



Who hath measured the ground?

William Shakespeare

The NZ Council for Infrastructure Development (NZCID) was launched in July. The mantra of the launch was that NZ must spend 5% of GNP each year on infrastructural deficit — anything less would harm economic growth. A fiscally responsible government cannot spend more than 2%, but the NZCID is here to help. Chairman Jim McLay is also chair of investment bank Macquarie NZ and associated with a major infrastructure investor, Macquarie Infrastructure.

Minister of Finance Michael Cullen said at the launch:

Given the very large long-term resource commitments involved in infrastructure development, poor quality debate — especially if it is driven by sectoral interests — can have quite major consequences. We learned that lesson with the Think Big projects.

The very concept of infrastructural deficit is very vague. It seems to apply only to the public sector, and to exclude energy efficiency measures — an area where most companies under-invest.

If a private drain blocks in an infrastructure company's yard, is that an infrastructural deficit? Very likely not. Cleaning the drain is often enough, or a spot repair is usually enough, but eventually a complete relay becomes economic. None of these is an infrastructural deficit unless work is delayed beyond the economically optimum timing: any other approach would be over-investment. Add real-world effects such as yard resealing (it pays to fix the drains first) and knowing little about drain condition (even a CCTV survey can miss essential information), and it is obvious that infrastructural deficit is no exact science.

How is a public street drain different from all this?

What, then, about a privately funded urban motorway — specifically mentioned by McLay? In principle most of the drain problems are present — writ large — but now there are new and very much greater uncertainties:

- How do you price the land? The 1999 SEF Conference was told by economist Tim Hasledine that a toll on the Grafton Gully motorway would be of the order of \$ 4.00/trip if the land had been properly charged, at the best alternative use value — in this case inner-city housing.
- About half of local roading costs are paid from rates and so are completely divorced from use, and externalities are not charged at all. Construction funding is 'pay as you go' which gives cheap motoring but would bankrupt a private sector organisation. The roading resource is underpriced by at least \$bn 3.0/yr, so no wonder it is over-used. (See *EnergyWatch* 33, page 23–24)
- What is the true demand? With charges unrelated to costs we simply don't know, but we do know that it also depends heavily on things like transport policy and urban design.
- Who decides whether to design cities for mobility (travelling further faster, the current paradigm) or accessibility (less need to travel)?
- Who carries the risk if traffic and hence the road's income are less than forecast? With Peak Oil looming over the infrastructural event horizon — and perhaps very close — the risk is significant.
- How will private funding influence these decisions, and in whose interests?
- What are we to make of Chris Trotter's comments about the Auckland road lobby on page 11 (and in much greater detail in the original article)?

The viability of a public-private deal depends on a wide range of factors. Most are outside the control of private funders and many are also outside public sector control. Will private funders be allowed to bind government actions? Or make assumptions and then transfer risk to the government? Or take massive profits to cover the risk? Or more than one of these?

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Underlying the debate is an assumption that infrastructure investment is a good thing, but this is true only up to a point:

- Too much money or too rapid growth in expenditure leads to ill-considered work.
- Over-investment in roading is only too likely because of massive levels of undercharging for road use: the resource is under-priced.
- The big benefits of road building have very largely been realised, and further measures usually bring little or no benefit — an apparent paradox.

Congestion cost estimates, commonly stated as a billion dollars a year for Auckland alone, seem to support massive roading investment, but this assumes that the new roads will fix the problem. In reality, traffic modelling shows only modest gains — barely distinguishable from modelling uncertainty in the case of Wellington's Inner City Bypass. The effect of Auckland's Eastern Corridor on the congested Southern Motorway will also be minimal. And experience suggests that modelling may be optimistic because of perverse effects such as induced traffic and shorter peaks.

Major gains are more likely to be available from neglected infrastructure such as public transport, but these may be harder for the private sector to capture. London's recent public transport investment, plus a crude congestion charge, has reduced central area congestion by 30%.

Has urban road building been shown to achieve such a result — anywhere, at any time in the last forty years? The onus is on the NZCID to demonstrate that they can do better than London, at comparable cost, but there is nothing about any such approach in McLay's speech. The viability of the solution is assumed, not demonstrated.

Of course we need to involve the private sector, and perhaps private financing too. But probably not in solutions tailored to cities and budgets far larger than ours; definitely not in poor-quality debate driven by sectoral interests; and most definitely not in generating impressively large 'magic numbers' which guarantee nothing but private profit and public waste.

And certainly not in perpetuating failed 'solutions' when ever-increasing problems — pollution, noise, resource depletion, cost, externalities and sheer inefficiency — cry out for a new approach.

(As EnergyWatch went to press a report commissioned by the AA was promoting a \$M 415 package for Wellington — very largely roading but with some public transport — that would, "help boost the regional economy by \$M 82 a year," according to The Dominion Post (25 August).

See also "Jim McLay on infrastructure" on p 11 — EW)

A UK view of climate change — and energy use

From notes on a talk by Professor Roland Clift
Director of the Centre for Environmental Strategy,
University of Surrey, UK

(The talk was given in Palmerston North on 14 July. Professor Clift is a member of the Royal Commission on Environmental Pollution, an independent body [they report to the Queen] funded by the UK Government.

The most encouraging aspect of this part of the RCEP's work is that their 'headline' recommendation — that emissions be reduced by 60% by 2050 — has been adopted by the UK government, which is now having some success in encouraging other states to adopt a similar goal. The implications for a possible eventual agreement on 'Contraction and Convergence' are clear.

— EW)

Professor Clift opened his talk with a view of the atmosphere's temperature history, which now extends back 500 000 years (Vostok cores). A curve of carbon dioxide levels showed — very broadly — four cycles of a relatively sudden rise in CO₂ concentration followed by a slow, uneven decline, then another sharp rise marking the start of a new cycle. A curve extension, magnifying the time scale for the last 2000 years, showed the peak CO₂ concentration at the end of the last ice age remaining relatively constant for some 8000 years to about 1750, then rising near-exponentially to the present day. The pre-industrial level of 270–280 ppmv (parts per million by volume) was fairly consistent during interglacials (as low as 180 ppmv in some glacials) but is now up to 370 ppm and rising fast.

A second curve showed historic atmospheric temperatures closely following the CO₂ level, but 250 years of human-induced CO₂ increases is not long enough to show more than a very slight temperature rise. So far.

The conclusion of the Royal Commission on Environmental Pollution (RCEP) is that atmospheric temperature is chaotic, but a small but clear human-induced temperature signature is now appearing.

The RCEP studies concluded that human-induced emissions will have to be reduced by 60% by 2050, and warned:

By the time the effect of human activities on the global climate becomes clear and unambiguous it would be too late to take preventive measures.

The problem

Clift emphasised that this is an entirely new problem. We have managed resource scarcity many times before, usually with market pricing. As wood fuel became dearer, mining coal and shipping it from Newcastle became profitable. But what about a scarcity in the capacity of a world-wide sink that has always been seen as free? Economic studies are mainly useless: one cited by Clift assumed that atmospheric changes are both linear and predictable (wrong and wrong) — and that a Bangladeshi life is worth 18 times less than an American life (wrong, according to the average Bangladeshi, or probably Kiwi for that matter).

A carbon charge may be able to function as a world-wide proxy market, or may not. Clift was also doubtful about some of the proposed technologies:

- Nuclear: If you give it up, don't just buy replacement energy from French nuclear plants. Nuclear fusion looks doubtful or very doubtful, and can be completely ignored before 2050.
- Hydrogen: It is only an energy vector, but both electrical and chemical (biogas) sources look possible.
- Fuel cells: There is not enough platinum to make them an all-purpose solution.
- Coal and other alternative fossil fuels: There is enough to completely wreck the planet.
- Sequestration: It may work well if you can extract the CO₂. In salt domes it is quickly and permanently fixed as calcium carbonate.

The response

Clift was very clear that the RCEP recommendations had been successful in convincing the UK Government because they worked at several levels:

- The figures were initially worked backwards from an assumed 550 ppmv upper limit for atmospheric CO₂. This figure has no real rational basis, because of unknown non-linearities, but it looks reasonable and is widely thought to 'probably' avoid the worst excesses (although Clift is personally "not too comfortable" with it). Possible examples of non-linearities given by Clift were the southern hemisphere hurricane belt moving south as far as Sydney, and the Gulf Stream turning off (which would make much of NW Europe uninhabitable, perhaps in as little as a decade).
- According to UK treasury estimates the long-term effect on growth will be very small: about a 2% reduction in total growth over half a century.
- The target looks technically do-able, at least in the UK. They have problems with renewables (such as wind turbines needing thermal backup) but expect

There is enough [coal] to completely wreck the planet

to be able to achieve 60% savings in each of three areas: transport (28% of energy use); domestic heating and hot water (26%); and commerce (15%), with lesser savings in other areas and renewables contributing on the supply side.

- Politically, the target also looks do-able. It is neither too close nor too far away, and it is equitable (heading towards a world-wide emissions level of about 3.6 t of CO₂ / person yr, which is the current best-guess of the maximum sustainable level).

However, still to be demonstrated is the long-term political will to push it all through.

A transport example

Professor Clift also spoke about another RCEP report, on air travel (*Environmental effects of civil aircraft in flight*, November 2002). In the UK, government planning is for the current growth in passenger numbers to continue indefinitely at 4.25% / yr (doubling in 16 years). If both emissions reduction and air travel policies are continued until 2050, with all expected efficiency gains achieved, air travel will by then contribute about 40% of the UK portion of the climate change forcing function. And that is with the UK share of international flights taken as half.

An important part of the air travel problem is that the total contribution to the climate change forcing function is about three times the effect of the CO₂ emissions. Ozone, nitrous oxide and water condensation all contribute, and are particularly severe at the levels where most commercial aircraft fly, around the tropopause (the top of the lower atmosphere, where temperature stops decreasing with increasing height). The importance of aircraft contrails (water condensation) became clear when all aircraft were grounded in North America for two days, after the terrorist attack on the World Trade Centre, and the diurnal temperature range changed by about a degree.

Possible policy responses include:

- Tax aircraft fuels: the current tax-free status dates back to the Chicago agreement of 1944.
- Don't provide additional runway and terminal capacity.
- Encourage travel by high-speed train for shorter distances, which are particularly polluting by air (UK train fares are currently about three times air fares, but emissions from rail travel are an order of magnitude lower).

However, Professor Clift emphasised that there are still very wide uncertainties around the effects of aircraft operation.

Distributed generation and net metering

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(This article has been edited, mainly to remove references to particular local organisations — EW)

When a utility customer decides to install a small private power generator at home, it creates a bit of a quandary for utility and customer alike: such customers obviously don't want to pay a utility bill, but most would not want to be disconnected from the grid, just in case something went awry with their personal system. In response, some local Public Utility Districts (PUDs) will buy solar power their customers generate at the full retail rate, while others will buy excess electricity, produced by any environmentally-friendly generation project, also at the full retail rate.

State net metering policies

Present practice derives from the PV Pioneer Program, one of the nation's leaders in net metering. Nearly 600 systems have been installed on the properties of one PUD's customers, who agreed to help Sacramento reach toward more solar energy. The programme has helped reduce the cost of solar electricity for the future, by helping the district learn and gain valuable experience of installing, operating, maintaining, and pricing home PV systems. As a result of this experience, customers can now take part in true net metering by purchasing their own PV systems.

In 2001, customers paid \$ 4800 (NZ\$ 7300) for a typical 2 kW solar system, which would provide roughly half of an average customer's usage. The district made volume purchases of equipment needed to install a residential system, and nearly halved the cost of the system, helping customers to find the capital investment more affordable.

When a home-based system generates more electricity than the customer needs, the excess is purchased by the PUD at retail rates. When customers use more than the system provides they are given the choice between paying a monthly bill or settling their account annually. Some PUDs allow customers who generate their own environmentally-friendly electricity to 'store' the electricity that is more than their immediate needs with the PUD for future use.

(This is apparently no different from simple net metering, except that it allows customers to claim that they use only their own renewable energy. But as a method of encouraging renewables it might be a good idea — EW)

Net Metering Programs are typically limited to customers who use fuel cell; solar; wind or hydroelectric generation in their homes, and are capped at 25 kW. When the customer is producing more power than the household needs, the meter on the customer's home will literally spin backwards, sending power back to the grid. The customer essentially sells their excess electricity back to the utility in return for credits on their account equal to the current rate charged for power by the utility. Systems vary widely. One PUD has a customer with a tiny hydro project within the Vancouver urban area, and other systems are up to 100 kW.

Distributed generation projects must be inspected by the PUD to ensure that technical and safety requirements are met. It also will ensure that a modern electric meter is installed, assuring accurate measurement of the power that the customer provides to the grid.

Federal law motivates net metering programs

Federal law (PURPA, Section 210) says electric utility customers can use electricity they generate in their own environmentally-friendly systems, allowing them to offset the power they would instead buy from their electric utility. However, if the customer lives in a state (or is served by a utility) where net metering is not allowed, the excess power should be purchased by the utility at the wholesale price.

Net metering makes it easier by letting the customer use any extra electricity to offset utility-provided electricity used elsewhere in the billing cycle. The customer, in exchange, is billed only for the consumed energy provided by the utility.

Seems like such a win-win

Net metering seems like a win-win situation for members of co-operatives and customers of PUDs and municipal systems. But very few customers are using it. Part of the reason could be the capital expense of setting up the systems in the first place. Another reason could be that many utilities provide programs as prescribed by law, but most don't publicise them. They view net metering as more of a headache.

In a time when transmission avenues are congested and distribution reliability is such a big issue, perhaps it is wise for utilities to take a serious look at the issue of net metering. Utilities gain also because they avoid administrative and accounting costs involved with buying and measuring the small amounts of excess energy provided by private generation systems.

Obviously, customers who are involved in net metering buy less power from the utility, which is an indirect cost for the system. According to the American Wind Energy Association, the revenue loss is similar to what a utility would experience when a customer reduces electricity use through taking energy efficiency actions.

Thirty states require net metering

Thirty states are currently requiring at least some utilities to provide customers with the opportunity to take part in net metering. The requirements in each state are different.

While most states that allow net metering had the rule enacted by regulatory commissions, California, Montana, Nevada, Oregon, Utah, and Washington all had net metering laws enacted by their legislatures since the late 1990s. Idaho's Public Utility Commission and the Arizona Corporation Commission enacted net metering rules in 1980-81.

For example, in all participating Western states except California, all customer groups are allowed to be net metering users. California's law says that only residential and small commercial organisations are eligible. In all cases throughout the NWPPA area, except Idaho, the scope of net metering regulations includes all public power and investor owned utilities.

The future

The horizon shows that there will likely be some increase in the use of net metering as different systems become available and prices fall. With customers learning more and more about the environmentally friendly nature of wind power and photovoltaics — not to mention the coming emergence of residential fuel cells — they will likely begin learning to use such systems on their own property, and start looking toward their utility for not only some relief on their electricity bills, but also for help and advice with installation.

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Pohokura go-ahead

In early July it was announced that Pohokura has had a go-ahead from the field's three partners, Shell NZ (48%), Todd Energy (26%) and OMV (26%). Production is expected to begin in mid-2006.

The Dominion Post, 1 July 2004

Maui update

John Blakeley, Steve Goldthorpe and Kerry Wood

(EnergyWatch has previously published two articles on Maui, in March and July last year [EW 28 & 29]. Both are on the web at: www.sef.org.nz

We noted a very sharp peak in condensate production in 1998–99, followed by a rapid decline. Condensate is outside the Maui contract, so the Maui Mining Companies get a market price, making it much more valuable than gas at a price set many years ago.

We also noted hints that there is more gas in Maui than was revealed by the Independent Expert's assessment, as well as a likely explanation — there is no requirement to produce when costs exceed revenue.

Now more gas has been revealed, at a 'market' price roughly triple the Maui contract price. Something like this was half expected but we now have greater clarity about how it might have happened. — EW)

On 2 June the Minister of Energy, Pete Hodgson, announced that the Crown had reached an agreement with other parties to the Maui contracts, that will ensure that the gas obtained from the field is maximised. Features of the new agreement include:

- The remaining gas to be supplied by the Maui partners (Maui Development Ltd, MDL) under the Maui contract is set at 367 PJ. This is the quantity determined by the Independent Expert to have been the economically recoverable reserves as at 1 January 2003. Gone are the uncertainties of, "estimates which lie within a possible range of outcomes;" the phrase used by Dr Lloyd Taylor of Shell NZ. However, if the total quantity is not delivered there is provision for the supply of make-up gas from another source, or payment of liquidated damages. This gas will be delivered to the Crown between 1 January 2003 and 30 June 2009 (which was the original end date for the Maui contract, 30 years after first gas supply).
- MDL are now free to produce additional gas from the Maui field, not economically producible at the contract price, and sell it directly at a market price. Methanex are entitled to 20 PJ of this gas, plus another 20 PJ subject to confirmation that there is enough gas for other sales. We understand that the Methanex gas is to be supplied in 2004–05.
- First refusal on other sales, again at market price, is to Contact Energy and the Natural Gas Corporation (Contact 60%, NGC 40%). However, MDL are only permitted to sell additional gas that is established (at an 85% confidence level) to be in excess of the 367 PJ to be sold to the Crown.
- The 'take or pay' clause has gone. MDL have

undertaken to optimise gas deliverability to meet the requirements of the buyers. A forecasting process will be implemented, to replace the existing fixed daily and annual contract quantity regime. This will involve aligning buyers' nominated quantities with a delivery profile provided by MDL.

