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Time for an energy policy

John Blakeley

In *The Energy File* (28 February) ACT Party leader Richard Prebble is quoted as saying:

New Zealand seems to be headed for a major electricity shortage as Maui gas fields appear to be exhausted much sooner than predicted and the Pohokura field appears to be much smaller than predicted.

The government's reaction to this prospect is to declare it a failure of the market and to say that what is needed is more planning.

There is no shortage of new alternative sources of energy. Meridian Energy has spent millions already on a new hydro scheme for the Waitaki, capable of creating significant electricity, and importantly without violating our Kyoto commitments.

It is most pleasing to see this 'Road to Damascus' conversion of the ACT Party towards renewable energy and the importance of the Kyoto Protocol!

Also on 28 February, a group of nearly 100 people, very widely representative of the energy sector in New Zealand, were meeting at a Hydrogen Workshop in Wellington, to discuss how and when a hydrogen economy might be developed.

When the break-out groups reported back there was an almost unanimous view that the most important issue was to develop a future energy 'Vision.' It is just not possible to develop proposals for a hydrogen economy without knowing how it will fit into a wider vision of our energy future.

In the discussion of this wider vision at the Workshop, people also called it an energy framework or energy strategy. One or two brave souls even used those awful 'P words' — energy *policy* or (even worse) energy *planning* — without being drummed out of the Workshop! These words have been banned from official circles in Wellington since the aftermath of the infamous 'Think Big' projects of the early 1980s.

Whatever word you use, there are a many pieces of the energy jigsaw which we need to fit together, to achieve a sustainable energy future. In his opening speech to the Workshop, the Associate Minister of Energy, Harry Duynhoven, discussed where hydrogen fits into general government policy. He mentioned five policies or strategies directly relevant to a hydrogen future: energy efficiency (NEECS); renewable energy and climate change; growth and innovation; and sustainable development.

When trying to solve a complicated puzzle, it is often wise to start by putting pieces together in certain areas, such as the above five policies. But to complete the task, it is then necessary to bring all these areas together and that is what in my opinion an energy vision/framework/strategy should aim to do.

The SEF Annual Conference to be held at UNITEC in Auckland on the weekend 5-6 July 2003 under the title Achieving Targets for Sustainable Energy in New Zealand *(see page 24 — EW)* will discuss just what might be achievable in just two areas: energy efficiency and renewable energy, but even that is just not possible without considering how these areas fit into a wider energy framework.

Despite Prebble's views, I believe that the premature decline of the Maui gas field, outlined on the next pages, is a firm wake-up call to the whole of the energy sector in New Zealand. We need to urgently work together and consult widely to achieve an overall energy 'vision' which has wide buy-in within the sector. I am sure that most of those present at the Hydrogen Workshop would agree.

The story of Maui

The need for improved management of New Zealand's gas resource

John Blakeley, Steve Goldthorpe and Kerry Wood
Sustainable Energy Forum

The story begins with discovery of the Maui offshore gasfield in 1969, a very large field by any standard. In 1973 a development contract was signed, based on the government's expectation that the gas would be used in large thermal power stations, needed to supply rapidly growing electricity demand. The contract included a 'take or pay' clause: once Maui was in operation, any unused gas within the agreed off-take allocation had to be paid for, but with the possibility of taking it later in the contract without further payment.

In the event the projected demand was unrealistic and by 1978 the Government was committed to buying more gas than it could use. This led directly to the 'Think Big' projects of the early 1980s, but that is another story!

The Maui A platform was completed and production started in 1979. The contract is for 4060 petajoules (PJ)[1] of gas over 30 years, an average of about 135 PJ/yr. We understand that there is provision for an early end to the contract if the economically producible reserves are exhausted. The contract take-or-pay quantity is 170 PJ/yr from 1988–89 to 1996–97, with ramp-up and ramp-down periods before and after. The original estimate was around 5500 PJ of recoverable gas, but estimating reserves at a very early stage is inherently difficult.

Delays in completing the Maui A platform meant that the first gas deliveries were late, and the off-take quantities were adjusted.

Contract redetermination

In the Maui contract there was provision for redetermination of gas reserves soon after completion of production well drilling (from the platform, as opposed to exploration wells drilled from a floating rig), and then every two years. This would allow off-take quantities to be adjusted as needed. Redeterminations were not called for by the parties to the contract and — at least publicly — none were done until 2001. No adjustments were made. Reserve estimates provided by the field operators remained above the contracted 4060 PJ up to 2001 but left little margin for error.

The DSIR originally had the right under the Petroleum Act to monitor flow and pressure data from the Maui field. In October 1985, they reported that reserves were probably near or below 3930 PJ: only 97% of the contract quantity. However, the Government's consultants considered that the original estimate of around 5500 PJ was correct. Had the DSIR's view been taken seriously, and a redetermination done about seventeen years ago, the now-inevitable disruptive changes could have been avoided. Government subsequently denied the DSIR access to Maui data and so became entirely dependent on industry experts.

Reserve estimates downgraded

The January 2002 *Energy Data File,* published by the Ministry of Economic Development, reported that estimated total recoverable gas reserves at 1 January 2001 were 4130 PJ, of which 1324 PJ remained. This was stated to be a downward revision of the estimate a year before: 4238 PJ of total recoverable reserves. These figures are above the contract quantity and so no great cause for concern.

The Minister of Energy's press release of 7 February 2003 *(see page 6 — EW)* gives the November 2001 estimate as some 3800 PJ of total reserves: below the contract quantity and very close to the DSIR figure. It also states that the Independent Expert has now confirmed the estimated total Maui reserves as 3562 PJ of economically recoverable gas (about 88% of the contract amount) with 370 PJ remaining on 1 January 2003.

Developing problems

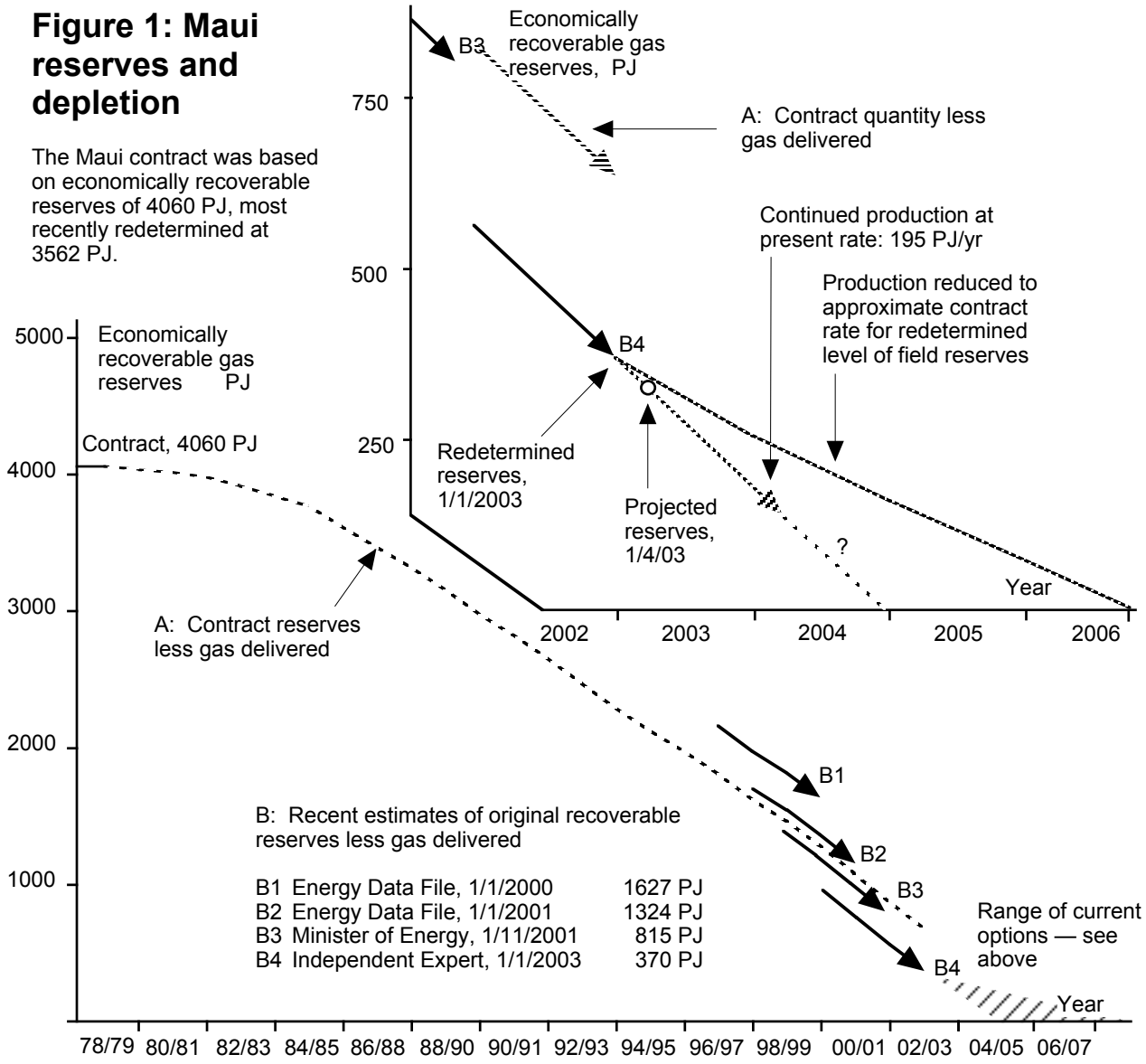
The effect of all this can be seen in Figure 1. Curve A shows the original contract quantity, less gas deliveries since 1979. It shows the off-take rate building up rather slowly, consistent with the known use of the take-or-pay clause until the 'think big' projects were in place.

Estimates of remaining gas quantities, given in the *Energy Data File* for 1 January 2000 and 2001, are shown by the arrows on curves B1 and B2. Both show three years actual extraction (the slight bends in the arrows are changes in the annual extraction rate), ending at the estimate date and estimated remaining quantity. Both are above the curve of contract quantity less gas delivered (Curve A) indicating more gas in the reservoir than

[1] A petajoule is a unit of energy, 10^{15} Joule, equivalent to about 28 million litres of petrol, or about 1% of NZ's petrol use

Figure 1: Maui reserves and depletion

The Maui contract was based on economically recoverable reserves of 4060 PJ, most recently redetermined at 3562 PJ.



contracted. However, the next estimate (Curve B3, data released on 7/2/2003) is more worrying: the remaining reserves were lower than contracted. Curve B4 shows that the estimate by the Independent Expert was worse.

