give emission credits to high emission trade exposed industries to meet their emission trading obligations. Details are at:-

http://www.mfe.govt.nz/publications/climate/development-industrial-allocation-regulation-ets/index.html

Surely, the purpose of the Emission Trading Scheme is to encourage a change in behaviour though providing an economic incentive for major greenhouse gas emitting industries to reduce their emissions. If, due to concern over the possible off-shore relocation of those big industries, the government pays there emissions bill for them, then the original purpose of the ETS is defeated. *-Ed*

A further example of losing the plot on responses to climate change was the preposterous claim by the CEO of the State-owned coal mining company that extraction and use of lignite to make liquid fuels would benefit the planet because it would avoid the emissions from a ship bringing liquid fuels made from the same resource overseas.

Don Elder: - "Use Lignite to Reduce Carbon Emissions"

Transcript from Morning Report, National Radio, 22nd October 2010

Solid Energy says mining Southland's vast coal reserves will be good for the planet's overall carbon emissions. The company spent time defending its lignite plans at the state-owned coal miner's annual general meeting yesterday, but a former coal industry insider says the claim seems ridiculous. Here is our environment reporter Ian Telfer.

Over the last few years Solid Energy has quickly become New Zealand's biggest producer of renewable energy products like wood pellets and biodiesel from oil seed crops, but it's still at heart a coal miner and moving ahead with plans to develop more than three billion tonnes of lignite in Eastern Southland. Critics say this will release enormous quantities of greenhouse gas speeding up global Climate Change.

But responding to a question about this at its annual meeting the company's chief executive Don Elder said the impact would be positive.

"If we develop projects in New Zealand using our lignites to produce these products then global greenhouse emissions will reduce. And the reason for that is simple. Producing a product from coal in New Zealand will displace the same product being produced by coal from somewhere else."

Dr Elder says there would be a second benefit because New Zealand wouldn't have to ship fuel in from overseas.

The climate activist who asked the question was Tim Jones. He said Dr Elder's answer was pure green wash.

"Digging up tonnes of lignite and converting it, whether it is into urea or briquettes or liquid fuels, and then in one way or another burning it, is going to create a very large volume of greenhouse gas emissions and, no matter how much Solid Energy try to wriggle around the point, that is not something that New Zealand should be doing or contributing to the world."

A former researcher for the British Coal Industry Steve Goldthorpe says Dr Elder's claim makes no sense. Because all the other forms of oil extraction like from oil shale and tar sands produce far fewer emissions than coal conversion.

"If you are going to do that you want to start with a good quality coal and then process that, and add a lot of hydrogen to it, to make liquids. Taking a very poor quality coal like lignite would seem to be a bit of a loser as far as CO_2 emissions are concerned before you start."

Solid Energy's hit back saying its opponents are using scare tactics, emotion and half-truths to denigrate projects potentially worth billions of dollars. The company says it is a given it will have to deal with the project's full carbon cost and impact and it could be years or decades before it finds answers to all the problems. *Morning Report*

