

Energy Watch

The Newsletter of the Sustainable Energy Forum

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

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Clinton on the Environment

*This is the core of President Clinton's speech at the Antarctic Centre, Christchurch, 15 September 1999.
It went a little deeper than the headlines suggested.*

I think, of all the work being done (in New Zealand), perhaps the most important... will be the work that tells us about the nature of climate change and what it is doing to the ice cap here, to the water levels around the world, and to the way of life that we want for our children and our grandchildren. The overwhelming consensus of world scientific opinion is that greenhouse gases from human activity are raising the Earth's temperature in a rapid and unsustainable way. The five warmest years since the 15th century have all been in the 1990s; 1998 was the warmest year ever recorded, eclipsing the record set just the year before, in 1997.

Unless we change course, most scientists believe the seas will rise so high they will swallow whole islands and coastal areas. Storms, like hurricanes, and droughts both will intensify. Diseases like malaria will be borne by mosquitoes to higher and higher altitudes, and across borders, threatening more lives—a phenomenon we already see today in Africa.

A few years ago, hikers discovered a 5000-year old man in the Italian Alps. You might think someone would have noticed him before. They didn't because the ice hadn't melted where he was before—in 5000 years. If the same thing were to happen to the west Antarctic ice sheet, God forbid—it's a remote threat now, but it could occur one day—and if it did, sea levels worldwide would rise by as much as (6 m). If that happens, not even Augie Auer will be able to save us from the weather. Now, I want you to laugh about it because I figure when people laugh, they listen. But this is a very serious thing.

In 1992, the nations of the world began to address

this challenge at the Earth Summit in Rio. Five years later, 150 nations made more progress toward that goal in Kyoto, Japan. But we still have so much more to do. America and New Zealand... because of our understanding of the significance of Antarctica and the work we have done here to make this a refuge of scientific inquiry, have special responsibilities in this area.

Of course, we have a big responsibility because America produces more greenhouse gases than any other country in the world. I have offered an aggressive program to reduce that production in every area. We are also mindful that emissions are growing in the developing world even more rapidly than in the developed world, and we have a responsibility there. But I wanted to say today—and if you don't remember anything else I say, I hope you will remember this—the largest obstacle to meeting the challenge of climate change is not the huge array of wealthy vested interests and the tens of thousands of ordinary people around the world who work in the oil and the coal industries, the burning of which produce these greenhouse gases. The largest obstacle is the continued clinging of people in wealthy countries and developing countries to a big idea that is no longer true—the idea that the only way a country can become wealthy and remain wealthy is to have the patterns of energy use that brought us the Industrial Age. In other

Another apology

Yes, we blew it again: the May issue wasn't on recycled paper either. This time the excuse was a new printer with different paper stocks... and the usual deadlines.

words, if you're not burning more oil and coal this year than you were last year, you're not getting richer; you're not creating more jobs; you're not lifting more children out of poverty. That is no longer true.

We now know that technologies that permit breathtaking advances in energy conservation, and the use of alternative forms of energy, make it possible to grow the economy faster while healing the environment, and that, thank God, it is no longer necessary to burn up the atmosphere to create economic opportunity.

We have somehow got to convince a critical mass of decision-makers and ordinary citizens in every nation of the world that that is true. It will help to concentrate their attention if the people who know about Antarctica can illustrate, year in and year out, in graphic terms, the consequences of ignoring climate change and global warming.

We are committed to doing more at home and to do more to help developing nations bring on these technologies, so they can improve living standards and improve the environment. We can do this. We can do it in the same way that progress is being made in dealing with the ozone layer. Consider that example—something again which we know more about thanks to the work of scientists here.

Because of chemicals we produced and released into the atmosphere over the past 50 years, every spring a hole appears in the ozone layer above Antarctica. You already heard, and you know more about it than any country in the world, about the unhealthy levels of ultraviolet radiation which pass through. Now, every Kiwi school child who has participated in Block Day knows what it means, why you have to have sunscreen and a hat. But in 1987, the international community came together in Montreal and agreed to stop the use of chemicals that deplete the ozone layer. Experts tell us that if we keep going the ozone hole will shrink, and by the middle of the next century the ozone hole could actually close, so that, miracle of miracles, we would have a problem created by people solved by people, and their development. This is the sort of thing we have to do with climate change—and the stakes are even higher. The Antarctic is a great cooling tower for our planet, a great learning tower for our planet's scientists. What happens to it will determine weather all over the globe, and will determine the patterns of life of the children here in this audience and certainly of their children and grandchildren. It is a bridge to our future and a window on our past.

