ENERGYWATCH

The Newsletter of the Sustainable Energy Forum - P O Box 11 152, Wellington, Phone/fax: 04 499 8668.

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

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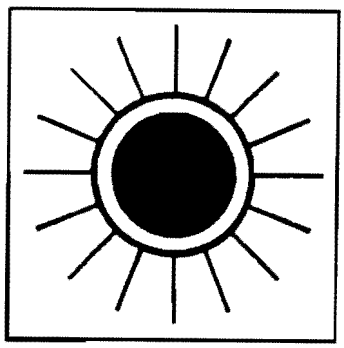
SEF MOMENTUM

Fiona Weightman , Manager



The Sustainable Energy Forum has had a busy first six months since becoming an incorporated society. We have launched membership, issued three EnergyWatch Newsletters, developed our office, written several submissions, continued networking on sustainable energy and worked on our next Conference for March 1996.

Being in the office has never seemed an isolated role with input not only from SEF's Management Committee but from many individuals who have been involved in previous SEF conferences. We have many people to thank for their support, those who have helped us 'in kind' ranging from supplying office equipment to providing access into conferences. Other people have given their professional time to input into our work, others too have made the effort to submit articles to EnergyWatch. Ideas, suggestions, assistance and critiques - it is what a 'Forum' is all about and we continue to welcome your input.

Of course the reality of running an organisation means that membership is not only crucial to our financial stability, but central to our role as a Forum, and we thank all our members for their support. SEF has been established to facilitate the exchange ideas on energy issues. Indeed our first 100 members reflect both the level of interest in sustainability issues and the 'broad church' umbrella of SEF. Our members have come from very diverse backgrounds - environmental groups and activists, energy companies and trusts, local authorities, private companies, iwi groups, government departments, energy equipment manufacturers and consultants, engineers, educational and academic organisations. Such a range of members does truly reflect what SEF is hoping to achieve.

Many thanks to all our supporters for their contributions. We look forward to seeing you in Tauranga, there is much to discuss and a lot SEF can contribute in 1996. We wish you a Happy Xmas and all the best for the New Year.

SEF CONFERENCE, 29-30 MARCH 1996

Our annual conference, which has been so successful in previous years, is this year planned for Tauranga with the title "Energy, Transport and Development: Policy as if People Matter". We have an exciting and full two days planned with plenary and workshop sessions covering Renewables, National Energy Policy, Communities, Iwi Issues, Electricity and ensuring Transport receives a high profile in the energy debate (particularly as submissions on the Ministry of Transport consultation documents will still be open).

There will be opportunities to discuss both policy and development in workshop sessions on Friday and Saturday following keynote speakers including, Neil Plimmer - The Ministry of Commerce, Chris Kissling - Lincoln University, a Tainui Representative, Roger Toleman - Ministry of Transport, Ralph Sims - Massey University, Alan Bickers - ABMS Management Services, Frank Pool - EECA, Bill Cassidy - Tauranga Electricity Limited, Mark Bachels - Canterbury Regional Council and Ken Piddington - SEF.

On Friday evening there will be an public meeting in a innovative format, which will involve input from both experts and politicians. Saturday afternoon has been set aside to visit a series of leading edge projects, and participants will be able to select those site visits of particular interest to themselves.

There will also be displays and exhibits on sustainable methods and technologies. Currently there is still display space available; organisations or individuals interested in mounting a display (for a very reasonable charge) should contact PO Box 1034, Tauranga.

If you would be interested in seeing the information flyer with further details, please contact 'SEF 1996, PO Box 1034, Tauranga - Telephone 07 578 7933, Fax 07 578 2670'. A discount is available for all registrations received before 20 January 1996, with the standard conference fee ranging from $290 (including meals) to $100 for the unwaged. Accommodation is a separate cost and a range of facilities have been retained to meet a range of requirements.