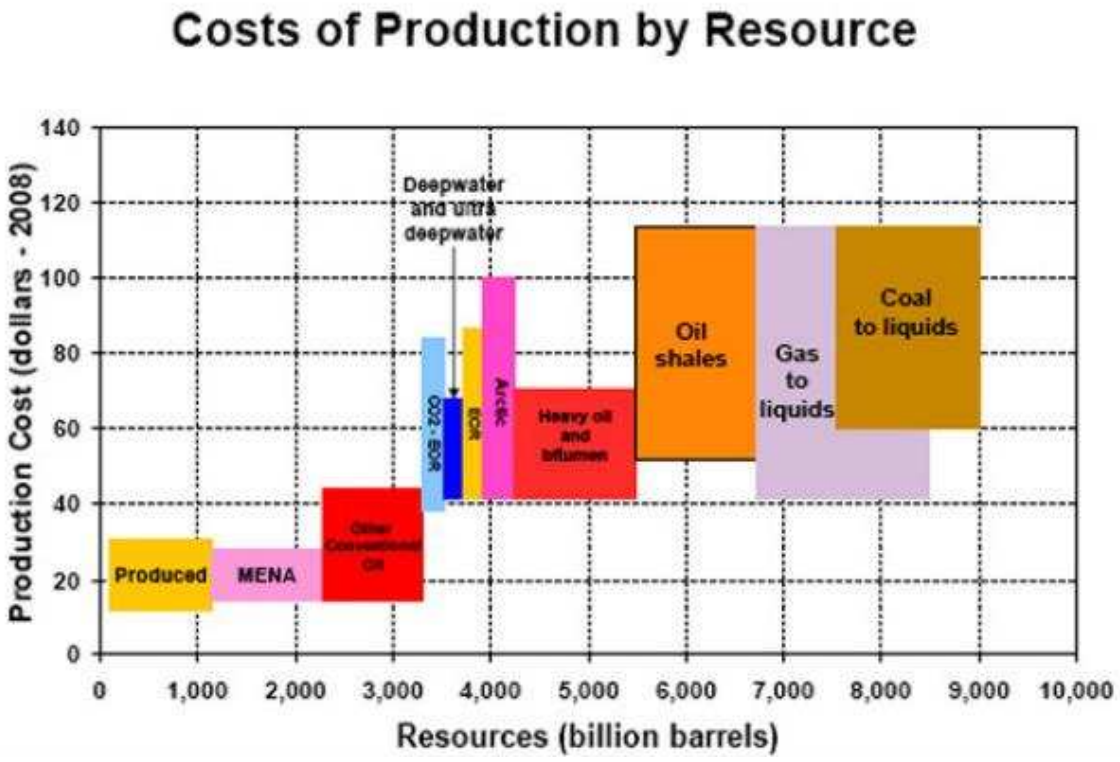
The following analysis shows that the production of liquid fuels from lignite by the 2 stage indirect gasification/synthesis route as the process energy source, as proposed by Solid Energy for NZ, is much more greenhouse intensive than all the technologies that use natural gas as the process energy source. Even direct liquefaction of black coal with integrated process energy from coal, as is likely to be practiced in coal-rich countries, is 20-25% less greenhouse intensive than Solid Energy's lignite to diesel technology.

CO_2 Emissions by Unconventional Liquid Fuel Sources

By Steve Goldthorpe

The extraordinary claim by Dr Elder for Solid Energy, that lignite use in New Zealand would reduce global greenhouse gas emissions, is based on the premise that the only option is for the liquid fuels to be produced by the same process from the same resource in other countries. This chart from the Parliamentary Report on Peak Oil shows that there is a wide range of global fossil resources and technologies that could be exploited to maintain a business-as-usual energy supply after conventional oil resources are depleted. Of course, there is also the imperative, driven by Climate Change, that the world needs to move away from fossil fuels as the means of sustaining our modern civilization.

This diagram shows the range and scale of sources of liquid fuels that are potentially available to provide transport fuels for the rest of this century under a business-as-usual scenario