Global Environment Outlook 2000

This report was released by the UN environment programme as EnergyWatch was being put together: perhaps President Clinton (see the article above) had seen a draft. The UK Guardian Weekly described it as a devastating assessment of the future of the human race in the early part of the next century, and says in an editorial:

Two million Americans have recently been on the move in one of the biggest evacuations in United States' history. As they sat in their traffic jams they would have done well to read the United Nations environmental programme's GEO-2000 report, published last week. They could then have reflected that the nights ahead on school floors or in hurricane shelters are a direct result of global warming. and such disruptions will be an increasingly frequent feature of their children's lives. It is only a small step from there to realising that the major cause of global warming is the massive, wasteful consumption of a disproportionate share of the planet's resources by the wealthiest countries. People need to make these connections if the human race is to survive.

The Guardian quotes the UNEP director, Klaus Töpfer as saying

...a series of looming crises and ultimate catastrophe can only be averted by a massive increase in political will. We have the technology but we are not applying it.

SEF Convener Ken Piddington reports that the general assumption in Washington was that this crisis was man-made. EnergyWatch will be seeking a more detailed summary of GEO-2000 for the next issue. EnergyWatch

Rapid climate change

Evidence is mounting that major changes in the earth's climate can take place in a very short time. Data from ice cores and ocean sediments suggest, for example, that 11 650 years ago the climate in Greenland switched from ice-age conditions to the current relatively warm conditions (a warming of 5–10° on average) in only 40 years. The author describes the oceanic currents that influence climate and establish its stability, as well as 'trigger' that may perturb changes—including the possibility that greenhouse warming could invoke a rapid switch.

American Scientist 87(4)(abstract)

Threshold 2000—Can our Cities become Sustainable?

The Forum's sixth conference was held in Auckland on June 23–25, 1999, and focussed on urban sustainability issues. Proceedings are now available from the SEF office.

- We heard a National MP—Christine Fletcher, also Mayor of Auckland City—say that the Market will probably not sort out Auckland's infrastructure problems.
- We heard a professor of economics—Tim Hasledine of the University of Auckland—giving us back-of-envelope calculations that the cost of a single trip movement on the 800 m Grafton Gully road is about \$ 4.00 if the opportunity cost is included.
- We heard Professor Peter Newman—of Murdoch University in Western Australia—say that workers in our main centres are putting in an extra half day a week to pay for our inefficient transport systems.
- In a video link we heard Bob Watson—Chairman of the Intergovernmental Panel on Climate Change and Director of Environment at the World Bank—listing five theoretically predictable consequences of global warming. All are happening now.

At the end of a heady couple of days we approved a final statement from the conference:

At the conclusion of the Conference of Sustainable Energy Forum today, delegates agreed that it will be a major test for Auckland to become a more sustainable urban unit. All aspects of the city's systems will need overhaul—most obviously transport and energy networks, but also the systems which deal with water and waste. The Conference endorsed the need for new approaches which could link the solutions to two or more of these problems, and which could illustrate practical steps to be implemented locally and at reasonable cost. We saw the success or failure of Auckland's efforts as nationally significant.

Like the rest of New Zealand, Auckland would need to take changing climate trends into consideration. Using a video link, we were able to discuss the state of scientific knowledge on

climate change with a leading global expert, Dr Bob Watson, who chairs the IPCC (Intergovernmental Panel on Climate Change). He told us bluntly "it is happening"—and in a way that cannot be fully explained by natural events, such as shifts in solar radiation.

For all of New Zealand, the impact of climate change will involve key decisions on land use, water management and energy use. The market alone will not equip us to handle climate change risk. New approaches and new thinking will be urgently needed as we head into the new millennium. The compound failure of a decade of energy reforms and 50 years of roading development has many lessons on how not to do it. We are now far more oil-dependent than when the oil crisis struck. At the local level, Metrowater's failure to encourage conservation at the household level also speaks volumes.

An immediate requirement therefore is to work up an approach to network valuation to ensure that the individual is not penalised for low resource use and that developers are rewarded for enabling households to put conservation into practice. Such measures should also ensure that those least able to pay were not continually victimised by creeping commercialisation and privatisation of services with high public amenity value, such as electricity.