- Agreement for open access to the Maui pipelines (which must already have plenty of spare capacity) is expected soon.

Oil/condensate

At the end of July, Maui operating company Shell Todd Oil Services (STOS) announced the decommissioning of their Floating Production Storage and Offloading facility (FPSO), which is currently installed near Maui B to produce oil. This implies the end of oil production from the 'F' sands when the facility is shut down in a few month's time.

The FPSO was initially commissioned in 1996. It is a converted 130 000 t oil tanker, moored to multiple anchors through a swivel head on the bow, which allows it to face into the weather. Also connected through the swivel head are flexible hoses connected to wells drilled from the Maui B platform, to access oil pockets in the 'F' sands of the Maui complex. Produced oil is separated from the associated water and gas on board the FPSO, then stored on board for later transfer to another tanker. Separated gas is returned to Maui B.

The press release quoted STOS General Manager Paul Zealand as saying that production levels had been steadily declining in recent years and had reached the point where the platform was no longer economical. But an interesting final comment was: *Mr Zealand said that the depletion of Maui's oil reserves did not mean that there was any end in site [sic] for the production of Maui's natural gas.*

Production history

Gas and condensate production from the Maui A platform began in June 1979. Hydrocarbons from the platform's 14 wells are given primary treatment on the platform, before entering gas and condensate pipelines which run 35 km to an onshore treatment station at Oaonui. The onshore (treated gas) pipelines to the New Plymouth and Huntly power stations are also part of the Maui contract.

The Maui B platform is 15 km further offshore than Maui A, and was commissioned to supplement Maui A in 1993. It is connected to Maui A by a single pipeline carrying gas, water and condensate. Maui B has no treatment facilities and is normally unmanned. It extracts gas from a separate geological structure from Maui A, both with similar, multiple, gas-bearing sands.

New hydrocarbons were discovered in 1993, during

well drilling for Maui B. These are oil deposits in the lowest of the sand layers, the F sand. Production of this oil is from additional wells on Maui B, and flows through flexible subsea lines to the FPSO.

Gas and liquids production

Gas and liquids (oil and condensate) production data is given in Table 1, and also in Figure 1 (Maui gas and liquids production) and Figure 2 (Maui liquids:gas ratio — see page 9). Points to note include:

- Oil production using the FPSO is included with condensate production.
- The annual take-or-pay gas quantity plateaued at some 160 PJ in 1989–1999 but was seldom reached in practice.
- The five peak gas production years in the life of the field are 2001, 2000, 1992, 1999 and 2002. These include all of the last four years before publication of the Independent Expert’s redetermination.
- The liquids:gas ratio almost halved in the first five years of production, but production rates were relatively low and this is hardly important.
- Much more significant is the rise in liquids:gas ratio from 1993, with a very steep rise in 1996–97, followed by an equally steep fall in 1998.

Production analysis

In our previous articles we drew attention to the steadily falling estimates of Maui reserves — 12% of contract reserves estimate in 3 years, almost double the gas used. We felt that estimates for a mature field should be better than that: even on a conservative estimate, a billion dollars worth of gas had apparently disappeared. We were not satisfied with Shell NZ Chairman Dr Lloyd Taylor’s explanation that the gas was never there in the first place, but we now feel that our judgement was too harsh. We now believe that we were misled by the following factors:

- Assuming that, after twenty five years of production, the field was mature and good estimates of the total gas quantity should be available. However, Maui B is on a separate geological structure and in 1993 was effectively a new field — as was shown by the discovery of new oil reserves in 1996. We now understand that it is also a more geological complex structure.
- Failing to take account of changes caused by Maui B coming onstream, producing from different reservoirs with differing gas: oil ratios.
- Assuming that oil from the FPSO was outside the Maui Contract and therefore not included in the total of Maui liquids.

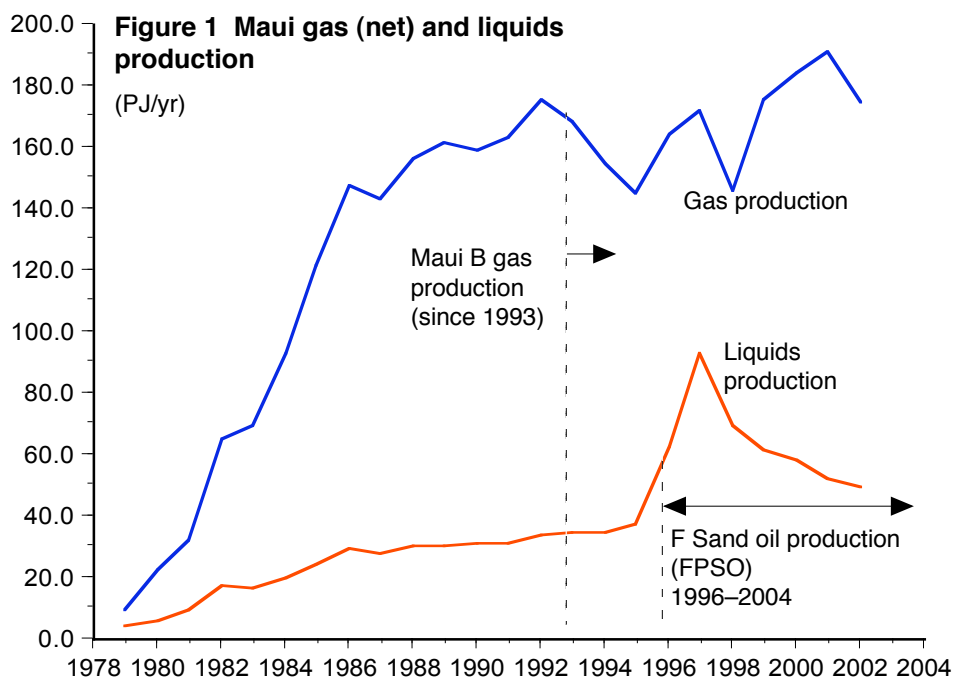


Table 1: Maui gas (net) and liquids production

Year	Gas (PJ/yr)	Liquids (PJ/yr)	Ratio (PJ/PJ)
1979	10	4.4	0.44
1980	22	6.5	0.29
1981	32	9.3	0.29
1982	65	17.7	0.27
1983	70	16.8	0.24
1984	93	20.4	0.22
1985	122	24.0	0.20
1986	148	29.2	0.20
1987	144	27.8	0.19
1988	157	30.2	0.19
1989	161	30.6	0.19
1990	159	31.0	0.19
1991	164	31.2	0.19
1992	176	34.0	0.19
1993	169	34.8	0.21
1994	155	34.6	0.22
1995	146	37.8	0.26
1996	164	62.3	0.38
1997	172	93.1	0.54
1998	146	69.7	0.48
1999	175	62.0	0.35
2000	185	58.1	0.31
2001	192	52.5	0.27
2002	175	49.5	0.28

What really happened?

After getting it wrong once we hesitate to offer too firm an opinion, but we suggest that the following factors will have contributed to the current gas shortage:

- The original contract was poorly written. For example it gives no useful guidance (such as a stated level of probability) on what is meant by economically recoverable reserves:
... the quantities of Gas that are estimated to be economically recoverable from the Maui field.
- It has been suggested that there were informal side-deals, outside the contract and adding to the overall complexity.
An inferred example is that Maui B was originally to have been developed soon after Maui A and as a similar platform: manned and with treatment facilities and pipelines independent of Maui A. In the event it was delayed by a decade or so, and became an unmanned satellite of Maui A. The delay and the revised layout substantially reduced the cost, but increased the risk of shutdowns. There must have been some sort of agreement here, possibly trading take-or-pay rights for lower capital cost.
- The minimum take-or-pay quantities turned out to be unrealistically high, but much higher demand would have depleted the field long ago. A key result is large quantities of gas paid for but still to be delivered.
- Low gas prices led to over-reliance on Maui, especially in combination with prepaid gas sold at a discount. This discouraged the development of other energy sources (not least renewables) and created a substantial commercial risk as Maui approached the end of its life.
Another substantial commercial risk was a Maui shut-down, and it is a credit to the operators — plus a slice of luck — that this has never happened for a significant length of time.
- In 1990 the Government onsold its rights and obligations to the Maui contract, in new contracts intended to mirror the Maui contract provisions. The intention seems to have been to remove the Crown from all responsibility, but the Maui contract was not assigned to the new buyers, leaving the Government's position as buyer unchanged.
- There were public calls to re-negotiate the Maui contract for at least five years before publication of the Independent Expert's redetermination early last year. However, there was never enough common ground between the parties, until it became obvious that the gas was about to run out.

Nearly three years before the redetermination, at the NZ Petroleum Conference in 2000, David Salisbury of Fletcher Challenge Energy, had referred to warnings about the Maui contract two years earlier

still, and had added his own clear warning:

Solutions to contract tensions must be arrived at by Buyer and Seller not just in response to short-term pressures but with a view to ensuring the transition to new supply arrangements occurs as seamlessly as possible. These solutions must provide the right pricing signals in order that NZ does not put at risk its security of gas supply over the years of the transition from Maui.

The Crown has a key role to play in actively managing the Maui Gas Contract. The Crown is the contracting party and the contract requires active management. It is important that the Crown has a pro-active approach rather than acting simply as the messenger between the Seller and NGC, Methanex, and Contact. The Crown must have consistent and clearly defined views as to what is in its interest and will assist with NZ's transition to other gas.

It didn't happen. There was a legal scrap over appointing the Independent Expert and it was as if all parties had got themselves into boiled frog mode — do nothing and hope for the best:

- The Government seems to have been mesmerised by the complexity and risk, and perhaps was also thinking that they had no business in such a contract. Perhaps they forgot that in 1973 there had been no other NZ organisation capable of accepting the risk of such a large contract, and that the 1990 contracts had left the Crown still in a pivotal position. Could this 1990 exposure have been because they were 'creaming' the contract? Could the demise of the Ministry of Energy have been a factor here?
- MDL may have breached their duty not to sell Maui gas if such sale would impair their ability to perform their supply obligations. In 2001 the contract take-or-pay quantity was exceeded by 25% or more. Was this wise, so late in the life of the field? Was any warning given? Why were they saying, as late as 2003, that there was no more gas?
- The 1990 contract buyers, Contact, NGC and Methanex, clearly increased their collective demands from about 1999, at a time when it must have been clear that Maui could not go on for ever. All of the last four years before redetermination are in the five peak gas production years. Were they each trying to corner as much gas as possible, before someone blew the whistle?

However, the Independent Expert's redetermination seems to have finally galvanised all parties, who have now reached an agreement acceptable to all, within an acceptable timeframe. Given the difficulties, we suspect that this was an impressive achievement.

The future of Maui

The present Maui contract price is thought to be very low, in the region of \$ 1.75/GJ. The reason is that

price increases were limited to half the rate of inflation (see the bottom of page 14 – EW), and we understand that increases were capped at 2.5%/yr. The Government added a ‘resources levy’ of \$ 0.45/GJ — in effect an inflation adjustment. We also understand that the Government were creaming something off the top of the 1990 contracts. *The Dominion Post* (30 July 2004) gave gas prices at the Kapuni urea plant, five years ago (see page 32 – EW), as \$ 2.50/GJ, which makes a reasonable-looking total for (Maui contract + levy + cream). The same source suggests a market price of \$ 6.00–7.00/GJ in ten months time, which we take to be the market price.

We feel justified in assuming that the additional gas from Maui will cost purchasers something like twice as much as present supplies, but we understand that the levy and ‘creaming’ are to go, making the additional gas worth about three times as much to MDL as the remaining gas to be supplied under the Maui contract.

No additional gas quantities have been announced, other than 40 PJ for Methanex, but we understand that the parties are reasonably confident (85% probability) that another 130 PJ can be produced under the new agreement. That will be worth about \$M 800 to MDL. We give in Table 2 a schedule of Maui gas production under the new agreement, which we have inferred from partial information. It includes gas under the Maui contract and additional gas. The same information is presented graphically in Figures 3 and 4. Additional gas in 2004–05 is allocated to Methanex, and the remainder to Contact Energy and NGC.

An alternative view is given in the Energy Data File (EDF), January 2004, published by the Ministry of Economic Development (Section 8, pp 124–5). It notes that the Independent Expert estimated that total economically recoverable gas under the Maui contract was 3562 PJ, implying that there was 367 PJ of Maui gas remaining as at 1 January 2003.

However, the EDF then notes that

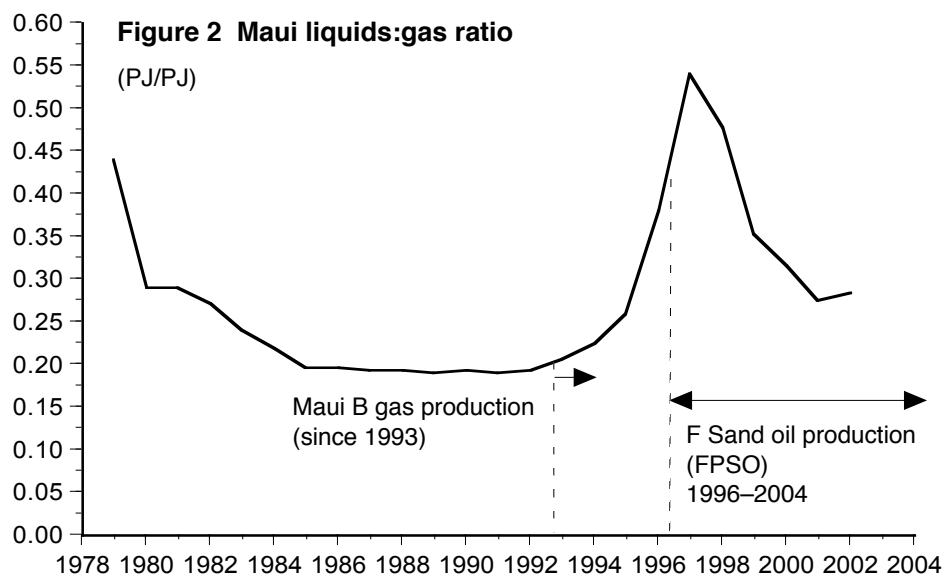
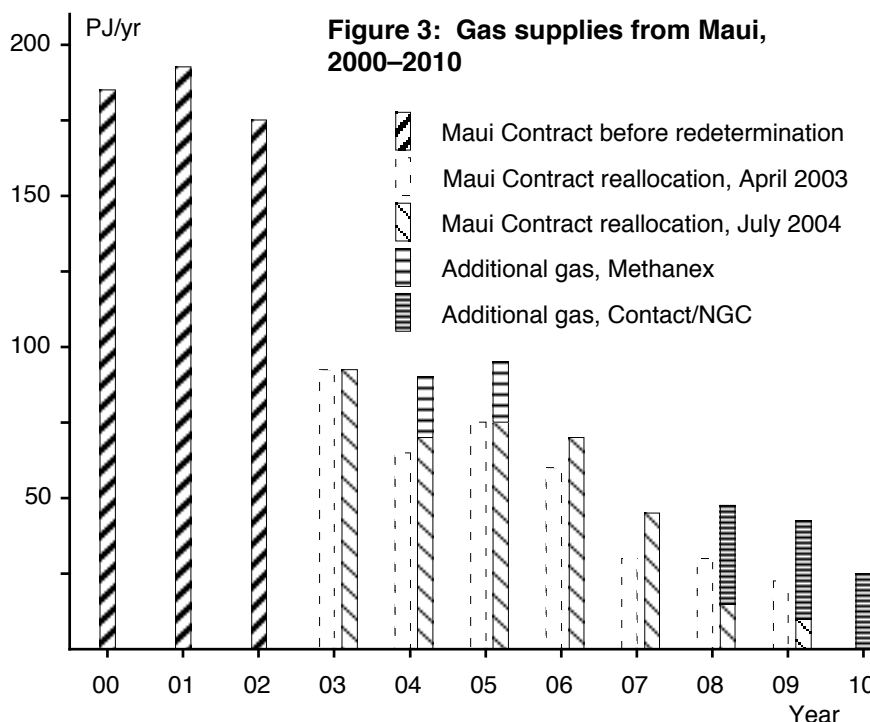


Table 2: Inferred Maui gas production schedule Maui contract and additional gas

Year	Maui Contract		Maui Additional Gas (PJ)
	After April 2003 (PJ)	After July 2004 (PJ)	
2003	92	92	-
2004	64	69	20
2005	74	74	20
2006	60	69	-
2007	30	45	-
2008	30	15	32
2009	22	8	32
2010	-	-	24
Totals	372	372	130



the Independent Expert's estimate is not on the same basis as other quoted reserve figures, including for other STOS-operated fields. (A footnote to Table H2 on p 125 notes that its stated reserves are estimated as "proven and probable" or P₅₀ by the field operators). On this comparable basis, the EDF estimates Maui reserves of 574 PJ as at 1 January 2003, to be over 200 PJ more than estimated by the Independent Expert.