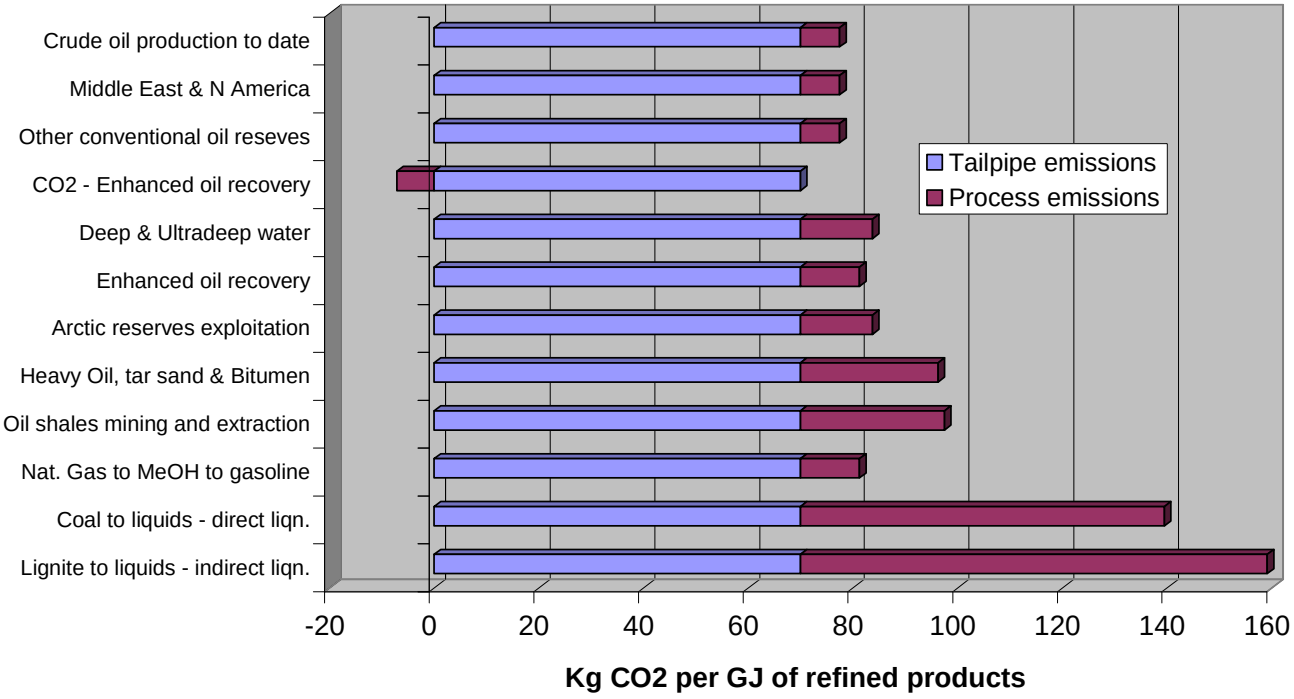
This diagram indicates that the potential resources that could be exploited are about seven times greater than all the conventional oil that has been consumed so far. It is this type of information that provides those who dismiss concern about Peak Oil with confidence that the peak in conventional oil supplies will be overcome by exploitation of oil from unconventional sources.

Theoretically, realisation of all the 9,000 billion barrels of potential fossil derived liquid fuel indicated in this diagram in one hit would increase the carbon dioxide content of the atmosphere from the current 3000 gigatonnes of CO_2 (i.e. 385 ppm CO_2) to about 7650 gigatonnes of CO_2 (i.e. 1000 ppm = 0.1% CO_2).

It is usually thought that New Zealand is so small that whatever we do cannot significantly influence the planet. However, if three billion tonnes of Southland lignite is exploited rather than left in the ground then the marginal increase in atmospheric CO_2 would bring any global climate change consequences forward by about four months

This calculation of the CO_2 emission consequences of unconstrained use of unconventional fossil fuel resources is based on a generic assessment of the energy conversion processes. The mid points of the indicative performance ranges detailed below have been used to provide a quantified view in this chart, which shows process energy use in comparison with tailpipe emissions.

The amounts of process energy required for production, conversion and refining of unconventional sources of hydrocarbons are substantially greater than the energy requirements to produce and refine conventional light crude oil. That energy use accounts in part for the higher cost of making fuel from unconventional resources shown in the above chart.



Assumptions

Emission factor for natural gas = 50 kg CO2/GJ	Energy for natural gas production = 5-10% of resource energy
Emission factor for liquid fuels = 70 kg CO2/GJ	Energy for coal mining = 5-10% of resource energy
Emission factor heavy oil & bitumen = 75 kg CO2/GJ	Fuel for processing, (except coal liquefaction) = Natural gas
Emission factor for oil shale resource = 75 kg CO2/GJ	Fuel for processing in coal liquefaction = Coal
Emission factor for black coal = 90 kg CO2/GJ	Thermal efficiency of tar & bitumen conv. = 70% to 90%
Emission factor for lignite = 95 kg CO2/GJ	Thermal efficiency of oil shale extraction. = 60% to 80%
Energy content of crude oil = 6.1 GJ per bbl of oil equivalent	Thermal efficiency of natural gas to MeOH. = 65% to 75%
Energy for conventional oil production = 5% to 10% of oil energy	Thermal efficiency of MeOH to gasoline = 70% to 80%
Energy for conventional oil refining = 5% to 10% of oil energy	Thermal efficiency of black coal to syncrude = 50% to 70%
Energy for CO2-EOR oil production = 10% to 30% of oil energy	Thermal efficiency of lignite to syngas = 60% to 80%
Energy for deep water oil production = 10% to 30% of oil energy	Thermal efficiency of syngas to diesel = 60% to 80%
Energy for EOR from depleted oil wells = 10% to 20% of oil energy	Oil yield from CO2-EOR = 1:1 vol:vol
Energy for Arctic oil production = 10% to 30% of oil energy	Density of liquid CO2 = 0.8 kg/litre
Energy for heavy oil & bitumen prodn = 10-20% of resource energy	Oil volume = 159 litres per barrel
Energy for oil shale mining = 5-10% of resource energy	Fraction of coal liquefaction from lignite = 0.15