The role of the Sustainable Energy Forum would now need to change. We could put our knowledge to work through constructive partnerships with stake holders in the region. The Auckland Regional Council, Infrastructure Auckland, Auckland City Council and other local bodies, citizen networks, NGOs and professional associations—all could contribute to such an approach.

Another potential partner would be the recently-formed Business Council for Sustainable Development. The Conference welcomed this new development and was adamant that it would significantly add value both for shareholders and the community. Professor Peter Newman had already exposed the economic penalty which Auckland, and therefore business, is paying through the transport muddle.

There are win-win-win solutions available now. We have the knowledge. What is needed is leadership and a clear capacity to take decisions. Parliament should for example give passage to the Energy Efficiency and Conservation Bill currently before the Select Committee.

It was agreed that SEF should implement the findings of the Conference by setting up a working party which would focus on the opportunity for integrated solutions, on utility networks, such as water and electricity, and on the possible establishment of a funding mechanism. Together these steps could assist progress towards the attainment of sustainable solutions in the region and in other parts of New Zealand.

Energy Research Funding Submission

In early September SEF made a submission to the Foundation for Research Science and Technology on the future directions and priorities of government research funding for the energy sector. This was in response to the release of FRST's draft Strategic Portfolio Outline (SPO) for the energy sector.

(See www.frst.govt.nz for full details)

The renewable energy industry (wind, solar and bioenergy) had been active during the drafting of the SPO document, but in the end it was dominated by conventional (fossil) energy interests.

The "sustainable self sufficient energy future" vision promoted by the renewable energy industry has been reduced to a "steady-as-she-goes / don't rock the boat" vision of 'sustainable' fossil fuel supplies for New Zealand—as long as we can keep spending government R&D funds to keep finding more oil & gas reserves.

The SPO uses the word *sustainability* to describe fossil fuel use, which is unacceptable.

Fairy Tales

It was a story to tell the grandchildren: the great computer melt-down of the ninth day of the ninth month of the nineteen hundred and ninety ninth year.

Remember?

SEF contended that government R&D funding on energy should only address long term sustainable energy supply and usage. Historical R&D allocation patterns must be ignored.

The SPO introduction explained that

...its scope has been extended from underpinning the Government's energy policies and its obligations with respect to greenhouse gases, to include economic and social enhancement together with security of supply.

However there is little evidence that this extension has been included. Underpinning of existing fossil energy continues unabated. The draft SPO document is dominated by the fossil fuel industry interests, and the renewables industry interests are mainly ignored. The SPO compounds this issue by the lack of focus on small commercial and domestic energy consumers. The energy supply and major industrial energy users are over-represented, while energy efficiency and other complementary measures are ignored.

Employment opportunities, social cohesion and environmental quality aspects—so clearly evident from renewable energy development activities—are not addressed.

Energy use by the transport sector is a very significant fraction of the total energy use, dominating the growth in energy use, but is mainly excluded from the SPO.

The submission concluded that the focus of future government energy research **must** be on sustainable energy resources.

Hybrid buses in Wellington?

The City of Tempe, Arizona, has ordered 31 Hybrid buses from Advanced Vehicle Systems in the USA, with an option to extend the order to 200 buses. The design is a development of a trial bus operating in Chattanooga. Power is from conventional batteries, recharged either by overnight connection to the grid or by an on-board Capstone microturbine running on CNG. (Fletcher Energy are part owners of Capstone).

Electric buses like this could easily be adapted to use Wellington's trolleybus wires through the CBD, then switch to batteries in the suburbs, but we shall not be seeing the Tempe design in Wellington: it is 250 mm wider than usual, to make space for wheelchairs!

Safer Cycling

Kerry Wood

Cycling is the most sustainable form of wheeled transport, and could be very much safer than at present. This is the summary of a study of bicycle safety in New Zealand.

Good quality cycle provision offers real policy options. Cycling fits well with policies supportive of urban containment; public transport; pedestrianisation; traffic restraint; low transport costs; improved economic and environmental sustainability; improved public health; and improved road safety.

Significant reductions in motor vehicle use are achievable, especially in the most polluting short trips. Many trips presently made by car are well within cycling range: the average length of an urban car trip is only 5 km. Some people are willing to cycle more than twice this distance, and in congested traffic many people find cycling the fastest way to travel. Twenty percent or more of commuters cycling to work is a practical option. The best UK workplaces have already achieved 25%, and the best Dutch cities 60%. In the main centres even greater numbers could cycle to the bus or train. Other cycle use is less well understood but seems to be reasonably proportional to cycle commuter numbers. Greatly increased numbers cycling to and from school or shops is practical, widening transport choice.

