



Editorial

Liability Estimate Keeps Changing

Official estimates of the cost of NZ's liability under the Kyoto Protocol during the five-year commitment period (2008-2012 inclusive) have been bouncing up and down like a yo-yo over the last 12 months or so.

As a signatory country to the Kyoto agreement, we must purchase credits to cover all emissions above the level which existed in 1990.

In early 2007 it was stated by The Treasury that NZ was forecast to incur a deficit of **\$600 million** for emitting 41.2 million tonnes of carbon dioxide equivalent in excess of the Kyoto Protocol target over that first commitment period. A quick calculation shows that this assumes a unit cost of \$14.56 per tonne.

In May 2007, it was announced that the 41.2 million tonne figure had been revised upwards to 45.5 million tonnes, increasing the liability to around **\$662 million**, but most commentators were saying at the time that it would be \$1 billion or more.

Then after a time of stoutly defending its previous estimated emissions cost of around \$15 per tonne, in December 2007 Treasury revised its liability figure upwards to **\$956 million**, based on a carbon price of \$21 per tonne.

In early May 2008, at the time of deferring for two years the entry of the transport sector into the Emissions Trading Scheme (ETS), it was announced that the estimated deficit reported in

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May 2007 of 45.5 million tonnes had now been revised downward to 21.7 million tonnes. This meant that the liability the country is facing is halved from \$1 billion to **\$481.6 million**. (It must surely be no coincidence that the above reduction figure is very similar to the statement made many times by the Minister during the September 2007 launch of the ETS that he was expecting emissions trading to achieve a reduction in the deficit from 45 to 25 million tonnes by the end of 2012).

The Government stated that this lower figure for its Kyoto liability gave it more flexibility to phase in the ETS. The new liability figure seems to be based on a unit cost of \$22 per tonne.

Information on the exact reasons for this sudden major reduction in the estimated deficit has been very sketchy to date and the new liability estimate seems to be based on two heroic assumptions:

- Has the estimated deficit **really** been halved from 45.5 to 21.7 million tonnes, and if so, why? If such a large reduction is being attributed mainly to the implementation of the ETS, then this may be wishful thinking, unless there is a real willingness within the community, business and industry to actually reduce energy consumption and greenhouse gas emissions, in conjunction with offsetting. The Sustainability Council estimates that the ETS may only reduce our greenhouse gas emissions by 2%.
- Is the estimated unit cost of emissions **really** only about \$22 per tonne when on the European carbon trading market, the figure is at present above 26 Euros per tonne? This figure converts to US\$40 (NZ\$53). For various reasons the European figure is expected to be well above the international price (see Page 26 of this issue), but Simon Terry of the Sustainability Council has recently stated that the current world price for good-quality carbon credits is NZ\$30 per tonne (NZ Listener, 31 May 2008, pg 27).

During the September 2007 launch of the ETS, it was stated to be important that the price of the NZ emission unit be closely linked to the international market price.

But at the same time it was being claimed that the estimated price of the NZ emission unit during the Kyoto commitment period was about \$15 per tonne. On this basis, it was estimated that the ETS would put the price of transport fuel up by only 4 cents per litre in 2009 (now 2011) and the price of electricity by only 5 per cent in 2010. Such estimates are now clearly much too low as the correct figure for the unit cost of emissions is likely to be between \$30 and \$50 per tonne, or more by 2012.

The Government and its officials cannot have it both ways. If they want the NZ emissions unit to be linked to the present international carbon price, then even at a 21.7 million tonne deficit, our Kyoto liability will be around \$1 billion or more by 2012, and not \$0.5 billion as is now being claimed.

Looking back on the changes in the official Kyoto liability estimate made over the last year, it seems to have been varying between \$0.5 and \$1.0 billion but then coming back down to \$0.5 billion, without sufficient justification being given for this lower figure. The size of the recent estimate reduction justifies a much more detailed explanation of how it has been derived than has been given to date.

The National Party climate change spokesperson, Dr Nick Smith, recently suggested in Parliament that the liability estimate figures are being politically manipulated to suit the agenda of the Government in explaining its delays in the implementation of the ETS.

He noted that in early May 2008, in the pre-Budget fiscal update, the Government advised that the estimated Kyoto deficit was **\$1009 million**, but just three days later the Prime Minister announced, at the same time as announcing changes to the ETS, that in fact the figure was only **\$482 million**.

Dr Smith suggested that if these Kyoto liability figures are to have any credibility, they should be managed independently and released in the same way as the household labour force survey, inflation, and other critical economic data.

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20th NATIONAL ESR CONFERENCE

Responding to Oil Depletion and Climate Change

Hosted by the School of the Built Environment, Unitec New Zealand



Saturday 26 July 2008

Oakridge House, Unitec, Mt Albert, Auckland



The 2008 joint conference of Engineers for Social Responsibility and the Sustainable Energy Forum provides a line-up of knowledgeable speakers who will address likely consequences of depleting resources of oil and climate change, and how society might change to adapt to a very different future.

8.30 - 9.00	Registration
9.00 - 9.15	<i>Opening Address</i> by Professor Thomas Neitzert (ESR President)
9.15 - 10.00	Simon Tegg - <i>Setting the Scene – Oil Consumption and Depletion</i>
10.00 - 10.45	Garry Law - <i>International Progress on Kyoto</i>
10.45 - 11.00	Morning Tea
11.00 - 11.45	John Blakeley - <i>Energy, Climate Change and Carbon Neutrality</i>
11.45 - 12.30	Arthur Williamson - <i>The Energetics of Carbon Capture</i>
12.30 - 1.15	Archer Davis - <i>Planning Issues for Transport in the Face of Energy Depletion</i>
1.15 - 2.00	Lunch
2.00 - 2.45	Tim Jones - <i>National Responses Linking Energy, Transport and Emissions</i>
2.45 - 3.30	Cameron Pitches - <i>Auckland Sustainable Transport</i>
3.30 - 3.45	Afternoon Tea
3.45 - 4.30	James Samuel - <i>Transition Towns</i>
4.30 - 5.00	<i>General Discussion</i>
5.00 - 5.15	<i>Summing Up and Conclusion</i> by Tim Jones (SEF Convenor)

Registrations On-Line

Payment and registration may be made on line to our Account ASB Bank No 12-3151-0159047-00

For your on-line payment please complete the Payee Particulars box with your name, and the Code box followed by the letters, code letter F, if you are in full time employment paying a full registration, R for retired people, S for students, spouses or unwaged, D if you are a member of ESR or SEF and if your payment is after 1 July please add a \$10 late fee and the code L.

For on-line payment, please also fill in the Reference Box to read Conf .

Please email this form with your name and address and payment details immediately after you have made the on-line payment to johnlaroch@xtra.co.nz

Registration Type	Fee	Your Payment	Code
Full Registration	\$100		F
Retired	\$70		R
Student/Unwaged/Spouse of Registrant	Less \$5		D
Late Fee after 1 July	\$10		L
Your Name (& spouse)			
Your postal address			
Date of payment			
Would you like a receipt			

Note if you prefer you can make your payment by cheque to

**ESR Conference
P O Box 6208,
Wellesley Street
Auckland 1141**

Editorial continues ...

ETS Increasingly Lopsided

The Government is now running out of time to push through its Emissions Trading Scheme (ETS) legislation before the election later in the year and concerns are mounting that the ETS in its initial years at least, will be placing an unfair share of the financial burden on household electricity consumers, motorised road transport users and small businesses while major emitting industries (including agriculture and large industrial facilities) receive increasingly longer term exemptions.

While the ETS has the highly commendable objective of putting an actual cost on all of NZ's greenhouse gas emissions as soon as it is realistically possible to do so, along the way another principle of fairly sharing the financial burden amongst the various emitters seems to have been lost sight of.

The situation has been compounded by "super profits" which the Government stands to gain from its ETS as pointed out by Dr Don Elder of Solid Energy (NZ Herald, front page, Friday 9 May). In his submission to the select committee he suggested that the Government stands to make windfall gains of billions of dollars from its ETS and he highlighted the extent to which the Government would over-recover from NZ emitters, the cost of complying with the country's obligations under the Kyoto Protocol.

In its present form the ETS would impose a carbon liability on every litre of transport fuel (from 2011) and on every cubic metre of gas and every tonne of coal burned in power stations (from 2010). And yet, the Government only has a liability for carbon dioxide emissions over and above 1990 levels and in the case of electricity generation, two thirds of NZ electricity comes from renewable sources so it is patently ridiculous to apply the carbon charge to all electricity generation as will be the case under the present manner in which the wholesale electricity market operates.

Similar points about windfall profits have also been made by the Sustainability Council in a

recent report (see Page 26 of this issue). The voting public is likely to become intensely dissatisfied if they are lumbered with significant extra costs in addition to rising costs generally which they cannot recoup in any way, at the same time as they see the Government making windfall profits from the ETS. They will see it for the tax grab which it really is.

The situation is well summed up by Brian Fallow writing in the Business Herald on Friday 30 May, page 16 as follows.

The tax grab argument arises from a feature of the ETS which was highlighted first by Simon Terry and Geoff Bertram for the Sustainability Council and then by Dr Don Elder of Solid Energy. The Kyoto Protocol makes NZ as a whole responsible for any increase in its net emissions above 1990 levels. Emissions from transport fuels have risen 64% since 1990.

But as the ETS stands, motorists will be expected to pay, via the oil companies, not just for that increase but for every tonne of emissions from their exhausts - not 64% of 1990 emissions but 164%.