Feed-in-Tariffs in NZ?

A report on the SEF seminar held in Wellington on 8th September 2010

by Doug Clover

Given the success of last year's seminar on electric vehicles, finding a topic that would pull in the punters was a hard task. The idea to have this year's SEF seminar on Feed-in Tariffs (FiTs) was instigated by Stephan Heubeck and he agreed to be one of the speakers.

The format was to be simple. One person – Stephan – would speak support the use of for FiTs in New Zealand and the other speaker would take up the contrary position. Steve Goldthorpe agreed to take on the second speaker's role and as it turned out rather than taking an outright contrary position he chose the role of the cautious pragmatist.

I was concerned that the turn-out would not be strong. Tim Jones had indicated that some people had asked after the early publicity material had been released. "What are FiTs?" In any case on the day the turnout was very good with around 50 people attending.

The seminar started with a short introduction from Tim Jones and then a short video presentation that explained the key features of FiTs, also known as Renewable Energy Payments (REPs). The take away messages from the video were:

1. Priority connection for distributed renewable generation
2. Long term contracts for electricity produced at agreed fixed prices
3. A wind down over time of this contract price for **new** contracts.

Stephan then argued that a FiT programme is necessary for NZ because there is increasing social resistance to large scale renewable energy projects and at the same time natural gas production is in decline. Therefore, to meet New Zealand's future energy needs, we need to go small on renewable energy as a means of getting community buy-in. Stephan also argued that small scale generation has benefits by diversifying the geographical spread of generation and developing new economic activities in small scale generation technologies and associated installation and maintenance sectors.

Stephan also argued that FiTs should be modified for NZ; possibly with the lines companies acting in role of the honest broker. However, the Government would need to take a lead and set up the legislative framework and a complaints panel. Stephan did not mention this, but presumably there would also need to be some kind a regulatory regime to ensure industry compliance with the scheme.

Stephan then highlighted the importance of designing the regime so as to avoid the mistakes of other countries. He expressed the view that the best systems are in Spain and Germany, but that there are aspects of some overseas programmes that do need to be avoided including:

- Capacity caps which can lead to boom and bust cycles
- The scheme having a focus only on one or two types of generation.

The scheme could be flexible enough to include non-renewables where these are efficient and it does not have to include very high cost renewables such as photovoltaic until such time as the costs of these technologies have come down further.

Steve Goldthorpe started his presentation by explaining that rather than give a presentation he was providing some observations.

His first point was that if we wanted to introduce FiTs into NZ the simplest way would be to renationalise the electricity system. He pointed out that the current system has features, which seem to be incompatible with the philosophy underpinning the use of FiTs. A key one is that preference be given to one form of generation in this case small-scale renewable.

He pointed out that small-scale renewable generation is largely uncontrolled by the grid or network operator. This is in contrast with the current system where generation must be treated as dispatchable – even wind.

In addition, the current system sets the price of generated electricity on a half hourly basis and any contracts are based on what people think the future wholesale price will be. On the other hand the prices for FiTs are set over a long period and are determined not by the wholesale market, but by the cost of the generation technology.

Steve then tried to find where FiTs might fit into the current electricity system. Transpower wouldn't be interested because they operate in high voltages. More importantly as the agency responsible for grid security the introduction of large amount of dispersed small scale uncontrolled generation could be seen as presenting a risk to this obligation.

The lines companies are more compatible with lower voltage system and subject to some degree of control there may even be benefits to network resilience. But issues of lack of timing control (dispatchability) and electrical safety would be still of concern.