The NZ cycling fatality rate is some 60 per billion kilometres cycled, which is high: the UK, with a poor safety record in European terms, has 47 fatalities per billion km. The average cost of reportable crashes is around 45 cents/km: some five times the average for car use. With supportive policies this could be reduced to around 7 cents/km. Non-reportable crashes (not involving a motor vehicle) presently cost as much as reportable crashes but here too, the risk is reducible, probably substantially. Taking a holistic approach and considering the benefits of cyclist's health, reduced congestion, reduced pollution and reduced risk to other road users, makes cycle use already safer and more economically attractive than car use, for some journeys.

Average costs conceal wide variations. Cycling is already twice as safe as driving for the high risk 15–20 years age group. It may be safer for most adults younger than 60 if the wider benefits are considered. At the other end of the scale, the cost

of young children's cycling risk may be comparable with the cost of taking a taxi.

Three broad methods are available to reduce cyclist's risk: they are best applied together:

- Provide integrated cycle facilities on busier streets or on equally direct alternative routes. Use semi-segregated facilities where actual traffic speeds are higher than 30–60 km/h, depending on traffic density.
- Traffic calm residential streets and selected CBD and shopping streets.
- Encourage wider use of cycling: this will itself reduce cyclist's risk. The effect is strongest in centres where cycling is at present least common and least safe. It is due simply to drivers becoming used to looking out for cyclists.

Costs for this approach—including the cost of delays to motor traffic—are substantially lower than the cost of providing for additional urban traffic in motor vehicles.

Safe cycle touring could open New Zealand to a lucrative new tourist market.

Achieving best international practice will need road space dedicated to cycles. Most of it will have to be space presently taken by motor vehicles, for either driving or parking. Major benefits are available from this approach and costs are lower than might be expected:

- Transferring space to cycles increases the people-carrying capacity of urban roads by at least 60%, and sometimes by over 300%. Parking space converted to cycle use increases parking capacity—in people-carrying terms—sevenfold.
- Making space for cycles—*limiting the opportunities for driver misbehaviour* in the Dutch phrase—increases safety for all road users.
- Motor vehicles need less space when they travel more slowly.

Achieving the benefits of safer cycling will need a major rethink of the way we prioritise and design for urban transport. However, the pioneering work has been done, the methods are known, the costs are reasonable. The benefits of encouraging cycle use and related policy choices are very large. We can no longer afford to ignore them.

Unbroken beliefs

The root causes of most of the problems we face are the unbroken beliefs, that:

- Growth Is Good
- Greed Is Good
Adam Smith, Pareto, Ricardo et al offer the ultimate answers for everything. The so-called *free market place* is the superior form of societal organisation, even superior to social democracy.
- Technology will solve all environmental problems
- There are no limits to technological efficiency
- We have time to spare
The disasters are not imminent and will not hit us or our children or grandchildren.
- We have sufficient resources to waste them on motorised traffic and a multitude of other so-called economic activities
- Speed and geographical mobility are good and necessary
- The public will not accept anything else than the current ways of life
We cannot go back to historical structures.
- So-called *free trade* is good and necessary.
Localised economies are not possible
- *The Market* will be able to deal with environmental problems
We can meanwhile let *the market* continue to deplete our planet from its last resources (minerals, arable land, forests, clean air, water, normal climate: the lot).

Blamed on the internet

Resource consent audit

Wellington Regional Council have had 65 of their Resource Consents audited, to see if they were imposing unnecessary costs on applicants. The audit, by Price Waterhouse, found that 63 were alright, but in the remaining two,

"WRC conditions were insufficient to mitigate identified risks to the environment and thus the WRC has erred on the side of the applicant rather than the environment."

Perhaps businesses are less put-upon than they would like us to think. from Environet

Increasing disasters threaten poorer countries

A Red Cross report warns that natural disasters are increasing, threatening economically vulnerable countries. "Everyone is aware of the environmental problems of global warming and deforestation on the one hand and the social problems of increasing poverty and growing shantytowns on the other," the president of the Red Cross International Federation, Dr Astrid Heiberg, said. "But when these two factors collide, you have a new scale of catastrophe."