At a carbon price of \$30 per tonne, that would be worth over \$400 million a year to the Government's coffers. It has recently said that it will put the start date for this part of the scheme back from 2009 to 2011.

For electricity consumers there is a double whammy as from 2010, generators will need to buy emissions units to cover every tonne of coal and every cubic metre of natural gas they burn, not just the increase from 1990 levels. That impact will be amplified by the way wholesale power market works. In every half hour period it is the marginal generator, the most expensive electricity needed to meet demand, which sets the wholesale price.

Except when electricity demand is light, that tends to be a thermal generator, which will have to recover its carbon costs. Renewable generators, notably state-owned Meridian Energy, will enjoy a windfall profit.

The net effect is that once the ETS is fully operational, the Government will be raking in from households and small businesses all the units it needs to cover the fiscal cost of providing protection from emissions charges for the trade-exposed sectors - and a whole lot more. (The Sustainability Council report suggests that households, road users and small businesses will meet 90% of the estimated \$4.4 billion cost of the ETS over the next five years and concludes that this will involve huge transfers of wealth but will only reduce NZ's greenhouse gas emissions by 2%).

Brian Fallow notes that National has said that one of the key principles the ETS must meet

is to be fiscally neutral "rather than providing billions of dollars of windfall gains at the expense of businesses and consumers".

Editor's Comment: Climate Change Minister, David Parker, says that the ETS's five yearly reviews are the way to take account of that windfall gain issue, but I am sure that once the voting public understands what is going on here, they won't buy that argument at all. Instead they will express their displeasure at the ballot box later in the year if the ETS is passed into law in anything like its present form without any recompense for windfall gains being made.

John Blakeley

Electricity Matters

Electricity Price Gouging Must Cease

John Blakeley argues that changes must be made to create a more fair and equitable electricity pricing system in New Zealand.

People must wonder why it is that our electricity generation companies continue to be extremely profitable even in difficult economic times and in what is supposed to be a competitive electricity market.

The answer lies in the method by which electricity prices are set in the wholesale electricity market, established in the mid-1990's and basically unchanged since.

Until about 15 years ago, under Government control our electricity was for many years priced on the basis of the average cost of producing it from various sources, including hydro and geothermal energy projects and coal-fired and gas-fired thermal power stations.

In the early 1990's the State Owned Enterprise ECNZ came up with the idea that in order to encourage the building of new generating capacity, the pricing system should be changed to make the price of all electricity generation

the same price per unit as that from new power stations required to meet growing demand.

The National Government of the day firmly rejected the idea, especially since ECNZ was then virtually a monopoly provider, producing around 90% of the total electricity output.

Subsequently, Contact Energy was split off ECNZ and privatised to create the illusion of price competition in an electricity market place.

ECNZ was later again split into three smaller SoE generation companies in 1999, also apparently in a bid to create an image of price competition which has never actually happened.

During this same period the wholesale electricity market was established and a pricing system chosen based on the cost per unit of providing additional generation. It was known that this pricing system would maximise wholesale electricity prices in order to facilitate investment in new generation, but it has also created windfall profits ever since for hydro and other low cost electricity generators.

The then Minister of Energy, Max Bradford constantly told the public that competition would bring electricity prices for the consumer down. But in reality there is still very little

real price competition in the electricity market, and there are very few places in the world with unregulated electricity markets such as we have now, which deliver either lower prices to the consumer, or sustainable outcomes.

This pricing system now needs to be changed in New Zealand because of the very significant electricity price rises likely to occur over the next two decades. A system whereby a price rise to cover the cost of building new power stations is then applied to all electricity generation across New Zealand can no longer be justified.

Prices have recently been reported to be likely to rise by as much as 40 to 50% in inflation-adjusted real terms within two decades if the Government pursues its ban on new coal-fired or gas-fired power stations and its target of 90% renewable electricity generation by 2025. Such a large price increase would have severe financial effects on many electricity consumers.

Responding to this report, the Minister of Energy, David Parker, said that even without the 90% renewable target and thermal power station ban, very substantial electricity price rises are still likely to occur if future natural gas price rises reflect the likely steeply rising global oil prices. But in fact, natural gas is the energy source for less than 20% of New Zealand's generation output.

I believe that large future electricity price rises do not necessarily need to occur as a result of the above factors. Instead there must be an independent review of the method by which electricity is presently priced in New Zealand.

One option would be for the Government, as owner of more than 50% of total generation capacity and main beneficiary of windfall profits, to insist that artificial distortions in the electricity pricing system be eliminated by requiring that only new generation be charged for at the actual increased prices of providing that electricity, and that existing electricity generation capacity be only allowed to increase in price at a much slower rate. This policy could be applied to all new generation sources coming into production from now on.

Another option would be to retain the present pricing system that creates windfall profits for generators, but require that a proportion of that windfall be managed by an independent trust that would focus on demand side measures that reduce electricity cost. Much of that windfall could then be rebated directly to electricity consumers, and the rest used to fund more efficient and sustainable electricity use.

Only an independent inquiry can circumvent the Government's vested interest, through the State-owned electricity generation companies, in the windfall profit being made, much of which goes straight into the consolidated fund, helping to create fiscal surpluses. Change must be made to create a more fair and equitable electricity pricing system.

John Blakeley

Reference: Published in GreyPower Magazine, June 2008 and in ESR Newsletter May 2008 Vol 24 No.2

\$7 Billion Overpaid by Electricity Consumers?

Energy Consultant, Bryan Leyland, has attempted to calculate how much extra the electricity market system has cost consumers since 1997. His estimate is somewhere between \$3 billion and \$8 billion with \$7 billion being the most likely figure.

In a paper presented to a meeting of electrical engineers, he has analysed electricity costs and prices since 1997, the year Transpower was split from ECNZ, before ECNZ itself was split into three SOE generating companies in 1999. Contact Energy was split from ECNZ in 1997 and floated in 1999.

Bryan Leyland said that the idea of splitting up ECNZ was to introduce competition into the market to get better power prices, "and they did compete for a time until they realised the game was not to compete but to rot. They realised if you withhold some generation from the system, then the price goes up, so you make more money from your remaining generation than you lose by not having your last generator on live".

Bryan Leyland said that the current market structure was only narrowly chosen ahead of a market where a central operator made decisions about where and when to build new generating capacity, and then entered into long-term supply contracts with competing generators. “Among the failures of the present market is the absence of any incentive to build spare capacity”.

In response to this article, Carl Hansen, Chief Executive of the electricity market company M-Co said that if electricity generators made \$7 billion surplus profit in the last ten years, that doesn't necessarily mean that they were abusing market power.

He said that incumbent generators in a market may earn surplus profits but the market is still competitive if they are unable to raise prices consistently above the cost of new generation.

He also noted that the cost of electricity generation has increased markedly over the past five years. There have been large increases in construction costs, coal prices have risen by a third and gas prices have more than doubled. **It would indeed be surprising if generators hadn't earned surplus profits with existing plant that did not face these cost increases.**

However Mr Hansen completely fails to address the point of whether or not it is fair and equitable that the electricity consumer should be paying for those surplus profits to be made, when one of the main objectives of the electricity market was supposedly to drive prices down through more competition!

Mr Hansen makes the point that more often than not, surplus profits turn into losses when changes in technology drive down market prices “because that is what happens in markets”.

But this completely overlooks the fact that in the whole of New Zealand's history, the price of electricity sold on a long term basis (i.e. disregarding the spot market) has always only gone one way - upwards and never downwards.

Political commentator, Matthew Hooton noted his concern that some major manufacturers have been forced by present high electricity

spot prices to cut production, costing export orders and potentially jobs and that we may yet all face power shortages this winter.

He noted that “If Labour really wanted to put the old Soviet-style ECNZ back together again it had ample opportunity to buy back Contact and do so”.

However many electricity consumers may well think that if they could collectively have saved \$7 billion or so in power bills over the last 10 years, then a “Soviet-style electricity system” might actually not be such a bad thing after all!

Reference: Sunday Star-Times 8/6/08 and 15/6/08.

Writing in the NZ Herald, columnist John Roughan said “The electricity market's marginal imperfections are minor compared with the damage that can be done to the economy by excessive public investment”.

However it is a fair question to ask whether or not up to \$7 billion in windfall profits is a fair price for consumers to pay over a decade in order to avoid some “excessive public investment” in new generation?

Reference: NZ Herald, 21/6/08

Electricity Market to be Modified?

A spokesman for the Electricity Commission (EC) has said that in recent years, the electricity sector has been reviewed four times to assess the need for further reserve generation and in its view none had been required.

However in response to the present tight electricity supply conditions, the EC was now looking at options to modify the electricity market, including whether generation capacity should be priced, as well as actual energy supplied. A discussion paper is due out around mid-June.

This comes as Contact Energy cranks up its old gas-fired New Plymouth power station to shore up dwindling power supplies. Doubts have emerged about its reasons for shutting down the plant in the first place.

In September 2007, Contact shut down the 300MW New Plymouth plant, saying it had discovered asbestos in unexpected parts of the plant site. Initially it said that the plant would restart after a few months of remedial work, but in December, Contact announced that the plant would be decommissioned.

The value of New Plymouth as reserve generation capacity has since become clear as low lake levels, especially in the South Island, drive spot power prices up to above \$300 per MWh. On Wednesday 28 May, Contact announced it would restart one 100MW generator in response to tight electricity supply conditions.

Although this recent move has been welcomed, Contact's motives in closing down New Plymouth in the first place are now being questioned, with the suggestion being made that Contact had done the calculations and figured that taking New Plymouth out of the system last year would tighten the market, pushing up wholesale power prices.