We hope to see all SEF members at the AGM on Thursday evening and many further participants over the following two days. We look forward to an exciting and provocative conference.

ENERGYDIRECT RESPONSE

Molly Melhuish

The last EnergyWatch reported on performance of (local) lines companies, and noted large variations in the reported direct cost per kilometre of local lines. The Monitor Table on the back page recorded values ranging from $357 (Otago Power) to $5221 (TrustPower). This last figure is over half the cost, $9521, incurred by Trans Power, whose lines are of course massive in comparison to local distribution lines. EnergyDirect's cost, at $4423, was the fourth highest of 43 companies.

David Griffith-Jones, Network Manager of EnergyDirect, wrote in to say "... it is incorrect to assume that there is any necessary relationship between the costs of any one power company and Trans Power". He said that EnergyDirect's proportion of the retail power bill has decreased from 30 to 25%, while Trans Power' has risen from 20 to 25%, because Trans Power's charges to Lower Hutt have increased.

Agree. But EnergyDirect's direct cost per kilometre local line is still unusually high. Mr Griffith- Jones explains that there are two reasons for this.

First, EnergyDirect has a large number of customers per kilometre of line - in the top 10% of power companies. Each customer has a separate connection, and more customers mean more transformers and switching gear.

Second, Lower Hutt and Porirua grew like Topsy from about 1946 to 1960; poles and lines now need replacement. About half are being undergrounded, and the other half, replaced by new poles. The new poles are all 'expensed' - that is, they are treated as direct costs. The company expenses service conversions within the undergrounding programme, which amount to around a third of the costs, and capitalises cables and transformers, as this appears to best fit the definitions under the new disclosure regulations.

Accounting policies for undergrounding are under legal challenge by Mercury Energy, so this will be a continuing story.

GREEN PRICING IN NZ?

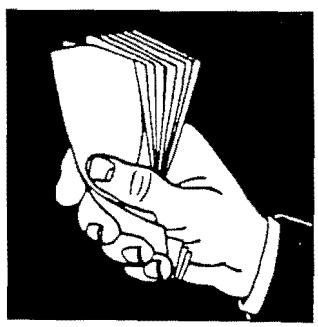
A November Seminar run by the Energy Efficiency and Conservation Authority (EECA) focused on the commercial opportunities of both Green Pricing and Energy Efficiency Services in New Zealand.

While Green Pricing is a new concept for New Zealand it is well suited to a deregulated energy market as it exploits consumer choice. The basic idea is that consumers can voluntarily opt to pay a premium price for electricity which is generated from renewable energy technologies. International experience has progressed the concept in many differing forms with varying success. However from this experience improved models could be developed, and both Citipower and Sydney-Orion in Australia were now promoting their own Green Pricing schemes. A common factor that arose from international experience was the level of support for the electricity company from its customers and the level of transparency of the programme. Customers needed to be completely reassured that their extra dollars were developing only renewable technologies.

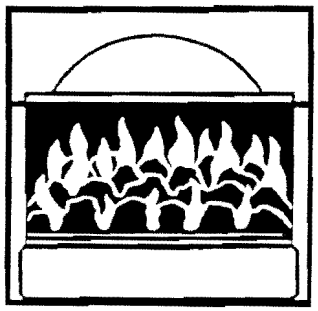
To examine the potential for Green Pricing in New Zealand, EECA released at the seminar a recent market survey. The survey was restricted to people with responsibility for household finances, resulting in 63% of the respondents being female. The survey demonstrated that a significant number of New Zealand electricity consumers would be prepared to pay extra for electricity from renewable energy sources. Eg; at a 5% price premium, 24% of the 500 consumers surveyed would definitely purchase 'green' electricity, and a further 39% would probably buy it. Also 51% of consumers would consider switching from their existing supplier to an electricity supplier who could supply 'green' electricity, even if it meant paying a little extra. The combined effect of the survey findings suggested that the optimum price premium would be around 10%. (To purchase the market research - $50 - contact Geoff Kelly, EECA, Tel. 04 470 2200).