These changes are non-trivial: for curves B2 and B4 the 'lost' gas is 564 PJ, with a contract value of around $ 1.1 billion, or perhaps twice that if the gas price was internationally competitive. Worse still, delays in appointing the Independent Expert meant that over a year passed before he reported. In that time over a third of the remaining gas was used, leaving very little time to develop alternatives.

Unless flow rates have recently been reduced heavily, extraction in the first quarter of this year will already have reduced reserves by some 50 PJ to around 320 PJ: enough for another 20 months at 2002–02 rates.

In response to a SEF press release, Shell recently stated categorically that, "The Maui cupboard is bare," with no more than the 370 PJ identified by the Independent Expert available at any price.

What went wrong?

The reduction in reserves determined by the Independent Expert is not particularly large. What makes it a major problem is that the redetermination is so late in the contract, combined with high production rates late in the life of the field.

Possibly the biggest single factor is that in the 1990s the Government took its eye off the ball. In 1991 it on-sold its rights to pre-paid gas at a heavily discounted price to three users. Since then, each user has been trying to use or sell this pre-paid gas as fast as possible, to maximise their own share before the field runs out. It seems that the present Government is either still not watching or

— much more likely — has decided that any attempt at action would be bogged down in the courts until all the gas was gone. We have already seen signs of this, with Methanex delaying the redetermination.

High production rates

A major area of concern is the current rate of gas off-take. Figure 2 shows recent actual annual rates (solid stepped line), and the rates proposed in the original agreement (upper broken line). The original contract provided for a 10 year ramp-down, closing when production was down to 40% of the take-or-pay rate, because high fixed operating costs would make any lower rate uneconomic. The actual rate has not been ramped down in this way, and in 2002 it was about 195 PJ/yr, half again as high as intended in the original contract. However, because of lower than expected reserves we now have the remaining gas quantity that was expected some three and a half years from the end of the contract (lower broken line in Figure 2); the Maui contract 'clock' is about two years fast. After allowing for this, the current production rate is double the contract rate, and likely to be too high.

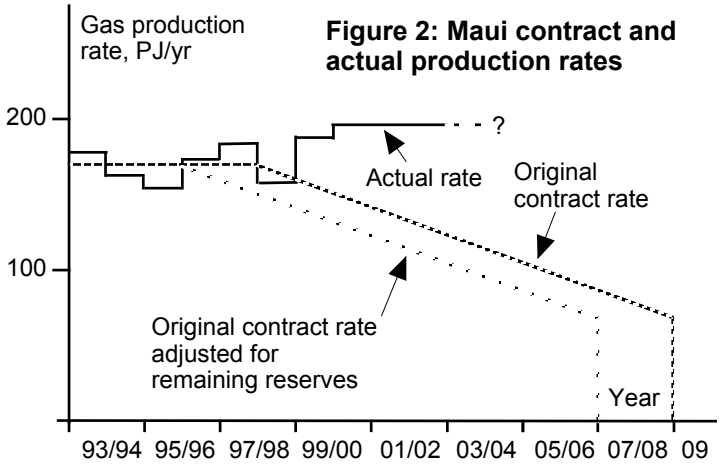


Figure 2: Maui contract and actual production rates

High production rates matter because they may limit the total gas quantity recoverable. Gas coming out of pores in sand-like rock is displaced by groundwater coming up from below (the top of the field is sealed by an impervious 'cap rock' which makes gas and oil accumulation possible). All is well when water movement is slow, but if it is too fast, water may rise more quickly in some places than others, for example by coming up a fault in the rock. This may leave isolated pockets of gas, or the well may produce too much water with the gas. As the field reaches the end of its life, the surface area of the gas/water interface shrinks (think of filling a spherical tank). Extracting a Petajoule of gas raises the water level further than it did when gas extraction began. This is the reason for ramping down the production rate (the ramp-up is just the practicalities of building up production and use).

Determining maximum production rates is a highly specialised area and we cannot say whether current rates are a problem at Maui, but what we can say is:

- Over a billion dollars worth of gas has somehow been 'lost.'
- The highest extraction years have been 2000 – 2002, late in the life of the field and at a time when the original contract expected extraction rates to be falling. It is known that the Maui 'tap' was turned up during the electricity shortage over the winter of 2001, but why has this continued?
- Reserves are lower than originally expected at this stage of the contract, so production rates should probably also be lower.
- Most or all of the parties now involved have an interest in rapid depletion. Gas purchasers can maximise their own share of the remaining gas by taking it quickly. Maui Development Ltd have been paid for much of the gas and will avoid very substantial operating costs if the field closes early. On the other hand, they may still wish to get more oil out.

If the 'lost' gas is not due to excessively high extraction rates, an alternative explanation is that the field estimates were wrong: the gas was never producible economically, or was never there in the first place.

Future off-take rates

Two of many possible off-take curves for the remaining life of the field are plotted in the inset to Figure 1:

- Continued extraction at the 2001–02 rate of about 195 PJ/yr, nominally leading to the field closing in late 2004. In practice this will probably not happen, because production difficulties or further 'loss' of gas will intervene. Indeed, production problems may already have begun.
- The extraction rate generally following the production ramp-down originally intended for this level of reserves (lower broken line in Figure 2), nominally leading to the field closing at the end of 2006. This is the depletion rate used in the table opposite.

We are already too late to reduce gas production in

the first quarter of 2003, and are apparently still using gas at very roughly half a Petajoule a *day* — business as usual. Taking this into account and referring to the bottom curve in Figure 2, a speculative but reasonable off-take rate might be: 2003, 115 PJ; 2004, 95 PJ; 2005, 85 PJ; 2006, 75 PJ, or a total of 370 PJ — the redetermined reserves established by the Independent Expert.

On this basis, and making the optimistic assumption that petrochemical use can be stopped very soon, the allocations in the table below will be possible. Obviously, this ignores production from other gas fields, both existing and new. However, with Pohokura unlikely to come on-stream before 2006, *(see page 20 — EW)* and Kupe later still, it is clear that avoiding major disruption will be a challenge, especially if we get a dry year soon.

	2002 PJ	2003 PJ	2004 PJ	2005 PJ	2006 PJ	2007 PJ
Electricity gen	90	60	60	55	50	–
Petrochemical	70	20	–	–	–	–
Industrial	20	20	20	15	10	–
Domestic/ Commercial	15	15	15	15	15	–
Total	195	~115	~95	~85	~75	–

In the 2001 dry year, extra gas from Maui made up for reduced hydro-electricity generation. We face some risk of the same threat this year — described by Energy Minister Pete Hodgson on 20 March as a "distinct possibility." Perhaps we can 'borrow' a little gas from later years, but not much, and there is no help available from Maui if any later year is dry.

Other dry year measures

One helpful measure will be to maximise coal burning at Huntly power station: we understand that little more is needed than to strip the overburden from the coal seams. This would be a bad start to meeting New Zealand's Kyoto Protocol commitments, but better than power cuts. Another useful measure would be to run New Plymouth power station on oil, and work to make this possible has begun *(see page 6 — EW)*. Yet another would be to increase production from the Kapuni and the smaller fields, although the high carbon dioxide content of Kapuni is another Kyoto problem.

Pohokura will help in the medium term, and in the longer term sustainable energy options — wind, geothermal; biomass and energy savings — are already competitive with Pohokura and later gas supplies. Unfortunately the sustainable options have been too long neglected and cannot now be introduced as quickly as needed.

What else is possible? In 2001 an energy-saving campaign was helpful, and in 2003–2008 any similar campaigns could be more useful if started earlier in the year. Consumer participation in the electricity market would also help *(see page 9 — EW)*.

Another option is importing LNG: liquefied natural gas. Industry murmurings have already begun and we expect to see a widely trumpeted proposal any time now. But LNG is a long-term, high-cost option, and we should not be railroaded into it simply because it can be introduced quickly.

New power sources needed

New Zealand must urgently move away from meeting growing electricity demand with more thermal power stations, and towards renewable electricity supply, including wind, geothermal, hydro and forestry biomass. The Minister of Energy sees these as likely to be the most cost-effective source for new electricity generation for the next two decades, and has recently announced credits against future carbon taxes for wind farms with a capacity of 80 MW *(see page 23 — EW)*. These are pilot 'Projects mechanism' credits under the Government's National Energy Efficiency and Conservation Strategy. The intermittent nature of wind energy is a concern to some, but with 65% hydro-electricity, wind turbines can be thought of as conserving water behind the dams, whenever the wind blows.

Any non-renewable generation policy would be high risk. The disappointing results from Tui indicate one risk *(see page 18— EW)*, and the unknown cost of Pohokura gas is another — it is likely to have a wellhead price of around twice the cost of Maui gas. Renewables on the supply side, and energy efficiency and demand management on the demand site, are now the safest approaches.

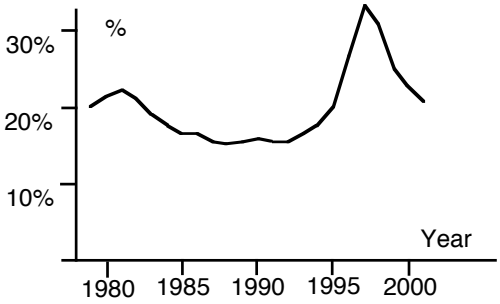
And we need to find out the real story of Maui, and what lessons can be learned. The one thing that is certain is that we don't have the whole picture.

An afterthought

The Maui field is a gas and condensate field, but the Maui contract covers only the gas. A gigajoule of condensate has a much higher value than a gigajoule of gas: it may be worth three or four times as much as the contract price of Maui gas, or possibly a lot more allowing for a proportion of the gas being pre-paid under the take-or-pay clause. The *Energy Data File* tells us that over 30% of the total energy in the Maui resource is, or was,

condensate. The curve below shows annual condensate production, expressed as a proportion of the total hydrocarbon energy produced (from the *Energy Data File*, July 2002, Tables D2a and E1a). In 1997 and 1998 the energy produced as condensate was over 30% of the total energy production from Maui. By 2001 this liquid fraction had fallen back to 20%. Is it partly the tailing off of the lucrative yield of condensate that results in there being a shortage of Maui gas "economically recoverable at the Maui contract price?"

Proportion of Maui energy produced as condensate



Redetermination of Maui gas reserves

New Zealand Government, 7/2/2003

The Crown has received the final redetermination of gas reserves from the Independent Expert carrying out the review of the Maui field. The Independent Expert was appointed under the Arbitration Act after parties to the Maui Contract were unable to agree on the remaining reserves.

The Independent Expert has confirmed that the Maui reserves are lower than originally estimated. He has concluded that total reserves are 3562 PJ. This compares to November 2001 estimates of approximately 3800 PJ. Taking into account total usage to date, this means that from 1 January 2003, approximately 370 PJ of Maui gas will be economically recoverable at the Maui contract price.