Now that spot power prices are very high, their fear will be a crisis which will precipitate a review of the way the market works at the moment.

The New Plymouth plant had been functioning as de-facto reserve generation capacity for some time. In the first half of 2006 for example, New Plymouth was run at full capacity for only one week in April.

The issue of reserve generation is a thorny one for New Zealand's electricity supply, because the market offers few rewards to generators for maintaining capacity in excess of normal demand. A Government-owned 155MW power station at Whirinaki in Hawkes Bay was commissioned in 2004 to provide reserve generation, controlled by the EC. Whirinaki has been in action most of the time for several weeks now as power prices soar on the spot market, but the diesel-fuelled plant is not seen as an efficient solution to the security of supply problems on a regular basis because of the high cost of diesel.

Contact has strongly denied any suggestion that it sought support from the EC to keep the New Plymouth power station as reserve generation, but it seems that Contact was unwilling to shoulder the burden of keeping the plant open just in case, and hence the decision to decommission the plant last December.

Reference: Sunday Star-Times, 1/6/08.

Editor's Note: SEF Member Norman Stannard who was involved at the time, has recently stated that during the period of design and construction of the New Plymouth power station, the NZ Electricity Department (NZED) issued a requirement that asbestos was not to be used in its construction.

Whirinaki Indicates High Power Prices

On the outskirts of Napier, Pan Pac paper mills has a grandstand view of the present squeeze on electricity availability.

From that site, workers can see heat waves from the neighbouring diesel-run 155MW Whirinaki power station when it kicks into life, indicating high spot prices on the wholesale electricity market. And this year the taxpayer-owned Whirinaki plant has already been in action more than usual, burning over seven million litres of diesel in the first three months of the year during periodic use.

But on Thursday 8 May the Electricity Commission (EC) said that Whirinaki will now be running almost constantly given low hydro storage levels. It burns up to one million litres of diesel a day and previously held reserve stocks bought at lower prices are being used up and replaced by much more expensive diesel stocks as the international price of crude oil rises.

In the Hawkes Bay, Pan Pac is not just an interested spectator to this expensive back-stop electricity generation plant swinging into action at Whirinaki but it is also a victim of the electricity spot price spiral that has caused it to cut production to around 40% of capacity.

Pan Pac's Managing Director Doug Ducker is concerned that some of the big profits enjoyed by the electricity sector in recent years has not gone back into creating a broader base of more electricity generation, which would help avoid sharp price fluctuations.

In cutting its production, his company was responding to market signals but he was concerned that there are at present no price signals for domestic electricity consumers to cut their use.

Ducker has no complaints about Whirinaki running, although he believes it could have been switched on late last year. "It was put there as peak load support and that's what it is doing - the issue is whether it should have come on earlier to conserve water (in the hydro lakes)".

Mr Ducker noted that Pan Pac has deferred decisions to expand their plant in the last decade because of lack of faith in NZ's electricity system.

Reference: NZ Herald, 10/5/08.

Power Price Rises by Winter's End?

Power prices have risen by up to 10% in the past year and analysts warn that more increases are likely at the end of the winter.

Consumer NZ has said that retail electricity rates went up between 7 and 10% in the year to March and it was very likely that companies would be looking to make further increases as the wholesale price of electricity rose.

Retailers have said that rising prices for coal and gas, low rainfall, and the need to invest in new generation capacity, would push power bills up again this year. Also lines company charges which make up to 40% of a typical power bill are likely to rise.

Also the present high spot prices on the wholesale electricity market due to low storage levels in the South Island hydro lakes could have some flow-on effect into retail power prices before the end of this year.

However the Government, with an election looming later this year, will be keen to see all price rises affecting the cost of living kept to a minimum over the coming months.

Reference: NZ Herald, 10/5/08.

Rural Power Supply to Continue

The supply of electricity to consumers in remote rural areas will continue to be protected by the Electricity Act beyond 2013, Energy Minister David Parker and Rural Affairs Minister Damien O'Connor announced today.

"In 2007, the Labour-led government had been considering how electricity should be supplied to remote users beyond 2013, because the obligation to supply to places supplied as at 1 April 1993 was due to expire on 31 March 2013," David Parker said.

"Following the consultation, the government will be revising section 62 of the Electricity Act so that the obligation to supply to those places will no longer expire in 2013. The obligation to supply will be able to be met by using either lines or using electricity supplied by alternative local generation, where the local consumers agree.

"This is a win-win situation. It allows distributors to meet the obligation in a more cost-effective way by providing the flexibility needed to accommodate new energy technologies as they become feasible and cost-effective to apply in different settings."

Damien O'Connor said that the expiry date was built in to the Electricity Act and created concern for some rural communities.

"The Labour-led government instigated this review to give rural communities greater certainty. Maintaining security of supply is a priority, and this applies to rural customers just as much as for those in towns and cities," said Mr O'Connor.

"Now that consumers have the security of knowing that their electricity supply will be

required under the Electricity Act, I hope to see distributors and consumers focus on whether there are better ways to meet the need for electricity, for example, utilising on-site renewable sources and improving efficiency,” said Mr Parker.

Reference: Ministry of Economic Development press release, 9/5/08.

Smaller and Smarter Wind Energy

A smarter way to achieve sustainable electricity in New Zealand was presented to the Energy Trusts of NZ conference in Wellington today by Windflow Technology Chief Executive and Director Geoff Henderson.

Mr Henderson told attendees at the Powering the People themed conference that, “the trend towards very large wind farms of several hundred megawatts using very large turbines is concerning for New Zealand”. His presentation was titled “Smaller and Smarter Wind Energy”.

“The media is increasingly reporting local opposition to these types of projects, and large ‘lumpy’ investments are not conducive to creation of a competitive electricity market which could deliver lower and more stable electricity prices”.

Mr Henderson’s presentation showed that large energy projects such as the 360 megawatt Taranaki Combined Cycle plant caused electricity prices to drop initially, the long gaps between new large lumps of generation caused a “feast and famine” cycle which cause price instability.

This lumpy investment problem is being repeated in the wind industry based on a false economic argument for “bigger is better”. This is a myth, he said, with smaller turbines actually being cheaper than larger turbines on an installed megawatt basis.

He also stressed the lower environmental and social impacts of “smaller and smarter” wind energy projects. “Smaller is smarter for

New Zealand for many reasons, with the right competitive market conditions, the country will be better off with this model in the long run”. Mr Henderson concluded.

Presented against the background of this week’s warnings of a falling hydro lakes, a tightening energy market leading to re-commissioning of the New Plymouth power station and the gathering momentum of the ‘Save the Landscapes’ campaign against vista-transforming 160m high wind turbines, Mr Henderson’s address attracted immediate support for further reforms in the energy sector.

“It looks as though only companies with both a generation and retail base can hedge the risks of our variable electricity prices, which are compounded by hydro uncertainties”, said Electricity Networks Association CEO Alan Jenkins.

“Without hedge ability, independent power producers such as local lines companies can’t risk building smaller and smarter generation projects close to the energy load. These market conditions are not encouraging competition in the electricity sector.

“Current moves to finally scale back the restraints on lines company generating are certainly welcome, and the time is right to replace regulatory silos with structures that promote supply security and more active market competition.”

Reference: Windflow Technology Media Release, 30/5/08.

Mighty River Power (MRP) has signed a “turnkey” agreement with Windflow to build its first wind farm near Wellington in Long Gully (near the Brooklyn wind turbine) using Windflow 500 wind turbines and subject to resource consent. This is on a very high wind-speed site where low visual and environmental impact are strong attributes of the Windflow 500 turbine.

MRP are currently investigating a number of other sites which may be suitable for the Windflow 500 turbine.

Reference Windflow Technology Media Release 30/6/08

Electric Vehicles/Biofuels

EECA Biofuels and Electric Vehicles Conference 2008: Some Thoughts

Since 2005, EECA has held an annual Biofuels Conference. This year, the scope of the conference was widened to include electric vehicles. I attended the conference, held in early April, and also went to a lunch put on by Meridian with Ed Kjaer and Chelsea Sexton, two of the speakers from the electric vehicles section of the Conference, which Meridian sponsored.

Following the EECA conference, there were several critical reactions to it – including Clive Matthew-Wilson’s criticisms that it was a waste of money, available online at

<http://www.scoop.co.nz/stories/PO0804/S00071.htm>,

and Frank Pool’s comment on SEF News that Western EV enthusiasts are looking in the wrong place and at the wrong technology, when there are already 40 million electric bicycles in use in China

<http://www.livescience.com/environment/071109-bts-electric-bikes.html>

for more on the environmental issues associated with this).

The EECA Conference presentations are online at :

<http://www.eeca.govt.nz/renewable-energy/biofuels/biofuels-conference-08/presentations.html>,

and I’m not going to try to summarise them here. Instead, these are the observations and reflections I’ve taken away from these events.

Key points

- Biofuels and electric vehicles are only useful insofar as they allow us to use less energy per capita, especially less fossil energy, and reduce greenhouse gas emissions.
- There’s much more to electric vehicles, and the electrification of land transport, than just electric cars. Too narrow a focus on electric cars risks missing out on the benefits of electrifying other elements of the transport system.
- Electric versions of the small commuter cars used in New Zealand are not yet commercially available. There is great demand for them from government agencies worldwide, and New Zealand is nowhere near first on the list to receive these vehicles.
- Biofuels, and biofuel feedstocks, vary widely on a wide range of criteria. Each biofuel feedstock needs to be evaluated on its own merits across a range of energy, economic, environmental and social criteria.