Gas depletion scenarios

Figure 4 shows a depletion curve similar to one in our first Maui article (EW 28, page 3, Fig 1) showing four scenarios:

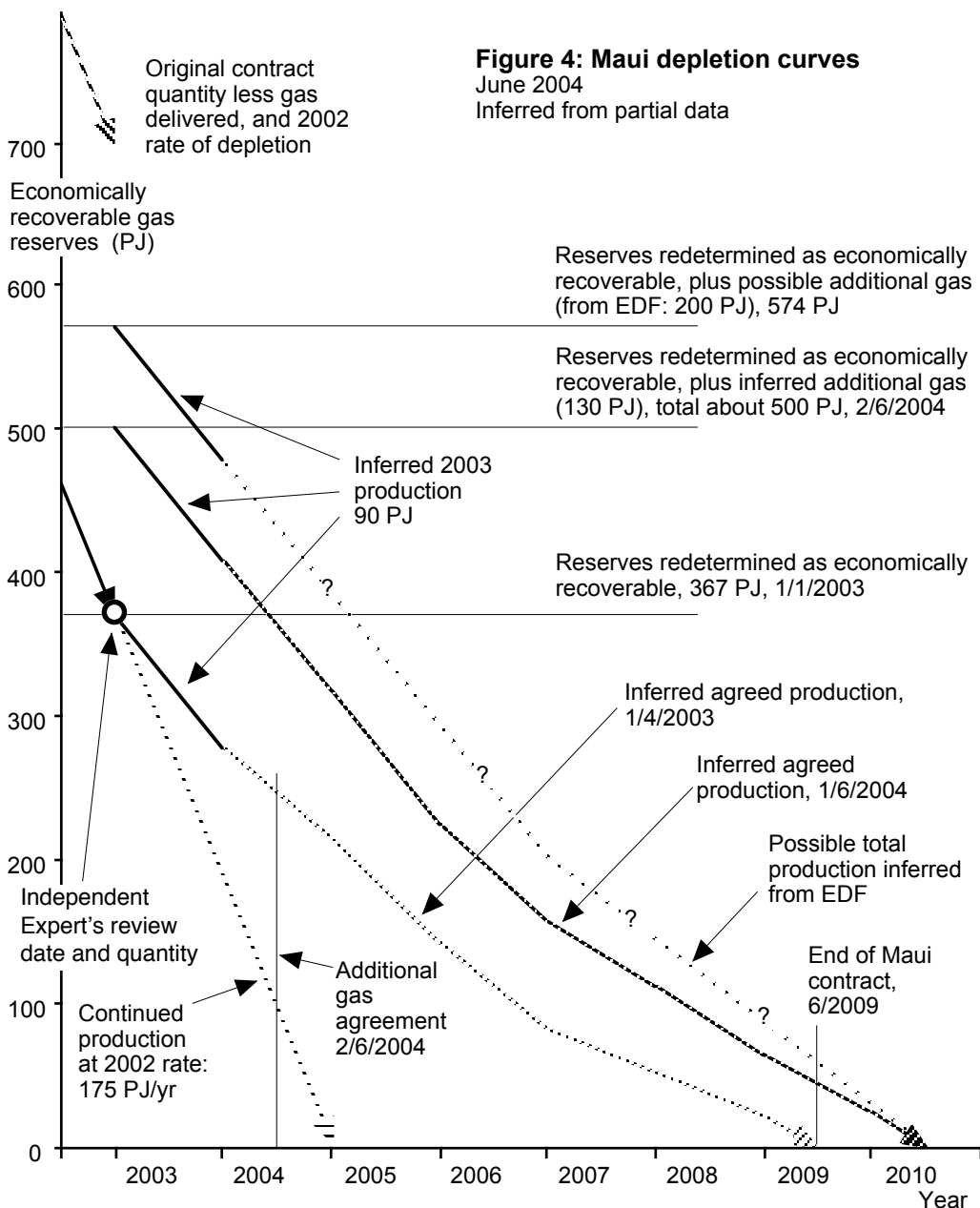
- Continued production at the 2002 rate, to illustrate where Maui was heading until early 2003.
- The agreement reached in April 2003 to reallocate the remaining Maui gas (inferred from partial data).

- The agreement reached in June 2004 to reallocate the remaining Maui gas plus some 130 PJ of additional gas (again inferred from partial data).
- A rough outline of a possible future agreement if the EDF estimate of 200 PJ of remaining gas outside the Maui contract proves correct.

Conclusion

The Minister's announcement on 2 June is good news for New Zealand and will give more scope for avoiding gas scarcity in the short-term. Perhaps steep price rises were inevitable if the total gas obtained from the Maui field was to be the maximum economically possible. However, there remain serious doubts about how we got here, and especially about the risk of repeating some of the mistakes. The Minister's reference to an 'arthritic' Maui contract is encouraging but hardly a full reassurance (*See the top of p 15 – EW*).

EDF estimates Maui reserves ... to be over 200 PJ more than estimated by the Independent Expert.



Jim McLay on infrastructure

Opinion

Some of Jim McLay's comments at the launch of the NZCID (28 July — see page 1) may have been more revealing than intended:

Addressing New Zealand's infrastructure deficit, raising the rate of infrastructure investment by just 1% of GDP, has the potential permanently to raise NZ's average GDP growth rate by 0.5%/yr ... thereby adding around \$bn 6.0 to GDP in the first year ...

Looking at the ratios of GNP, it is clear that what he is saying is that if Macquarie Infrastructure spend \$ 1000 fixing up their notional private drain (page 1) they will achieve growth of \$ 500/yr, permanently.

Really?

The only reason that "all roads led to Rome" was because they were needed to move its armies quickly to protect and expand the empire, and because someone responded by building them ...

In the early 1600s, a consortium led by one Hugh Myddelton, acting under a Royal Charter from King James I, first brought fresh water supply to London. That was, for its time, a massive project, bringing water 40 miles to large cisterns at Finsbury, before delivery in 'pipes' made from hollowed logs. ...

We still need such infrastructure today.

We are left wondering what McLay has in mind:

- The 'someone' who built the Roman roads were the dictator Caesars, using the Roman army and slave labour. No PPPs here.
- Sir Hugh Myddelton's New River had huge cost overruns and needed very substantial government money to complete the project.
- The New River Company's charter gave it a monopoly that lasted for nearly three centuries and obstructed progress for at least the last century. It was finally bought out in 1906 — using public funds — for a huge £M 5.0 (two-thirds of the cost of the *Titanic*).

All we want to see is a good road. What better statement could there be of a simple and clear objective for road reform? and what better statement could there be of a simple and clear objective for the whole infrastructure sector. No ideological nonsense, from the left or the right; just a plain statement of need.

EnergyWatch is offering a chance to win your very own recycled, infrastructure-enhancing, road reflector stud.

Just send in a list of all the questions begged by this quotation, by 15 November please.

Running on empty

Extracts from an article on Peak Oil in *The Independent* (30 June 2004), by political commentator Chris Trotter, made some good points about how New Zealand might be affected. The full article is available at:

<http://www.theindependent.co.nz/index2.html>

Trotter gives the ASPO estimate of when Peak Oil will arrive — between 2006 and 2010. When that day arrives, whoever controls the world's energy reserves will be perfectly placed to dictate the planet's future. As the demand for oil outstrips its supply, and the prices of petrol, diesel and home-heating oil begin their inexorable rise, governments world-wide will struggle to balance the need to end their economies' dependency on oil against their citizens' love affair with the private automobile.

The main points of Trotter's article include:

- Energy and transport policy will come to dominate domestic politics. Everything will change, from the way we lay out our cities and towns to the way we assert our social status.
- The key strategic objective of the US is to retain effective control over the rate of global oil depletion. This will offer it control of the oil supply to its economic and military rivals. Only after a colossal transfer of wealth — the most spectacular in human history — will the US seriously contemplate a transition to a more energy-efficient economic system.
- Many on the right argue that our best hope of economic survival lies in rejoining the Anglo-Saxon club as Australia's errant, but now fully repentant, junior partner. This would require us to play an expensive game of catch-up in defence spending, but it might all be wasted if the Eurasian and Arab worlds unite against US policies.
- Our larger cities should make an all-out effort to prepare the population for the inevitable demise of the private automobile. In the Hutt Valley this will be a return to the policies of the 1930s and 40s, but Auckland is likely to find that change is much more traumatic. Construction of the Eastern Corridor motorway may be completed just about as the dire predictions start coming true. Will we see the construction industry siphon nearly \$bn 6.0 worth of soon-to-be-empty motorways from the pockets of long-suffering tax- and ratepayers?
- This sort of short-sighted approach has convinced the Greens to put energy and transportation policy at the heart of their party's 2005 manifesto. Unwilling to surrender the country's diplomatic

independence for a few more years of cheap oil, the Greens argue strongly for state and private sector investment in such alternative energy sources as wind and solar power.

Ironically, the political party with the firmest grasp on the likely shape of the future is struggling to keep its head above the electoral tide. Like Cassandra, they seem fated to be disbelieved by their fellow citizens, even when they are telling them the truth.

Perhaps this is the greatest of all the illusions about the looming energy crisis: to believe that the measures required to surmount its effects will be accepted in a democracy before it is too late for them to do any good.

By 8 November we will have a better picture of which of these energy illusions remain intact. The US will have either endorsed or rejected the oil-driven imperialism of George Bush, and Auckland will have voted either for a regime led by an acknowledged petrol head or a ticket determined to transport us beyond tomorrow.

Perhaps this is the greatest of all the illusions about the looming energy crisis: to believe that the measures required to surmount its effects will be accepted in a democracy before it is too late for them to do any good.

Compact Fluorescent Lamps

From the SEF News Discussion Group

The SEF News debate on when to use Compact Fluorescent Lamps (CFLs) opened with a 9 June BRANZ press release, which had SEF member Nigel Isaacs saying, "Some 230 000 homes turn on their lights when the sun goes down, and BRANZ research shows that simply replacing those ordinary light bulbs with readily available ... CFLs would cut peak-period demand by up to 35 MW — an important contribution."

That's fine as a first approximation, but the greatest gains come from the bulbs that are on during the evening peak, or use the most power. There is little benefit in changing bulbs that don't get used much. However, (the h-word seems unavoidable in these debates) savings may be very small for bulbs used rarely or for short periods, or even non-existent.

Problems include:

- Greater first cost than incandescent lamps (but falling fast; now around \$ 4–10 for popular sizes).
- Too often CFLs are of questionable quality. There are no compulsory standards in NZ.

- Uneven supply, with the right connection, light colour or wattage often unavailable.
- Slow or reluctant start-up, sometimes taking several minutes to reach normal brightness, or needing a tap to start at all.
- Often poor lumen maintenance (they go dim) or a blue colour.
- Light fittings not designed for CFLs, which stick out beyond the shade. However, more compact loopy or curly-wurly lamps are becoming readily available, and a 'poor' fit in the shade may be a good thing in a badly designed shade.
- Reduced lamp life with frequent starts, sometimes enough to make them uneconomic compared with incandescent lamps, for example in toilets (there is a rule of bum here, but personal habits could favour the CFL). Standards tend to assume fewer starts than are likely in practice.
- Some of these factors encourage leaving lamps on for long periods, introducing an adverse consumer reaction. It is too easy to let a CFL lamp satisfy your green conscience (if any) and leave it on

because you will/may be back soon, and it will/may be dim on start-up/start from a switch in the wrong place/be damaged by too many starts. And so on.

There are well-established methodologies to design, monitor and evaluate national

programmes for lighting efficiency, but unfortunately they are not yet followed in NZ. Ideally lighting should be part of a programme of domestic energy audits, but these are fairly expensive (who pays?), their benefits are invisible to a non-savvy customer and they trip over the hassle-factor we all apply to such things.

One contributor suggested that CFLs are less useful when they are little used during demand peaks, which raises two questions: who pays for the lamp? and who gets the benefit? Reducing demand by 35 MW will reduce consumer energy use by perhaps 70–140 MWh/day and unquestionably help consumers, but will only help the generator-retailers if the reduction is at peak periods. But at peak periods the savings in reduced need for additional supply capacity (MW), supply energy (MWh) and transmission capacity (M\$) are very large. Everybody benefits if the market can recognise this and take a demand-side approach, but this is not happening because the market does not make it profitable. The result is that consumers who help themselves are also helping the gentailers in a big way, and facing higher supply charges for their pains.

Energy Planning for NZ

Pete Hodgson, Minister of Energy
2004 Hopkins Lecture
4 August 2004

(The introduction of this speech has been edited — EW)

You have asked me to speak on energy planning for New Zealand. Was this out of a sense of mischief? The reason I ask is that some say we don't have any, others say we do. My truth is we now have some, and that follows a history where we used to have lots, followed by none at all. To use other words, we went from central planning to free market and now to managed market. The pendulum swung wildly and is now settling.

I want to explore that history, briefly. Then I want to ask and answer the question "do we have the level of planning right yet?" — the conclusion I will reach is not yet, but it is nearly there. Then I want to talk about the current transition in energy, largely due to the arrival of the post-Maui era. Finally I want to talk about long-term planning, which will lead us off onto topics such as climate change and the forthcoming peak in world oil production.

The end of central planning

The central planning era in electricity began to crumble when some idiot decided to put a high dam on a fault line that runs under the Clutha River at Clyde, and then had to spend millions grouting the river bed; putting a new road in a place where the road didn't want to go, and tunnelling the hillsides so that the resultant lake didn't lubricate escarpments, causing those escarpments to topple into the lake that had just been filled and overtop the dam that had just been built. Two low dams would have done the trick.

That idiot was the political process in general and the Government of the day in particular. Had the resulting cost overruns not been dropped into the consolidated account for taxpayers to blithely pay off over the years, then the cost of Clyde dam electricity would have been about 14 ¢/kWh.

So corporatisation began; commercial decision-making processes, more transparency, less politics, and all of that. NZED became Electricorp and then rebranded to ECNZ to try and put the 1992 electricity shortage behind it. Development of a wholesale electricity market began.

Then the National Party decided to split ECNZ and sell the bits off, and that anyone who owned an electricity line couldn't own an electron as well, and the upheaval of the so-called Bradford reforms

began, most of them irreversible.

So then I became Minister, inheriting a system that was in turmoil, but magically operating well day-by-day. Most of the companies in the sector were brand new. Most of the rules needed for industry to run itself hadn't been written, and the market that was to deliver the political promise of lower prices delivered higher ones which left the public annoyed and which indirectly saw Mr Bradford depart politics.

Most interestingly of all, the formal policy was that there was no plan. The market would deliver electricity just as it delivered baked beans. Prices would be set. Markets would be clear. We would never produce too much electricity, and we would never produce too little. Intervention would be thoroughly unnecessary.

Policy development

And so we entered the winter of 2001. Guess what? The Government intervened in the market, strongly and in haste, in the form of a public conservation campaign. However, the largest retailer of the day, On Energy, lost its shirt and disappeared because we refused to intervene and cap the spot price on the grounds that that would be like putting a sticking plaster over the fuel gauge.

Then it rained.

Busily industry worked to put in place the rules that Government required in the Government Policy Statement that we had issued in late 2000. All through 2001 and 2002 they worked, and in the meantime Parliament passed backstop legislation in case the industry process failed.

By early 2003 it looked like it might fail, and just then it stopped raining again. Again the public conserved, understandably grudgingly. By May the Government had had enough, as had everyone else. The backstop legislation was dusted off and the emergency provisions, which had previously been labelled as draconian by political opponents, were implemented without a whimper. The result is the Electricity Commission. We now have a regulator.

Then we intervened again. The free market model had failed to deliver security of supply in very dry periods. We had just experienced two of them in three years. So the Government built the first reserve generation plant of 150 MW and ring fenced it so that it will run only in times of emergency and not therefore compete with ordinary generation investment. It was opened a few weeks ago. It was built on a Contact Energy site at Whirinaki and it's diesel fired. It is built on precisely the same site that an earlier 150 MW diesel plant once occupied. When Contact was privatised by National the company took an entirely logical decision to get rid of it. The last unit left in autumn 2001, just as the rain stopped falling.

Pure markets do not deliver security of supply. But neither, as the Clyde Dam or 1992 indicate, does central planning. Had there been such a thing as price discovery Clyde would not have been built. The 1992 crisis would have been averted, or mostly averted. It was hydrologically less severe than 2001, but the resultant economic damage was more severe. Welcome therefore to a managed market, or to a regulated market. Or to some central planning: planning limited to security of supply issues.

Planning level

Do we have the level of planning about right? As I have said my answer is not yet, but nearly. Some of the rules, transmission pricing methodology, are almost unbelievably still not in place. Much of this stuff should have been done in the nineties but correctly sequencing events was not a strong feature of that Government. In any case I have surely had time enough, but the fact that it involves the possibility of wealth transfer between players has meant that all the industry processes, so optimistically embarked upon, failed. The Commission is now fixing this backlog.

Some of the tools are not in place. I have not yet given the Commission the full toolbox of necessary powers. If we are to have a market model, the model needs to function better still. The Commission can advance that cause, if they see the merit and if they have a full toolbox. The necessary legislation will be through in the next few weeks.