The parties to the Maui contract will now settle on a lower rate of off-take for the field, to make the best use of remaining reserves. The reserves will be allocated across the remaining time until the Maui Contract expires in 2009.

"Over the next five years, New Zealand faces a fundamental transition in our energy supply," Minister Pete Hodgson said. "We have enjoyed over 20 years of cheap, bountiful Maui gas, and that era is now drawing to a close."

As off-take from Maui decreases, gas extraction will shift to multiple smaller fields. The largest of these, Pohokura, is currently expected to begin production in early 2006, but fields such as Kapuni, TAWN, McKee, Mangahewa, Rimu and Kupe are also likely to play important roles.

Preliminary Ministry of Economic Development analysis shows that for the next few years some existing thermal stations may switch to coal or oil as a fuel source. This is because Maui is running down earlier than originally anticipated. However, for most of the next two decades, recent work by the Ministry of Economic Development shows renewables like wind, geothermal, hydro, and forestry biomass are likely to be the most cost-effective source for new generation.

"It's also important to remember that New Zealand wastes at least 20% of the electricity that is generated, through inefficient lighting, heating, appliances and industrial processes. The Government''s National Energy Efficiency and Conservation strategy is about capturing some of that wasted energy, at a profit to homes and businesses, and at a much lower cost to the economy than building new generation."

The Minister of Energy has instructed government officials to incorporate the Maui figure into their detailed energy modelling, and provide an update within a week on future projections for gas and electricity supply and pricing, and new generation. The Minister will brief the media on these detailed projections once the analysis is complete.

Contact Energy responds to Maui redetermination

Contact Energy

Contact Energy has announced plans to restore dual-fuel capability to its New Plymouth power station, to help meet possible gas shortfalls as the Maui gas field winds down. Equipment is being replaced and a new resource consent applied for.

The upgrade will apply to four of the 100 MW units, although Contact will only seek to run a maximum of three units on liquid fuels at any one time. Contact's chairman, Phil Pryke, said, "Restoring New Plymouth power station's capability to run on liquid fuel is a key ingredient in our planning to deal with possible gas shortages over the next few years."

Redetermination of reserves

The redetermination of economically recoverable reserves confirmed the warning first issued in late 2001 that the Maui field has significantly less gas remaining than was previously estimated. "There is no magic bullet solution," said Pryke. However, there are a number of clear areas where there is obviously a requirement for swift action:

- The flow-on impacts of Maui redetermination need to be settled rapidly. In particular, the parties need to swiftly resolve revised usage profiles that will apply to remaining reserves;
- The so-called 'use it or lose it' provisions of the Crown Minerals Act should be strictly enforced. This applies particularly to the Pohokura and Kupe fields;
- There is urgent need for a regime that guarantees open access to the gas transmission system. Without that, no investor will move willingly to develop non-Maui resources;
- The industry needs to develop a gas balancing regime that can manage short term fluctuations in gas availability.

Security of supply and the steps needed to ensure it are essential underpinnings to the future development of the economy as a whole.

"There is no option here just to 'muddle through'," said Pryke. "Failure to act decisively on these issues not only increases the likelihood of under-investment in new energy sources and generation, but also increases the likelihood of pressure for a political solution. It would be disastrous, for example, if the problems in the gas market were to be addressed by attempts at further reform in the electricity market."

"While I acknowledge that there is scepticism in some quarters about NZ's electricity market arrangements, the fact is that they are working well — giving clear signals to and prompting action by all parties on both the short and long term trends in electricity supply and demand. The plan to restore dual-fuel capability at the New Plymouth plant is a clear example of the electricity market working.

"Such problems as do exist are concentrated in the gas market. It is essential therefore that any regulatory focus remains on gas sector issues and allows the electricity market to continue to function and mature," Pryke said.

RMA changes for renewable energy, climate change

NZ Government, 10/2/2003

The Government is amending the Resource Management Act to give greater weight to the national benefits of renewable energy and to give a clearer mandate to consider the effects of climate change.

Energy Minister Pete Hodgson said the amendments would reflect the importance of energy and electricity supply in the government's Programme of Action on Sustainable Development. They would also help meet the renewable energy target set under the National Energy Efficiency and Conservation Strategy. "The government is well aware of growing pressure on New Zealand's electricity generation capacity," Hodgson said. "Renewable energy is one of the most effective and sustainable ways of meeting this demand."

"This change will smooth the path for renewable energy while retaining the necessary environmental safeguards," Environment Minister Marian Hobbs said. "The RMA will still require consideration and management of the environmental effects of renewable energy production." Amendments are likely to involve changes to sections 2 and 7 of the RMA, providing explicit national direction on the importance of renewable energy. The changes to the RMA will make it clear that improving energy efficiency is also a key national objective.

The government has already announced an amendment that will remove the requirement for regional councils to have regard to the global effects of greenhouse gas emissions through resource consents, as these will be managed by national climate change policies. At the same time councils will be directed to have regard to the local effects of climate change (such as rising sea levels) when preparing or reviewing their plans or making decisions on resource consents. "Councils are not explicitly required by current law to do this and they differ in the extent to which they do so," Hobbs said. "If required, in due course we may introduce a National Policy Statement on climate change to provide binding statutory guidance." "These changes will be given priority by government and we expect they will be passed into law in the latter part of this year," Hobbs concluded.

In hot water

This article is based on a round of the SEF discussion group, put together from insights and debate by various authors. Thanks to Arthur Williamson for starting this one.

HEEP (the Household Energy End-Use Project) has now been running for six years, and has data on 414 randomly selected and monitored houses, plus a further 66 non-randomly selected. We understand that only one house monitored so far has a solar hot water system.

Average domestic water heating requirements from HEEP data are:

	Hot water use KWh/day	Standing losses kWh/day	Total kWh/day
Electric	5.3 ±0.4	2.6 ±0.1	7.9
Gas storage	12.0 ±2.0	4.0 ±0.2	16.0
Gas instant	14.0 ±1.0	–	14.0

The first figure in each row is the energy used to get the water up to temperature; the second is the standing loss — the energy to keep it there. Other things being equal, standing losses are higher on smaller tanks, such as under-bench units.

The HEEP data shows that there are many old (C and D-grades: pre-1986) tanks around, making tank replacement or blanketing good options for greater efficiency. A-grade cylinders became compulsory on 1 February 2003 (apart from selling off existing stocks and perhaps a small second-hand market).

The figures imply that gas water heaters use at least twice the energy of electric heaters to do the same job. Electric immersion heaters are virtually 100% efficient (if generation and transmission losses are ignored), so the figures imply an average gas efficiency of less than 50%. Alternatively, householders may tend to install gas because they anticipate above-average hot water use. However, properly installed new gas water heaters should achieve around 70 – 80% thermal efficiency — 90% is claimed for one storage heater, excluding standing losses. To compare gas and electric heating on a consistent, new installation basis it is therefore reasonable to assume that electric heating is 100% efficient and gas water heating is 75% efficient.

Storage volumes are similar for gas and electric, but electric cylinders tend to be set hotter — older systems in particular are sometimes dangerously hot — and tank losses increase with temperature. Recovery time is an issue here: a SEF member recalls a very small (~125 litre) gas storage system that was run cold by filling a bath, but then recovered in 20 minutes — quick enough to top up the bath!

Which system to choose?

As is so often the case, it all depends — and wetback or solar thermal systems are other options. A very efficient but expensive option is to stay with electricity but use a heat pump. There would be a substantial efficiency gain (up to 340% consumer efficiency for water heating according to one manufacturer: see <http://www.qes-hw.com>), with a corresponding reduction in demand for the marginal electricity generators. Another potential option is the WhisperGen gas-fuelled heater /generator, but this NZ company is not marketing locally, reportedly because gas may become scarce and electricity is cheap!

The instinctive answer to the gas or electricity choice is is to use gas directly, instead of sending half the energy up the chimney of a gas turbine power station , or two thirds at the Huntly (steam turbine) power station.

In practice the efficiency losses in domestic systems reduce the benefit of using gas directly. Assuming that the electricity comes from a CCGT station running at 50% efficiency and there are 10% transmission and distribution losses, the non-renewable energy use for water heating is (7.9 /(0.50 x 0.9), or 17.5 kWh of gas energy a day. Assuming a lower power station efficiency of 35% (Huntly) the non-renewable energy requirement goes up to 25 kWh/day. A new domestic gas hot water system at 75% efficiency would use about (7.9/0.75) or 10.5 kWh/day of gas energy.

These figures indicate that we can often make better use of dwindling supplies of natural gas by using it directly in new gas water heating systems, than by first converting it into electricity. And the overall costs are better if old and inefficient gas systems are replaced with new, re-using the existing distribution system.

Downsides to gas water heating are:

- A gas supply will have a separate standing charge, pushing up overall energy costs.
- An instantaneous gas heater may have a pilot light, further reducing efficiency (a pilot light in a storage heater is at least helping with standing losses).

- Instantaneous heaters generally have less good heat transfer than storage water heaters.

Any electricity demand reduction achieved by conversion to gas heating would include peak savings, which would reduce gas consumption by the marginal electricity generators — which is little help to house owners while the gain is simply pocketed by the generator-retailers.

Pipe losses

Water heating efficiency is only part of the story: pipe losses are a problem common to most systems. One SEF member, living in an old house, measured the water needed to run the tap hot at six litres. All that is water that was hot when it left the tank, but then cooled in the pipe when the tap was turned off. A litre or two is enough for hand washing, so in this particular case the overall system efficiency is only a fraction of the heater efficiency. Insulating the pipe will help if the next draw-off is soon — while the water in the pipe is still at an acceptable temperature — or may simply mean that the water cools a bit more slowly. Other losses are hot water pushed out of a storage tank as the main body of water in the tank expands under heating, or uninsulated pipe connections conducting heat away from the tank.

All this points towards a counter-intuitive suggestion: for frequent hand washing, an electric instantaneous heater will be a good idea: no tank losses, no pipe losses and low internal thermal mass. Or washing in cold water is better still.

But a more general conclusion is that solar water heaters (savings around 50%) are a better deal in greenhouse terms than converting to gas, which has non-renewable energy savings (compared with electricity) ranging from about 65% to a total loss (–100%), depending on where the power comes from. And gas has a second standing charge.

And on the supply side, wind turbines (non-renewables savings nearly 100%) aren't bad either.

HEEP reports are available from BRANZ.

Wind growth in Europe

Europe's wind energy industry grew by 40% in 12 months, mainly as a result of new wind farms in Germany and Spain, a European Wind Energy Association (EWEA) study showed. Installed capacity rose to 20 447 MW, from 14 652 MW in the twelve months to October 2002, in the 21 countries included in the study.