Introduction

I disagree with many of Clive Matthew-Wilson’s criticisms of the EECA Conference. However, he does make a vital point:

“There’s no quick fix to either the energy shortage or global warming. In the longer term, we’re all going to have to use less energy, and that means smaller houses, less plastic junk that we don’t really need and less wasted trips in our cars.”

In my opinion, and making allowances for some imprecise wording, this is correct. The primary response we should be making to our heavy dependence on the use of fossil fuels for transport is to use less: by making fewer trips, finding non-transport alternatives to services currently provided by transport, and changing the focus of transport funding to public transport and active modes (walking and cycling) wherever this is possible.

But this doesn't mean that biofuels and electric vehicles have no role to play. Trips are still going to be needed, and the less we are dependent on fossil fuels to make them, the better.

With all that said, what did the conference actually tell us about the current state of electric vehicles and biofuels?

Electric Vehicles

One point I frequently make, and will keep making, is that “electric vehicles” doesn't just mean “electric cars”. Indeed, at present, the electric transport options in widespread use are not electric cars – they are either sub-car options ranging from electric skateboards (yes, they really exist!) and electric scooters, through China's 40 million electric bicycles, to electric motorscooters and motorbikes; electric golf carts, mobility scooters and the like; a comparatively small number of lightweight electric cars (in UK terms, “quadricycles”) such as the Indian Reva; and on the larger end of the scale, electric buses, trams and the like, right up to electrified heavy rail systems. Doug Clover has suggested that the term “electrification of land transport” is better than “electric vehicles” to capture the full scope of what's involved.

So a criticism I have of the conference presentations, and the current push for electric vehicles in New Zealand, is that they were unduly focused on electric cars, rather than on the full spectrum of electric transport. As energy prices increase, it is likely that more people will seek to use the full range of forms of electric transport. Even with the high efficiency of electric motors in comparison to internal combustion engines, cars are not a very efficient way of transporting people, due to the high mass of the car relative to the mass of the passengers. We must not neglect the potential of non-car forms of electric transport.

Nevertheless, the presentations at the conference focused on electric cars. They could be boiled down to: consumers want electric cars; electric utilities see value in the uptake of electric cars (and other forms of electrified transport); even in countries with much lower proportions of

renewable generation than New Zealand, the widespread use of electric vehicles is likely to reduce transport GHG emissions; many countries want to have electric cars on their roads, or at least to have demonstration models available; the main bottleneck is the actual availability of electric cars (at least, this is the case in Japan and the US). This availability problem is expected to start easing from 2010 onwards, but it may be some considerable time after that before the new generation of electric cars comes into New Zealand in any significant quantities.

Battery technology remains the key hurdle if the goal is to produce electric cars whose range is comparable with that of present IC-engined cars. Opinions vary as to whether, and how soon, battery technology and production will mature to the point at which next-generation electric cars can be produced in sufficient quantities. Supercapacitors also offer promise, especially for heavy vehicles such as buses. Ed Kjaer, the principal conference speaker on electric vehicle technology, said that he thought availability of raw materials, especially for batteries, would not be a factor limiting their deployment.

Caution over the likely level of consumer uptake of electric cars was expressed by several of those who asked questions at the Thursday lunch. My own hunch is that, once they actually have the chance to see and drive electric cars, those customers who can afford them will be keen to acquire them. This obviously begs two key questions: when will they be available, and how much will they cost?

There was some discussion at the lunch of alternative ownership models — both of the model being used by Project Better Place in Israel and Denmark

(see <http://www.projectbetterplace.com/>),

and of other options, such as car clubs which jointly buy electric cars and share them among their members — to reduce the initial cost hurdle.

Biofuels

Recent biofuels policy, especially in the US, has been disastrously misguided. This has led to unsustainable biofuels production which has displaced food production, greatly increased food costs, and led to increases rather than decreases in net greenhouse gas emissions.

This policy failure (whether accidental or deliberate), and such similar disasters as the stripping out of Malaysian and Indonesian rain forests for palm oil production, have led to a backlash against biofuels. This backlash has had some positive consequences, such as lending weight to proposals in the EU, the UK and now NZ that sustainability standards covering GHG emissions, avoidance of biodiversity reduction, and avoiding the displacement of food production should be included in biofuels enabling legislation.¹

The backlash has had the negative consequence that all biofuels have been tarred with the same brush. But, as conference presentations made clear, **all biofuels are not created equal**. It is no more accurate to say that “biofuels are bad” (or “biofuels are good”) than it is to say that all sources of heat energy are equally bad or good. Each biofuel feedstock, and each biofuel project, needs to be carefully evaluated in the light of its own specific circumstances.

The second important point — one which militates against excessive enthusiasm for biofuels in the near future — is that, in general, **the further off a specific biofuel feedstock is from commercial exploitation, the better it stacks up in energy and environmental terms**. For example, algae appears to be by far the most promising feedstock in EROEI (Energy Returned on Energy Invested) terms, but considerable practical problems — in both growing and refining — remain to be resolved

¹ In a comment on sefnews in response to an earlier version of this article, Stephan Heubeck makes the point that all non-agricultural land use is in competition with food production, and that biofuels should not be singled out in comparison to other non-agricultural land uses. On one level, I agree — but it is the rapidity and extent to which land has been converted from food production to the first-generation biofuels production that makes biofuels stand out in this regard.

before this potential can be realised. Similarly, in NZ, organizations such as Scion and the Royal Society have been very bullish about the potential of cellulosic ethanol from wood, but even if land use and biodiversity concerns about large-scale biofuel production from forests can be satisfactorily resolved, we are some way off having scalable commercialised technology to produce biofuels from this source.

One could interpret the above point cynically, to say that sustainable biofuels with net GHG emissions reductions and positive EREOI are still in never-never land. I’m not that negative, but what I will say is that any significant contribution by biofuels to the net GHG reductions and increased resilience needed by our transport system remains in the realm of potential rather than actuality.

Finally, according to Boeing, the commercialisation of biofuels for use in aviation is proceeding considerably faster than expected. Opinions will doubtless differ as to whether this is a good thing!

Conclusions

- The Conference, and the Meridian-sponsored visits of Chelsea Sexton and Ed Kjaer, were worthwhile exercises, despite legitimate concerns about the registration cost. Cath Wallace of ECO negotiated a sharply reduced conference fee for students and NGO reps, and this reduction should be made official, and adequately publicised, at future such conferences.

- Electric transport is already with us, and we can expect it to grow as a proportion of our transport system. The Government and industry need to widen their focus to the electrification of land transport as a whole, not just electric cars.

- Biofuels differ widely on a whole range of criteria, and biofuels feedstocks and projects should be evaluated individually, not condemned (or lauded) indiscriminately.

- Neither biofuels nor electric transport should be treated as a like-for-like replacement for

our present transport system (with its heavy reliance on the private car and on road freight, extremely high dependence on oil, and rapidly rising greenhouse gas emissions). They do, however, have a part to play.

Tim Jones

Electric Scooter for Commuters

An electric motorscooter called “Electroscoot” is now being imported into NZ for local distribution by Electroscoot New Zealand based in Manukau City.

It comes in two models, a 1000 watt model available in sunflower yellow and a 1500 watt model available in fiery orange. Both models feature ABS brakes, burglar alarms and lockable rear storage areas.

A 15km trip can cost as little as 10 cents in electricity used - and less for shorter trips. The maximum cost is 40 cents per day for 60 kilometres after which the scooters will need recharging overnight.

The scooters have minimal maintenance costs. Their long life, sealed batteries have a life expectancy of between two and four years. Riders simply need a valid NZ motor car drivers licence to ride the scooters and they are easy to manoeuvre, park and ride.

The scooters retail for \$2,200 including GST (1000 watt) and \$2,400 including GST (1500 watt) and can carry passengers weighing up to 100kg or 120kg respectively.

Electroscoot scooters can be viewed at

www.electroscoot.co.nz

or at their retail premises at 10 Eric Baker Place, Papatoetoe, Auckland.

Note: In 2003, there were 7,685 licensed petrol motorscooters and mopeds with a capacity of less than 50cc in NZ. By January 2008 that number has risen to 17,788, representing a 230% increase.

Reference: Jalfon Communications Ltd Media Release 4/2/08.

Fuels

A Twelve Step Plan

Press Release: A Twelve-Step Plan to End Oil Addiction – Sustainable Energy Forum - 23 May 2008.

With the price of 91 octane petrol hitting \$2 per litre nationwide, the Sustainable Energy Forum has proposed twelve steps for New Zealand to end its increasingly self-destructive addiction to oil. “Our addiction to oil has been bad for us for a long time,” says Tim Jones, Convenor of the Sustainable Energy Forum. “We’ve paid a high price for it in terms of high greenhouse gas emissions and cities choked by cars. But now we can’t afford our regular fix any more.” “So here’s what we need to do to conquer our addiction. It won’t be easy, but it will be worthwhile — and besides, we don’t really have a choice,” Tim Jones adds.

The Twelve Steps:

1. Stop deluding ourselves. The era of cheap, readily-available oil has ended. Prices may fluctuate, but the underlying trend is up, up, up. We have to get used to using less.
2. Demand that politicians take the issue seriously. Make it an election issue. Don’t take ‘we’ve got everything under control’ as an answer
3. Stop building new roads. They’re a monumental waste of money, time and effort. They encourage, rather than ease, congestion, and besides, the growth in car travel that’s used to justify them isn’t going to happen anyway.
4. Divert that money and effort into measures that address the challenges of oil depletion and climate change.