The afternoon examined the value of selling energy efficiency services in New Zealand and how energy efficiency measures could add (often dramatically) to company profits. International examples of Energy Performance Contracts or Shared Savings Schemes were examined. For example, this can involve an Energy Service Company (ESCO) accepting total responsibility for the analysis, commissioning and monitoring of energy efficiency measures and the ESCO is then repaid for their costs out of savings resulting from the project.

The session concluded by examining a New Zealand project funded by the Crown Energy Efficiency Loan Scheme via EECA. This particular project saw a hospital upgrade its lighting on twelve floors, installing more efficient and targeted lighting. This resulted in a reduction of connected load by 60% and the consequent cost reductions. Also there were other non-energy benefits such as increased lighting levels, improved uniformity of light, reduction of fluorescent flicker and reduction of maintenance (as now only 5,000 lamps, rather than the previous 9,000 lamps, were required to provide this improved service). It seems as if New Zealand has both the potential and capacity to examine further both Energy Efficiency Services and Green Pricing.



LET'S HAVE SOME POLICY...!



This was the title of the keynote address to the International Symposium on "Energy, Environment and Economics" delivered by Ken Piddington in Melbourne on 20 November. The following is a summary of his paper. (Copies of the full text are available if you fax your request to Ken at (04) 479 2020).

In the field of public policy the distinction between what we know and what we don't know is often blurred. Even more problematic is the distinction between those situations in which we can act because we know enough, and those where no sensible action can be taken because the evidence is inconclusive. Nowhere is this better illustrated than in the environmental and economic dimensions of energy policy.

The theme of this Symposium captures a set of linkages which apply to energy production and use at both the macro and the micro levels. Just as the prospect of climate change has accentuated the global dimension, we are also being made aware of the potential for shifts at the local or micro level. These will create both environmental and economic benefits. At either level, we need to ask whether we know enough to act.

The short answer at the climate change level is that the political jury is still out, even though the scientific jury has now moved to a much clearer conclusion. The evidence is much more convincing at the local level, whether we are considering developing country needs for village electrification or the needs of remote communities in Australia, the USA and other developed countries. Cost factors alone tell us it is time to move into renewables. Welfare factors say we should hurry up.

At all levels the new renewable technologies offer a range of benefits which fit with the paradigm of sustainability. One might expect therefore that sustainable patterns of energy use would by now be high on the policy agenda, and that the twin goals of improved efficiency and greater reliance on new and renewable sources of energy (NRSE) would be seen as the strategic priorities which will take the resolute policy Pilgrim into the Vale of Sustainability, and change the world.

Despite some shifts, overall progress in this direction is marginal to date. In fact, it is overshadowed in many countries by the sheer momentum of "business as usual", particularly in choices about modes of transport and electricity generation. I suggest therefore we focus on a set of issues in the financing area that may well hold the key to more rapid progress, say within a horizon of five to ten years.

Despite the problem of identifying all costs, including environmental externalities, there are established ways of dealing with risk and uncertainty in financial analysis, so these difficulties need not obstruct investment decisions. There is an important distinction to be made between familiar and unfamiliar risks. To deal with the latter, new analytical approaches and new financing mechanisms may be needed.

The Global Environment Facility is an example of such a mechanism at the international level. It has created a precedent for financial transfers for certain types of energy investment, including a component to cover indirect project costs, such as training

As far as Australia and New Zealand are concerned, one must for the foreseeable future assume the continuation of tight budgetary constraints and of the extreme reluctance of governments to get drawn into "picking winners". We should look first at what might be done domestically to meet the financing needs for a shift into renewables.

All the options will however depend on intellectual and political acceptance of the case for an expanded stock of environmental finance. The rationale for incentives of this type and for more dynamic policy development in Australia and New Zealand should now be place squarely on the political agenda in both countries.