Renewable Energy Research Showcase

The role of renewable energy technologies in New Zealand's future

Seminar

Wednesday, 17 November, 1999
9.00 am–5.00 pm

Massey University, Palmerston North

Objectives:

- For Renewable Energy researchers, recently funded by FoRST, to present their latest results.
- For Industry Users to provide input as to the direction and relevance of future renewable energy research.
- For Policy Makers and energy analysts to contribute to the discussion on the drivers for future Renewable Energy projects.
- For all interested parties to consider Renewable Energy developments worldwide and their relevance to New Zealand.

For a detailed programme please contact:

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In association with

- Centre for Energy Research, Massey University
- Forest Research
- Energy Efficiency and Conservation Authority

The annual World Disasters Report said that in six years, the number of people who needed aid after disasters like floods and earthquakes had risen, from fewer than 500 000 a year to more than 5.5 million.

Last year, natural disasters left far more people needing aid than armed conflicts did, the report said. Drought, flooding, deforestation and soil problems drove more than 25 million people from their houses.

In Indonesia, the El Niño weather pattern set off the worst drought in 50 years, exemplifying a trend of chain-reaction disasters, the report said. The drought caused rice yields to plummet and led to an increase in rice imports. Because of a devalued currency, the price of imported rice soared to four times its earlier level and food riots erupted in the capital, Jakarta.

At the same time, Indonesia had a dry rainy season, so fires that farmers set in slash-and-burn agriculture were not doused. Other countries and regions have also suffered disasters like Hurricane Mitch in Central America. "Both climate change and environmental change are forcing people into more vulnerable areas," the disaster response coordinator for the Red Cross Federation, Margareta Wahlstrom, said.

The poor often cluster in urban or coastal areas to seek employment. One billion people live in unplanned shantytowns, and 40 of the 50 fastest growing cities are in earthquake zones, the report stated. An additional 10 million people are vulnerable to flooding because they live in low-lying areas.

The Red Cross estimated that 96% of deaths from natural disasters were in developing countries. "We used to look at these natural disasters as blips on the screen of a country's development," the director of disaster policy at the Red Cross, Peter Walker, said. "But now they really change the development future of a country."

Access to insurance is dropping because insurers have incurred mounting losses for 10 years, the report said, and natural disasters represent 85% of insured catastrophe losses.

New York Times

Vital Signs 1999

The Worldwatch Institute has released a new report on world events. Their press release sets the scene with facts on the horrendous weather-related events in 1998 and then asks, are rising atmospheric levels of carbon dioxide from fossil fuel burning causing climate change to spiral out of control? Or was 1998 an aberration, something that happens rarely and may never be repeated?

We cannot know for sure, but climate simulation models suggest that the events of 1998 could be a window on the future, a consequence of failing to rein in carbon emissions soon enough.

The world energy economy is undergoing massive reconstruction, from heavy reliance on oil and coal to renewable energy sources, such as wind turbines and solar cells. While wind use was expanding at 22% a year from 1990 to 1998, and solar at 16%, the use of oil was growing at less than 2%, and coal was not increasing at all. Glimpses of the new energy economy can be seen in the solar cells rooftops of Japan and Germany and in the wind farms of Denmark, India, Spain, and parts of the USA.

The growth in world wind generating capacity, from 7600 MW in 1997 to 9600 MW in 1998 was concentrated in a handful of countries. Germany led the way, adding 790 MW of capacity, followed by Spain with 380 MW, Denmark with 308 MW, and the United States with 326 MW. In the developing world, India is the leader with more than 900 MW of generating capacity in operation.

In 1998, sales of solar cells jumped 21%. Growth is being fueled by a new photovoltaic roofing material that generates electricity. In Japan nearly 7000 rooftop solar systems were installed in 1998. The new coalition government in Germany announced the goal of 100 000 solar roofs. In response Royal Dutch Shell and Pilkington Solar International are together building the world's largest solar cell manufacturing facility in Germany. Italy joined in with a goal of 10 000 solar rooftops.

Worldwatch

Inner city sustainability

A late nineteenth century terrace house in an inner Sydney suburb is on a section of less than 200 m², but at the end of the twentieth century it has:

- No off-site drainage—sewer or stormwater (*Not even an overflow? EW*).
- No external water needs—they are met from rainwater catchment.
- No toxic or unsustainable materials, PVC, or tropical hardwood.
- Very low power bills: over twelve months it is a net exporter of electricity.