Or to give another example, electricity planning in this country, under any model, has never planned for demand side management or energy efficiency. Always the thinking, the speeches and the random outbreaks of panic and catastrophising speak of the supply side. It has always been that way. The end result, surprise surprise, is that our economy uses energy inefficiently. The demand side market or the energy efficiency market is not working; it is close to opaque. It is much the same in every country, the difference being that we have been uncommonly slow in recognising it. That is one reason why our energy intensity did not start to decline until the nineties, twenty years after most countries.

Some people still don't recognise it. These are folk who dryly observe that there is no such thing as a \$ 10 bill on the pavement because economics dictates that it will already have been picked up by someone. But these are the same folk who will walk straight past a \$ 50 bill because it represents the dividend of an energy efficiency investment. To give you an extreme example I know of a heated swimming complex where a \$ 70 000 per annum saving is available so long as a one-off investment of \$ 80 000 is made. Right now, it still hasn't been.

So demand side planning is still not optimal. In recent weeks we have set out to fix that too. Now

planning for security of supply involves both the supply and demand side and the Electricity Commission can in effect buy both. The demand side investment is currently tiny, as we learn how to size it. And the remarkable work of the Energy Efficiency and Conservation Authority continues unabated, probably rapidly increased if the Commission chooses to purchase services from them.

But the point to grasp is that demand side planning and supply side planning now reside in one organisation, the Electricity Commission. They buy whichever is the cheapest as they implement their security of supply obligation. So there we have it. The pendulum is now more or less in the middle, with a managed market and a regulator. We still need to finish the rules, we still need to give the Commission a full toolbox and we need to secure a future where supply side and demand side thinking are integrated.

Energy transition – Maui

Now I turn to that transition, not in electricity but in energy that I spoke of at the beginning.

The transition could be characterised by many things – the move to distributed generation, the possibility of a permanently higher price for oil, the advent of hybrid motor vehicles, the arrival of wind energy, the future for biomass and on it goes. However I want to limit my remarks to the Maui gas field.

We don't have one. It has gone, or it has nearly gone. Maui was big. It was enormous by our standards and when discovered it was sizeable even by world standards. The fact that it is running out around two years early has been a comprehensive pain in the neck. It has had many repercussions. The Maui Contract had to be negotiated so that the incentives to fully deplete the field were in place. I convened these negotiations. They were complex and frustrating for all of us and they took over a year. But they are now done. Second, electricity and gas prices rose earlier than they might otherwise have and the result, as always, is a grumpy public. The reason is that thirty years ago the Maui contract allowed gas prices to rise at only half the price of inflation. After the inflatorary 70s and 80s Maui gas became very cheap indeed. Replacement gas isn't.

But the biggest repercussion was psychological. Maui was always big and comfortable and long-lasting. Until now. For decades we haven't particularly looked for more gas because we haven't needed to. We have looked for oil, and found gas, but most of our gas potential is still unexplored. So now we need a significant increase in exploration levels, even to the point where the Government has recently announced a more favourable fiscal framework, for five years, to help the increase get under way. Not that we are in any immediate trouble — the likes of Pohokura and Kupe see to that

— but a decade from now they too will be well on the decline.

What is more, a free gas market doesn't really exist. Gas has been traded by way of very long-term contract. The Maui contract is one of the oldest and arthritic in the economy. However the industry and the Government are now well advanced in getting modern governance around the industry, and the future will be a much freer market than exists now. A Government policy statement on gas has now been finalised.

I don't believe that the finance sector has yet fully adapted to the idea that long gas contracts are unlikely to be a part of our future because another Maui-sized field is unlikely. They have a risk aversion which has yet to catch up with the reality that Maui is gone.

As the post-Maui era dawns so the Think Big era sets, evidenced most notably by the rapid decline in methanol exports from Methanex.

And finally, our largest electricity plant, Huntly, is running hard on coal these days to plug the gap between Maui and its smaller successors. While coal does not play a large part in our energy mix, its ability to give our system some resilience is very important.

So did energy planning help in all of this transition from Maui to post-Maui?

Yes and no. Certainly the economy as a whole was planning for the demise of Maui, but then we got the timing wrong. Or, more accurately, we may have; debate about how much gas is still left in Maui continues as it always will in any gas field.

The improvements to gas governance were certainly planned by the Government, and will arrive on time, as will the changes to policy for exploration. On the other hand I was caught short about eighteen months ago by an absence of a coal stockpile. I think that was a planning failure, directly attributable to the split of ECNZ and the move to a market based approach.

The future for gas is roughly the same as for electricity — a managed market model with a regulator — though the likely regulatory model will be co-regulation with industry. If that doesn't work I shall reach for backstop legislation as I did last year for electricity. That legislation will be in place in the next few weeks.

Oil

Which leads me to a much bigger energy planning issue — planning for the effects of world oil production decline. About the only thing that commentators on this issue agree on is that world oil production will peak and decline sometime this century. If planning for the decline in Maui turned out to be a bit tricky, trying to put a date on when

oil production will peak is a real headache.

It requires data we don't have and assumptions we can't test. We even have to factor in psychology, which itself varies from denial to catastrophising. But it will be this century. And it seems more likely to be in the first half than the second, though equally one could argue that it might be in the middle.

I'll put some dates on the table to give the issue some focus. Oil production seems likely to peak sometime between 2021 and 2067, with probability highest around 2037. The source I'm choosing to quote is the US Department of Energy's Energy Information Administration deploying up to date US Geological Survey estimates. The two outlying dates, 2021 and 2067, are the result of different chosen assumptions on the size of reserves, and rate of demand increase between now and then.

I stress again that other estimates abound, and that I do not assert that I have chosen the right one. I simply don't know. I chose it because it's probably mainstream. That doesn't necessarily make it correct.

Some of you will remember that back in the sixties the Club of Rome predicted the world would run out of copper, but along came, for example, fibre optics, and those who ridiculed the prediction were proved right.

Conversely there is Hubbert's accurate prediction in the fifties that US oil production would peak early in the seventies. He was also ridiculed but his prediction eventuated right on time.

So how do we plan, or begin to plan, for this? Globally, the evidence for planning comes mainly in the form of targeted research and development effort. The technologies are many — hybrid motor vehicles being the most obvious success to date. The words 'hydrogen economy' have crept into the lexicon in recent years and a lot of research and development effort is focussed on fuel cell technology. But only ten years ago the focus was different. It was on electric vehicles, so called zero emission vehicles, and in another ten years it is possible the focus will shift afresh. Planning for success in a particular, identified technology is problematic.

But if the fuel source is to be hydrogen then where is it to come from? Again there are a lot of technologies at play. Extraction from coal has a lot of current focus and extracting from quite a range of biotechnologies has another. Then again, in the New Zealand context it may even be contemplated that hydrolysing water is an option.

Climate change

Enter climate change. The difference between an oil production debate and a climate change debate is the difference between sources and sinks. Will we run out of fossil fuels first, or the atmosphere's ability to

absorb the resultant CO₂? Given the huge global stocks of coal the answer is certainly that we run out of sink capacity first.

That means that as we switch from oil we aren't going to have the option of, say, burning coal to produce electricity to split water to extract hydrogen to fuel a car. Which is why, of course, research on the direct extraction of hydrogen from coal is accompanied by research on sequestration of the resulting CO₂.

In New Zealand we have our own research going on, at CRL, IRL, IGNS and elsewhere into aspects of a hydrogen economy. Our various biotechnology skills are likely to prove important globally, over the next one or two decades. For our size, we have a lot of them.

But the best planning we can do, given that we will be, or will be substantially, technology followers is to be found in climate change policy, transport policy and sustainable development more broadly.

The New Zealand Transport Strategy is now twenty months old and the associated law, the Land Transport Management Act, is about eight months old. We are just beginning to see their effects. Piloting a vehicle emissions standard begins later this year, double tracking of some rail has now begun, the rail track is now back in public ownership, a road pricing study is underway, the North Shore bus way is being built, cycle ways are being built, passenger transport funding has increased 70% since the change of government (though off a low base) and so on. It is, I stress, just a beginning.

Or, to give an example from climate change policy, tomorrow I attend the opening at Te Apiti in the Manawatu of the first of the wind turbines on that 90 MW site. Not that wind power substitutes for oil in the New Zealand context, but if our future includes the option of hydrolysis from renewables then we may as well edge towards that future. That particular project received emissions or carbon credits, later sold offshore, as the result of the Government trialing a policy called Projects to Reduce Emissions.

The problem with climate change planning is that we have to reduce the causes, and prepare for the effects, simultaneously. Climate change is coming, ready or not. Changes in temperature, rainfall and storm frequency are now being predicted with growing, but still insufficient, accuracy. We put out our latest predictions to all local governments, last week.

One consequence, in Canterbury more than anywhere, is the need for a national water policy. Climate change will probably see wetter headwaters and drier plains. Our ability to allocate water is currently weak. That is why the Government is now engrossed in developing a national water policy led

by Marian Hobbs, with folk like me and Agriculture Minister Jim Sutton taking a keen interest.

There are infrastructure issues to consider too. Transpower found some pylons flattened earlier this year from high winds, local governments will need to take care that their sewage systems don't become tidal before they become obsolete and the Prime Minister has sharpened her interest in the adequacy of New Zealand planning law following the Bay of Plenty flood.

Infrastructure issues abound in this country, from transport to electricity to water. Which is why Michael Cullen convenes an infrastructure ministers group. It is why the Government's growth and innovation advisory board has it firmly on the agenda. The immediate task is to address the infrastructure deficit of the nineties. We're in catch up. The task further out is to plan for, not just a prosperous future in a progressively transformed economy, but a future which this century promises the twin challenges of peak oil production and the effects of climate change.

Emission units for wood pellets

Hastings wood pellet manufacturing company, Fire-Logs (NZ) Ltd has been awarded almost 20 000 units under the Projects to Reduce Emissions programme.

"This scheme and others like it, make a very real contribution towards tackling climate change. From when production starts in 2005 to the end of the first Kyoto commitment period in 2012, it has the potential to displace 26 309 t of CO₂," says Convenor of the Ministerial Group on Climate Change, Pete Hodgson.

Fire-Logs (NZ) Limited Managing Director Duncan Wattie said, "This project, with the government's support, will allow our company to develop and produce not only a new renewable solid fuel but also to contribute towards reducing greenhouse gas emissions from fossil fuels."

Fire-Logs will produce wood pellets from waste sawdust for domestic and industrial use. They will be sold through established retail supply chains. Use of pellets for heating over fossil fuels will reduce greenhouse gas emissions. Fire-Logs will use pellets in its manufacturing process, reducing the use of gas.

The pellets are designed to fuel dedicated burners to provide industrial and domestic heating. When used in this way, they produce fewer pollutants than standard wood fire burners.

NZ Government, 2 August 2004

Oil: the illusion of plenty

Alfred Cavallo, energy consultant
<http://www.thebulletin.org/issues/2004/jf04/jf04cavallo.html>

(A US view of Peak Oil, edited from the Bulletin of the Atomic Scientists. However, note that not everyone will support the author's reliance on the credibility of the USGS data
— EW)

One hundred and twelve billion of anything sounds like a limitless quantity, but it may be just a drop in the gas tank. The world currently uses about 27 Gbbl of oil a year (4.4 km³), so 112 Gbbl — the proven oil reserves of Iraq, the second largest proven oil reserves in the world — would last a little more than four years. In the future, such a reserve will likely prove even shorter-lived. In the US, gas-guzzling sport utility vehicles and larger homes are deemed essential. As the underdeveloped world industrialises, demand for oil by billions of people increases; China and India are building superhighways and automobile factories. Energy demand is expected to rise by about 50% over the next 20 years (2% annual growth), with about 40% of that demand to be supplied by petroleum.

Ever-increasing supplies of low-cost petroleum are thought vital to the US and world economies, which is why the invasion of Iraq — and the belief that controlling Iraqi oil reserves would give the US a limitless pipeline to cheap oil — were so dangerous. The invasion, occupation, and rebuilding of Iraq will cost the people of the US both blood and treasure. But more to the point, Iraq could be a fatal distraction from many fundamental and extremely unpleasant facts that actually threaten the US — one of which is the finite nature of petroleum resources.

Reserves limited

Petroleum is not a renewable resource and production cannot increase indefinitely. The point at which production can no longer keep up with increasing demand will mean a radical and painful readjustment globally to everyday life. In spite of that indisputable fact, people behave as if the global petroleum supply is unending. Predictions of the exhaustion of oil reserves seem to have lost all credibility. The public assumes that inexpensive oil will be available essentially forever. The idea that petroleum resources are finite and that petroleum production might peak in the near future seems to have vanished from all discussions of energy policy — in Congress, in the press, and even among public interest groups.

For most people, the market price of a commodity is

what signals shortage or plenty. Time and again, collapsing oil prices have succeeded rising oil prices, leading to the belief that oil will always become cheap again. That oil supplies are currently inexpensive, and that the models used to predict Peak Oil production are not easy to understand, appear to ignore economic factors, and are based on proprietary data, partially explain the feeling of permanent abundance.

Market pricing limits

The differential between petroleum production cost and market price is so large that market price cannot be used as a measure of resource depletion. For example, the variation in the average price of oil between 1998 (US\$ 10/bbl) and 2000 (US\$ 24/bbl) had nothing to do with depletion of reserves and everything to do with an attempt to exercise 'market discipline' by the Organisation of Petroleum Exporting Countries (OPEC).

But the most important reason for the apparently unending supply of oil is the activity of non-OPEC producers. Oil production is immensely lucrative. Large amounts of petroleum have been and will continue to be produced outside the Middle East at very low cost, US\$ 5–10/bbl (NZ¢ 4.8–9.6/ℓ), compared to the desired OPEC price range of \$ 22–28/bbl. The opportunity to realise extraordinary profits provides irresistible pressure to produce as much oil as possible, as soon as possible.

Finite resource

Yet oil is a finite resource, and there are only so many places to look for it. Sooner or later petroleum production will decline, so sooner or later the prophets of depletion will be correct. The question then becomes:

Can a Peak Oil forecast be made that is useful to the petroleum industry and to consumers, one that will alert them to the problems and allow for a redeployment of resources?

Everyone knows that computers, telecommunications, and medicine have advanced dramatically over the last 20 years. But unknown to most people, advances in geological sciences and petroleum technologies have been equally profound and dramatic. Since the 1970s, plate tectonics has been providing a uniform framework for understanding the geology of the Earth's surface (including petroleum formation). Three-dimensional seismography now allows potential oil-bearing formations to be evaluated in great detail. Nuclear magnetic resonance probes are used to determine porosity and hydrocarbon content as well as to estimate the permeability of these formations. Petroleum deposits are being brought into production on the continental shelves off Texas, Brazil, and West Africa in water up to 2.4 km deep

— inaccessible until recently. Technological advances like subsea terminals, directional drilling, and floating production, storage, and offloading ships have been developed to exploit smaller, previously uneconomic or unreachable deposits. Sophisticated technology and unparalleled profitability has provided the foundation for the wide availability of oil.

USGS data

The same advances that have provided consumers with seemingly limitless petroleum also allow much better estimates to be made of how much oil may ultimately be recovered. After a five-year collaboration with representatives from the petroleum industry and other US government agencies, the US Geological Survey (USGS) completed a comprehensive study of oil resources. The *USGS World Petroleum Assessment 2000* is the first study to use modern science to estimate ultimate oil resources.¹

The importance of this assessment is difficult to overstate. We now have credible long-term production records and science-based resource estimates for all of the important oil producing regions in the world — crucial for understanding how oil production might evolve over time.

The USGS assessment allocates reserves to three categories: 'proven reserves,' or petroleum that can be produced using current technology; 'undiscovered reserves' — oil deposits that are highly likely to exist based on similar areas already producing oil; and 'reserve growth' which represents possible production from extensions of existing fields, application of new technology, and decreased well spacing in existing fields.

Oil in this last category can be extracted much less rapidly than oil in the proven and undiscovered categories. (For purposes of determining the approximate year of peak or constant output, the best that can be hoped for is that all proven reserves are produced and all undiscovered reserves are found and produced as rapidly as needed. Petroleum from reserve growth, produced at much lower rates, can be ignored. According to the USGS, it is available only to lengthen the period of peak production or to reduce the decline in a field's output.)

World reserves

As of January 1, 1996, OPEC's proven and undiscovered reserves amounted to about 853 Gbbl

¹ T Ahlbrandt (project leader), *The USGS World Petroleum Assessment 2000*. The assessment is available at www.usgs.gov and on compact disc. A detailed analysis using the assessment appears in Alfred Cavallo, Predicting the Peak in World Oil Production, *Natural Resources Research*, 2002, vol. 11, pp. 187-195. Production statistics, based on data from the International Energy Agency, are available in a variety of trade publications, including *Oil and Gas Journal*, *World Oil*, and *Petroleum Economist*.

(136 km³), while similar non-OPEC reserves were 769 Gbbl (124 km³), according to the USGS assessment. Based on actual production patterns in many non-OPEC oil producers, output can increase until there remains between 10 and 20 years of proven plus undiscovered reserves (as determined by the USGS), at which point a production plateau or decline sets in, depending on the reserve growth that is actually available.