There was a lively discussion following the presentations. The issue of the cost of micro generation specifically micro wind and photovoltaic was raised. Stephan argued that with FiTs communities have some certainty about future revenues and they can get creative about how to address these costs and also take into account other non-financial benefits.

Another person argued that rather than using financial cost, projects should be assessed based on the energy return on energy investment measure.

Another view was that there is an important control issue and an urgent need for modelling how these systems will fit into the electricity networks.

Finally the issue of only focusing on generation at the expense of energy efficiency was raised and the need to consider nega-watts in conjunction with distributed generation.

As a follow-up in the following Friday's Dominion-Post the issue of FiTs was discussed in an article written by Adolf Stroombergen, an economist, who was one of the attendees of seminar.

Doug Clover

Stroombergen's article is reproduced here.

http://www.infometrics.co.nz/article.asp?id=5121

How fit are Feed-in Tariffs?

By Adolf Stroombergen

Published in the Dominion Post on 17th September 2010 under the headline: -

Small-scale producer figures don't add up

A Feed in Tariff or FiT is the price paid by power companies to consumers, for electricity that consumers with their own generating plant supply back to the grid.

In South Australia my cousin is paid 44c/kWh (soon to rise to 54c) by the local electricity company for electricity that she sells into the grid from her solar photovoltaic system. When she has to buy power from the power

company the price is 19c/kWh. Furthermore, the capital cost of her photovoltaic system was heavily subsidised, resulting in an expected payback period of about ten years. So it is quite a good investment – from her perspective.

Similar schemes operate in other Australian states and in other countries, particularly in Europe. In most countries the highest FiTs apply to solar photovoltaic systems, though other forms of renewables-based generation may also be eligible. Germany, one of the world's least sunny countries, has massive FiT schemes for solar photovoltaics. There is much interest in New Zealand in such a scheme.

No government subsidy is involved. Retail power companies are mandated to purchase the power at a price that is generally higher, often much higher, than their wholesale cost of power from large scale generating companies. They compensate for this by charging a higher price to consumers. So if you're a consumer who does not own any electricity generation plant you pay for those who do.

Is this any different than paying for higher cost power supplied by a high cost large scale generator? Under the FiT case all that is different is that the supplier happens to be a household, farm or small business, rather than a large generator. We do not object to a dairy farmer being both a producer of milk and a consumer of milk.

However, the three key features of an FiT are that it is mandated by government, that it applies to renewable energy (in most cases) and that there is a large difference between the selling price and purchasing price. Governments introduce these schemes for a variety of motives such as lowering CO_2 emissions, lowering peak power demand and deferring investment in new power stations. Other reasons such as promoting regional development and job creation have also been mentioned. Sometimes a higher share of energy from renewable sources is seen as an end objective in its own right. In the space available I discuss only the energy related motives.

In South Australia, the long run marginal cost of new wind generation is about 10c/kWh, which is approximately equal to the increased cost of electricity from coal-fired plant under a carbon price of $100/tonne of CO_2. Contrast this with the price premium under the FiT of around 34c/kWh, which would be analogous to a carbon price of $340/tonne of CO_2. There are many much cheaper ways of reducing emissions, such as by installing energy efficient light bulbs and insulating houses. Thus the FiT is extremely inefficient by this measure.

It is possible that FiTs could flatten the daily and seasonal peaks in electricity demand, thereby lowering prices. There would also be less pressure on transmission and distribution infrastructure under 'distributed generation' (the technical term used to describe generation from lots of small generation plants). However, in New Zealand as in most of South Australia, the peak season for power is winter, and peak daily loads occur in the morning and early evening; periods during which solar photovoltaic systems are least productive.

It is also possible that FiTs defer the need for new large scale investment, but this does not provide a benefit if the power that they produce is more expensive than what could be obtained from an alternative source. As noted above, producing a kWh of electricity by new large scale wind generation is much cheaper than producing it by solar photovoltaics under a FiT scheme. Small scale wind generation, also typically within the ambit of FiT schemes is also uncompetitive, as windmill efficiency is proportional to the area swept by

the rotor, which increase with the square of the radius.

The deferred investment argument for FiTs makes about as much sense as introducing regulations that force bakers to pay us for producing bread, in order to defer investment in a new bakery.