Ecovillage News

Carbon trading in Sydney

The Sydney Futures Exchange is to create the world's first exchange-traded market for carbon credits as part of a plan to become a global emissions trading centre. The exchange expects to offer trading of so-called carbon sequestration credits by the middle of next year, working in association with NSW State Forests.

Already the Tokyo Electric Power Company has signed a deal with NSW State Forests to plant 1000 hectares of forest next year. Discussions are in progress to expand that to 40 000 hectares over the next decade. One million hectares of trees will absorb about 300 000 tonnes of carbon dioxide.

Sydney Morning Herald

Ship emissions confuse global warming

Exhaust from ship's engines account for 60 – 90% of the SO₂ found in the air over large areas of the North Atlantic and northern Pacific. These emissions provide a surface on which water can condense, causing clouds to form or making existing clouds brighter. More clouds and brighter clouds cause more sunlight to be reflected back into space, cooling Earth. The cooling is enough to confuse researchers by masking whatever greenhouse effect is at work.

James Corbett thought ship emissions might be an interesting research topic, after spending two years as a ship's engineer. He expected that ships

might affect local or regional air quality, but "they turned out to be important on a global scale." Ship engines are the dirtiest combustion sources per ton of fuel consumed, producing 14% of the world's nitrogen emissions from fossil fuels and 16% of all sulphur emissions from petroleum.

Nature

Europe proposes fluorescent light regulations

The EU has proposed tightening energy efficiency standards for fluorescent lights used in offices and public buildings, saying the plan could save up to 12 TW hours of electricity each year. The Commission proposes phasing out the most inefficient lighting equipment one year after the new law is agreed, before requiring buildings to use only the most up-to-date lights three years later.

Annual energy consumption in the EU by the sort of fluorescent lights used in offices, schools and hospitals is equivalent to the total electricity consumption of Belgium and Portugal.

Reuters

Flexibility in the Baltic?

The Baltic region could become a main testing ground for some of the flexible mechanisms envisaged under the Kyoto Protocol. Draft proposals presented to the Baltic Sea Council should form a basis for a common position at a Nordic Council ministerial meeting in Helsinki, Finland at the end of October. They include joint implementation projects, under which countries fund and receive credit for emissions reductions projects in second countries.

A possible Nordic system of green certificates for renewable energy is also being developed. Taking in both relatively rich and poor countries with widely differing levels and structures of greenhouse gas emissions, the Baltic grouping could prove fertile ground for joint implementation schemes.

Sweden, for example, could notch up credits for helping to convert oil-fired power stations to biomass in countries such as Estonia. Swedish officials say this option could be very attractive given Sweden's small scope for further reducing

domestic emissions, and particularly in the light of the country's commitment to phasing out nuclear power. Officials are at pains to stress that the initiatives are being developed "in parallel with the Kyoto process," and that no final decisions will be taken until after the sixth conference of parties due in late 2000. 2003 has been suggested as a feasible date to put the first parts into practice.

ENS

The other side of the coin

As an antidote to more standard EnergyWatch fare we include something from the bad guys. An article in the US Journal of Commerce (Roy Cordato and James Carter, 15 June 1999) argues that the Kyoto Protocol is inhumane. Some quotes give the flavour of the article, and then we explain what is wrong and why this rubbish is important:

The... Department of Energy projects economic losses (due to the protocol, in the US) of \$397 billion (in 1992 dollars) by 2010.

If implemented with 100% participation and compliance, (Kyoto) would reduce global temperatures 0.07° C by 2050—an amount so small that it could not be reliably measured with ground-based thermometers.

DRI estimates the average annual job loss during the 2001–2007 transition period would be 900 000 jobs. From 2008–2012 this number rises to 1.1 million. This implies an average increase of 980 000 unemployed individuals per year between 2001–2012.

One study... attributes many unemployment-related deaths to heart attacks, suicides, homicides, and alcohol-related cirrhosis of the liver.

The Kyoto Protocol would expose an average of 980 000 additional people annually to these often fatal risks.

The employed will also face a more dangerous life if the Senate ratifies Kyoto. Slower rates of job creation reflect less overall demand for labor. Thus the treaty would lower wages and, therefore, incomes.