Given that non-OPEC production rates are nearly twice as great as OPEC rates, and assuming stable prices and 2% annual market growth, non-OPEC production will reach a maximum sometime between 2010 and 2018 based on resource limitations alone (assuming complete co-operation of producers and that all undiscovered oil is actually found and produced as rapidly as needed).² Once this happens, OPEC will control the market completely, and it is unlikely that production will increase further.

Yet this simplistic analysis is too optimistic. There is no such thing as 'non-OPEC oil,' but rather US oil, Norwegian oil, and oil produced by various other countries. In particular, about 39% of non-OPEC proven plus undiscovered reserves are located in the former Soviet Union. It is only a matter of time before these countries reach an agreement with OPEC on how to divide the oil market, at which point the current illusion of unlimited oil resources will end, not due to resource constraints but to political factors.

Yet most people in the US do not believe that they need to be concerned with the finite supply of oil and its unfavourable (from the US perspective) geographic distribution. As noted earlier, the overwhelming majority behaves as if inexpensive oil will be readily available far into the distant future.

US policy

This attitude is reflected in US policy toward Iraq. One might expect that a major consequence of the US conquest of Iraq would have been full control of Iraqi oil reserves, reducing or eliminating the ability of OPEC to set prices, and giving the US a permanent — because oil is forever —

² The most popular method used to predict a peak in oil production is in M King Hubbert's monograph, *Energy Resources: A Report to the Committee on Natural Resources*, National Academy of Sciences-National Research Council, Publication 1000-D, December 1962. Hubbert noted that resource production often (but not always) could be described by a logistic growth curve, and used oil production records and estimates of proven oil reserves made by the American Petroleum Institute's Committee on Petroleum Reserves to estimate the year of US peak production. Hubbert does not discuss the assumptions implicit in his model, among which are stable markets, excellent profitability, and affordable prices for oil. See also Colin Campbell and J. H. Laherrere, The End of Cheap Oil, *Scientific American*, March 1998, pp. 78-83. The *Oil and Gas Journal* has also recently published a series of articles discussing the future of petroleum and its alternatives. See Bob Williams, Special Report: Debate Over Peak Oil Issue Boiling Over, With Major Implications For Industry, Society, *Oil and Gas Journal*, July 14, 2003.

overwhelming strategic advantage. It would allow the US to dictate production rates and lower prices, which would serve two important aims. Reduced prices would reward consumers in the West, buying their support for US policies. It would also deprive oil producers of the revenues with which they could challenge the US domination of the Middle East. Oil prices could be expected to drop to US\$ 15–20/bbl once existing Iraqi fields were refurbished and large new deposits were developed.

However, lower prices would stimulate consumption and decrease the incentive to develop more inaccessible reserves, making peak oil production more likely occur earlier, at the front end of the 2010–2018 forecast. So the very success of the current effort to seize control of the Middle East would doom US imperial ambition to failure within the next 10 years, from an oil supply standpoint.

This scenario is now implausible given the bitter Iraqi resistance to US occupation, and it is not clear when Iraqi production might reach — much less significantly exceed — its pre-invasion level. To understand what may unfold, given current levels of sabotage and chaos in Iraq, one must examine how the petroleum marketing system has changed over the past year, and in particular the role that OPEC producers have played.

OPEC

In 2002, Iraqi oil production averaged 2 Mbbbl/day. The US must have understood that an attack might interrupt production, which would in turn cause a large increase in the price of oil. Since this would have a severe negative impact on the world economy, it would further inflame anti-American sentiment throughout the world and even turn US voters against the enterprise. The conclusion: Lost Iraqi production had to be replaced. Thus, an agreement was reached with OPEC to stabilise the markets by increasing production levels as needed. In March 2003, the Saudi oil minister reassured the International Energy Agency of Saudi Arabia's long-standing policy and practice of supplying the oil markets reliably and promptly, and highlighted the collective responsibility that producing countries have shown in addressing the concerns of world oil markets. This was most likely viewed as a temporary measure, as it was assumed that Iraqi production would be restored and expanded rapidly after the US took charge.

In addition to the impending interruption of Iraqi production, in early 2003 Venezuelan oil production was far below its OPEC quota due to a conflict between populist president Hugo Chavez and the business community; Nigerian production was also depressed by civil strife. OPEC rose to the occasion (or, more likely, felt compelled to rise to the occasion, given the huge US military presence in the Persian Gulf in preparation for war) and increased

production by about 3.2 Mbbbl/day — equivalent to the production of the Norwegian North Sea sector — virtually overnight, more than compensating for lost Iraqi, Venezuelan, and Nigerian production. Saudi Arabia alone contributed more than half the increase and probably controls what remains of any spare production capacity.

The critical role that OPEC, in particular Saudi Arabia, plays as the swing producer for the world oil market is clearly evident from this episode, which allows one to quantify the ability of the Saudis to affect the world oil market and the world economy.

The US assault on Iraq has not undermined the power of OPEC and Saudi Arabia. On the contrary, it has if anything enhanced that power. This will not change until Iraqi oil production significantly exceeds its pre-invasion level. Thus, even in the short term, and on the most cynical level, US Iraq policy vis-à-vis oil has been a failure.

Oil supplies are finite and will soon be controlled by a handful of nations; the invasion of Iraq and control of its supplies will do little to change that. One can only hope that an informed electorate and its principled representatives will realise that the facts do matter, and that nature — not military might — will soon dictate the ultimate availability of petroleum.

CAN Cycle-Friendly Awards 2003–4

The Cycling Advocates Network is seeking nominations for the second national 'Cycle-Friendly' Awards, celebrating initiatives to promote cycling and create a cycle-friendly environment at both national and local levels. Nominations should be based on activities carried out some time during the 18-month period January 2003 – June 2004.

There are four award categories:

- Best Cycle Facility Project
- Best Cycling Promotion
- Cycle-Friendly Commitment by Business
- Cycle-Friendly Commitment by Public Organisation

Nominations are due by Friday 8 October 2004.

Details are on the CAN website

www.can.org.nz/awards/

4x4s create dust storms

A report in *The Times* ascribes a tenfold increase in dust storms around the world to the 'Toyotarisation' of deserts — off-road driving damaging the fragile surface crust of deserts and allowing clouds of fine dust to be blown away.

The Dominion Post, 21 August 2004

Sustainability engineering and science conference

Robbie Morrison
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A report on the International Conference on Sustainability Engineering and Science, Auckland, 6–9 July 2004

This article contains some personal observations on the conference but I do not claim to be comprehensive. At the outset, let me congratulate the conference committee, the event co-ordinator, and helpers for an excellent and enjoyable three days.

The conference website is located on the server of the New Zealand Society for Sustainable Engineering and Science (NZSSES):
<http://www.nzsses.org.nz>

Central themes and interpretation

Common themes in the conference included:

- Improving sustainability is a systematic activity.
- Many of the potential benefits arise through purposeful integration, but, in general, explicit trade-off will be required as well.
- There is no one 'super metric' for sustainability, rather any assessment will require a selected subset of impact and cost measures.
- In which case, the usefulness of weighting impact categories to produce a single metric remains in dispute.

It was encouraging to see imaginative organisations formulating and implementing sustainability strategies with vigour. These initiatives were much more than exercises in public green-wash.

That said, a number of presenters stressed that individual initiatives are not sufficient. Rather the problem needs to be addressed in local, central, and multilateral governmental contexts. Some local councils have taken this on board. The Waitakere City Council Tools for Urban Sustainability (TUSC) programme is clearly leading-edge (www.tusc.org.nz), and Forest Research has been looking at regional energy options for Rotorua.

It was also encouraging to see officials from Government agencies in attendance. However there was only one presentation from such an agency and that was keynote rather than research-oriented. The plenary address by Bill Bayfield (NZ Ministry for the Environment) focused on securing a patchwork of voluntary negotiated agreements without recourse to wider analysis.

My impression (formed over some years) is that NZ officials are reluctant to publicly indicate that they do not have a good handle on sustainability (or any other big picture policy problem). Clearly they don't. No one does. But it would help if senior officials and/or ministers could bite the bullet and concede that their current state of knowledge is insufficient. Nigel Jollands (NZ Centre for Ecological Economics) reinforced this same conclusion: that policy analysts are destined to toil fruitlessly because the analytical frameworks they adopt are simply too limiting in terms of scope and sophistication.

Several researchers reported on development of numerical models; hence another notable theme:

Numerical modelling is inescapable

- David Allen (U of Texas) presented an industrial ecology modelling framework. A single social decision-maker is used and the framework may need to include distributed decision-making later.
- Dayna Simpson (Melbourne U) examined the role of firm-to-firm relationships in supply-chain management in an innovative way.
- Susan Krumdieck (U of Canterbury) presented a feedback-informed model of sustainable development for the energy sector.
- The case for the 'hydrogen economy' was provided by UNITEC. A presentation by John Blakeley was even-handed on the prospects for widespread uptake of H₂ in NZ; clearly this is an open question.
- Robin Batterham (Chief Scientist, Australia) as a keynote speaker gave a refreshing perspective on sustainability. His central message was that: *Rate of change issues in relation to social transformation need to be explicitly considered.* This will be particularly important where the social transformation in response to public policy change is sufficiently rapid to force private asset stranding and/or (RMA) impact entitlement loss.
- Finally, a number of presentations covered topics in urban sustainability — particularly in relation to building design and usage.

NZ University and Research Institute participation

Institutional participation was rather patchy, with Auckland University in the lead but with three other universities not taking part. The pattern was similar for Crown Research Institutes, with the lead taken by Forest Research. There was a clear geographic dimension to participation, with Auckland-centric institutes leading the table.

The ratio between New Zealand and Australian research participation was about 2:1, indicating substantial interest from Australian universities.

The conclusion is — unfortunately — that

sustainability remains a marginal research activity for most NZ institutions, although some research groups doing important work in this area were not represented.

Closure

Taken collectively, shortcomings in the sustainability agenda, as given at this conference, include:

- The issue of cost-effectiveness needs more attention, given that one response may preclude another response on strictly financial grounds.
- Model-builders need to adopt contemporary software engineering practices where appropriate — most notably object-oriented design.
- Government agencies need to concede that sustainability remains a research agenda to which they need to contribute — as opposed to side-step.

But all in all, a very encouraging event. Once again, my appreciation to the organising team.

A cross-party approach to climate change

Mike Ward MP
Speech in the House, 23 June 2004
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Climate change is happening. While a tiny minority of scientific opinion may dispute whether the build-up of greenhouse gases and the overheating of our planet is our fault, overwhelmingly the evidence is clear. It is us. It is the behaviour of people like us that has been responsible for the increase in carbon dioxide (CO₂) levels from 280 ppm prior to the industrial revolution to around 375 ppm now. Globally, the future is bleak. Unless we can effect an enormous and rapid shift in human behaviour, global warming, and energy, water, and food shortages combined with burgeoning populations pose unprecedented threats to world peace and political stability, as well as cataclysmic environmental consequences.

Here at the bottom of the Pacific, we may be better placed to survive global warming, but it will not be possible to isolate ourselves from the global consequences, and the local climatic consequences are already evident and inescapable. The last time I spoke about those issues in the House, it was clear some members thought I was overstating the case. I said then and I repeat now that wishful thinking —

and, I add, blind faith in a merciful God or in human ingenuity — is no substitute for hard evidence. Nobody can be sure of the exact consequences, but we need only look at the consequences to date and extrapolate from there. If the 30% increase in CO₂ has resulted in the planet experiencing, since 1990, the 10 warmest years on record, and in June, July, and August 2003 being the hottest months in Western and Central Europe and, in the UK alone, experiencing for the first time temperatures in excess of 100 degrees Fahrenheit (37.8°C, *but we feel that something is lost in translation — EW*), then one does not have to be terribly imaginative to work out that something like a doubling in CO₂ levels in this century will present unimaginable consequences.

The floods, the droughts, the desertification, and the extreme weather events are likely to overwhelm us. What must we do?

If ever there was a time for a cross-party accord, the equivalent of an old Parliament wartime-type Cabinet, now is that time. There has never been such a need for co-operation in this place. If we are serious about our commitment to preserving peace and tranquillity, and we talk about it every time we come into the Chamber, then we need, most urgently, to begin to work together. To date, we have focused on perpetuating the unsustainable and the absurd. We have spent vast fortunes to enable people to live too far from where they need to be, to access food and stuff from all over the planet, and to bury my children's and my grandchildren's inheritance in expensive holes in the ground. We are destroying our future and undermining the quality of our present.

Our global responsibilities and our local needs are one and the same. We must put in place the infrastructure to enable rapid reduction in our fossil fuel use. Passive solar energy for heating our spaces and our water would result in more comfortable houses and more efficient industry, and would lower our energy bills. Investment in rail — and marketing a campaign to persuade people to live closer to the places they work, play, shop in, and go to school in, and to source their needs locally — could dramatically reduce our energy demands, avoid some of the impacts of burgeoning fuel prices, begin to meet our Kyoto commitments, and create safer and healthier communities.

In short, consumerism is killing us. We have never worked longer or harder. Some of us have no jobs and suffer the worst kind of poverty, that is, poverty in the midst of plenty. Too many of us have too much and work too hard. New Zealanders do not need to produce or consume more, but we do need to share the work and the time, and we do need to make sure that we spend more of our money on the things we really need. We need to make sure that those things are made to last, and made by the people around us, so that we restore the welfare

community and reduce the energy component of our possessions and our food. We need to change our behaviour, not by creating new rules, but by persuading people that the choices are between learning to live within the capacity of the planet to sustain, or consuming away our children's future. I like to think that this country and its people have the ability to demonstrate a different way of doing things. We can wait until the consequences of our behaviour are inescapable and irreversible, and the population is baying for our blood, or we can demonstrate a new measure of integrity and leadership by articulating a vision that inspires a new purpose and direction.

Environmental fundamentalism

Some well-meaning environmental groups tend to take a fundamentalist position: Diesel is evil, CNG is good. All efforts to explain fall on deaf ears:

- Transit vehicles are a very small fraction of total vehicles
- Natural gas vehicles put out more greenhouse emissions than diesels
- Diesels can and are being cleaned up
- Diesel-electric hybrids outperform CNG in every way
- CNG actually forces a cut in service for an equal operating budget since they usually cost more to operate.

One result was Californian legislation (and I think it passed) favouring petrol-hybrids over diesel, and allowed single-occupant hybrid cars to use the HOV lanes. Again efforts to explain all fall on deaf ears:

- Hybrids are not more efficient than many other small cars in motorway driving
- Hybrids don't need a boost as there are waiting lists to buy them
- Letting cars in HOV lanes slows down transit and decreases transit ridership.

I also note that the Governor, Arnold Schwarzenegger, repealed a new tax on autos as soon as he entered office but apparently supported this hybrid bill. These kinds of bills are great to pretend that you care about the environment, and the environmental community is providing these opportunities.

Eric Bruun, New Mobility / WorldTransport Forum, WorldTransport@yahoo.com

Emission credits

As EnergyWatch went to press it was reported that a two-person Dutch team were in New Zealand to buy emission credits.

Can individual farmers benefit from wind power?

Based on a SEF press release, 5 July 2004

A recent survey showed that 82% of NZ respondents approve of wind power as a solution for our energy needs. In contrast, only 24% approve of coal-fired electricity generation. This is good news for future electricity generation in this country, according to SEF Convenor John Blakeley. "The challenge now is to support power developments that meet our desires for a cleaner energy future," he said.

SEF believes that NZ has to find a way of connecting wind turbines to the electricity grid which will encourage smaller operators to become involved and bring a rapid expansion of sustainable power generation. "Some form of wind power purchasing agency may be required," says Blakeley. "In some parts of Europe, it is easy for individual farmers to invest in wind turbines on their own farms. The farmers are supported by a simple guaranteed price for all wind generated electricity. This price is not subject to fluctuations in electricity price experienced in a spot market."

Established power companies want to install large wind turbines with a capacity of 1.5–2.0 MW or more, in large wind farms. They tend to be located on ridges and may not be very well tolerated when located near urban areas.

Dispersed smaller wind turbines of around 500 – 750 kW capacity may be ideal for places such as the windy Manawatu plains. "Smaller wind turbines will give greater scope for private or community ownership and would be more suited for individual connection to local electricity supply networks than are large wind farms," says Blakeley.

Blakeley points out that recent amendments to the Resource Management Act to encourage renewable energy should facilitate development of more wind turbine projects, and Regional Plans could do more to encourage local energy initiatives. "I am very encouraged by the efforts of Wellington City Council in this regard," says Blakeley. "Hydro and wind are ideal complementary renewable power sources," he added, "because when the wind blows, this will effectively add storage to the hydro lakes. NZ has an abundant wind resource capable of producing up to 20% of our electricity needs."

(A handful of 500–750 kW turbines might help to support a sagging rural power line [not on a still day], but much more would need a new line.

—EW)

Solar cities initiative

The Australian Federal Government has unveiled a package promising more money for renewable energy, and measures to encourage homes to use more solar power. It includes A\$M 75 (NZ\$M 84) for a 'Solar Cities Initiative.'