5. Make a major investment in public transport. It needs to be better, faster, more comfortable, more regular, and more predictable. It needs to cater for everyone, not just peak-hour commuters – though they need a better service as well.

6. Make a major investment in broadband internet to allow more people to work from home, and change tax and business practices that discourage working from home. The more car trips we can avoid, the better.

7. Electrify transport where possible. New Zealand is well placed to use renewable electricity for transport. We should be electrifying commuter rail where it is not already electric, using light rail (trams) in cities, and looking at electrification of the main trunk line. On the other end of the scale, electric bikes and scooters can make a big difference in our cities. And electric cars show promise, though there are a lot of questions to be answered yet.

8. Don't use cars unless there's no alternative. Take the bus. Take the train. Switch to a motor scooter. Walk or cycle – both your wallet and your doctor will thank you.

9. Deal with other aspects of our oil dependence. Agriculture, for example, is highly dependent on oil. We're going to need to change the way we grow and distribute food. Let's get to work on that now, not wait until supermarket shelves start to empty.

10. Stockpile or manufacture vital products currently imported from overseas. When oil runs short, will that still be possible? Let's take stock now and work out what we may need to start stockpiling or making in New Zealand.

11. Think local. Ending our oil addiction isn't just up to central government, though it can play its part. Communities can work together to make themselves more resilient. Join or start a Transition Towns group in your local area.

12. Accept reality. The age of cheap oil is over. It's not coming back. As individuals and as a nation, we have to adapt.

Tim Jones

Oil Supply/Demand Finely Balanced

During 2008 to date it has become abundantly clear that world oil supply and demand are now finely balanced. Increasing awareness of this fact may be one of the factors responsible for the rapidly rising price of oil in recent months, compounded by the increasing demand for oil in major developing countries, particularly China and India.

In its 23 January 2008 issue, NZ Energy and Environment Business Week (NZEEBW) noted that in the December 2007 issue of *Energy Watch*, your editor had said that whenever Peak Oil is raised as an issue, Government ministers and officials tend to adopt a rather negative, if not hostile reaction to the suggestion it is a serious future problem for NZ which needs to be planned for now.

However in the same article, NZEEBW went on to say that my fears about a looming oil crisis were somewhat allayed by a new report by Cambridge Energy Research Associates which predicts oil consumption will continue to rise during the next decade and will exceed 100 million barrels per day (bpd) by 2017 compared with 85 million bpd now.

It is interesting to note that such optimistic future predictions seem to have completely vanished over the past four months as oil prices have risen dramatically. A key factor seems to have been a statement by Shell CEO, Jerome van der Veer at the end of January 2008 predicting that world demand for oil and gas will outstrip supply within seven years (i.e. around 2015) and that this would have serious environmental and political consequences (see NZEEBW, 6 February 2008).

This initiative by Shell represented a major breaking of the ranks with the other major oil companies such as Exxon and BP in maintaining that "there is still plenty of oil out there, technology will overcome shortages, and we'll go out there and find it".

At about the same time, the Paris-based International Energy Agency (IEA) predicted a growth in oil demand of 2.5% in 2008. This would mean that world oil demand would rise to 87.8 million bpd during 2008, up 2.1 million bpd from 85.7 million bpd in 2007, and that demand from China alone will increase by 5.7% to 8 million bpd as oil imports expand to support an economy that is likely to grow during this year by 11%.

Global production figures show world oil production reaching a peak of 86.1 million bpd in June 2006 and then declining slightly to around 85.1 million bpd, then starting to progressively rise again to 86.5 million bpd towards the end of 2007.

A recent article by Telegraph Group Ltd notes that the world's finely balanced market for crude oil has been creeping into surplus for several weeks now. Opec's recent monthly report says that the demand in the second quarter of 2008 will average 85.75 million bpd, whereas supply was averaging 86.8 million bpd during the month of April.

In recent months several countries have been able to increase their output. Nigeria has boosted output by 200,000 bpd in May making up most of the shortfall caused by rebel attacks on pipelines in April. Iraq has added 300,000 bpd to make a total of 2.57 million bpd as security is improved in the Kirkuk region (Before the 2003 invasion, Iraq was producing 3.5 million bpd).

Saudi Arabia is adding 300,000 bpd to the market in response to a personal plea from President George W Bush - even though Riyadh insists that there are abundant oil supplies for sale.

Also major oil forecasters have recently nearly halved their estimates for crude oil demand growth to 1.2 million bpd during 2008, compared with the earlier IEA forecast of 2.1 million bpd. This could take demand to 86.9 million bpd by the end of 2008.

It has been widely reported that output from the trio of non-Opec countries of Norway, Britain and Mexico has been steadily falling, but it is less well known that a number of other countries are gradually filling the breach.

The US Energy Information Agency says non-Opec supply will increase by 600,000 bpd over coming months as Brazil, Azerbaijan and Sudan raise production.

On the demand side, the USA added just 7% of the world's crude oil demand growth from 2004 to 2007, compared with 34% for China, 25% for the Middle East and 17% for emerging Asia.

Reference: Telegraph Group Ltd as reported in NZ Herald, 24/5/08

Oil demand this year will rise by 1.1 million barrels per day (bpd) to 86.88 million bpd, Opec has said in a report dated 13 June 2008. That is about 60,000 bpd less than Opec's previous estimate (produced monthly) of 86.94bpd by the end of 2008. The reduced estimate reflected lower global economic growth.

UN Secretary-General Ban Ki Moon has said that Saudi Arabia had told him that the country would add 200,000 bpd of output for July after increasing output by 300,000 bpd for June, bringing its total production up to 9.65 million bpd which is 11% of total global oil production. **However it should be borne in mind that a total Saudi production increase of 500,000 bpd still represents only 0.6% of current world oil production and some commentators are sceptical that this production increase will actually be made.**

"The scary thing is that people are saying it's the last bullet" said Anthony Nunan, Assistant Manager for risk management at Mitsubishi Corporation in Japan. "If that can't get the market down, then we're in real trouble. Here come oil prices of US\$150 to US\$200 per barrel!"

On 16 June the oil price climbed again to a record of almost US\$140 per barrel on news of a further decline in the value of the US dollar. Over the previous two days it had fallen to US\$134 per barrel on receiving news of the Saudi increase in oil production.

The previous record oil price of US\$139 per barrel was reached on 6 June.

Reference: Bloomberg as reported in NZ Herald, 17/6/08.

While Governments have highlighted refining shortages and increased demand as the cause of rapidly increasing global oil prices, producer nations say that action has to be taken to rein in “speculators” who they say have played a key role in doubling the price of a barrel of crude oil over the past year. (However the IEA sees supply/demand fundamentals driving oil prices, rather than speculators.)

Saudi Arabia is one of the countries which wants action against “speculators” and its gesture in increasing oil production has not been matched by other members of the Organisation of Petroleum Exporting Countries (Opec) which accounts for about 40% of world oil output. Opec President, Chakib Khelil said that increased production was “irrational and illogical”.

A Saudi source said that there was scope for other countries to follow the Saudi gesture. “Some people believe that there is 1 million bpd of spare capacity within Opec outside Saudi Arabia”.

British Prime Minister, Gordon Brown, said in an interview with the Guardian newspaper that the present one was “the biggest of all three oil shocks”. He called it “the downside of globalisation”.

Reference: NZ Herald, 23/6/08.

Oil Price Milestone

The world oil price passed a New Zealand-related milestone today: for the first time, it has gone above the highest price shown in the high oil price scenario in the Ministry of Economic Development’s 2006 publication New Zealand’s Energy Outlook to 2030, which is available online at: <http://www.med.govt.nz/templates/MultipageDocumentTOC21862.aspx> (PDF download, 15MB).

The high oil price scenario in this document assumed that the world price of oil would reach a level of US\$125 per barrel in 2010 and stay there until 2015, after which it would begin declining again, as alternatives became available, to a level of US\$90 per barrel. This

high oil price scenario was based on the then-current prediction of the Association for the Study of Peak Oil and Gas (ASPO) of a peak in world conventional oil production in 2008.

In contrast, the “base case” in the New Zealand Energy Outlook, on which the Government has based subsequent planning, shows a world oil price staying at the level of US\$60 per barrel from 2006 onwards.

The MED deserves credit for including the high oil price scenario in its 2006 report. Of course, the prices given in this scenario are averages, and are indicative only; but it’s still striking that the world oil price has gone up to and above the MED’s predicted “high” oil price two years ahead of schedule.

So here’s a couple of questions you could raise with central and local Government officials:

1. What oil price do you use in your transport and energy planning?
2. If this price doesn’t reflect the real-world oil price, why not, and what are you going to do to ensure that it does?

Investigation of pricing assumptions used by Wellington’s transport planners has shown that transport modelling is increasingly divorced from the new reality of high oil prices. I suspect the same applies in many other places as well.

Tim Jones

Reference: SEF News Posting, 23/5/08.

Gas Galore?

There continues to be divergence in opinion as to the extent of NZ’s current known reserves of natural gas.

Back in 2003 there was a “big Maui gas shock” when, suddenly, an independent expert found that the Maui field was in danger of running out around 2007, two years earlier than was then expected.

As a result, the Maui gas contract was terminated at an agreed total amount of gas delivered, and from then on, a new price was to be negotiated

for all remaining Maui gas. In fact, “dwindling Maui gas reserves” became something of catchphrase as that independent expert’s report triggered a series of retail electricity price rises in subsequent years.

As it happens, the Maui field is still going strong and while some industry executives believe that there is a possibility that it could “water out”, and effectively cease production at any time now, a Todd Energy executive has recently said that it could keep producing until well into the next decade (refer EnergyWatch Issue 48, p15).