For many, reduced incomes mean greater health risks. One often cited study by Lutter and Morrall in the Journal of Risk and Uncertainty suggests

that a reduction in national income, expressed by GDP, of \$9 million to \$12 million (in 1991 dollars) will lead to the loss of one life.

Why? Lower incomes cause people to live in more dangerous neighborhoods and reduce their ability to obtain health care and related services.

Kyoto would result in 32 000 to 42 000 additional deaths per year by 2010. Unfortunately, because these deaths would be seemingly random, linking individual deaths to Kyoto could prove extremely difficult. Thus, while morally unacceptable, these deaths won't be politically damaging.

It is easy enough to mock this kind of stuff, or to see its authors as stupid, uncaring or evil. EnergyWatch readers will have no difficulty in finding multiple problems:

- Emotive wording: *...will also face a more dangerous life...*
- Extreme range predictions: *...(Kyoto) would reduce global temperatures .07° C by 2050...*
- Unidentifiable sources; *One study...*
- Claiming authority through spurious accuracy: *...projects economic losses (due to the protocol, in the US) of \$397 billion (in 1992 dollars) by 2010.* This is an accuracy of 0.25%: much better than most construction cost estimates, yet it is looking at highly uncertain effects a decade ahead.
- Counting every cost, no matter how uncertain: *...a reduction in national income, expressed by GDP, of \$9 million to \$12 million (in 1991 dollars) will lead to the loss of one life.*
- Ignoring every benefit, no matter how predictable: no mention here of any possible boom in sustainable energy.

We need to be aware of this kind of thing, and to counter it where possible. But we need to be especially on the lookout for using these methods ourselves. How many examples of bias would Roy Cordato and James Carter find in this issue of EnergyWatch? More important, how often would an impartial assessor agree with them? At least twice—in the second and seventh lines of this article:

- Emotive wording: *...the bad guys... this rubbish.*

Climate Change Bill

A Climate Change Bill has been introduced into the Australian Senate by Green Party Senator Bob Brown. The objective is to provide certainty for the environment and industry on greenhouse gases and to ensure that government does not rely on voluntary action to meet its Kyoto commitments.

Australia's agreed Kyoto 2010 target is to release 8% extra greenhouse gases compared with 1990.

The Climate Change Bill puts the government's own targets for reducing greenhouse gas emissions into law, provides a mechanism for assessing individual project proposals, and gives industry taskforces the opportunity to work out their own plans for meeting greenhouse targets. It also sets up a Greenhouse Gas Office to oversee the whole process.

Green power lives up to promises

The green power market delivered on its promises to customers in its first year, the San Francisco-based Center for Resource Solutions has reported. The finding is based on completion of the first official product verification process required under the Center's Green-e Renewable Electricity Certification Program. "The process demonstrated that green power claims can be verified in deregulated markets," the Center said in a news release, "and affirmed broad acceptance and participation by electricity companies in the voluntary Green-e program."

The Green-e program is the USA's first certification program for electricity supply based on renewable energy. The major results of the verification process in California's first year of electric service choice are:

- Marketers exceeded requirements for green power supply: Reports by independent auditors show that California's retail electricity suppliers selling Green-e Certified Products purchased more renewable energy supply than required for certification. Ninety nine percent of the total electricity purchased by retail green power companies was supplied by renewable resources, despite the fact that seven of 13 Green-e certified products offered in California were marketed as having 50-75% renewable energy (the other six were 100% products).

- Over 90% of California's residential green electricity customers bought Green-e certified products: A comparison between aggregate switch numbers derived from the Green-e Verification reports and California Public Utility Commission data received over the same period show that over 90% of Californians who chose green power in 1998 bought Green-e Certified Products.

Green-e verification reports also document a significant interest in green power on the part of nonresidential consumers. Aggregated sales data indicate that 21% of green power demand in the first year came from large customers (industrial, small commercial, and agricultural).

The verification data also show that California's market restructuring has helped stimulate the construction of new renewable resources in the state for the first time in 10 years. Erron Wind Corp. is building a new 16.5 MW wind facility and GreenMountain.com is contracting for a 2 MW facility specifically to meet the demand of the green market.

Another 55 projects comprising over 500 MW of new renewable resources are planned for construction under the California Energy Commission's \$160 million first round grant program established by California's restructuring law. Approximately 300 MW of this new generation will be in operation within the next year.