A White Paper introduced by Prime Minister John Howard, *Securing Australia's Energy Future*, includes steps designed to make Australia a world leader in low emissions technologies. A centrepiece of the strategy is the establishment of a Low Emission Technology Fund. The Government will provide A\$M 500 to this fund which in turn will leverage at least twice that in private sector investment to develop and demonstrate low emission technologies.

The package includes a range of new initiatives:

- An A\$M 500 fund to provide dollar-for-dollar support for the private sector to demonstrate breakthrough technologies with significant long-term greenhouse gas reduction potential;
- The provision of A\$M 134 to support commercialisation of renewable technologies;
- A commitment of A\$M 75 million for Solar Cities trials to demonstrate a visionary new energy scenario — where solar, energy efficiency and markets reforms combine to provide a sustainable future;
- A comprehensive overhaul of the fuel excise system, reducing excise costs on businesses and households by A\$bn 1.5 in the period to 2012-13;
- A requirement that Australia's largest energy users undertake regular energy efficiency assessments, with firms using more than 0.5 PJ/yr undertaking mandatory energy assessments every 5 years and reporting publicly on the outcomes; and
- A requirement that large energy projects and recipients of more than A\$M 3.0 in excise credits to manage their emissions through membership of the Greenhouse Challenge Programme.

Howard said, "Renewable energy sources such as wind and solar power will play a part in meeting growing energy demands. But for the foreseeable future, coal, oil and gas will meet the bulk of Australia's energy needs. It is for this reason that we must look at more environmentally responsible ways of developing all our natural resources. The choice is between low and high emissions outcomes — not between renewables and other energy sources. We can have both of them."

He added, "These Solar Cities trials will, for the first time, place a proper market value on the role solar energy can play in meeting peak demand and reducing the need for transmission and distribution

investments. This is about doing things smarter with solar panels; better insulation; energy efficient appliances; and smart meters that allow households to sell excess electricity back into the grid at peak times. The trials will be held in two or three urban centres. They will require support from industry, state and local governments. Centres in Adelaide and Sydney would be prime locations for trials. The Australian Government encourages governments and industry to develop proposals to host the trials so that the best locations can be chosen."

Australian Federal Government, 16 June 2004
Solarbuzz, Inc

(There is some good stuff here, but we suspect that the money will not go far if the project is to live up to the rhetoric. Apart from the possibility of a big breakthrough, perhaps the most useful part of the package will be to require large energy users to run energy audits.

But what is that bit about reviewing the fuel excise system — specifically downwards? Could it be paying to encourage energy efficiency with one hand, and then effectively discouraging it with the other, by reducing costs through forgoing taxation? — EW)

Global cooling?

Kenneth Chang, *NY Times*, 13 May 2004

In the second half of the 20th century, the world became, quite literally, a darker place. Defying expectation and easy explanation, hundreds of instruments around the world recorded a drop in sunshine reaching the surface of Earth, as much as 10% from the late 1950s to the early 90s, or 0.2–0.3%/yr. In some regions like Asia, the US and Europe, the drop was even steeper. In Hong Kong, sunlight decreased 37%.

The dimming trend — noticed by a handful of scientists 20 years ago but dismissed as unbelievable — is now attracting wide attention. Research on dimming and its implications for weather, water supplies and agriculture was presented in Montreal at a joint meeting of American and Canadian geological groups in June. "There could be a big gorilla sitting on the dining table, and we didn't know about it," said Dr Veerabhadran Ramanathan, a professor of climate and atmospheric sciences at the University of California, San Diego. "There are many, many issues that it raises."

Satellite measurements show that the sun is as bright as ever, but that less and less sunlight has been

reaching the ground. Pollution dims sunlight in two ways:

- Some light bounces off soot particles in the air and goes back into space.
- Pollution leads to more water vapour condensing to form clouds, by providing 'seed' particles, leading to thicker, darker clouds, which also block more light.
- *(Presumably some sunlight is also absorbed by the pollution particles* — EW)

Some less polluted regions have had little or no dimming, but Antarctica, which would be expected to have clean air, has dimmed. "We don't really understand this thing that's going on," said D Shabtai Cohen, a scientist in the Israeli Agriculture Ministry who has studied dimming for a decade. "And we don't have the whole story."

The measuring instrument used, a radiometer, is simple; a black plate under a glass dome. The plate heats up as it absorbs the sun's energy, and the temperature gives the amount of sunlight. Although radiometers are simple, they do require periodic calibration and care. Dirt on the dome blocks light, leading to false readings.

Since the 1950s, hundreds of radiometers have been installed, from the Arctic to Antarctica, dutifully recording sunshine. In the mid-80s, Dr Atsumu Ohmura, of the Swiss Federal Institute of Technology in Zürich, sifted through the data to compare levels in different regions. "Suddenly I realised it's not easy to do that, because the radiation was changing over time. I thought it is rather unbelievable," he said. He was convinced that the figures were reliable and presented his findings, but there was then no reaction. "Very disappointing," he added.

A major set of measurements from the Indian Ocean in 1999 showed that air pollution did block significant sunlight. Following plumes of soot and other pollution, scientists measured sunlight under the plumes that was 10% less bright than in clear air.

Dr Ohmura said, "I have a very strong feeling that probably solar radiation is increasing during the last 14 years." He based his hunch, he said, on a reduction in cloud cover and faster melting rates in glaciers. But clearer, sunnier days could mean bad news for global warming. Instead of cloudiness slowing rising temperatures, sunshine would be expected to accelerate the warming.

<http://www.nytimes.com/2004/05/13/science/13DARK.html?ex=1085429577&ei=1&en=d22bce36478a4106>

Sorting the brass from the muck

Ian Bywater's work on energy savings
in dairy farming

In 2003, SEF member Ian Bywater won the New Spirit Challenge award, offered by the UK Institution of Electrical Engineers for an engineering project that promotes sustainability. Entries must show multidisciplinary thinking and imagination as well as novelty, and offer potential opportunities for the engineering community.

The latest news is that research on the main components of the system is complete and application has been made for grants to fund a demonstration plant for a dairy herd of 200 cows.

The problem

Many network companies are experiencing a growing electrical load on rural networks, due to the rapid increase in dairying in New Zealand. In addition to the general problem of increasing demand, there are undesirable morning and evening system peaks caused by the refrigeration load. The total load can strain long rural power systems that are often not designed for such loadings.

The proposal

- An ice bank to reduce the peak refrigeration load, by spreading it over 6–12 hours instead of a 2 hour milking period. Ice banks have other benefits to the dairy industry, such as reserve cooling capacity if the network supply fails.
- A biodigester to treat the dairy shed effluent, providing a primary source of energy. Initial trials will have electrical backup, but LPG is another option if only occasional backup is needed.
- A Stirling engine to generate power from biogas.
- Solar thermal heating for shed hot water.
- Local groundwater for initial milk cooling, if available.
- Further integration, such as using biogas or waste heat from the Stirling engine to heat water for shed use, and hot water to maintain the biodigester at optimum temperature.

The potential benefits of such a system include reduced electrical energy use; further reductions in peak electrical energy use; improved effluent disposal; reduced methane emissions; and reduced investment in rural power supplies.

The award judges envisaged several stages in project development, provided that each preceding stage is a success:

Stage 1

- Undertake a desktop study into the energy balance of the system.
- Undertake a world-wide search of suitable suppliers of equipment.
- Formulate a system as described and seek research funding.

Stage 2

- Operate an ice bank for a number of daily cycles to determine its characteristics in a laboratory and report back the test results.
- Operate the digester for a number of weeks to determine its characteristics in a laboratory.
- Use the biogas produced to fuel a Stirling engine, and report back the test results.
- Combine the ice bank operation with the power output from the Stirling engine generator.

Stage 3

- In conjunction with a network company, locate a suitable dairy farm where the system will be installed. This 'on-farm' situation will enable a comparison between operations with and without the ice bank.
- Analyse and report on the results.

Stage 4

- Commercial development.

The numbers

Dairy farms generally operate on a regular, twice-a-day milking pattern, although once-a-day is becoming more common and milk collection may be only every other day. The milk comes from the cow at about 37°C and needs to be cooled to below 7°C within two hours of milking.

A herd of 200 cows producing 2000 ℓ of milk at each milking requires a cooling capacity of 70 kWh, or 35 kW for two hours. For a typical refrigeration unit with a CoP of about 2–3 this requires about 12–18 kW of electrical compressor power.

The load can be reduced by using local ground water as a heat sink for the first stage of cooling, from say 37–25°C. This will reduce the power requirement by about 40%, but at the expense of drawing about 2 ℓ of water from the aquifer for each litre of milk cooled.

Using an ice-bank to store cooling capacity reduces the load, and also the size of refrigeration equipment, making it more environmentally beneficial. In this way the two-hour cooling requirement can be met from ice generated over a period of up to 12 hours. This will need a refrigeration system only about 1/6 as large; 2–3 kW capacity for total cooling, or 1.5–2.0 kW if used with water as an initial cooling agent. The amount of ice

required is about 400 g/ℓ of milk (latent heat of fusion 320 kJ/kg, specific heat of milk 4.2 kJ/°K, cooling range 30 K), or just under 800 kg for 2000 ℓ. For two-stage cooling the ice requirement is about 60% of this, or around 500 kg.

The operation of the ice-bank is as follows:

- During the ice making period the refrigeration system runs continuously at a capacity of 6 kW (cooling) or about 2 kW (electrical). This load can be met by a Stirling engine running on biogas, with LPG available as a back-up energy source.
- During the milk cooling period the ice is melted to produce water at 0°C (or cooler if a lowered freezing-point fluid is used). This cools the milk to 7°C, and in doing so, its temperature rises to say 2°C. The 'warm water' is recycled to the ice-bank where it is re-cooled to 0°C by melting more ice.

By the end of the milk-cooling period, all the ice has melted and all the milk has been cooled. The cycle begins again.

Hot water is also needed; very roughly 300 ℓ / day at 85°C. This typically uses a 6 kW electric heater, but some large farms use a 1200 ℓ tank with a 14 kW element (with permission from the retailer). In a more sustainable system, energy for water heating could come from a solar heater; waste heat from the Stirling engine; biogas; mains electricity; or LPG, in about that order of priority (but probably not all in the same installation!).

Clearly a fully integrated system is going to be fairly expensive and need some fairly sophisticated controls, but with some very real benefits available.

This article is largely taken from the New Spirit Challenge award notice with additional information from Ian Bywater and Malcolm Souness

Flower power

The mystery of how plants derive energy from sunlight by splitting water molecules is solved at last. Now the challenge is to do the same in the lab.

The reward is unlimited energy.

According to electrochemical theory, the energy required to dismember water is more than enough to destroy any biological molecule. Yet plants do it all day. But now a team at Imperial College, London, have made what could be a decisive breakthrough. They have worked out the precise spatial arrangement of a small number of metal ions, oxygen atoms and water molecules at a crucial site in the plant's photosynthetic machinery — the so-called 'catalytic core'. And knowing the structure will provide a springboard into artificial synthesis.

New Scientist, 1 May 2004

More power for pushbikes

Electric bikes are at present classified as mopeds and treated as motorcycles. This makes them uneconomic, so the Land Transport Amendment Bill proposes to reclassify them as bicycles if they have motors of less than 200 watts (W). However, engineer Alan Parker says this is not enough, and argues for electric bikes of up to 500 W.

eCAN, NZ Herald, 9 July 2004

EnergyWatch comments:

Parker has a good point. The following table gives likely maximum speeds for all-up weights (cycle, rider, motor and batteries) of 75 kg and 150 kg, under a range of conditions. Data is from a Dutch cycling manual (CROW, 1993):

Rider + cycle = 75 kg

Available power	(W)	200	500
Maximum speed on a level surface, still air	(km/h)	27	38
Maximum grade at 10 km/h			
— In still air	(%)	8.5	23
— With 30 km/h headwind	(%)	2.5	17.5

Rider + cycle = 150 kg

Available power	(W)	200	500
Maximum speed on a level surface, still air	(km/h)	25	36.5
Maximum grade at 10 km/h			
— In still air	(%)	4.0	11.5
— With 30 km/h headwind	(%)	1.0	8.5

The significance of an uphill speed of 10 km/h is that cycle stability is an issue at lower speeds. Wobbling begins at about 11 km/h and increases as speed falls (data from CROW).

Anyone with experience of cycling in Wellington can appreciate that a maximum gradient of 8.5% (75 kg all-up weight) is marginal. Obviously, a maximum gradient of 1.0% against a 30 km/h wind (150 kg all-up weight) is useless.

We suggest that the only real argument against allowing 500 W motors on cycles is a risk of excessive speed, which is easily managed by building a speed limiter into the control system. However, this is already a standard feature, usually set at 20–25 km/h.

EnergyWatch supports a maximum power of 500 W for a bicycle exempt from powered vehicle requirements such as registration.

A sound solution for Windflow

Windflow Technology says it has solved the sound level problem of its wind turbine at Gebbies Pass. Chief Executive Officer Geoff Henderson is confident it can now operate at an acceptable noise level. A modified gearbox was reinstalled in mid-July. "Our early monitoring shows that we're now operating within our Resource Consent requirements," said Henderson. "While we have yet to confirm it with the District Council, this is very good news."

Earlier this year, the Company identified gearbox vibration as the source of the noise problem, and returned the prototype gearbox to the supplier for modification. The effects were measured on a \$200,000 test rig manufactured to factory-test the prototype and all future gearboxes for the Windflow machines.

"The problem noise was caused by vibrations at 311 Hz being amplified by the rotor. That gave rise to a tone at that frequency in the windmill's sound spectrum. Factory testing has shown that our modifications have totally removed these vibrations," said Henderson, "and now our field monitoring has confirmed that we have eliminated this tone. The residual sound levels are much lower, and importantly, tonal characteristics are absent."

The council has a maximum sound level of 40 dBA for night-time rural environments. "During the Resource Consent consultation process, we identified that the neighbouring McQueens Valley has a uniquely quiet environment," said Henderson, "so we offered to comply with a maximum level of 30 dBA at all times. We now believe that our gearbox ranks among the world's quietest wind turbine gearboxes."

The company was to celebrate this milestone with an on-site 'Public Hearing' of the Gebbies Pass wind turbine, for neighbours and media.

Windflow Technology, 15 July 2004

On 19 July *The Dominion Post* reported Windflow's progress and added:

But McQueen's Valley resident Julie Riley says she listened to the turbine on Tuesday evening [13 July] and could hardly notice any difference from the noise it was making before being shut down last November for breaching strict noise limits the company had agreed to in its resource consent.

She was surprised with Windflow's statement that it had solved the problems and described it as, "just codswallop." She said Mr Henderson called her while the turbine was running. "It sounded more or less the same. I could hear every turn."

“Get prepared today, not tomorrow”

From an interview on Australian Radio by Mark Colvin, 10 August 2004
<http://www.abc.net.au/pm/content/2004/s1172404.htm>

Dr Ali Samsam Bakhtiari, a planning expert and Vice President of the National Iranian Oil Company, was recently in Australia as a keynote speaker at the Sustainable Transport Coalition's conference on living with less oil.

The problem, he says, is not in the Middle East countries like Iran, Iraq and Saudi Arabia, which still have plenty, but in other producers such as Australia and Indonesia, which were both net exporters of oil but are becoming net importers. And meanwhile, with China's phenomenal economic growth, the world-wide demand is growing and growing, and now it regularly matches peak production of 81 Mbbbl/day (12.9 million m³/day).

Extracts from Dr Bakhtiari's radio interview include:

SB: The supplies side is limited. We are reaching the limits of the planet very soon. We can't produce much more oil than we are producing today ... I am talking about two to three years from now.

MC: *So 81 million barrels a day — you are saying that the supply will not keep up with that within two to three years from now.*

SB: Exactly, yes. That's the maximum in my opinion that the world can produce.

MC: *Now what are we talking about here when we turn to the world economy? Is this going to be comparable to the previous three oil shocks, or worse, or easier?*

SB: If what I predict is going to happen in 2006 or 2007 then you will have a constant oil shock after that. So everything is going to change ... [The oil price] certainly is going to go up ... but where, that will depend on many factors. It will depend especially on factors in the Middle East area, which is now producing roughly 40% of the total crude in the world and this 40% is going to increase with time naturally. But I could see easily prices of three or four dollars very, very soon for every litre of petrol. (*Up to NZ\$ 4.50. or NZ\$ 6.00 if Dr Bakhtiari is thinking of US dollars — EW*)

MC: *Wouldn't a price rise on that level have the effect of slowing world growth to such a huge extent that the demand would drop off really drastically anyway?*

SB: Oh no, no, no, no ... not this time around. You will cut demand first but then the supply is going to go down as well. In the previous [recessions] it

was not like that. You would cut demand and supply would go up and you would recalibrate the whole system. This time you will not be able to recalibrate. What I'm saying is that you don't have any more spare capacity neither in the Middle East, nor in OPEC, nor anywhere else. That's why a problem like Yukos, which is a small problem after all, becomes such a big problem today.

MC: *Because the system is so stretched that any little problem at the edges becomes magnified?*

SB: Exactly and this you will have more and more. So you will have a brand new world very, very soon.