While the official position seems to be that we have around 2000 petajoules (PJ) of available proven gas reserves, Todd Energy believes that the correct figure is about 2600PJ and they also believe that there is “very substantial scope for incremental development and production at existing producing fields, substantial enough to effectively double the current supply position of 2000PJ”.

To be fair, Todd Energy have been saying this for some time, and estimating gas reserves is clearly an inexact science. The Kapuni field, discovered in 1959 and originally estimated to contain 200PJ, has to date produced 800PJ and may well squeeze out another 400PJ.

Still you have to wonder to what extent the gas production industry keeps its cards close to its chest in order to keep upward pressure on gas prices?

Associate Energy Minister, Harry Duynhoven said that there was “clearly a difference of opinion” between the official gas reserves figures he gets from the Ministry of Economic Development and what oil and gas producers are now saying. “What it does tell us is that we need better information from the industry”.

Reference: The Business Herald, 14/3/08.

Editor’s Note: It seems that the difference between Contact Energy’s recent statement (see EnergyWatch Issue 48, pg 15) that NZ has a likely sufficiency of domestic sources of natural gas till about 2015 and Todd Energy’s view that there are sufficient proven natural gas reserves to last until at least 2020 relates to whether NZ at present has proven natural gas reserves of around 2000PJ (the official position) or 2600PJ.

Calculations indicate that at an assumed annual production rate of about 180PJ the official suggested reserves figure would take us through until about 2018 and the Todd Energy suggested reserves figure would take us through until about 2021.

Climate Change/Global Warming

Progress(?) Since Bali

The world is obviously going to be faced with great difficulties in trying to get a post-2012 agreement to replace the Kyoto Protocol.

But the NZ Government is at present trying to push through legislation for an Emissions Trading Scheme (ETS) with exemptions for some industries now extending into the future as far as 2030.

It is rather difficult for NZ to plan ahead for what we might be doing in 2030 when we don’t really know what is likely to happen after 2012 as far as any international climate change agreement is concerned.

Recent newspaper articles on the difficulties of the present negotiations convey the impression that a key problem is getting the USA to sign any new agreement will be solved when a new US President is elected at the end of this year. But in fact, the problem of getting the US to sign up is more complicated than that.

It is the US Senate which must make the decision for the US to sign. The President can only recommend that an agreement be signed.

As reported in NZ Energy and Environmental Business Week, reports are circulating in Wellington that the UN negotiations on an international agreement to replace Kyoto are

not running smoothly, and may even be going backwards.

At briefings for stakeholders held in Wellington on Thursday 22 May (and in Auckland the following day) NZ's climate change ambassador, Adrian Macey, indicated that the last round of negotiations held in Bangkok in April this year did not go well. It now seems unlikely that the timetable set in Bali last December to have an international agreement in place by the end of 2009, can be met.

Given that the climate change issue can only be solved by international action (NZ with less than 0.2% of global emissions is only a bit player), slow progress in the UN negotiations reinforces the argument that NZ should proceed cautiously with the implementation of its ETS.

Some NZ authorities contend that once the international process for combating climate change post-2012 is known as a result of further international negotiations, only then should a domestic regime which fits with the international programme be implemented.

Reference: NZ Energy & Environmental Business Week, 28/5/08.

The latest round of UN climate talks have ended in Bonn with little progress towards agreement on a post-Kyoto pact.

Developing nations accused the rich nations of dragging their feet in setting new greenhouse gas targets and failing to share new technology and help poor countries adapt to climate change.

But Climate Change Secretariat head Yvo de Boer describes the road ahead as "daunting". The next talks will be in Accra, Ghana in August.

Reference: NZ Energy and Environment Business Week, 18/6/08.

International Agreement Remains Difficult

While our Government is urgently trying to pass legislation to enact its proposed Emissions Trading Scheme with phase-in

periods for some industries now extending to 2030, the future of world climate change negotiations for the period post-2012 is still extremely uncertain.

A widely accepted view is that after the present Kyoto Protocol agreement expires at the end of 2012 there will be increasingly tougher measures implemented internationally to combat global warming, with tighter controls on greenhouse gas emissions being progressively applied. In reality this may be far from what is likely to happen.

The chances of the existing Kyoto agreement being tightened and extended for even a few more years after 2012 are virtually nil, because the emissions reduction requirements within the agreement involve too few countries producing only a fraction of the world's greenhouse gas emissions.

A replacement agreement will be required from 2013 because the existing signatory countries are most unlikely to agree to any extension unless major developing countries - code for China and India - are committed to making significant emissions reductions as well.

It is futile to expect those major developing countries to undertake any kind of economic sacrifice to reduce emissions which cause climate change while the largest and wealthiest emitting country, the USA, remains outside the agreement.

In December 2007, a major two-week climate change conference in Bali, Indonesia almost ended in failure. The US supported by Japan, argued that the post-Kyoto agreement should favour voluntary emissions targets, noting that mandatory emissions cuts would threaten economic growth which generates money needed to fund new technology to effectively fight global warming.

In other words, the US was arguing that new technology is the key to solving the world's climate change problem rather than people around the world "going without" as a result of emissions cuts reducing economic growth.

At conference-end, there was a “U-turn” by the USA which prevented the meeting breaking up in acrimonious failure. The compromise consisted of the parties stating that they have committed to the “consideration” by all developed countries of quantified emissions reduction objectives and comparability of efforts amongst them. However the weasel word “consideration” gives the USA the opportunity to back out, as it did from the original 1997 Kyoto agreement.

A more optimistic view expressed at the time by our Climate Change Minister, David Parker, and others, focused on the “all developed countries” and “comparability of efforts” and saw the final conference statement at Bali as an undertaking by the US to join the rest of the developed world in adopting emissions reduction targets.

But within days of the Bali conference ending, the White House issued a statement expressing serious concerns about the agreement just reached, noting that the problem of climate change cannot be adequately addressed through commitments by developed countries alone and that major developing countries must also be included.

It seems that the United States is concerned about climate change policies handing to China a competitive economic advantage with the risk that any such post-Kyoto agreement will become entangled in a broader economic rivalry between the USA and China. This will add to American concerns about trade imbalances, and also the further loss offshore of US manufacturing jobs which has already become an important issue in the primary election campaigns.

So at present there appears to be a “Mexican standoff” developing between the USA on the one hand and China and India on the other, with neither side being willing to become committed to any binding emissions reduction targets unless the other side does so first.

Some people are saying that this problem may be solved when the US elects a new president at the end of this year, but will it? Under the American political system it is actually the Senate which must approve any post-Kyoto agreement before the US can ratify it. The last

time approval of a climate change agreement went to the US Senate was during the Clinton/Gore administration where it was very heavily defeated.

The Senate then made a statement on conditions which must be fulfilled before it could approve any subsequent agreement. These conditions included that it must not have a negative economic impact on the US and that major developing countries must also be involved.

At present, informed opinion suggests that regardless of who the President is in 2009, the US Senate will not agree to ratify any post-Kyoto climate change agreement. The most that can be hoped for is a domestic cap-and-trade system to try and limit emissions either within the USA as a whole, or by individual states within the US, and especially California.

So where does this leave the development of a new international agreement? At Bali a “road map” was set out leading towards an agreement being approved in Copenhagen in December 2009, for implementation after 2012. Since then, a meeting has been held in Bangkok in April with another held in Bonn in the first half of June, and another to be held in Accra, Ghana later in August.

Following the Bali conference, negotiations have been proceeding at a snail’s pace discussing mainly technical issues rather than political issues, and developing countries will not agree to discuss mitigation measures until the first meeting in 2009, so the chances of a new international agreement being reached by the end of 2009 are virtually nil.

As an example of the difficulties being faced, many developing countries are not prepared to even talk about long-term goals for emissions reductions in their own countries, so instead the euphemism is used of a “shared vision for long-term co-operative action”.

What will happen if no future international agreement is in sight as 2013 approaches? There might just be a possibility of a rollover of the existing Kyoto agreement for a year or

two while another attempt is made to sort things out, but it is unlikely that such a rollover would be agreed to except as a very short-term holding arrangement.

A fundamental concern with our Government's proposed Emissions Trading Scheme is that to date there has been no clear analysis of by exactly how much the scheme will reduce emissions. One estimate is that it will be only 2% before 2013, partly because of the extent of the exemptions now proposed. Much more action than this will be required under any new international agreement.

My own view is that while I have no objection to the New Zealand Government introducing measures now which will increase efficiency in our use of energy and decrease our greenhouse gas emissions in a variety of ways, these measures should not be seen to be harming our economy or reducing the living standards of New Zealanders.

I believe this should remain the case unless and until we can see enough other countries following through in implementing strict measures to mitigate climate change, through some form of international agreement to replace the Kyoto Protocol from 2013. That would be the time for New Zealand to take further tougher action to reduce emissions.

John Blakeley

Methane's Impact May Be Downgraded?

At the briefing for stakeholders held in Auckland on Friday 23 May, NZ's climate change ambassador, Adrian Macey said that among the ongoing technical discussions now taking place as part of the international negotiations over a future climate change agreement, it was likely that the relative impact of methane will be adjusted downwards because it doesn't stay very long in the atmosphere.

Compared with carbon dioxide, methane is a much more potent greenhouse gas and its equivalency to carbon dioxide has been

calculated accordingly. However, whereas carbon dioxide stays in the atmosphere for a very long time, methane doesn't stay nearly as long.