When FiTs are being promoted we should ask "What are the problems they are meant to address and are there better ways of addressing those problems?"

In principle FiTs can have merit, but the FiT rate must be much closer to the marginal cost of power from other sources. Indeed, complications around balancing electricity demand and supply may well lead to quite low FiTs.

The effect of very high FiTs is to force a transfer of income from electricity consumers in general to a small group of micro-scale electricity producers who are themselves also consumers. Were it not for this transfer of income (via the initial capital subsidy and the high FiT rate) such electricity production would be undertaken only by those who are happy to pay over the odds for particular types of power. I have no problem with people wasting their own money, but I do object to policies that waste mine.

Adolf Stroombergen

FiT for purpose in NZ?

A recurring theme of the discussion on SEFnews, which was also articulated by Stroombergen was "What is the problem that FiT legislation is meant to address?"

The answer to this question is location and country dependent. Accordingly, the question needs to be addressed in a New Zealand context rather than by attempting to use successes and failures in other countries as a model for an NZ FiT scheme.

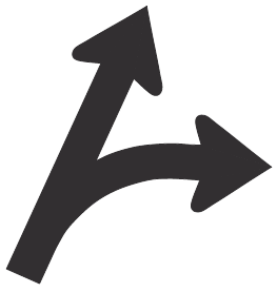
In New Zealand electricity is mostly generated a long way away from where it is used. Hence a substantial component of the delivered cost of electricity is transmission and distribution. Therefore electricity generated at low voltage directly into the distribution network close to the consumer has a substantially higher value than electricity generated into the grid at high voltage at a distant location. In addition there are constraints in the transmission system that would require major investment to cater for increasing demand. Hence there are significant benefits to be obtained in some NZ locations from local generation of electricity directly into the local network.

The problem in NZ is that the competitive market model is constructed around generation into the grid, which cannot account for the non-fiscal benefits of distributed generation into the local networks. This is the problem that FiT legislation could usefully be used to address.

A simple comparison of c/kWh assuming no infrastructure constraints on growth, as is the basis of Stroombergen's analysis, misses the point of FiT s. The report "Energy Efficiency - Made in Germany" lists advantages of a decentralised electrical energy supply as:-

- Efficient use of electricity and heat production;
- Significantly lower transmission losses;
- Independence;
- Energy security;
- Generator directly influences the energy source;
- Diversification of different energy sources;
- Job creation; and
- Regional accumulation of value.

No mention here of blind adherence to the mantra of cheapest is best, *Editor*



Signs of Change

A national e-conference showcasing transition towards sustainability

15-16 November 2010

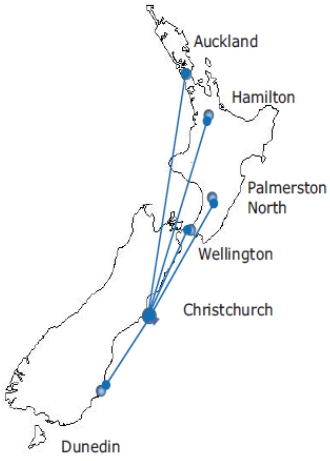
Christchurch – Wellington – Auckland – Hamilton
Palmerston North – Dunedin

Participate and help create a pathway of change

Using new video-conferencing technology means travel costs and related impacts will be minimized. Don't miss this opportunity to network and debate locally as well as nationally.

Speakers will showcase examples of fundamental change in a wide variety of contexts including:

- **Energy**
- **Transport**
- **Healthcare**
- **Waste Management**
- **Agriculture**
- **Business/Finance**
- **Housing/Living**
- **Community Development**



Registrations now open

www.signsofchange.org.nz

SEF AGM

The SEF AGM was held on 8th September 2010 at EECA's offices in Wellington with 10 members in attendance, one on the phone and 6 proxies. Tim Jones had completed his term on the SEF committee and Martin Shaw was elected. Doug Clover stood down as convenor. After Ian Baxter offered to take over the task of treasurer, Steve Goldthorpe was elected at Convenor of SEF for the forthcoming year.

At the AGM the following SEF members were confirmed as the management committee for 2010-11.