MC: *Well what do you suggest that we do about it?*

SB: Get prepared today, not tomorrow. Don't leave things for tomorrow ... There are 1001 solutions already but you have to think about it. You have to study it and see what solutions you can come up, and there is no panacea you know. There is no hydrogen economy at the horizon. There is small little things in my opinion you can do and when you add these all up, it amounts to quite a lot, but you have also to get ready to live with less oil.

Oil price

Claims that prices are the highest ever are true only in dollar terms. In year 2000 dollars, prices peaked at about US\$ 35/bbl in the early 1970s, and at about US\$ 59/bbl at the time of the Iran-Iraq war in 1981.

30 July US\$ 43.80 (NY), US\$ 40.03 (Brent)

Cited reasons include fear of closure of Yukos; Middle East unease (and at 95% capacity), bulk buying from N America. "Traders also remain wary over accelerating Iraqi oil flows after repeated export disruptions this summer. Baghdad has consistently missed higher targets due to a spate of pipeline sabotage in the south."

6 August US\$ 44.77 (NY), US\$ 41.50 (Brent)

Russia withdraws Yukos permission to access its bank accounts. "Concerns about spare OPEC supply eased when cartel President Purnomo Yusgiantoro said the group could immediately tap into spare production capacity of 1–1.5 Mbbbl/day." Consumption is accelerating at the fastest rate for more than 20 years.

20 August Close to US\$ 49.00 in Tokyo (equivalent to about NZ\$ 47/ℓ)

National Party finance spokesperson John Key said the Government should consider delaying the 5¢/ℓ levy planned from April 2005, which is equivalent to the retail effect of about a US\$ 4.50/bbl price rise. (*But wouldn't delaying a levy make the problem worse? — EW*)

The Dominion Post, various dates

MiniWhats

Whirinaki in business

The new diesel-fired 155 MW reserve power plant at Whirinaki, near Napier, was opened on 1 June by Minister of Energy Pete Hodgson. He said, "This station will run only when the limits of the electricity system are tested by problems like low inflows to the hydro lakes, or perhaps a major generation or transmission breakdown. It is effectively a form of insurance against the risk of power shortages." Hodgson added, "Whirinaki can be up and running in seven minutes if needed, and at full capacity could supply up to 3% of New Zealand's average power needs." Contact Energy, which owns the Whirinaki site, has built and will run the plant on behalf of the Government.

And run it has, several times, when the capacity of the Cook Strait cable was reduced for maintenance. Supply has been for about a dozen bursts of 30 minutes or so. In effect the station has been used for peaking, to keep North Island wholesale prices below 10¢/kWh when some thermal stations "did not offer supply."

NZ Government, 1 June 2004
The Dominion Post, 22 July 2004

RMA proposals will worsen climate change

A coalition of environment, energy, public health and resource management organisations has called on the Government to abandon proposed changes to the Resource Management Act (RMA) that will undermine New Zealand's efforts to address climate change. "The proposed changes are irresponsible economics and will foist polluting industries onto unwilling communities," said Ian Shearer, spokesman for the Climate Defence Network. "Robert Muldoon wanted to make it easier for major projects to get planning permission and gave us Think Big and the National Development Act. Those days appear to be returning," he said.

The Climate Defence Network believes that proposals to add a national interest clause into the RMA and speed up RMA processes for major projects are just a modern form of the National Development Act. This will just encourage more climate, health and environment damaging developments like coal mining, thermal power stations and unnecessary motorways. "At a recent meeting, officials were unable to provide any evidence of why the changes were needed. In fact, the evidence suggests that New Zealand's compliance costs are moderate by international standards and are not a barrier to responsible development," Shearer said.

"This week, Nelson MP Nick Smith campaigned against the RMA, claiming it needed to be changed

to allow an upgrade of transmission lines at the top of the South Island. Transpower, the company that maintains the lines, rejected this claim. The campaign against the RMA is based on misinformation, anecdote and distortion," said Shearer. "Applications for wind farms in the Wairarapa and Manawatu have gained permission without difficulty. Climate friendly generation, properly located, faces few barriers under the RMA." Climate Defence Network, 8 July 2004

Members include:

Cycling Advocates Network; Ecoaction;
Engineers for Social Responsibility;
Environment and Conservation Organisations of
New Zealand (ECO);
Environmental Defence Society;
Federated Mountain Clubs; Forest & Bird;
Friends of the Earth NZ; Greenpeace NZ; MedEco;
Nelson Environment Centre;
Pacific Institute for Resource Management;
Public Health Association;
Sustainable Energy Forum

Northern South Island transmission risk managed

Transpower admitted that it might not have enough capacity to supply peak power to the northern South Island in winter. The problem is limited to some 65 peak hours (based on an anticipated 10% load growth) during the period 17.00–19.00 on weekdays.

But in the end the Electricity Commission were instrumental in brokering a management agreement, including:

- Lines companies switching off water heating at the same time for a few hours, using ripple control.
- Some customers using their own back-up diesel generators.
- Transpower adding more equipment on a Christchurch substation to get more capacity on the transmission lines.
(This seems to mean new trip switches? —EW)
- Timaru being switched to other transmission lines for power supplies (From the 220 kV Twizel system to the 110 kV Waitaki system).
- Paying some large electricity consumers to reduce their usage at peak times. Total payment for the winter was thought unlikely to exceed \$ 90 000.

The Dominion Post, 5, 8 & 10 June 2004

WHO advocates taxation to combat obesity

The World Health Organisation is advising governments to consider using taxes to help combat obesity, despite intense lobbying by the US and the world-wide food industry to water down its recommendations. In the final version of its draft global strategy on diet, physical activity and health,

the WHO suggests governments should use fiscal measures to discourage consumption of too much sugar, salt and saturated fat. It stops short, however, of advocating specific 'fat taxes' or subsidies for healthy foods.

The latest version of the strategy places greater emphasis on physical activity than a draft published in November. It says governments should ensure that "walking, cycling and other forms of physical activity are accessible and safe" and that "transport policies include non-motorised modes of transportation."

eCAN, *Financial Times*, 20 April, 2004

Velo-City Conference 2005

Dublin, Ireland, 31 May–3 June 2005

This international cycling conference goes from place to place and strength to strength. A call for papers closes on 1 October at:

www.velo-city2005.com

New Zealanders favour renewable energy growth

An EECA study released at the beginning of July shows that New Zealanders overwhelmingly support wind energy and hydro electricity.

Wind power comes out top in the EECA-commissioned survey, conducted by UMR research, of attitudes towards electricity generation options. Some 82% of respondents approved or strongly approved of wind power. Hydro generation was the next most preferred option with 79% approval while geothermal scored 67%.

Energy Minister Pete Hodgson said, "Not only does this report show very strong support for wind developments overall, it indicates low levels of the 'not in my back yard' or NIMBY syndrome. When people were asked if they support a wind farm being built in their local area, support dropped to only 60% with only 18% opposed." "Only 9% did not want them even if they could not see or hear them," he said.

Wind power is already set to grow fourfold, from around 40 MW to 160 MW, in the year to next April. "New Zealand has an abundant wind resource capable of producing about 20% of ... electricity needs. The perceived main problem with wind, that it is unreliable, is not an issue in New Zealand. Wind and hydro are ideal complementary renewable power sources because when the wind does not blow, we effectively have electricity stored in our hydro lakes. This resource, coupled with high levels of public support for wind and renewable energy; plus government initiatives, will encourage many more developers to bring forward new plans," said Hodgson.

Green Co-Leader Jeanette Fitzsimons added, "Wind power is fast to design, consent and build and

comes in relatively small and flexible installations, so it can be sited close to demand, allowing changing needs to be quickly responded to and reducing the need for large unsightly transmission lines."

EECA, Green Party, 1 July 2004

Car-free day, Wednesday 22 September 2004

The 'In town without my car!' event, organised for the first time in France in 1998, was established as a European initiative by the European Commissioner for Environment Margot Wallström in 2000. It is an opportunity for participating cities to show — midweek — that environmental matters concern them, by presenting their centres in a different light for one day. Restricting motorised traffic in certain areas, encouraging the use of sustainable modes of transport and raising awareness for the environmental impacts of citizens' modal choice, are the key actions. In Europe, 760 cities and towns were involved in 2000, 1005 in 2001 and 1448 in 2002.

Much of this is of poor quality but there are a small number of cities and projects that are helping show the way. While no one yet has fully mastered the art, there has been significant progress here and there and it is important to be able to build on it.

Anybody wishing to organise a car-free event can obtain planning information through:

postmaster@ecoplan.org

<http://newmobility.org>

<http://www.mobilityweek-europe.org/info/info.html>

(A regular participating city is Limerick. Any offers?

— EW)

Cheaper electricity for small users

The Government has announced new regulations requiring power companies to provide cheaper tariffs for customers with low power demands. Customers using less than the average 8000 kWh/hr must be offered a tariff having a fixed charge of no more than 30 ¢/day. It is thought that about half of all residential customers will benefit. The new requirements come into force on 1 October 2004.

The Dominion Post, 9 July 2004

Government approves packaging accord

The government has approved a new Packaging Accord that will reduce waste and increase the amount of packaging that can be recycled.

The voluntary accord has been developed by the Ministry for the Environment and the Packaging Council of New Zealand, with support from Local Government New Zealand and the Recycling Operators of New Zealand (RONZ). Key sectors involved are paper, plastic, glass, steel and aluminium; and brand owners and retailers.

Under the accord producers have to consider the full packaging life-cycle, from initial need and design to what happens when the packaging is no longer needed. This will see brand owners, retailers and packaging manufacturers become more efficient in the production, use and recovery of packaging materials. The accord has been developed in accordance with the NZ Waste Strategy, developed by the Environment Ministry in partnership with Local Government NZ.

NZ Government, 1 July 2004

Solar house day

ANZSES will be holding a solar house day on 12 September. The aim is to demonstrate just how simple it is to build or renovate a home that requires virtually no heating or cooling other than that provided freely by the Sun and our environment.

ANZSES are looking to hold tours in a the number of centres throughout New Zealand and are looking for a wide range of energy efficient housing (both old and new) using a wide range of sustainable technologies including PV and solar hot water.

For further information see

<http://www.solarhouseday.com>

Health Board funding for house insulation

The Wairarapa Healthy Homes Project has insulated about 100 homes since the initiative began in April. Installation is free, although a further 50 homes have paid a discount price. Homes are nominated for insulation through referrals from Work & Income NZ, or health professionals. Chairman Bob Francis said that the health and economic benefits of warmer homes to individuals, families and the wider community were potentially huge.

And now the project has attracted District Health Board funding. The Board is following up occupants of homes selected for insulation to determine any other health needs and ensure that they have access to health services. Chief executive David Meates said, "We want to make sure that people not only feel better by having a warmer home but can also access other health professionals and support services available in the community."

The Dominion Post, 12 August 2004

Sulphur hexafluoride (SF₆)

Sulphur hexafluoride (SF₆) is the most potent greenhouse gas, used mainly in electricity transmission and distribution systems. In July, Government, national grid operator Transpower, electricity generators and large electricity users signed a voluntary agreement to minimise SF₆ emissions. The signatories undertake to:

- Adopt best practice to minimise SF₆ emissions;

- Set and meet emissions targets (in the case of major users); and
- Report on SF₆ use in accordance with internationally recognised guidelines.

In turn, the Government has reaffirmed that it will exempt users of SF₆ from costs arising from its use under climate change policies.

"Transpower is committed to minimising emissions of this greenhouse gas, and the signing of the agreement provides a useful framework within which this goal can be achieved," says Transpower's Chief Executive Dr Ralph Craven. The other electricity users who are being invited to sign the agreement include: Vector, Meridian Energy, Mighty River Power, Genesis Power, Contact Energy and Comalco.

Sulphur hexafluoride is a heavy gas with excellent insulating properties, but it has a global warming potential (over 100 years) nearly 24 000 times greater than CO₂. Its main use is in electricity transmission and distribution systems, where it is the preferred insulator for high voltage switchgear. Transpower holds around 90% of NZ stocks, or about 30 t. Of the electricity distribution companies, only Vector holds a significant quantity, about 3 t.

NZ Government, 26 July 2004

Local government help on climate change

Climate change guidance for local authorities has been announced by Pete Hodgson, Convenor of the Ministerial Group on Climate Change. "Today we launch *Preparing for Climate Change*, a practical guide for local government to help it play its full part in identifying and preparing for the effects of climate change," says Hodgson.

The Guide is part of a toolbox of resources for councils including case studies, information and technical guidance and covers three main areas:

- Projected changes in climate and extreme weather events;
- Climate change-related obligations and practical methods to assess likely impacts; and
- Practical advice on how best to integrate climate change into natural hazard management, land-use planning, building regulation, and infrastructure decision-making.

The launch of the guide coincided with the Ministry of Economic Development's release of the latest report of greenhouse gas emissions from the energy sector. This shows a year-on-year increase over 2002 for the common basket of greenhouse gases is 3.9%, on a carbon dioxide basis.

"Despite this increase, NZ remains one of the few countries with a comprehensive policy response to address its Kyoto commitments. A suite of government policies are now starting to reduce

emissions as measured against business as usual, and contribute towards establishing a permanent downward path for total gross emissions by 2012."

For further information see:

www.climatechange.govt.nz/resources/local-govt/guidance.html
NZ Government, 26 July 2004

Councils sign up for climate change initiative

Energy Minister and Convenor of the Ministerial Group on Climate Change, Pete Hodgson, launched the Communities for Climate Protection (CCP) programme in late July. The Minister welcomed the first New Zealand councils to sign up to CCP: "I'm delighted to see so much interest in this Ministry for the Environment programme," said Hodgson. "Councils are ideally placed to lead local action on climate change within the community and I hope more will join this initiative."

Waitakere City Council, Kapiti Coast District Council, Christchurch City Council and Masterton District Council are the first to sign up to this international programme to reduce greenhouse gas emissions. Through the programme, participating councils take a multi-step approach to reducing emissions:

- Developing emissions inventories;
- Setting targets for reductions;
- Developing action plans to achieving this; and
- Ongoing monitoring against targets.

Action to reduce emissions can be taken by councils on a number of fronts including: waste management; sustainable transport; urban design; air quality; energy efficiency; and sustainable land use and planning.

The international nature of the programme means New Zealand councils can tap into a broad range of best practice and experience in this field. The programme is complimentary to the Climate Change Office's provision of extensive guidance to Councils and the Energy Efficiency and Conservation Authority's (EECA) EnergyWise Councils Partnership.

NZ Government, 28 July 2004

First power from Te Apiti

Electricity from the first turbines commissioned at Meridian's Te Apiti windfarm site near Palmerston North was connected to the national grid by Energy Minister Pete Hodgson in early August. With a total planned capacity of 90 MW, the site is set to be the largest wind farm in the Southern Hemisphere. "Wind power is enjoying unprecedented growth in New Zealand and is on track to have grown four-fold by the end of the year to April 2005. Nationally, our wind resource is capable of supporting

developments that could provide over 20% of all our power needs," says Hodgson.

The granting by Government of tradable greenhouse gas emissions units enabled this development to go ahead sooner than it otherwise might. The units were awarded as part of the Government's climate change policy.

"The prospects for wind have never looked better. There is a consensus that the country needs more generating capacity, wind power is the generation type most preferred by New Zealanders and wholesale power prices are now at a level where a growing number of wind projects are economically viable," says Hodgson.

Seventeen turbines have now been commissioned. When complete, there will be 55 turbines with a total generating capacity of around 90 MW, enough to supply around 32 000 homes. The site is expected to supply power over 40% of the time, compared to 20-30% which is the norm for wind farms internationally.

EECA CEO Heather Staley commented that the speed with which Meridian were able to build Te Apiti shows that wind energy is a quick solution for energy generation. "Myths surrounding the viability of wind as a renewable energy source, suggest that one of the problems with building wind farms is the length of time this takes. Te Apiti is now generating energy and it's less than a year since the process got underway," said Staley. She added, "Now people understand the speed with which wind farms can be built, I am confident other communities around NZ will recognise the potential of wind farms and consider this important source of renewable electricity. There is potential for wind to supply half a million homes in New Zealand."

NZ Government, EECA, 5 August 2004

Designing a better urban future

A draft protocol to improve the quality of our urban environments is now available for public consultation, Environment Minister Marian Hobbs, Minister with Responsibility for Urban Affairs, has announced. "The Draft New Zealand Urban Design Protocol is a national commitment to improving the liveability and quality of urban design in our towns and cities," she said.

The protocol was developed by the Ministry for the Environment and an urban design advisory group of central and local government representatives, private developers, professionals and educational institutes.

"New Zealand is more urban than ever — 87% of us now live in urban areas, one of the highest proportions in the world," Hobbs said.

The protocol is intended to be non-statutory and voluntary but the Government will lead by example,

ensuring that quality urban design becomes better embedded in the decision-making processes of all government departments and crown entities. They will commit to the protocol by developing, monitoring and supporting a set of actions specific to their organisation.

A range of resources is also being developed to support the protocol, including case studies of successful urban design throughout NZ, an urban design toolkit and a "show case" of the economic, environmental and social benefits of quality urban design.