This could have a major impact on NZ's calculated greenhouse gas emissions, because of our very high proportion of emissions from the agricultural sector (around 50% of the total).

However, it could also mean that new initiatives now being researched into ways of reducing NZ's methane emissions could have less overall impact on NZ emissions profile than is assumed to be the case at present.

John Blakeley

Carbon Dioxide is Not Carbon

We are told that we must "reduce carbon" or "carbon emissions". To do this we need to engage in "carbon trading" and "carbon capture and storage" and even build up "carbon credits" to offset our "carbon liabilities". We are encouraged to calculate our "carbon footprint" and examine ways in which it might be reduced.

What on Earth is that all about? "Carbon" is a solid, naturally occurring, non-toxic element found in all living things. Carbon forms thousands of compounds, much more than any other element. Everything from medicines to trees to oil to our own bodies and those of all other creatures are made of carbon compounds.

Of course, what is really being addressed is one specific compound of carbon, namely carbon dioxide. Ignoring the oxygen atoms and calling carbon dioxide merely "carbon" makes about as much sense as ignoring the oxygen in water and calling it "hydrogen".

What we are really doing is using the word "carbon" as shorthand for "carbon dioxide" or often more correctly, "carbon dioxide equivalent" if we are also taking into consideration the global warming effect of other greenhouse gases such as methane and nitrous oxide.

Calling the gas “carbon” encourages people to think of carbon dioxide as “pollution” or something “dirty” like graphite or soot.

Calling carbon dioxide by its correct name would help people remember that, despite the debate on the impact of man-made carbon dioxide on global warming, it is really an invisible, odourless, tasteless gas essential to plant photosynthesis and therefore to all life.

People should bear this in mind next time they see one of the countless television images in relation to climate change/global warming of a very large industrial chimney belching black smoke into the atmosphere.

Reference: Opinion piece by Tom Harris, NZ Herald 1/2/08.

ETS Bill Running Out of Time

The Government is in danger of running out of time to push through major pieces of legislation before the election - including its cornerstone climate change policy, the Emissions Trading Scheme (ETS).

With fewer than 37 sitting days left before Parliament is likely to dissolve for the election, Labour still has about 70 bills which it wants to push through.

The ETS has been a high priority for the Government - although its value in an election year is now debatable as it has been linked to rising petrol prices.

Passage of the ETS bill before the election is increasingly in danger if the select committee gets bogged down in its progress or small parties follow through on threats to pull their support.

Labour does not have a majority on the select committee, so National could try to get small party support for an extension to its deadline.

This would give the select committee time to consider the Government’s proposed amendments to delay the introduction of transport fuels into the scheme by two years from 2009 to 2011, and to give export industries five more years of free emissions allocations.

These proposed amendments were announced

after submissions were closed, so the committee could also force the Government to introduce the changes as separate amendments rather than inserting them into the select committee rewrite of the Bill as reported back to Parliament.

This could potentially subject the amendments to further select committee scrutiny - and further delays - if they are considered to have major policy implications.

The Government wants the select committee to report back by 11 June, and the committee has been having some long sessions in both Auckland and Wellington to meet the deadlines.

National has now decided not to support the ETS Bill. Labour is putting a brave spin on National’s capitulation. But the reality is that it now faces an uphill battle to pull together enough support from minor parties to get the legislation through Parliament before the end of this term.

In backing away from supporting the Bill, John Key has acknowledged the enormous economic complexities involved in what would be a major revamp of the tax system. He argues that the process should not be rushed. But he promises that if National wins the election, it will put emissions trading at the top of its agenda in the new Parliamentary term.

Key is essentially reiterating the view of virtually every business lobby group that has appeared before the select committee, saying that they are in favour of emissions trading in principle but more time is needed to work through the details.

John Key notes that there are still many unanswered questions about the legislation. For example, **there has been no clear analysis of by exactly how much the ETS will reduce emissions.**

National believes that NZ should not try to be a world leader on climate change because “Kiwis simply can’t afford to pay the price of that particular experiment”. Key also argues that the ETS should be fiscally neutral rather than providing “billions of dollars of windfall

gains” to the Government. And he wants the ETS to be as closely aligned as possible with the planned Australian scheme.

Realistically, if the ETS is not passed by this Parliament, National is likely to be busy with many other issues competing for time if it forms the next Government. So it is hard to see any emissions trading scheme coming into effect before 2010.

References: NZ Energy and Environment Business Week, 14/5/08 and 21/5/08 NZ Herald, 12/5/08.

Political support is drying up for the ETS. Labour’s fallback options for passing this legislation into law are dwindling with United Future confirming it will oppose the legislation and the Maori Party voicing significant concerns about it.

Labour is now locked in talks with the Green Party and the NZ First Party as it attempts to get its major climate change policy passed through Parliament. Both the Greens and NZ First are discussing with Labour some form of compensation for households affected by the rising costs that the ETS will bring.

But United Future leader, Peter Dunne, said that even if the parties still talking with Labour did manage to secure some kind of compensation, the cost was too great for households to bear, given rising petrol, food and mortgage bills.

While the Maori Party has not formalised a position yet, a statement from its co-leader Tariana Turia labelled the ETS a rip-off for taxpayers which hurt poor families the most. She said that the ETS which emerged from the Select Committee on 16 June was not “fair and transparent” and she highlighted that big businesses and farmers were getting off “scot free” for years.

The Maori Party’s concerns about the fairness of the ETS for taxpayers may not be easy to quell. That leaves Labour trying to stitch together a deal with NZ First and the Greens, with time running out before the election to pass the bill into law.

Reference: NZ Herald, 18/6/08.

ETS Revenue Beyond 2012

The Government’s fiscal projections beyond 2012/13 do not incorporate an estimate of any net emissions liability which may eventuate from NZ’s obligations under future international climate change agreements. This is due to uncertainty around the size and timing of any future liability.

The Emissions Trading Scheme (ETS) is intended to exist beyond the period of the Kyoto Protocol (which expires on 31 December 2012). Since there is as yet no estimate of future post-Kyoto financial obligation, Treasury says that if revenue from the ETS was explicitly modelled, a substantial build up of surplus credits would result.

Because of this, the Government’s fiscal projections beyond 2012 include an “ETS revenue track” which exactly offsets the fiscal impact of a modelled “expense track”.

Effectively this may assume that net proceeds from the ETS post-2012, after meeting any future emissions liability, are recycled back to the public through some unspecified tax reductions.

In late May the Government conceded that advice from officials indicated that the sale of emissions permits would yield it between \$6 billion and \$22 billion in revenue, depending on the price of carbon dioxide emissions credits.

There could also be a windfall profit for the Government of up to \$150 million a year arising from the higher power prices obtained as a result of the ETS by Meridian Energy, Mighty River Power and Genesis Energy, and for which they do not have to buy emissions permits for their renewable electricity generation.

Reference: NZ Energy & Environment Business Week, 28/5/08.

The NZ Government could reap massive revenues - as much as \$21.4 billion - from trading carbon credits after 2013. The figures have emerged after weeks of Treasury and Ministerial claims that no reports had been done on the potential windfall, as the government sells off its emissions credits after 2013.

It was revealed during a meeting of the Finance and Expenditure Select Committee in Auckland on 15 April that officials had indeed advised the committee on the amount of revenue that the Government could expect to make from auctioning off surplus emissions units. The amount ranged between \$6.6 billion and \$21.4 billion.

The high-end scenario was based on trading of carbon credits being priced at \$50 per tonne. The Government has been allocated 309.5 million assigned amount units (AAU's) under the Kyoto Protocol processes and expects to devolve 90% of them to heavy - emitting industries to maintain their international competitiveness during the transition period to 2025 (now 2030).

Reference: Carbon News media release, 15/4/08.

The Government, besides needing the votes of the Green Party, is pressing the NZ First Party to vote for the ETS. But NZ First leader, Winston Peters, is saying that his party had "serious reservations" about the ETS proposals. This suggests that his proposal to get substantial electricity cost rebates for SuperGold cardholders (those over 65) is still being worked on, to cover price increases under the ETS.

The problem is that in September 2007, the Government calculated that electricity prices would increase by 10% if the price of carbon credits was \$15 per tonne. At \$25 per tonne that price increase would rise to 18%. But the price of carbon credits is already as much as \$40 per tonne suggesting a wholesale electricity price increase at the order of 25%!

National has said that the Government will score windfall profits from the way that the ETS is designed. It says that officials advised the Select Committee in April that the ETS could generate as much as \$21 billion in revenue from the sale of emissions permits.

Reference: NZ Energy and Environment Business Week, 18/6/08.

UN Climate Programme Wastes Billions

According to two analyses of the United Nation's carbon offsetting programme, billions of pounds are being wasted in paying industries in developing countries to reduce greenhouse gas emissions.

Leading academics and watchdog groups allege that the UN's main carbon offset fund is being routinely abused by chemical, wind, gas and hydro companies, who are claiming emissions reduction credits for projects in developing countries that should not qualify for those credits.

Reference: Article by John Vidal, Environment Editor, The Guardian (UK), 26/5/08.

Is the Kyoto Protocol's clean development mechanism (CDM) a sham? New research shows that billions of dollars worth of "clean" investment on the world's largest carbon offsets market ends up polluting the environment.

The research, by two senior Stanford University academics, seriously undermines the credibility of the CDM. It found most money through the CDM goes to coal and oil companies, builders of "destructive" hydro dams, and other enterprises which are "not green in the slightest".

The researchers examined more than 3,000 projects which have applied for or have already been granted up to US\$10 billion of credits from CDM funds over the next four years, and concluded that most should not be considered for assistance because they would have been built anyway.