Ian Baxter, John Blakeley, Doug Clover,
Murray Ellis, Steve Goldthorpe,
Susan Krumdieck, Bob Lloyd,
Neil Mander, Martin Shaw, Alan Thatcher

Calling all inventors

Launch of "Wild Energy"- The Green Energy Design Competition

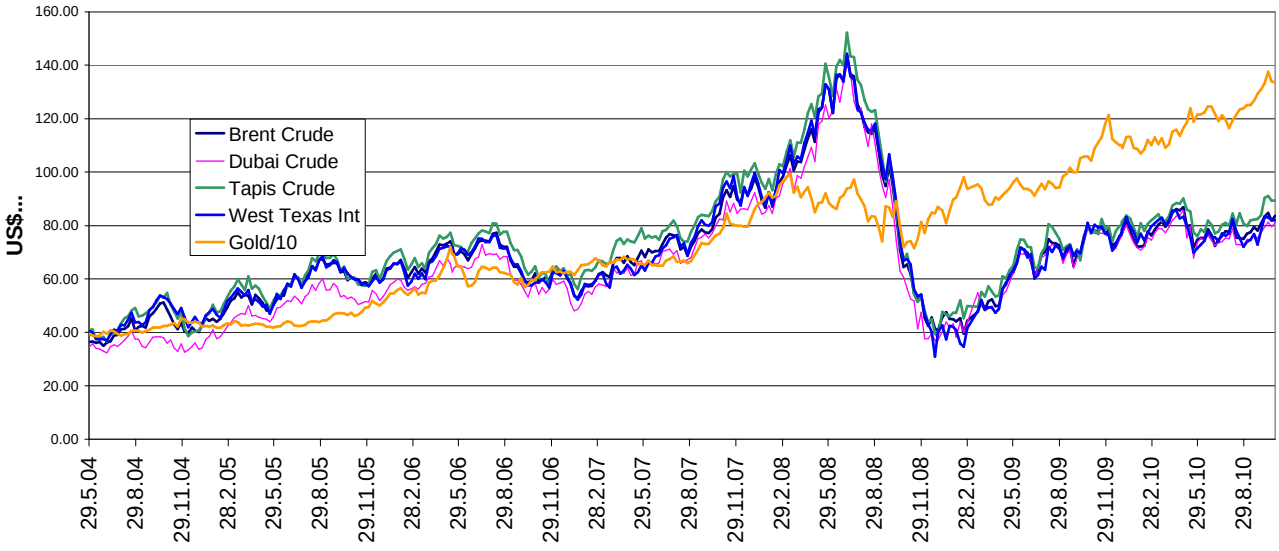
http://happyzine.co.nz/2010/10/18/happyzine-announces-the-launch-of-wild-energy-the-green-energy-design-competition

A competition has been launched inviting inventors and visionaries to submit designs and ideas for electricity generation concepts that might be used in New Zealand. This competition was devised to seek alternatives to flooding some of New Zealand's most pristine and wild rivers and valleys to create hydro-power dams. The competition is looking for ideas for schemes which, at full scale, would generate or save at least 180 GWh/year. i.e. 50% of the planned output from the Mokihinui project.

Neil's Oil Price Chart

This chart, compiled by SEF member Neil Mander, tracks a basket of oil prices in comparison with the gold price. (Source NZ Herald)

Over the last six months the oil price has been relatively steady at US$70-80 per barrel. However, in October it has increased to over US$80/barrel. This chart also shows how the gold-price, which has historically been a bench mark for the oil price, has increased by 10% over the last 2 months.



Join our sustainable energy news & discussion group

SEF Membership provides a copy of our quarterly EnergyWatch magazine. In addition, many members find the SEFnews email news and discussion facility an easy way to keep up to date with news and views as it happens. The discussion by the group of 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, and a brief statement of their interest and/or involvement in sustainable energy issues, 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. 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 6 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 administrator <admin@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

SEF membership

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

Low income/student	$30
Individual	$50
Overseas	$60
Library	$65
Corporate	$250

Mail the form below, with your payment or order, to The Sustainable Energy Forum Inc, P O Box 11-152, Wellington 6142. A receipt will be sent on request.

Name: ....

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Amount enclosed: $.....