SO WHO INSURES THE INSURERS?

(A full page advert in the Financial Times & other newspapers - 25 October 1995)

A mere 400,000,000 Swiss francs. That's what we paid out to insurance companies in Florida in the aftermath of hurricane Andrew. Although its only a small percentage of our means, its still a lot of money. Enough to make you stop and think: giant storms are triggered by global warming; this is caused by the greenhouse effect; which in turn is accelerated by man.

Instead of either raising premiums, or insuring fewer risks, wouldn't it pay to help people reduce the risks themselves? Of course. But to do so will take of thrust of environmental innovation at source: in city planning, construction and industry, in finance and high technology, in taxation and incentives. Without this, we'll all have to pay - one way or another.

That's why Swiss Re, together with its clients (the insurance companies of the world), is implementing a dedicated environmental strategy. Because putting two and two together is the least homo sapiens can do. Clear-sighted strategies like this have been the foundation of our success for more than 130 years. Making us one of the leading reinsurers in the world today. And we are still looking ahead. If you are interested in where we're going, please fax +41 1 285

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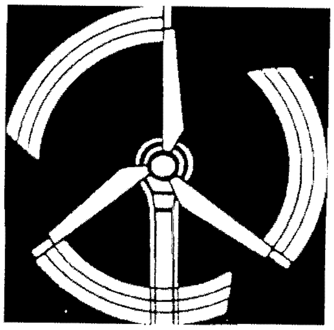
NZ NEWS

NEW WIND FARM?



Tararua Wind Power, a joint venture between CentralPower and Merrill International (NZ), has been set up to develop a wind farm, proposed for eleven kilometres east of Palmerston North. In November Tararua Wind Power applied for a resource consent for potentially 137 turbines, however present planning is for an initial development of 65 turbines. With wind tests showing the site to be amongst the best wind sites in the world, the initial development would provide around 25% of CentralPower's present energy needs (or enough electricity for approximately 15,000 homes). Should the resource consent be granted then construction could begin in late 1996 and the operation could begin in mid-1997.

While this is the third proposed wind farm for New Zealand, it is of a much larger scale than its predecessors. The site is located on 700 hectares of private land on a ridge of rolling hills which is presently used for sheep and beef farming. To capture the wind effectively the turbines will be sited on ridge lines, therefore from various vantage points some will be visible. Visual simulations have been prepared showing the expected visual impact on the landscape. The nearest public residents are more than 4kms away and the nearest sealed public road over 5km from the site.

The initial 30MW development is expected to cost between $40-$50 million and approximately 25% of this will be spent locally. Construction is expected to take 9-12 months with between 15-40 people employed at the site during this time. Once operational it is expected that there will be 8-10 full-time staff for operation and maintenance activities.

Although a final decision on the turbine equipment has yet to be made, Tararua Wind Power has developed an association with Kenetech Windpower. It is therefore expected that the wind turbines will be mounted on steel lattice towers, similar to a power pylon in construction. The turbines will have 3 blades, with each blade having a maximum length of 17 metres. The very good wind speeds on the site (8-12 m/s average) means that the cost of electricity generated from the project will be similar to CentralPower's present delivered cost of power.

Public submissions to the Tararua District Council on the application close on the December 18. An information brochure on the proposed wind farm is available on request by calling 0800 106 866, or writing to Tararua Wind Power, c/o CentralPower Ltd, Private Bag 11-024, Palmerston North.

MoC REPORT

Research estimating the costs of electricity from an early NZ wind farm is expected to be available in the new year. The work has been undertaken by the Ministry of Commerce to add to the information on the development of early wind farms in NZ.

STOP PRESS

As detailed in the October issue of EnergyWatch, the Ministry of Transport is publishing a series of Land Transport Pricing Study discussion documents. The first discussion document ('The Cost of Roading Infrastructure') has been released and in December 'Roading as an Economic Good' will be released. The Safety and Environment documents will be available in February - March 1996. Consequently submissions on all these documents will now close on 30 June 1996, not 29 February 1996 as previously advised.