Stanford Law Professor, David Victor, believes that between one third and two thirds of all CDM offsets do not represent any actual emissions cuts.

More than 1,000 CDM projects have so far been approved, and 2,000 more are making their way through the process. Policy makers are set to start reviewing the CDM in the near future as the Kyoto Protocol expires in 2012

CDM credits are the world's largest offset market, with annual trading last year totalling around 40 billion Euros (NZ\$80 billion).

Most credits are traded on the European trading system but when the US starts to participate (?), trading will rise to over 100 billion Euros (NZ\$200 billion) within two years easily.

This latest research appears to confirm what critics of emissions trading have been consistently warning. There is enormous potential for fraud.

The challenge is for those designing emissions trading schemes to keep one step ahead of those trying to rot the system.

Reference: NZ Energy & Environment Business Week, 4/6/08.

NZ's Emissions Continue to Rise

The 2008 Greenhouse Gas Inventory was released in mid-April by the Ministry for the Environment. This showed that NZ's greenhouse gas emissions increased by just under 1% between the 2005 and 2006 calendar years (from 77.2 to 77.9 million tonnes).

The inventory shows for the 2006 calendar year:

- Total greenhouse gas emissions were 77.9 million tonnes of carbon dioxide equivalent.
- This is an increase of 16 million tonnes of carbon dioxide equivalent (26%) on the 1990 level of 61.9 million tonnes.
- Emissions absorbed by forests in 2006 amounted to 22.7 million tonnes of carbon dioxide equivalent. This is up 11% on 1990 levels.

The Government is trying to put a positive spin on the figures with Climate Change Minister David Parker, saying that they are an improvement on the 3% increase in emissions recorded between the 2004 and 2005 calendar years (see Editor's Note below).

- Agriculture is still NZ's largest emitting

sector with its combined methane and nitrous oxide emissions making up **48%** of the total. Agricultural emissions were up by 16% on 1990 levels.

- Transport was the next largest contributor with **19%** of total emissions. Transport emissions have increased by 64% since 1990.
- Electricity generation and space heating comprised **11%** of total emissions in 2006. Emissions from this sector showed the largest increase of 138% since 1990, partly because of the increased use of coal-fired generation.
- Other energy sector emissions (including industry) comprised **14%** of total emissions.
- Industrial processes accounted for **5%**. Emissions from this sector have increased by 24% from 1990 levels.
- The waste sector accounted for only **2%**, being the only one to register a fall (of 26%) since 1990, mainly due to improved solid waste management practices.

Figures also released in April show that greenhouse gas emissions in both the EU and the US fell during 2006. US emissions were down by 1.3% and EU emissions by 0.3%, whereas in 2005, US emissions rose by 0.6% and EU emissions fell by 0.4%.

Globally, greenhouse gas emissions are rising at about 3% per annum, mainly due to rapid economic growth in China and India. This is fuelling a rapid increase in demand for energy from high carbon-dioxide-emitting coal-fired power stations, and also from a rapid increase in motor vehicle numbers.

Reference: NZ Energy and Environment Business Week, 23/4/08.

Editor's Note: The change from a 3% increase in 2005 to a 1% increase in 2006 in NZ's emissions figures must be regarded as a "statistical blip". The overall rate of increase since 1990 has been around 1.6% per year. (Also energy sector greenhouse gas emissions actually reduced slightly in 2004, which perhaps helps to explain the subsequent 3% increase in 2005).

What is the NZ Price of Carbon?

Simon Terry of the Sustainability Council has recently stated that the current world price for good-quality carbon credits is NZ\$30 per tonne (NZ Listener, 31 May). Other commentators seem to agree that this figure is about right.

And yet at the time of the launch of the Emissions Trading Scheme (ETS) in September 2007 the Government was claiming the appropriate price was around NZ\$15 per tonne and after months of stoutly defending this figure, Treasury finally admitted that it was very low and put it up to NZ\$22 per tonne.

In September 2007, the price of 2008 carbon credits on the European market was around 20.5 Euros per tonne and in June 2008 this figure has increased to around 26 Euros which converts to around NZ\$53 per tonne.

Why is the European price so much higher than the estimated NZ price? In an interview with the NZ Herald, Mark Franklin who has been appointed chief executive of the NZ Stock Exchange's carbon market venture (TZ1) provided some explanation.

He noted that NZ Government officials have suggested allowing assigned amount units or (AAU's) to be fully interchangeable with the NZ emissions unit (NZU). AAU's are the units allocated to Governments equivalent to their target under the Kyoto Protocol.,

But some potential buyers are unwilling to buy AAU's from countries like Russia and the Ukraine. Their allocations, like everyone else reflected their emissions in 1990, Kyoto's year zero. Shortly after, the Soviet-era economy collapsed, leaving Russia and the Ukraine with a potentially large excess of AAU's to sell.

Mark Franklin said that initially he was among those who opposed allowing NZ's emitters to buy such AAU's to reach obligations - should they become available. But he has since come to sympathise with eastern European resentment at fastidiousness about the environmental validity

of these units. Likewise, he believes that the Europeans will eventually abandon their refusal to allow into their internal market emissions units arising from afforestation.

In addition, the European internal market has strict rules about the proportion of clean development mechanism (CDM) units that any European country can use in meeting its obligations under the Kyoto Protocol.

For the above three reasons - their objection to AAU's from Russia and the Ukraine, their refusal to allow emissions units from afforestation and their insistence on only a small proportion of CDM units for European countries - the price of carbon credits on the internal European market is likely to be considerably higher than the current world price for good-quality carbon credits of NZ\$30 per tonne, as suggested by Simon Terry.

Reference: NZ Herald, 24/5/08.

Editor's Note: The abbreviation TZ1 is an allusion to time zones, and a belief that, as global carbon trading develops and deepens, there will need to be a trading hub operating at a time of day when the London and New York (or Chicago) exchanges are not operating.

Sustainability Council Report

The Sustainability Council has released a report written by Geoff Bertram and Simon Terry showing that households, road users and small business will meet 90% of estimated \$4.4 billion costs of the Emissions Trading Scheme (ETS) over the next five years until the expiry of the Kyoto Protocol.

The report concludes that the ETS will involve huge transfers of wealth but will only reduce NZ's greenhouse gas emissions by 2% compared with where they would otherwise be, leaving them still 30% above the Kyoto target by the end of 2012 (at present 26% above for the 2006 calendar year).

Therefore the ETS will do little to reduce emissions or prepare the NZ economy for a

much more stringent international emissions regime which may come after the Kyoto Protocol expires at the end of 2012. “New Zealand would commence the next commitment period in 2013 staring down from the top of an emissions cliff” Simon Terry said.

Of the \$4.4 billion in payments resulting from the ETS up to 2012, the report says that about \$1.8 billion will go in windfall profits which electricity generators with renewable generation assets stand to make when the wholesale power prices include a carbon charge.

But the agriculture sector does not come into the scheme until 2013, while large industrial emitters will be heavily exempted and have the lion’s share of their emissions covered by a free allocation of NZ emissions units. (Subsequently the Government has announced that some major industrial emitters will get an extension to the date from which they would have to accept the full costs of their emissions up until the year 2030!)

Bertram and Terry propose amending the ETS so that all emitters pay the carbon charge on the same proportion of these emissions from the outset. “If spread equally in this way, the cost of the Kyoto bill would be covered if all emitters paid the world price for greenhouse gas emissions on about one third of their emissions from 2008 to 2012” they said.

The delayed inclusion of agriculture represents a subsidy of \$1.3 billion over the next five years Bertram and Terry say, even allowing for the farmers’ share of higher fuel and power costs.

References: NZ Herald, 30/4/08 and NZ Energy and Environment Business Week, 7/5/08.

The Coming Carbon Crunch

The Government’s central proposal for addressing its Kyoto commitments will make little difference to the country’s gross greenhouse gas emissions. The Emissions Trading Scheme (ETS) is based on a sound idea - put a price on all sources of greenhouse gases and so pass on the message that excess emissions impose costs.

Yet the current scheme would cut gross emissions by less than 2% by 2013, partly because of the extent of exemptions and corporate welfare proposed. This means NZ’s gross emissions will still be nearly 30% above the country’s Kyoto target over the next five years.

During that period, over 90% of the net charges resulting from the ETS will be paid by householders, road users and small and medium enterprises, even though these sectors account for only a third of all emissions.

By contrast, pastoral farming accounts for 49% of NZ’s emissions but will be completely exempt during the next five years. As a result, there will be a major transfer of wealth from ordinary consumers to agricultural producers; **\$1.36 billion at the current world price for good-quality carbon credits of \$30 per tonne**, after taking into account payments farmers will make on fuel and electricity under the ETS. Major industrial producers will also be heavily cross-subsidised.

For a challenge to the economy as fundamental as adapting to a price on “carbon”, such disproportionate loading on ordinary consumers is politically unsustainable. Although the ETS does call for emissions from all sectors to be subject to it from 2013, and for all greenhouse gas emissions to be priced eventually, these are promises to be fulfilled only in the distant political future.

For the next five years, the ETS essentially accepts business-as-usual growth in emissions and redirects the Kyoto charges away from the politically powerful major emitters and on to households, transport and small scale businesses. In this sense it is a continuation of the past, rather than a green dawn.

It also means that from 2013, NZ would commence a new emissions reduction commitment period staring down from the top of an “emissions cliff” above any new and more stringent post-2012 emissions target

Reference: Article by Simon Terry in the NZ Listener, 31/5/08.

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