Planet Arc, 15/11/2002

More on the electricity market

In December, EECA put out a press release making a compelling case for demand side participation in the New Zealand electricity market.

EECA Chief Executive Heather Staley said a report, *Exploring Our Untapped Electricity Resource*, shows that up to $M 100 of electricity cost savings may be available to medium and large energy users through demand-side participation. The report highlights how the electricity market is immature and how medium and large users are often captured by imperfect supply agreements. In a developed market, both buyer and seller are fully aware of the price. But NZ's larger users are exposed to the electricity spot market, but have no idea of the price of electricity until 24 hours or more after they have used it. For the market to operate as it should, the demand side must be given timely information and the ability to participate.

If retailers allow the market to work, the opportunities are huge. Demand response can deliver a peak supply reductions of 250 – 900 MW (roughly equivalent to the generation from a new combined cycle gas turbine plant), which will manage exposure to spot electricity prices at times of peak demand. The value of tapping into this resource could be as high as $M 100 and will also reduce the need for generation from inefficient plants which sit idle for all but the peak demand times of the year.

Medium and large electricity users must turn the heat on their suppliers to allow them to be an active demand-side participant in the market. They should demand timely price signals from their retailer that can enable them to respond by rescheduling their load, or to run standby generation as a back up.

"Many New Zealand businesses have switched on to the fact that energy efficiency saves them money, and now we hope to show businesses how they can have more influence over the price they are charged for the energy they do use," Staley said.

SEF's response

Issued as a press release

"The issue is not whether electricity costs **can** be reduced, but whether the generating-retailing companies will **allow** this to happen" said Molly Melhuish, energy analyst for the Sustainable Energy Forum. Melhuish was welcoming an EECA

report released this morning about the ability of demand management to reduce electricity costs for New Zealand businesses.

Active demand-side participation — customers knowing the price and responding — would reduce growth of the peak demand that drives the 'requirement' to build new power stations. But it would also reduce the profits that generator companies need to fund the new power stations. The power companies have little incentive to pay customers to use less energy (save kWh) or to reduce demand (reduce peaks) — other than to keep the Minister of Energy happy.

Peak load response is just one of four types of demand management, and all four together are needed to effectively reduce the cost of electricity:

- Energy efficiency is the most important. If targeted to locations where supply is constrained, investments in energy efficiency could generate 'negawatts' at typically less than half the cost of electricity from new power stations.
- Peak load response targets changes in the time of use. This is particularly favoured by electricity retailers because it is most easily controlled by them.
- Fuel switching: using solar water heating, gas or firewood to replace electricity, especially in dry years.
- Distributed generation: installing small generators, such as wind turbines, and also using the stand-by generators in commercial or industrial buildings at peak hours.

Together these technologies could easily halve the growth of electricity demand, and reduce the cost of electricity to all consumers. But there are other barriers, and the Government needs to take a stronger lead to eliminate these. The present system of industry self-regulation will perpetuate this costly bias towards supply-side investments.

Maui Warnings

On February 5 there was a generator failure on the Maui A platform, and gas supply was interrupted for several hours. Gas fired power stations were shut down at once. Electricity spot prices went very high and supply failures were only barely avoided.

London introduces congestion charging

Kerry Wood

On February 17, London introduced a congestion charge for motor vehicles, with a £ 5 (€ 8, NZ$ 15) daily charge to enter the central area. This is by far the most ambitious charging scheme yet, and cities around the world are watching the outcome carefully. Maurizio Tomassini, Director of the Mobility Agency of Rome, stated that the failure of the London scheme could set road pricing back 10 years. The scheme is strongly linked with Mayor Ken Livingstone, who gained a strong mandate when he campaigned on congestion charging, and whose political future is now riding on the scheme.

The charging area is bounded by main roads that are just outside it, to minimise the problem of local congestion caused by traffic going around the charge area. The boundary roads include Euston and City Roads in the north; Tower Bridge in the east; Kennington Lane and New Kent Road in the south; and Park Lane and Vauxhall Bridge in the west. Most of the main line railway stations are just outside the charging area.

The system works by reading number plates automatically, using technology developed for security when the IRA was active in the city. Some 400 video cameras are used at 230 sites: 56 of them within the charging area, the rest on the entry points. Video signals are processed to locate and read the number plate of each vehicle, then look up whether that vehicle has paid to be in the area. Surprisingly, correlating infringements with vehicle registrations is done manually.

The entry fee applies on weekdays between 07.00 and 18.30, and must be paid by 22.00 the same day. Late penalties are steep, starting at about € 15 for payments by noon the next day, and increasing to € 180 after 28 days. Payment can be made at cash outlets, by phone or online, but on the first day the phone system crashed and some 10 000 vehicles incurred penalties.

Exemptions have been granted to motorcyclists, taxi drivers, health professionals using their cars for work, and disabled drivers. Residents who live within the charging zone get a 90% discount, paying about € 0.30/day when their cars move in the zone.

Reactions have been strong and predictable, both for and against. Opinion on the scheme is fairly evenly divided, but there is strong support for a charge of some sort, with profits recycled to

improve transport. Two thirds of residents support more bus lanes and better facilities for pedestrians and cyclists — and all of these will tend to reduce the car-carrying capacity of the streets. Less predictable is how effective the scheme will be, with organisers predicting a 10 – 15% traffic reduction, gaining a 20 – 30% congestion reduction. However, the first day traffic reduction was much bigger, at 25%, and this was maintained throughout the first week — there were complaints from cyclists and pedestrians that some traffic was too fast. On 7 March, after three weeks operation, traffic levels were 17–18% below normal, with all traffic flowing smoothly — including traffic on the ring road just outside the charge area. Officials expect that it will be two or three months before the scheme can be properly evaluated.

The system has cost €M 300 to set up, with expected operating costs of €M 75 a year. Expected revenue is €M 200. Profits will be used mainly to give buses greater priority, with a major package of bus priority measures recently announced, covering 21% of the city's 3000 km of bus routes. Other schemes to be supported include bus security, safe routes to schools, and road safety. Wider economic benefits are also expected, with fuzzy benefits such as vitality and quality of life, but also concrete benefits such as greater retail turnover and tourism.

Inevitably there were claims that public transport would be unable to cope, but the reality is more encouraging — especially against a background of 6% growth in bus passenger numbers in each of the previous two years. Only 12% of the 1.115 million people entering the central area during charging hours come by car. Some of these will switch to walking, cycling or telecommuting, leaving about 17 000 to use public transport. Before the scheme was introduced some 11 000 additional spaces were provided on extra buses. Introduction of the scheme will itself speed up the buses, further increasing capacity (in the event, delays were halved on the first day). Those switching to rail and tube should add an average of only one extra passenger in each carriage. Paradoxically, surveys indicated that more than a third of car users switching to public transport would use rail rather than buses, but on the first day neither bus nor rail operators reported increased numbers.

Another inevitable claim was that the scheme would disadvantage the poor. This is true enough in some cases; one early survey suggests that 90% of payers are in the richest half of households. But on the whole, low-income families are more likely not to own a car and to rely on public transport.

One worry is that charges may not be recoverable from up to 15% of entering vehicles. Misread, altered or obscured number plates, other vehicles too close, lane changing and foreign-registered vehicles (not necessarily foreign owned!) are all possible difficulties. The scheme will be in severe trouble if too many reliable rorts are found.

Further out, new and possibly better systems are under development, using GPS to track vehicle location. Their success will depend heavily on what happens in London in the next few months.

The Green Party targets traffic

A private members bill from Green Party Co-leader Jeanette Fitzsimons, which aims to decouple growth in vehicle use from population and economic growth, was tabled in Parliament late last year. The Bill would require the Minister of Transport and regional councils to set targets, timetables and measures to reduce motorised traffic.

"Some people think that all we need to solve problems of congestion is to build more motorways," said Fitzsimons. "But the evidence is against them. No country in the world has managed to solve congestion for long just by building more roads." The benefits [of traffic reductions] will be substantial savings in economic costs as well as clean air, less greenhouses gas, safer streets and healthier people."

At the NZ Land Transport Summit, Fitzsimons responded to Banks' keynote address. "Infrastructure Auckland advises me that even if Auckland can find the $bn 4.96 needed to do all proposed motorway projects, by 2020 traffic will get 50% worse in the central Auckland isthmus, 20% worse in the west and almost 10% worse in the south." "Auckland could have 15% less traffic by 2015 rather than 50% more, if it adopts sensible transport policies."

(The Greens have a point here, exemplified by a recent article in the Seattle Times*. The same thing happened in Auckland during the APEC conference: in amongst all the predictions of chaos was a lone prediction of* ***reduced*** *congestion, and it was right — EW)*

Road capacity and traffic

Just as expanding highway capacity generates traffic, reducing capacity seems to reduce it. In the summer of 1985, the Oregon Department of

Transportation closed half the southbound lanes on a section of Interstate 5 for two months, for reconstruction. Southbound traffic on a key bridge dropped by more than 37 000 vehicles a day, about 31%. About 22 000 switched to other bridges, but the remaining 15 000 seemed to disappear. There was no sign of extra car-pooling or bus trips, and the most plausible conclusion is that most of them just didn't make the trip: stayed at home or went to other destinations.

Public transport needs new thinking

A young environmental scientist in Auckland got her first job in an office in a business park in Mt Wellington. She wanted to do the right thing by the environment so she chose to live in Ellerslie, on a frequent and convenient bus route for her to get to work. The buses pass close to both her flat and her office, so all should have been well.

However, reality did not match theory. The bus stop is the opposite side of the road from the business park. The road is six lane, with no bridge, underpass, traffic lights or pedestrian crossing. So to get to work every day she had to take her life in her hands crossing the very busy road, quite daunting even for a young fit person.

After a few weeks she concluded that the only viable solution to this unmanageable problem was to get a car, and negotiate the traffic on equal terms. So there is one more unnecessary car on Auckland's roads and one less fare helping to fund the buses.

The conclusion is that detailed thinking is required — from a non-car perspective — if any change to the car-focussed environment of Auckland is to be achieved.

Steve Goldthorpe

(This traffic increase is not a justification for more motorways! The same applies to most 'escort' trips, such as taking children to school, and at up to around 20%, these are a substantial proportion of peak hour traffic. If the roads are not safe for most children to walk or cycle, that is part of the problem and needs attention. It should not be taken as a given, and then used to justify ever-less effective 'solutions.' — EW)

Investors keen to leverage Transmission Gully Opportunity

Wellington Regional Council, 28/1/2003

The proposed Transmission Gully highway has attracted least six overseas consortia. Terry McDavitt, Chair of the Regional Land Transport Committee, said, "It is important for the community to realise that Transit is not the only possible supplier of funds for the highway network in this region. Even prior to the Bill that would enable private sector finance to accelerate the construction of certain key roads, we had six separate financial and construction interests... initiating expressions of interest in building Transmission Gully."