NEW CAE REPORT

The Centre for Advanced Engineering at the University of Canterbury is publishing their major report 'Energy Efficiency: A Guide to Current and Emerging Technologies' in early 1996. The report not only details current energy use in differing sectors, but discusses to what extent various energy efficiency measures could impact on energy consumption, and which energy efficiency methods could be most appropriate.

Volume 1 (available in January 1996) contains the reports of the domestic buildings, commercial buildings and transport task groups. Volume 2 (available in February 1996) focuses on primary production, food processing, forestry processing, manufacturing and minerals, with a section on energy efficiency technologies that apply to a wide range of industries.

Volumes 1 & 2 can be purchased separately at $150 (GST exclusive) or together for $250. Contact CAE, University of Canterbury, Private Bag 4800, Christchurch. Telephone 03 366 7001.

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add this box in p.2

This issue sponsored by ECNZ - no editorial influence (gave $ but no input)

LESSONS FOR NZ?

November saw the visit to New Zealand of Andrew Garrad, Director of the well respected Garrad Hassan & Partners, one of Europe's leading wind energy consultancies. In a presentation at the British High Commission he discussed his paper 'How can New Zealand learn from Europe's Wind Energy Experience?'. If the Europeans have made some mistakes, then perhaps the idea of avoiding unnecessary costs and difficulties by identifying them may prove useful for New Zealand. Aspects of Andrew Garrad's paper have been reproduced below.

Different forms of developments in Europe have brought together different levels of community involvement, even some community ownership. However in some cases where bigger entities have been responsible for the developments some local communities affected by the wind farm have felt disenfranchised which has led to serious conflict in the UK, objection and ultimately, to the rejection of a planning application.

Early consultation and education have proven to be very helpful. The consultation process should be highly educational, with first hand experience of a working (perhaps demonstration) wind farm being significant. To ease the planning stages of wind farms the British Wind Energy Association also developed a consensus report with various objectors which defined 'Best Practice Guidelines for Wind Farm Developments'.

The role of utilities is crucial in progressing wind power, and in Europe their interest has developed when money could be made from the development. In NZ the interest in wind farms from both generators and distributors would suggest that larger wind farms may be developed and that substantial public opposition may result unless the developments are handled very carefully.

In the planning stage two issues have emerged as the central causes of concern for wind energy - noise and visual intrusion. There is no doubt that some of the early turbines in Europe were noisy, but each new generation of machine has become quieter and this now should no longer be a problem. However it must be remembered that machines are quiet and not silent, and imprudent use of the word silent has caused considerable trouble.

The issue of visual intrusion is, however, more vexed. The judgements on the visual merits of a development will always be subjective. All the developer can do is to treat the landscape as sympathetically as possible, to avoid important views and to provide high quality visual material in their applications.

Comparisons of wind conditions in other industrialised countries show that only some parts of Scotland, Central and South America have wind speeds as good as New Zealand's. Developers will want to check carefully on the suitability of machine survival in such extreme wind conditions, as significant working data in such high wind speeds has not yet been gathered. In principle the high demands on the machines should present no particular problem and can usually be accommodated by minor design changes.

There is much which can be learned from consideration of the mistakes which have been made in project development in other countries. The issue of choice of site, local consultation and education are of paramount importance. New Zealand has a fantastic wind resource, it has a growing electricity need and is highly concerned about its environment. It will not be able to resist this means of clean, cheap, new capacity for very much longer.

Drawing on their technical and commercial experience Garrad Hassan has set up a consultancy for New Zealand's specific circumstances. Consequently Graham White, Director of Garrad Hassan Pacific, can be contacted for further information on PO Box 44-152, Pt Chevalier, Auckland, Telephone 09 849 6600, Fax 09 849 6200.