Tasmanian Credits for Sale

Tasmania plans to become Australia's only greenhouse gas sink—and profit from it. Since 60% of the state is forest and all power is produced from renewable hydroelectric sources, it soaks up more carbon dioxide emissions than it releases a net reduction of 8.3 tons per year per head of population.

Tasmania would like to earn an income from this unusual situation and sell carbon credits through an emissions trading program. Though details of emissions trading for greenhouse gases are not yet final, programs would allow industries to buy net carbon sink capacity rather than reducing emissions by other means.

The Tasmanian state would also like to increase its sink capacity by developing cleared land into plantations and building more renewable power, such as wind energy, to sell to mainland

Australia. But this would need the proposed Basslink cable project to proceed, and this has been put on hold many times.

For more on Australia's emissions strategy from the Australian Greenhouse Office see <http://www.greenhouse.gov.au/>

BP Amoco Emissions Trading Scheme

At a recent meeting for "industry" on possible carbon trading regimes, hosted by the Ministry for the Environment, there was a presentation about the BP Amoco company internal carbon-trading scheme.

The presentation has been developed to help convince others (politicians) that emissions trading is a better option than other systems such as a carbon charge.

The extracts below are from the introductory sections of the presentation, and are presented to assist SEF members with the debate. See the end of this article if you want a full copy.

Last year BP set itself the target of reducing greenhouse gas emissions to 10% below 1990 levels by 2010. With the merger with Amoco this target now extends to the whole BP Amoco group. Given the future business plans for the group, the target represents a deep cut on forecast emissions—a total of some 30 million tonnes before 2010 below the business-as-usual projection.

BP Amoco intends to use a system of group-wide emissions trading as a central tool to deliver this target in the most cost-effective way possible. It is intended that the system will be introduced on 1 January 2000. This will be the first global greenhouse emissions trading system actually put in place.

BP has already been operating a pilot emissions trading system, with 12 business units, since September 1998. The decision to move quickly to group-wide trading means that the pilot will be wound up—but the lessons from this experience are being fed into the design of the wider system.

Economic theory suggests that trading emissions should allow an environmental target to be achieved at the least cost to the economy. This is because the firms who can reduce emissions most cheaply, can gain from emission reductions by

selling emission rights to firms who would have to pay more to reduce their emissions.

Trading is an important policy alternative to taxation, and has the important advantage that it can work with other policy initiatives such as voluntary agreements between industries and governments. Trading may also work with tax.

Greenhouse gases are particularly appropriate for trading. Unlike other pollutants, where the local impact matters, the impact of CO₂ is felt globally and it is global concentrations that must be reduced. If we wish to address this problem seriously and sensibly, what matters is that we achieve the biggest reductions most effectively and at least economic cost—and that means adopting a global perspective.

The agreement at Kyoto commits most OECD countries and the countries of Central Europe and Russia and Ukraine (the "Annex 1" countries) to targets for the period 2008–2012, and these targets embrace a basket of six greenhouse gases. They are differentiated, to take account of different national circumstances, but require, on average, approximately a 5 per cent cut from 1990 emissions levels.

If you want an e-mail copy of the whole BP Amoco presentation (an Adobe reader—PDF—file) then please contact the SEF office (sefi@actrix.gen.nz), Energy Information Services (0800 65 46 36), or see the BP Amoco web site www.bpamoco.com.

Metric prefixes

If you are muddled by some of the more obscure metric prefixes, join the club! Here is a crib sheet:

Name	Symbol	Value
Tera-	T	10 ¹²
Giga-	G	10 ⁹
Mega-	M	10 ⁶
Kilo-	k	10 ³
*Hecto-	h	10 ²
*Deci-	d	10 ⁻¹
*Centi-	c	10 ⁻²
Milli-	m	10 ⁻³
Micro-	μ	10 ⁻⁶
Nano-	n	10 ⁻⁹
Pico-	p	10 ⁻¹²
Femto-	f	10 ⁻¹⁵
Atto-	a	10 ⁻¹⁸

* Avoid where possible

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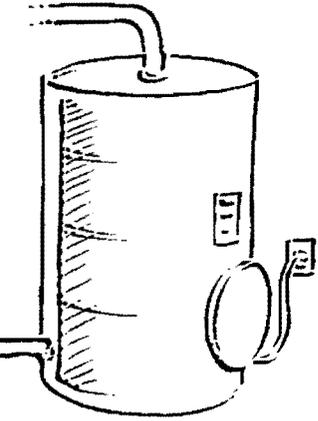
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