"Invariably these professionals explain they are only interested in a 'clean', ready-to-go project," said McDavitt. "They have done enough homework to indicate the project is viable if certain conditions are met. They are interested in discussing such conditions, but we have been unable to progress any further and refer them on."

"It is interesting to note that recent approaches are more enthusiastic about building two or more projects together as one package, to achieve efficiencies. Building Transmission Gully and the connection to Hutt City at the same time for instance is a prospect private consortia regard as worthwhile. One recent approach even offered to build the Inner City Bypass as well as part of the package."

McDavitt questioned the scepticism in official circles about Transmission Gully. "When I compare the views of experienced private sector road builders that a package using Transmission Gully as the spine is a definite goer as soon as offered, I suspect our officials are stuck in an old mindset and don't realise the real opportunities."

(We may be stuck in an old mindset but we suspect that the real sticking point is the requirement that existing roads remain toll-free. Long, steep climbs, a toll-free alternative and very limited time savings outside peak hours may effectively condemn a Transmission Gully franchise to surviving mainly on commuters. It will be interesting to see if the Hutt City link helps with profitability: watch for the Hutt end being sited as far as possible from the existing links at Ngauranga Gorge and Haywards — say near Melling. The toll collection points might be interesting too!— EW)

Transit NZ draft programme

Transit New Zealand, 24/1/2003

Transit New Zealand (TNZ) CEO Dr Robin Dunlop said there had been more interest in this year's draft state highway programme than in any of the last 12. The only difference for the 2003–4 year is that it is extended over 10 years.

The draft programme is based on expected revenue from Transfund. With the recent economic growth more funds could be available for the state highway programme. If so, some projects could be brought forward. Alternative funding such as borrowing by Transit was another avenue that could be pursued.

It was expected the Government would soon pass legislation that allowed the use of public private partnerships and tolling. This would improve the funding situation, said Dunlop. In addition to local and regional authorities and the Regional Land Transport Committees, TNZ also seek comment from road user groups. Once their input is received, the TNZ Authority reconsiders the programme before submitting it to Transfund. Transfund then considers it along with demands such as local roads, passenger transport, alternative to roads, regional development, walking and cycling and make the final decisions on funding. "It is only at this time Transit will know exactly how much money will be available and which projects have been approved," said Dunlop.

Dunlop said that while the public focus had been on new capital projects the main work of TNZ was the operation and maintenance of the state highways which consumed half of total funds.

The facts do not support the claim that Auckland is receiving all the funding, according to Dunlop. "Over the last three years, on average, Auckland has received one quarter of the total funding for state highways. Next year, if Transfund adopts the draft programme, Auckland region would receive just over one third of the funding. Given the low level of funding in Auckland in the past for capital development and the considerable traffic growth that has occurred in Auckland over the last 10 years, the proposed allocation is reasonable.

Transit has to prioritise the whole national state highway network. Areas with the lower priorities have to wait until the funds are available for their projects but the highways are still being well maintained," said Dunlop.

Energy in the (UK) spotlight

The Guardian, 13/2/2003

The UK government's much-anticipated and much-delayed energy policy white paper may confuse more than it convinces. Early indications were that policy would be decisively tipped in favour of the environment, with more energy produced from renewable sources like wind to help the country cut the amount of carbon dioxide (CO_2) produced. Then came the billion Euro bail-out of British Energy, the privatised nuclear power generator, and now a proposed €M 90 hand-out for deep coal pits, which will save 2000 jobs but make reducing greenhouse gas emissions harder.

What these payments in fact show is that the government's previous adherence to a market approach has failed, and energy policy is now very much in the visible hands of the state. This is a good thing. A new pattern of energy consumption and power production will only come into being with the connivance of ministers, because Britain's traditional energy sources are either too dirty (coal), running out (North Sea gas) or past their expiry date (nuclear). Ministers need to take decisions that may not advance their political prospects but which help the country's long-term needs. This needs large amounts of cash for renewable energy sources and improving energy efficiency. The white paper will need targets on reducing CO_2 emissions and getting green technologies from the drawing board to the wind farm. Such goals will have to be more ambitious than the ones the government is struggling to meet already.

The question is not the government's intent but whether it is committed to delivery. For example, leaks suggest that the government will want renewables to generate a fifth of the total energy produced in Britain by 2020. At first glance, this should help considerably, but even at this level renewables will only replace the contribution now made by nuclear power.

The real gains in reducing CO_2 will come from energy efficiency. This means a radical plan to alter the amount of heat lost in homes through boilers and heating systems. There are some simple gains to be made — tighten the building regulations which allow twice as much energy use in a new home as in Germany. Again money is needed — to convince people to spend € 450 to install cavity wall insulation that will save them € 150 a year. The real problem is that unless radical new ways of

generating cash are found, the Treasury will be reluctant to hand out billions of pounds. Some cash might be found from business — a recent paper by energy consultants Oxera suggested that if the social cost of carbon was taken into account on corporate balance sheets, many large companies would be in the red. Ultimately the taxpayer will pay — possibly through higher taxes. But a better solution would be higher electricity prices. Higher prices mean more money for investment and a dampening of society's insatiable demand for energy. It may sound unappealing — but it is better than the lights going out.

2002 hot, 2003 hottest?

Last year was one of the warmest on record, warmer than 2001 and second only to 1998. Now it looks as if 2003 will be warmer still.

A report by scientists at the UK Meteorological Office's Hadley Centre — the world's leading authority on predicting the climate — concludes that 2003 is likely to be as warm or warmer world-wide than 1998. The report says that the most important determining factors of world-wide temperatures are global warming, in the long term, and the El Niño weather phenomenon, on a year-by-year timescale.

Dr Chris Folland explained that it was a particularly strong El Niño that made 1998 so warm, raising global temperatures by 0.2˚C. Global warming adds 0.02˚C to world-wide average temperatures every year, so the five years after 1998 will have raised temperatures by 0.1˚C, making up half the effect of that year's El Niño. Another weaker El Niño is expected to raise temperatures by about 0.1˚C in 2003, causing it to equal 1998. The current rate of warming is faster than at any time since the end of the last ice age.

Using data from the Hadley Centre, Britain's environmental ministry warned that droughts in summer and floods in winter would inevitably become more common in the south and east. The Environment Agency, responsible for monitoring recent river flooding and protecting the British environment, said tackling the effects of climate change was already proving costly, and added: "Our emergency workforce is the 'thin green front-line' when it comes to flood events."

NZ Herald, 29/12/2002
Independent (UK), 12/2/2003

Russia the Kyoto wild card

Wired, 8/2/2003

Fears are mounting that the Bush administration has embarked on a fresh effort to kill the Kyoto Protocol by pressuring Russia to bow out.

To many observers, Russia seemed to change its public stance on Kyoto following a recent visit to Moscow by Harlan Watson, the State Department's senior climate negotiator and special representative. Whether Watson was working behind the scenes to encourage the Russians not to ratify the treaty, or it's merely a matter of timing, speculation has been rampant that the US has been flexing its diplomatic muscle. "Many, many people think that they are trying to push Russia out of Kyoto," said Alexey Kokorin, who handles climate change issues for the Russian branch of the World Wildlife Fund, adding that given the expected secrecy behind any US efforts, he had no hard facts to go on.

US officials have denied lobbying Russia on Kyoto. However, the two countries now plan to work together to formulate policy on climate change — and will hold a conference on the topic in Russia in the northern autumn. The central issue is economics. Many experts believe that the protocol would have a positive economic impact in Russia, since the new system would feature buying and selling of emissions credits. Russia, with its vast geography, would be in a position to sell credits.

Alexey Kuraev of the Russian Regional Ecological Centre said that while behind-the-scenes pressures would be difficult to detect, the US government's public opposition to the protocol has forced Russia to change its own thinking. "Naturally the US government does not officially pressure Russia not to ratify the Kyoto Protocol," Kuraev said. "But after the US withdrew from Kyoto, some of the influential Russian politicians started to say that Kyoto lost economic value for Russia."

But the creation of the Chicago Climate Exchange indicates that, even with no US participation in Kyoto, it will be closely involved in emissions trading. Some speculate that the US is trying to provide political cover to establish its own approach to mitigating global warming. "We hear the US is going to propose to Russia to develop a new international agreement on greenhouse gases that would be an alternative to Kyoto," said Kuraev. "This fact slowed down ratification of Kyoto by Russia also."

On 17 January the US State Department released a joint statement:

The United States and the Russian Federation agree to broaden their global climate change co-operation by promoting a Climate Change Policy Dialogue to intensify and strengthen their efforts, including through a Climate Change Working Group to facilitate the Dialogue process. This Dialogue will involve various ministries and agencies of the two Parties that are already actively engaged in the issue.

Through this Dialogue the US and the RF seek to:

- Discuss and exchange information related to climate change policy and related scientific, technological, socio-economic, and legal issues of mutual concern and interest.
- Explore possible common approaches to addressing climate change issue before the UNFCC, IPCC and other relevant international fora.
- Identify and encourage needed climate change science and technology research that is or could be performed individually or jointly by US and Russian departments, agencies, ministries, and scientific institutions.
- Benefit from and complement other established bilateral activities between the two countries.

The US and the RF also agree to co-operate closely in preparing for the World Conference on Climate Change to be held in Moscow in 2003. The initial meeting of the Climate Change Working Group will be co-ordinated by Dr Harlan Watson, US Department of State Senior Climate Negotiator and Special Representative, and by Dr A I Bedritsky, Head of the Federal Service of Russia for Hydrometeorology and Environmental Monitoring.

EU urges Russia to ratify the Kyoto Protocol

Three top level European environment officials have gone to Moscow for a three day attempt to persuade Russia to complete ratification of the Kyoto Protocol, and to discuss a strengthening of co-operation in the fight against climate change. The EU member states have all ratified the climate treaty, and now Russia's ratification is necessary to enable the protocol to enter into force.

ENS, 5/3/2003

Contraction and convergence again

Aubrey Meyer , 21/2/2003

The UK's leading think tank, the Institute of Public Policy Research (IPPR), have produced *The Generation Gap,* a report that urges the UK Government to get behind Contraction and Convergence (C&C).

The IPPR report refers back to an earlier Royal Commission which, "made a clear and emphatic recommendation to the Government that in its view, the best prospects for success at international level were offered by the 'Contraction & Convergence' policy framework for international climate change policy as the basis of future negotiations. The Institute observe that this policy framework is consistent with the 'leading' approach to climate policy that the Government has expressed its intention to play.