Hobbs said the protocol is an important component of the Government's Sustainable Development Programme of Action and is a key result for the 'Sustainable Cities' section, which seeks to make our cities healthy, safe and attractive places where business, social and cultural life can flourish.

A copy of the draft protocol and an electronic feedback form is available on the Ministry for the Environment website:

www.mfe.govt.nz/publications/urban/draft-protocol-aug04/index.html

Submissions close on 30 September 2004.

NZ Government, 6 August 2004

SEF Member Peter Olorenshaw has agreed to do a SEF submission. He comments:

I don't know if others have looked at this, but I can't find anything in it about:

- *Guaranteeing solar access*
- *Making new residential subdivisions solar friendly*
- *Trying to keep cars out of cities, or at least discouraging commuting by car.*

Urea plant problems

Fertiliser company Ballance Agri-Nutrients is warning that it will have to close its Kapuni urea plant if it cannot get a long-term gas supply contract at a 'realistic' price. Ballance is a co-operative 80% owned by 17 800 farmers, and produces 250 000 t of urea each year. The plant was built in 1983 and a \$M 50 expansion programme was completed in 1997.

The company has a five year contract with NGC that still has 10 months to run. Gas prices five years ago were about \$ 2.50/GJ and have since risen to about \$ 6.00–7.00/GJ. *The Dominion Post*, 30 July 2000

Maui replacement in PNG?

Sydney-based oil company, Oil Search, with extensive interests in Papua New Guinea, is preparing to sign a deal to ship gas to New Zealand for electricity generation. Company representatives have met NZ trade officials to present a proposal,

and the PNG Minister for Petroleum, Sir Moi Avei, said his government was "facilitating" the project. He said that PNG had established a bilateral framework to fast-track the project.

Oil Search has just signed a 'pre-development agreement' with a US-based company specialising in marine transport of compressed natural gas and a Japanese developer of industrial projects, to explore transporting CNG from Papua New Guinea to New Zealand. The companies will assess the potential to take gas from Oil Search's, "extensive resources in PNG," the market potential in NZ and the economic viability of transporting large volumes of ... natural gas. Engineering and design work could get under way at the end of this year.

Kent Atkinson, Archivistuff, 30 July 2004

(We thought this must in fact be LNG, but apparently not. But if not, the ship would need some very large and heavy tanks, with even more at the shipping and receiving terminals.

—EW)

NZ energy modelling workshop

The first NZ energy modelling workshop will be held at 09:00–17:00 on Wednesday 20 October 2004, at:

The School of Mathematical and Computing Sciences
Victoria University of Wellington
CO 249, Cotton Building, Kelburn Campus

The focus of this workshop will be on the modelling and simulation of aspects of national policy development, with an emphasis on identifying pathways toward greater energy sustainability.

<http://www.mcs.vuw.ac.nz/events/EMW>
Robbie Morrison (robbie@mcs.vuw.ac.nz)

Whisper Tech signs \$M 300 contract

In mid-August, Christchurch firm Whisper Tech signed a contract to supply 80 000 of their WhisperGen domestic power units, for NZ\$M 300. The units will be supplied to UK company Powergen and used for domestic heating and auxiliary power supply. Whisper Tech are now looking for subcontractors, probably mainly in Europe.

The WhisperGen unit uses gas or heating oil, and is claimed — under UK conditions— to reduce domestic energy costs by 40%. The units have been trialed in the UK for 3 years and are now entering commercial production. The order follows a trial order of 50 units and a pre-production order of 400 units.

Whisper Tech Managing Director David Moriarty says that the technology is ground-breaking. "The exciting thing for us is that the WhisperGen is the power station equivalent of the personal computer. It has the potential to revolutionise power supply options for the home market."

The WhisperGen will be the first commercially available in-home CHP generator in the European market, where six million domestic boilers are sold each year. The unit is sized as a suitable alternative for the bulk of this market. Powergen has estimated that, by 2020, at least 30% of UK homes could be using this technology.

The unit is not yet being marketed in New Zealand, where high cost and a shorter heating season make it less attractive.

WhisperGen

(But still better than burning gas in a central power station? — EW)

Another piece of the jigsaw

William Ruddiman, a climate scientist at the University of Virginia in Charlottesville, has a new theory that widens the debate about the timing and extent of human impact on climate. Ruddiman noted a telltale discrepancy in greenhouse gas levels revealed by ice cores. As the earth warmed after three ice ages, levels of atmospheric CO₂ and methane fell in lockstep with decreasing sunshine caused by cyclical changes in the earth's orbit. But after the most recent ice age the pattern changed. Atmospheric CO₂ levels began to increase 8000 years ago, followed by methane 5000 years ago, even though summer sunshine had been decreasing. "both gases followed the expected pattern for a while but then went up instead of down," says Ruddiman. He now thinks that early farmers clearing forests in Europe, India and China account for the surge of CO₂, while rice paddies and burgeoning herds of livestock produced the extra methane. *New Scientist*, 13 December 2003

Triple bottom line?

BP have provided EnergyWatch with a copy of their 2003 Triple Bottom Line Report. Inside the front cover they have highlighted one of four points under each of the three headings. We quote the highlighted points in full:

Environmental performance:

Red Bus, one of New Zealand's largest public bus fleets, chose to use BP low sulphur diesel in their 194 diesel buses.

Social performance:

Surf Life Saving New Zealand used BP IRBs (inflatable rescue boats) to rescue 1015 people on New Zealand's beaches.

Economic performance:

New investment in New Zealand increased by 33% over 2002, with \$32 million invested during the year.

Only one of these points, the financial one, covers the performance of BP itself.

Waitaki catchment legislation to proceed

Environment Minister Marian Hobbs has rejected a call from Waitaki Valley residents to drop the Waitaki legislation. The government will proceed with plans to establish a Water Allocation Board under the Bill currently before Parliament.

"Despite Meridian's announcement not to proceed with Project Aqua there are still substantial competing demands for water in the catchment and a large number of applications for water permits that need to be addressed," Marian Hobbs said. "A statutory framework to guide water allocation is needed and that's what the board will develop."

Hobbs again rejected claims that the original bill had been designed to facilitate Project Aqua. "In the absence of a water allocation plan, resource consent applications were being considered in a policy vacuum and the legislation was about ensuring an efficient, transparent decision-making process, which involves the community," she said.

NZ Government, 13 August 2004

SEF District Plan submission

In mid-July SEF made a submission to Wellington City Council, on their District Plan, supporting renewable energy. The submission stated:

The Sustainable Energy Forum supports the direction that Wellington City Council is taking in formally acknowledging the role that renewable energy and energy efficiency could make in the development of a sustainable future for Wellington City. The proposed changes address renewable energy and support wind energy, but do not offer enough support for the benefits that solar energy technologies could contribute to a sustainable future.

The submission specifically supported:

- Solar energy in all areas, for water and passive space heating.
- Considering the siting of buildings so they do not limit or block the solar resource available to another building.
- The Council undertaking a role as advocate and role model in encouraging the use of renewable energy and energy efficiency.
- Installation of solar water heating and solar electric panels on all new Council owned buildings, especially community facilities.
- Strongly support for the installation of appropriately placed and sized wind turbines in rural areas.
- Proactive Council action to ensure energy efficiency in its own buildings.

Where do the bikes go?

Cycle Aware Wellington spokesman Patrick Morgan says there is a problem with cycling in central

Wellington. CAW members are angry that the council was not prepared to clearly sign which bus lanes could also be used by cyclists. "Some bus lanes are signed 'bus lanes', some are signed 'buses only', some are painted green and some are not. The council has refused to signpost the cycling-legal lanes, despite our best efforts."

Morgan said the confusion would not encourage people to use bikes. Wellington was continuing to buck the national trend with a rise in the number of adult commuter cyclists, so it was important to sort the problem out.

It seems the group may have a point. Councillor Ian Hutchings said cyclists could use any bus lane, but WCC spokeswoman Trina Saffioti said cyclists could not use lanes marked 'buses only'. Saffioti said the distinction was made on safety grounds. It would be dangerous for cyclists to use narrow lanes heavily used by buses.

eCAN, *The Dominion Post*, 9 June 2004

Marsden B to run on coal?

On 18 August, Mighty River Power announced a public consultation process as part of seeking resource consents for a coal-fired generation plant at its Marsden Point site, south of Whangarei.

The company plans to obtain consents for a plant with a capacity of up to 320 MW by refitting into the existing Marsden B oil-fired plant, which was completed in 1978 but never commissioned. Mighty River CEO Doug Heffernan said, "While we ruled out recommissioning the Marsden B plant to run on oil as a dry year reserve plant earlier this year, we continued to look at alternate thermal generation options and believe coal is a good option for this site. Marsden Point has sound infrastructure with a good deep-water port for bringing in coal, access to transmission and cooling water and a location in a growing market in Northland with additional straightforward existing transmission access to the Greater Auckland region."

Marsden would help meet the growth in electricity demand after 2008 and reduce the threat to security of supply if no new gas supplies are developed. Subject to RMA approvals, the station could be operational in 2008–09.

"I expect community consultation on findings of the environmental studies to probably take place in October," says Heffernan.

However, Green Co-Leader Jeanette Fitzsimons pointed out that running Marsden B on coal will be polluting, but also inefficient because it was built before modern combined cycle technology.

"The bean-counters will certainly think that firing up Marsden B on coal is a low-cost option because its construction costs have long since passed through the books. But such a move will drive out

new renewables such as wind and cost the country dearly in lost greenhouse credits," said Fitzsimons. She suggested that firing on waste wood should be considered.

(A question for the experts please: Would it be practicable to fire boilers designed for oil on waste wood? — EW)

Tax relief for public transport?

Environment Canterbury (ECan) is calling on the IRD to exempt companies from paying fringe benefit tax (FBT) on company-subsidised public transport costs. The exemption would be an incentive for firms to pay employees' public transport costs and would increase the effectiveness of ECan's business travel plan. The plan is the first of its kind in NZ and should reduce participating company's single occupancy car use by 10%, if the results are comparable with those in the UK. "That's like reducing peak-hour traffic to that experienced during school holidays," said ECan transport policy analyst Michael Blyleven.

The FBT was originally designed to tax company perks such as private vehicles and business flights. ECan wants the IRD to encourage company payment of employees using public transport. "The FBT is one of the barriers to businesses subsidising public transport," said Blyleven.

The IRD is proposing to raise the tax-exempt individual quarterly allowance from \$ 50 to \$ 200. The maximum an employer can now subsidise employees is a total of \$ 2000, which means that large companies are unlikely to pay employee transport costs unless they are particularly interested in helping the environment.

The Christchurch Press, 22 March 2004

Improving appliance efficiency

New Zealand businesses and households are on the path to saving up to \$M 50 over the next 10 years under a new proposal by the Energy Efficiency and Conservation Authority (EECA). The measures are part of the Appliance and Equipment Energy Efficiency Forward Programme 2004–05.

As part of this initiative, Cabinet has approved new minimum energy performance standards (MEPS) for household refrigerators, air conditioners, refrigerated display cabinets and distribution transformers. The new standards will take effect from 1 October 2004 for these products with the exception of domestic refrigerators which will not be introduced until 1 January 2005.

Heather Staley, EECA Chief Executive, said, "These standards will identify types of equipment and appliances which are more energy efficient. By using electricity more efficiently, New Zealand can delay the need to build new power stations."

The new product classes covered by the Forward

Programme includes electric water heaters; commercial refrigeration; hot water cylinder wraps; distribution transformers; dairy water heaters; solid fuel heaters; gas water heaters; solar water heaters; building insulation; windows; gas space heaters; chargers for portable appliances; incandescent lights; dehumidifiers; motor rewinds; commercial lighting; electric ranges and two-stroke motors.

Ways to reduce standby losses from appliances are also included.

Copies are available at: www.eeca.govt.nz
EECA, 12–13 August 2004

More attention needed on pedestrian & cyclists

The safety of cyclists and pedestrians on New Zealand roads needs to be made a priority if alarming accident statistics are to be turned around, says a leading authority on traffic and transportation. At the Traffic Institute's annual conference in Napier, Glen Koorey, technical and policy adviser for the Cycling Advocates Network, said safety rules employed for motorists were not always effective for cyclists and pedestrians, and safety measures needed to look beyond the provision of specialist facilities for them.

Since 1988 injuries through motor vehicle crashes had halved despite usage increasing by more than 70%. In contrast, cycle and pedestrian accidents had increased in the face of falling numbers. "We've talked a lot about the big reduction in injury and accident rates due to various measures but walking and cycling have not seen those benefits and we've got to look at why that is," said Koorey.

Under-reporting of cycle and pedestrian accidents means less funding is available to tackle safety issues, and there is a misconception that the solution to safety problems was to spend heavily on specialist facilities. Instead Koorey advocates the adoption of a European model, with the reduction of traffic volumes and speed; better traffic management; and a reallocation of existing space, all considered before creating new safety infrastructure. NZPA/eCAN 21 July 2004

Huntly e3p, 385 MW power station

Genesis Energy has announced the go-ahead for a 385 MW new power station at Huntly, at a cost of \$M 520. The station should start generating in 2006.

The station name is short for Huntly Energy Efficiency Enhancement Project. It is a conventional combined cycle gas turbine (CCGT) plant which uses a gas turbine first, then converts what would otherwise be waste heat to raise steam to generate further power using a steam turbine. It will be sited alongside the existing Huntly steam turbine power station, and will use the gas supply pipeline to the old station, which is now fired on coal.

The government has facilitated the development by agreeing to share a limited amount of risk with Genesis, around the long term supply of gas. Energy Minister Pete Hodgson said, "This risk sharing arrangement is a one-off to smooth the transition to a post-Maui environment in which alternative gas sources have yet to be confirmed."

Genesis Energy has entered long term contracts for gas from Kupe, Mangahewa, McKee and Pohokura. "Against this background, it is thought that there is only a slim chance of sufficient gas not being available," said Hodgson.

Hodgson said the government's advice was that e3p was desirable and that likely alternatives did not offer adequate levels of certainty. He likened the Genesis Energy arrangement to earlier decisions to enable Meridian and Trust Power to bring forward 126 MW of wind capacity through the provision of emissions units, and to contracting Contact for the Whirinaki reserve generation plant.

However, Sustainable Energy Forum Convenor John Blakeley described the move as, "one more step along an unsustainable business-as-usual road for New Zealand's energy future," and added, "Today's announcement further delays the necessary transition to an alternative way of thinking about energy supply and demand that is vital for the long term sustainability of energy in New Zealand."

"The fact that the project has to be underwritten by the Government ... should be a clear signal that the technology of choice for gas-rich countries is no longer appropriate for New Zealand, which faces a shortfall in gas supplies within the next decade," said Blakeley. "The philosophy of pouring more and more electricity into an overloaded grid to meet unconstrained demand growth is simply not sustainable indefinitely."

NZ Government, 12 August 2004
SEF, 12 August 2004

Harvesting the wind (extract)

It is fair to say that some of the mythologies against wind are stunning in their complete disregard for fact. To explode a few of the myths:

- Wind turbines are bad for tourism.
Local bus companies run tours to the Te Apiti windfarm site and we are inundated with requests to visit.
- Wind turbines are noisy.
They aren't. Take a drive to our Te Apiti site and listen for yourself.
- Wind turbines distract motorists and cause crashes.
Transit thinks they are fine.
- Wind turbines cause epilepsy.
Not according to the British Epilepsy Foundation.

There is still a long way to go before wind takes its

rightful place as a key component in New Zealand's electricity system. So what is needed to make this happen?

Local government and planners must recognise that wind power is here and is likely to be a valuable contributor to local economies and infrastructure. They must take the initiative in their planning processes. The Manawatu and Tararua regions are great illustrations of how communities can get behind wind development.

The wind industry must drive toward a long-term goal of local manufacture of towers, blades and nacelles. This will facilitate growth and strengthen the industry.

Adam Muldoon

NZ wind development manager, Meridian Energy
The Dominion Post, 18 August 2004

SEF Conference

Victoria University of Wellington, Rutherford House (the old NZED building, by the main bus station)

Thursday Nov 18 to Saturday Nov 20

Think Big or Think Smart?

- Make a diary note — now!
- Call for papers

See the SEF website: www.sef.org.nz
Or contact the SEF office: info@sef.org.nz
P O Box 11 152, Wellington

SEF AGM

The next Annual General Meeting of the Sustainable Energy Forum will be held at Rutherford House, Wellington at 08.30 on Saturday 20 November 2004, in association with the SEF Conference.

Breakfast will be provided.

SEF members who cannot attend, please let us have your proxy vote. E-mail us saying something like this:

*I cannot be present at the SEF AGM on 20 November.
I appoint [name] as my proxy.*

The name can be 'The Convenor', or any SEF member who you know will be there.

EnergyWatch

This is our first 36 page edition (nominally 27 200 words, but you would be amazed how many words the spell checker thinks are lurking in a web address). The three copies that go to corporate members are a noticeably tighter fit in the envelopes. However, our standard length remains 28 pages.

Current policy is to increase length as justified rather than to do extra editions (the last was in May 2002). The new policy is cheaper and allows a more consistent publication schedule.

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

SEF membership

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

Membership rates, including GST, are:

Unwaged / student	\$	22.50
Individual	\$	45.00
Library	\$	56.25
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