C&C is a simple global policy framework that would work as follows:

- All countries would agree a safe global ceiling on concentrations of CO_2 in the atmosphere (such as 450 ppm), and then calculate a global emissions budget consistent with reaching it.
- On the question of national emissions allocations, C&C recognises that developing countries will only accept emissions targets under an emission regime that is equitable. Accordingly, national emissions entitlements would converge from current emissions levels (which are proportional to national income) to an allocation based instead on population, by an agreed 'convergence date' such as 2040.
- Full international emissions trading would be allowed so that countries could meet their targets flexibly and at least cost. (The existence of a global price on carbon would also provide each country with a clear incentive to reduce dependency on fossil fuels as quickly as possible, in order to reduce the number of emissions permits that have to be bought — or indeed increase the number of surplus permits to sell.)

Although it has been widely forgotten since the publication of the Royal Commission's report on energy, the UK target of reducing CO_2 emissions by 60% by 2050 is in fact derived from a C&C scenario, with a concentration target of 550 ppm and a convergence date of 2050.

The most important distinction between C&C and the approach taken by Kyoto is that C&C starts with the question of what global level of emissions is safe, and only then turns to the secondary question of how much CO_2 each country is permitted to emit.

Kyoto, by contrast, began by determining national entitlements; assessing the overall level of global emissions came at the end of the process rather than at the beginning.

Interestingly, C&C meets the stated position of the Bush Administration on climate change where Kyoto does not — even though it enjoys very much higher environmental integrity than Kyoto. President Bush has consistently stated that the US desires a global policy that both includes quantified targets for developing countries, which C&C includes but Kyoto does not. Bush has also been equally consistent in emphasising that international climate policy should be consistent with the goal of stabilising atmospheric concentrations of greenhouse gases in the atmosphere (to the extent of actually including this objective in the US National Security Strategy in 2002); again, C&C offers this through its formal atmospheric concentration target where Kyoto does not.

Biodiesel in NZ

Not it's not available commercially in New Zealand just yet, but that didn't stop Ralph Sims from winning the EnergyWise Rally environmental award in a VW Golf running on the stuff. He and his team averaged 4.65 l/100 km (60.7 miles/gal), running over 1500 km on home-brew at an average speed of 84 km/h.

EnergyWatch's first reaction was that home-brew biodiesel needs to be tried in an old vehicle — just in case — but this might be the wrong approach. Most European manufacturers now have their newer engines optimised for biodiesel, and will maintain the warranty on biodiesel if it is up to scratch. In an older engine it is best to run a blend of normal and biodiesel, as some types of injector pump don't like running on neat biodiesel (lubrication problems), and it will eat any rubber-based fuel lines or seals. Massey student Andrew Smith says that he runs a 1989 Toyota Hiace on a 10% blend, "and it loves it, and is running better than ever."

Basic home-brew recipes for biodiesel from http://www.journeytoforever.org/biofuel.html

Arab states claim Kyoto could cause slump

Independent (UK), 9/2/2003

Powerful Arab oil producers have hardened their stance on climate change, in a defiant statement dismissing claims that oil consumption is the main cause of global warming. Ministers of 13 Arab oil producers claimed they had an inalienable right to continue producing oil and increasing the region's wealth from oil sales. But at the same time the bloc claimed they deserved substantial compensation and new technology subsidies if the world pressed ahead with cuts in oil use.

Their lengthy and at times contradictory declaration claimed environmental protection and climate change were pretexts to damage the region's economic interests. "Such unfounded allegations and doubts would make victims of the oil and gas sector, and may result in a recession in world demand, thus harming the interests of producers," it read. In another passage, the signatories of the so-called Abu Dhabi Declaration said they, "re-affirmed the necessity of a continuous and unobstructed supply of oil and gas to international markets." Their blunt dismissal of the climate change case appears to strengthen the anti-Kyoto Protocol camp.

The declaration was signed by states accounting for roughly 40% of global oil and gas production. Worryingly for the UN, it makes clear that the Arab world plans to exact a heavy price for accepting future cuts in its oil revenues, which is expected to involve substantial help in developing new technologies and industries.

Continued oil production, the signatories insisted, was central to tackling poverty in the region and to ensuring the 'sustainable development' of their economies — code for guaranteeing the long-term protection of their oil exports. However, the statement repeatedly stressed the need for the industry to be as environmentally friendly as possible, for example by focusing on clean production techniques and developing new techniques to dispose of CO_2 safely. Although the statement fails to set any regional targets for CO_2 reduction, seasoned observers believe its numerous concessions on the environment suggest Arab states will eventually accept climate change is a reality. Many younger Arab ministers are thought privately to accept that the scientific case has been made, but are determined to ensure their economic wealth and political survival are not harmed in the process.

Antarctica 'sensitive' to CO_2

Stuff, 29/1/2003

"Ominous" new research has indicated that the Kyoto Protocol will not go far enough to avoid a climate disaster. New work shows that CO_2 played a far bigger role in the origin of the Antarctic icecap than previously thought. Victoria University's Professor Peter Barrett said the latest study published in *Nature* confirms the sensitivity of the icecap to rising greenhouse gas emissions.

If emissions are not checked, by the end of this century they will probably lead to a climate like the Earth's before the icecap was formed, Barrett said. "This new research on the past Antarctic climate has an ominous warning for the future, indicating that more extreme measures than currently proposed under the Kyoto Protocol will be needed to forestall climate disaster in the decades ahead," he said. "Land-surface and ocean temperatures are rising in response to human-induced emissions of greenhouse gases — and remarkably fast on a geological timescale. "The effects of this will be difficult to predict, but they will plainly be profound. [This new research] ... indicates that world leaders will have to go beyond the Kyoto Protocol to avoid a climate disaster."

The research prompting the warning is computer modelling of climate during the formation of the first Antarctic ice sheet, 34 million years ago. At the time, the climate was cooling. Previously it was thought changing ocean currents, caused by the drifting continents, were primarily responsible for the cooling of the region, but now it has been shown that CO_2 had a much bigger role to play.

Barrett said it was worrying that the research emphasis has shifted away from understanding climate behaviour and towards mitigating the effects of greenhouse emissions.

US Congressman Sherwood Boehlert, head of the powerful US science committee and on a visit to Antarctica, described the research as vital. He said, "Congress is prone to say ad nauseam that we want to operate on science-based fact rather than speculation and theory, but sometimes when the science leads us to politically inconvenient conclusions then there's a tendency on the part of some to go in another direction." "But it's hard to argue with a fact that's been methodically and meticulously developed over years of in-depth study."

Nuclear pollution blamed for 65 million deaths

press@greenmeps.org.uk, 29/1/2003
www.carolinelucasmep.org.uk

A scientific committee has blamed pollution from nuclear energy and weapons programmes for 65 million deaths. The findings, published in January in a report from the European Committee of Radiation Risk (ECRR), show that previous figures dramatically under-estimated the industry's impact.

The ECRR, an international group of 30 independent scientists led by Dr Chris Busby (a member of UK government's radiation risk committee) and Professor Alexey Yablokov (member of the Russian Academy of Sciences), estimates that radioactive releases up to 1989 have caused, or will eventually cause, the death of 65 million people world-wide. It concludes that the present cancer epidemic is a result of releases from nuclear energy and atmospheric weapons fallout, which peaked in the period 1959 – 63.

The ECRR was formed in Brussels in 1998, following concern that the methods used to calculate the effects of nuclear pollution failed to explain the massive evidence of ill-health in exposed populations. The ECRR model uses evidence from new discoveries in radiation biology and from human epidemiology to create a system of calculation which gives results which are in agreement both with the mechanism of radiation action at the level of the living cell and observation of disease in exposed populations.

The ECRR findings are a direct challenge to the convention methods of calculating risk of the International Commission on Radiological Protection (ICRP). The ICRP had been widely criticised as being too close to the nuclear industry and lacking balance.

Commenting on the report, Euro-MP Dr Caroline Lucas said: "There have been concerns for years that we have been underestimating the ill-health caused by nuclear pollution. This new research cites vast amounts of evidence such as the levels of breast cancer in women who were adolescent between 1957 and 1963 when nuclear weapons testing was at its peak." "The fact that existing analysis could not account for the abnormally high local levels of illnesses like childhood leukaemia was more a reflection on the research methodology than the acclaimed safety of the nuclear project."

MiniWhats

SEF and Solar Action

SEF and Solar Action member Andrew Pollard has picked up the suggestion from the SEF AGM that we should be looking for partners, to gain critical mass and perhaps to merge with one or more other organisations. In January, most SEF members were sent a sample copy of the *Solar Action Bulletin* (sorry, we were short of copies and missed a few), and still on the stocks is sending a sample copy of *EnergyWatch* to Solar Action members — hopefully to be fixed with this issue.

Solar Action is in fact the New Zealand Branch of the Australian and New Zealand Solar Energy Society (ANZSES), after a merger in 1991. ANZSES has about 800 members throughout Australia and New Zealand. ANZSES has looked to work with other like minded organisations to better achieve developments in renewables and energy efficiency. In Australia, the Alternative Technologies Association(ATA) (about 1500 members and perhaps 30 in NZ) is one such organisation. The difference between the two organisations is that ANZSES is the professional and industry body whereas ATA has a more general membership and often looks at 'do-it-yourself' approaches.

Now Andrew has said that he would like to propose that the November 2005 ANZSES conference be in New Zealand, held jointly with SEF. Your Committee is in principle very supportive of this idea, which should help both SEF and SEF members gain new ideas and contacts.

Another small energy saving

Ireland has reduced plastic bag use by 90% in five months, by introducing a € 0.15 (NZ$ 0.30) levy on each bag.

Dominion Post, 10/12/2002

(Bags are effectively made from fossil fuels. Ironically in energy terms, the initial focus of the article was that a plastic bag had affected the Bathurst 1000 motor race in Australia, by blocking a radiator — EW)

The value of domestic energy savings

Two reports released in December drew attention to poor environmental conditions in New Zealand homes. A report by the Building Research Association showed that about a third of NZ homes regularly fall below WHO temperature guidelines (minimum 16˚C). And a Health Ministry report drew attention to related issues of damp, mould and poor ventilation, together with pollution (including more moisture) from unflued gas appliances. Mould and fungi then aggravate conditions such as asthma and bronchitis, which are common causes of hospital admissions.

All this suggests three effects relevant to the National Energy Efficiency and Conservation Strategy (NEECS):

- The advantages of insulating homes are much wider than energy savings.
- Energy savings from home insulation (and sometimes other building insulation) will be less than theory might predict, because users will tend to take the gain as a warmer building instead of lower energy use.
- Draught stopping may actually be dangerous, if an unflued gas heater is retained.

Plants won't save the world

A conventional argument against action on climate change is that with more CO_2, plants grow larger and more vigourously, and absorb excess carbon.

In tests by a team at Stanford University, increasing CO_2 levels from 380 ppm to 680 ppm, plant growth increased by 30% over three years. But when other factors were added — changing temperature, nitrogen and moisture levels — the result was a 9% decrease. Team leader Christopher Field said, "We honestly don't know what the mechanism is," but his hunch is that soil bacteria and fungi somehow fare better under elevated CO_2 levels and out-compete plants for nutrients such as potassium or phosphorus.

New Scientist, 14/12/2002

Tui a dud?

NZ Oil and Gas announced on 10 February that its Tui-1 well had been unsuccessful, The well location is some 20 km north west of the Maui A platform, in the Offshore Taranaki Basin, and the target formation was the Kapuni D sands. NZOG Exploration Manager Eric Mathers said the firm was "totally gutted" However, NZOG still saw some hope for hope for producible gas in the lower F sands.

A few days later, a 10 m oil column was discovered in the lower Kapuni F sands, "of which 100% is new oil pay in excellent quality reservoir rocks." "NZOG considers that the discovery of oil at Tui is positive, not only for itself but also because the

presence of oil rather than gas has upgraded the other prospects of the block."

Dominion Post, 11 & 15/2/ 2003

New Assessment Of Electricity Supply Security

Minister of Energy Pete Hodgson has released a new assessment of the dry year risk for NZ's electricity system. The report by consultants Energy Link Ltd indicates that the chance of a supply shortage is in the region of 1:35 in each of the next four years. It notes that this is considerably less than the historical standard applied by the former ECNZ, which operated its hydro reservoirs to a 1:20 dry year security standard.

The report was commissioned by the Ministry of Economic Development to increase the depth of information publicly available on New Zealand's electricity system. The Energy Link modelling is considerably more detailed than modelling by the University of Canterbury-based Centre for Advanced Engineering and Transpower, the national grid operator. It takes into account possible hydro inflow variability within years, storage capacity in the different reservoirs, and the transmission constraints within the grid.

NZ Government, 20/12/2002

(We suspect that this report has looked at inflow to the dams statistically rather than climatologically. Might consulting with NIWA and the Independent Expert appointed under the Maui contract have given a different answer? — EW)

Windflow turbine cleared for installation

Windflow Technology can now go ahead with installation of a 500 kW wind turbine in Gebbies Pass, near Christchurch. The proposal has been delayed for about three months by two objectors. A hearing in the Environment Court would have taken some 12 to 18 months. Agreement has now been reached with the objectors, and the turbine could be working as early as March. The agreed resource consent is now for 10 years instead of 20, and the likely outcome will be that after 10 years the turbine will be transferred to another wind farm. There is a further confidential agreement (which does not include any payments by Windflow).

Preparations have begun for the next stage, which is to raise working capital for another six turbines, initially through a rights issue.

Dominon Post, 29/1/2003
Windflow Newsletter No 5, 2/2003

What to do about rail in the UK? (and closer to home?)

Professor Chris Nash gave a talk in Wellington on this subject, on 2 December (He appeared to have been advising the NZ Government on what to do with Tranz Rail, and he understandably declined to discuss NZ issues). Nash is Professor of Transport Economics at the University of Leeds, UK. Key points he identified for the existing UK system (with several competing operators on tracks owned by a state owned enterprise) included:

- Who allocates the timetable slots? In practice they are allocated in blocks, with attention to return working (the operator needs to be able to get the train back) and offering a regular service.
- Social considerations need care. In some places trains can offer a much better service than buses, but the community benefits may be illusory if a train carrying six passengers displaces a 1000 t freight train onto 40 road trucks.
- Transaction costs can be very high.
- Track costs are very largely joint costs, making allocation to operators difficult.
- Fixed costs may be very high, as illustrated by the value of life implicit in safety investment decisions:

Road	£M	1.25	
Rail	£M	10	At present
Rail	£M	100	If recent recommendations for introducing Automatic Train Protection are accepted

- Major upgrades have shown huge cost over-runs. Up to half of the total can be payments to operators for occupations (of the track while maintenance work is done), but Nash pointed out that maintenance occupations are a real cost to operators.

US groups sue EPA for climate change

Three US-based environmental groups are suing the US Environmental Protection Agency (EPA) for failing to act to prevent climate change. The International Centre for Technology Assessment (ICTA), the Sierra Club and Greenpeace have announced that they are suing the EPA for its failure under requirements of the Clean Air Act to limit all air pollution from vehicles that endanger public health or welfare. According to the ICTA, the EPA ignored a formal petition by the three groups submitted over three years ago, calling for it to abide by the Clean Air Act. A public comment period that ended in May 2001, carried out by the

EPA received over 50 000 comments, the vast majority of which strongly agreed that global warming should be addressed under the Act, says the ICTA.

Edie weekly, 13/12/2002

Methanex shelves Australian plant

Methanex has shelved plans for a large Australian plant producing 2 Mt/yr of methanol, citing "disproportionately high" costs. The move was described as not having any short-term impact on effort to replace an expected drop in production from the company's New Zealand facility after a loss of natural gas rights from the Maui field.

Dominion Post, 15/3/2003

Tokyo wind turbines

Two 70 m wind turbines are being built on a Tokyo waterfront, the first to be constructed in the metropolitan area. Officials said they hoped the new windmills would become a symbol of Tokyo's efforts to counter global warming. The windmills will be built on a landfill site near breakwaters in Tokyo Bay. They will be visible from Tokyo Disneyland and Haneda Airport.

The Danish 1.7 MW turbines are scheduled to start operating from the end of March, and will bring Japanese wind turbine capacity to a total of 310 MW. However, a government outline that promotes measures to combat global warming suggested this figure be increased tenfold to 3 GW by 2010. A government decision is expected by the end of this year.

Yomiuri Shimbun, 9/1/2003

EU to clamp down on car air conditioning

Air conditioning in cars will be subject to tighter EU legislation to curb the rise in emissions from vehicles that now require more energy to keep their interiors cool and more fluorinated gases to pump their air conditioning units. Without tighter control, mobile air conditioning is expected to account for 10% of total greenhouse gas emissions from cars. At a European conference on reducing greenhouse gases, EU Environment Commissioner Margot Wallström said that proposals were currently being drafted for legislation to curb fluorinated gas emissions, including those from air conditioning systems.

Given that air conditioning is rapidly becoming a standard feature of new cars and is predicted to add another 30 Mt of CO_2 emissions by 2010, Wallström said that the EU must also act to curb the trend to more energy-intensive cars.

Consumers might be surprised to learn that even the most fuel-efficient and low-emission cars were churning out more gases than they were tested for, because fuel consumption measurements on new cars do not include the weight and operation of the air conditioning unit, said Wallström.

The EU is considering phasing out HFCs currently used in air conditioning, which would entail a transition period to enable manufacturers to switch to alternative cooling technology. Wallström said that while the legislation was being prepared, the EU would remain open to suggestions from industry on the feasibility of and alternatives to eliminating HFCs, while staying on target to reduce greenhouse gases under the Kyoto agreement.

Edie weekly, 15/2/2003

Pohokura and the Commerce Commission

Shell, Todd Energy and Preussag Energie, owners of North Taranaki's slightly-offshore Pohokura gasfield are applying to the Commerce Commission to be allowed to market the gas jointly rather than in competition. They claim that if the application is rejected, there may be high gas and electricity prices, and power blackouts.

Pohokura is thought to have reserves of about 600 PJ of gas. With joint selling it was claimed that production could start in 2004, producing 15 PJ in 2004, 30 PJ in 2005 and a peak of 70 PJ in 2007 (*that's 12% of reserves in one year — EW*). However, without joint marketing, development would be delayed by three years, or might not go ahead at all. The application claims that, "Possibly the greatest impact [of delay] would be on electricity generation. A significant rise in both gas and electricity process would be expected, with blackouts a possibility."

The owners estimate that the present value of public benefits from joint selling would be $M 204, or $M 451 if Methanex continued in full production. The application says that, "The risk of no development, creation of sub-economic parcels of gas, sub-optimal pool depletion and increased production and transaction costs would render gas exploration and production in New Zealand a less viable option."

In a later report, NGC told the Commerce Commission that joint selling of Pohokura would shrink competition to one or two suppliers from 2005 to 2015, and bring higher prices at the well head.

Dominion Post, 18/2/2003
Dominion Post, 14/3/2003

Project Aqua to be declared a Network Utility Operation

The Government has decided that Meridian Energy's Project Aqua will be declared a network utility operation under the Resource Management Act, Environment Minister Marian Hobbs announced in early December.

Project Aqua is a joint hydro and irrigation development on the lower Waitaki River, below Kurow in North Otago. It is being developed to meet future energy demand and to irrigate 30 000 hectares of land.

New Zealand Government, 3/12/2002

The Waitaki scheme involves drawing off river water into a 62 km canal system, bypassing 55 km of river, where a series of hydro stations along the canal will generate up to 570 MW. Adequate minimum flows will be maintained in the main river, with a minimum winter flow of 100 m^3/s, and 80 m^3/s in summer. First power generation is expected in 2008.

Fewer dry years to come?

South Island river flows are being enhanced by glacier melting due to global warming. NIWA consultant Trevor Chinn, who watches the nation's 3140 glaciers, said that many of the South Island's largest glaciers are retreating rapidly. These glaciers together cover 1158 km^2 and hold 53 km^3 of ice. The effect is that flows into the hydro rivers have a component of water 'borrowed' from storage as ice. The borrowed component of flow into the Waitaki is at present about 4 m^3/s, but could rise to around 8 m^3/s with scenarios of a 0.5–3˚C rise in average air temperatures. However, this is only a small proportion of the total flow.

The input from the glaciers is expected to taper off over the next 50 years. "If there was a reversal of the climate and glaciers advanced you would get water going back into ice storage, but it's highly unlikely," Chinn said. He estimates that before the arrival of European settlers there were about 100 km^3 of glacial ice in New Zealand. That has since reduced to about 53 km^3, and predictions are that by 2070 it will fall to just 25 km^3.

Dominion Post, 28/2/2003

You can run but you can't hide

Record gas prices in the US are boosting manufacturer's operating costs, hitting profits and forcing some companies to move production overseas where gas is cheaper, analysts say. An interest group representing some of the biggest chemical companies has warned Congress that high gas prices are having a "devastating impact."

Dominion Post, 27/2/2003

Contact Energy's 2002 Annual Report

Timely development of known gas reserves needs to be the energy industry's most pressing priority in the year ahead, Contact Energy's chairman, Phil Pryke, and chief executive and managing director, Steve Barrett, say in the company's 2002 annual report.

"New Zealand faces a challenging period of transition over the next few years from the abundant energy supplies enjoyed over the last generation to a new era in which security of supply will be less certain," said Pryke and Barrett. *(In unison, we hope — EW)* "Recent supply constraints, when scheduled maintenance at Maui and Otahuhu-B has reduced both available gas and generating capacity, provide a foretaste of the conditions that might reasonably be expected at times during this transition."

Maui gas has been the backbone of the country's gas supply for the best part of a generation, and insufficient gas has so far been discovered to cover the shortfall left by the Maui rundown.

"Moreover, there is in our view far too little urgency or focus going into the commercial development of the only two major known gas reserves — Kupe and Pohokura," said Pryke. "Their timely development will help to close the gap created by the rundown of Maui. We urge the gas industry and Government to give this issue the priority it deserves."

Contact Energy has put on hold any plans to build new generation until uncertainty over gas supply is resolved, but is planning incremental upgrades in capacity at geothermal and hydro sites, and investigating the use of liquid fuels at its New Plymouth power station as a back up fuel.

Newsroom, 13/12/2002

Fishing for clues

The best indicator of what's happening to global climate could turn out to be fish. According to biological oceanographer Francisco Chavez, a small change, perhaps less than one degree, determines whether huge schools of sardines, or anchovies, occupy fishing grounds off California, Japan and Peru. When the Pacific is warm, sardines abound. When it's cool, anchovies thrive. Periods in which one or the other dominate appear to run in 25 year cycles. We are, perhaps, about 5 years into a cooling trend. "What surprised me most was

that people in different parts of the world were seeing this, but without realising they were all the same thing," said Chavez, at the Monterey Bay Aquarium Research Institute in California, "it's seen all around the Pacific." Now Chavez and three colleagues — whose work is published in *Science* — suggest that fish populations and where the fish are can offer clues to changes in global climate. "Because... [the changes in fish] are fairly long-term and significant, they can play into the global warming interpretations," he said. Oceanographer Frank Schwing, at the National Oceanic and Atmospheric Administration laboratory in California, said Chavez's report, "is a nice summary of things we've been looking at for some time. A lot of scientists have speculated there is a relationship between these climate cycles and fish population cycles."

While more study is needed, what seems clear is that a 25 year cycle does exist, and it resembles the known, but more frequent, climate changes called El Niño and La Niña. These occur alternately in roughly four-year cycles, with impact on winter weather, the number of hurricanes that form, plus droughts and floods at various places around the world.

Newsday, 10/1/2003

Controlling coal fires?

Uncontrolled coal fires have been described as a 'global catastrophe,' and may contribute more than 3% of world-wide CO_2 emissions — 'equivalent to the emissions from all motor vehicles in the US.' However, a new a heat-resistant grout has been developed to smother coal fires. It is made of sand, fly ash, cement, water and foam and has the consistency of shaving foam.

New Scientist, 14/2/2003

(For a report on uncontrolled coal fires see 'Underground fires and climate,' *EnergyWatch 24, May 2002)*

"Genesis Power media release"

The delightfully low-key headline used by Genesis to announce gas price increases on 11 February, for implementation from 20 March.

Sensible recommendations for University research

A new report claims that the UK government is subsidising the oil industry by about €M 40 a year, through capture of academic institutions doing subsidised research that benefits the industry. EnergyWatch cannot confirm that the UK report is correct — let alone that the same thing is happening here — but the recommendations made in the report seem well worth thinking about:

- All public money spent on energy research should be redirected toward finding viable, sustainable energy sources.
- The involvement of private interests in public institutions should be made transparent through a central, open access register of all institutions' and academics' industry links and interests.
- Public research funding bodies like the Research Councils should adopt a commitment that prioritises problem-solving in issues of major public interest, such as global warming, over furthering the generation of private profit.

However, correspondents on the ESR discussion group point out that there is no rigid demarcation line between commercial and public research.

The report was published by PLATFORM, Corporate Watch and the New Economics Foundation on 16 February. For more information see:
http://www.corporatewatch.org/pages/degrees_of_capture.htm

Oz business shifts tack on Kyoto

Business support for the Australian Federal Government's hardline position on climate change is crumbling, with the Business Council scrapping its outright opposition to the Kyoto Protocol. Despite the move, the Government is adamant it will not officially endorse the protocol and its raft of measures to combat global warming. After "passionate" debate that cut across industry sectors, the Business Council of Australia endorsed a "neutral" stance on Kyoto. The council's early opposition to Kyoto is said to have influenced the Government's stance.

The council's neutral position sent an important signal to the Government, Australian Conservation Foundation executive director Don Henry said. "The only opposition to ratification of the Kyoto Protocol in Australia has been business opposition," he said. "If the Business Council is neutral, and given that we all know the huge impact of climate change, this is a very clear signal to the Federal Government that they should move ahead and ratify the Kyoto Protocol."

In a separate report, NSW Premier Bob Carr released a report showing Australia would be economically better off ratifying the Kyoto Protocol, rather than trying to reduce greenhouse

gas emissions outside the treaty. The report, prepared by the Kyoto Ratification Advisory Group which Carr established, found Australia could lose important investment in new clean, green technologies if it remained outside the treaty framework.

The Age, 1/3/2003
News.au.com, 17/2/2003

Death notice

Spacecraft Pioneer 10, aged 30 years, sometime after 22 January, at a point some 12.2 billion kilometres from earth (over 40 times the diameter of the earth's orbit). The last signal received took 11 h 20 min to reach home. The mission was originally scheduled to last less than two years.

Reuters

Genesis cleared to acquire Taranaki CCGT Station

The Commerce Commission has approved an application from Genesis Power Ltd to acquire all the shares in Stratford Power Limited, a subsidiary of Natural Gas Holdings Corporation Limited (NGC), which owns Taranaki Combined Cycle thermal electricity generation plant (TCC).

Chair John Belgrave said the Commission is satisfied that the proposed acquisition would not have, nor would be likely to have, the effect of substantially lessening competition in the national markets for electricity generation and wholesaling, ancillary services or electricity retailing. "The Commission has assessed the likely competitive impact of the proposed acquisition having regard to market concentration, potential for anti-competitive strategic behaviour, market co-ordination, entry conditions and other relevant factors," said Belgrave. He added: "The Commission is satisfied that the proposed acquisition will not have, or be likely to have, the effect of substantially lessening competition in the market."

Contact Energy added:

The Taranaki Combined Cycle (TCC) is a four year-old, 357 MW plant situated near Stratford and will complement Contact's existing thermal generation fleet at Otahuhu-B (380 MW), Otahuhu-A (40 MW), New Plymouth (400 MW), and Te Rapa (44 MW). Contact also has geothermal and hydro power stations capable of producing a total of 996 MW.

Commerce Commission, 4/2/2003
Contact Energy, 4/2/2003

Arctic ice to open shipping short-cuts

The shrinking Arctic ice cap may open a passage for ships between the Atlantic and Pacific Oceans within a decade. Ship owners may be among the few to benefit from global warming in the extreme north, where the giant thaw is threatening traditional habitats for indigenous peoples and wildlife ranging from polar bears to caribou.

UN studies project that the Arctic may be free of ice in summer by 2080. The polar passage may come to challenge the Panama and Suez canals. "In the next 10 years I believe we will solve the problems of round-the-year goods transport through the Northern Sea route," said Alexander Medvedev, general director of Russia's Murmansk Shipping Company. "You can save at least 10-15 days on the voyage from Japan to Europe, especially in summertime."

Reuters, 29/1/2003

Two new wind farms given Kyoto credits

The NZ Government has agreed to help the development of two proposed wind farms by allocating climate change 'carbon credits,' says Energy Minister Pete Hodgson. The projects are TrustPower's 36 MW extension of its existing 32 MW Tararua wind farm and a new 40 – 80 MW wind farm proposed by Meridian.

"This is a way for the Government to support the development of renewable energy by making use of the opportunities created by the Kyoto Protocol," Hodgson said. "These wind farms could be commissioned in 2004 and 2005, helping to meet NZ's need for new electricity generation capacity in a sustainable way."

"These two proposals have come in ahead of the Projects mechanism, but they show how climate change policy is intended to work," Hodgson said. "Electricity from these wind farms would avoid some gas or coal-fired generation, with its associated greenhouse gas emissions... but the initial costs mean that the wind farms would probably not proceed without the credits the Government is offering. Providing the credits therefore helps us meet both our climate change and our energy security objectives."

Promissory notes for Kyoto Protocol emission units would be allocated to the companies depending on the final amount of generation involved. Over the Protocol's first commitment period 2008 – 2012, the wind farms could deliver emissions reductions of up to a million tonnes of carbon dioxide.

NZ Government, 4/3/2003

The supply-side energy junkie's last hope

In November an article in *Science* (v 298 p 981) by '18 influential energy scientists,' took the view that bizarre energy technologies will have to be developed if we are serious about tackling climate change. They say none of the power generation technologies being developed now will be able to control greenhouse gas emissions and meet the world's energy needs — which may rocket by 200% by 2050. The analysts propose that governments undertake broad energy research programmes, exploring technologies such as:

- Collecting solar power in orbit, using a large array, and sending it down to earth as a microwave beam.
- Reflecting solar energy onto a moon-based large array, then using microwaves to send the power down to earth, relayed through a station in earth orbit.
- Using space-based lenses called 'parasols' to deflect solar energy away from our atmosphere.

Atmospheric scientist Ken Caldeira of the US government's Lawrence Livermore Laboratory described debate over the Kyoto Protocol as polarised and claimed to stake out a third position: "Climate stabilisation is important, but we can't really do it with current technology, even if we wanted to."

New Scientist, 9/11/2002

(That last phrase looks significant — EW)

EnergyWatch

The next edition of EnergyWatch will be published in June.

EnergyWatch is published 'at least four times' a year, normally in March, June, September and December. However, these dates are sometimes varied to make room for extra editions.

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Sustainable Energy Forum Conference

The next SEF Conference will be held on Saturday and Sunday 5 – 6 July 2003, at the UNITEC Institute of Technology, Carrington Road, Mt Albert, Auckland. The theme will be:

Achieving Targets for Sustainable Energy in New Zealand

The objective is to review the National Renewable Energy Strategy and the National Energy Efficiency and Conservation Strategy; progress in their implementation; and to compare this with what might be realistically possible over the next decade.

See the SEF website: www.sef.org.nz