RENEWABLE ENERGY CONFERENCES

Early March 1996 sees two conferences on Renewable Energy being co-ordinated by the Energy Efficiency and Conservation Authority (EECA) in Rotorua.

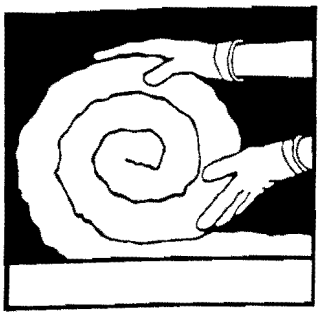
On 11 March there is a seminar on 'New Renewable Energy Opportunities for New Zealand'. The Centre for Advanced Engineering (CAE) is at present working with EECA to update the 1993 Ministry of Commerce publication 'Renewable Energy Opportunities for New Zealand'. Draft chapters of the revised report will be prepared prior to the seminar to ensure the latest information and potential applications are fully updated and discussed. Technologies covered will include wind energy, solar thermal, photovoltaics, small hydro, biofuels, landfill sites, wave and tidal. The draft chapters will then be reassessed by CAE with a view to producing a final publication in mid-1996.

On March 12-13, EECA and the Forest Research Institute will co-ordinate a Conference on 'Applications of Bioenergy Technologies in New Zealand'. This conference will focus on New Zealand bioenergy but will include international speakers, who are in the country for an IEA meeting, to illustrate overseas experience. Key topics covered include bioenergy and the environment, bioenergy availability and use in NZ, conversion technologies and economics, and research needs and opportunities.

Following these two days of discussion there is an opportunity to visit current or potential bioenergy sites on 14 March.

Any potential participants can obtain an information flyer from Graham Diedrichs, EECA, PO Box 37-444, Parnell, Auckland. Telephone 09 377 5328, Fax 09 366 0531, Email grahamd@eeca.ak.planet.co.nz

SUSTAINABLE SOLUTIONS



Two positive books on how local communities can develop successful renewable energy projects have recently been published in the US. If you are interested in how other groups have gone about achieving their more sustainable energy plans then either invest in these books or ask your library to get copies.

The first is the 'Community Energy Workbook - A Guide to Building a Sustainable Economy', Alice Hubbard and Clay Fong, Rocky Mountain Institute. The book clearly demonstrates that addressing environmental problems does not have to be at the expense of the economy. By investing in energy efficiency and renewable energy, communities across the US are solving environmental problems and building stronger economies.

The book details how to; set up a Community Energy Steering Committee, draw a local energy picture, mobilise the community, establish task forces (on residential, commercial/industrial and transport areas), examine your resources & opportunities, create project ideas, select energy plan projects and how to turn the plan into action. The workbook is a challenge to community residents to ask new questions about how their community meets its energy needs; it provides tools on how to discover the benefits of sustainable energy practices and the framework on how to achieve goals. And when the planning all seems to get too much, the numerous examples of successes are both encouraging and seem achievable.

- In Osage, Iowa (pop. 3,500) residents use 25% less electricity than the state average. The energy efficiency program, which started in 1974, by the municipal utility keeps an additional $1 million a year in the local economy.
- In Ellensburg, Washington (pop. 12,000) energy efficiency programs, which began in 1989, will result in an additional $6.84 million in industrial output. This saving is enough to support approximately 18 jobs per year between 1990-1999.
- In Davis, California several residents asked for dedicated cycleways in 1967. Today Davis has 50 miles of bike ways (compared to 100 miles of roads) and 25% of all trips taken in town are on bikes.
- Spurred by a mix of zoning regulations and incentives, the majority of new apartments and offices in Toronto are built within easy walking distance of the city's subway system. 77% of downtown workers now use public transit to get to work.
- In Mt Airy, North Carolina, local government has built a library that uses 80% less energy than the City Hall, a similar sized building.
- San Jose, California began converting t0 HPS lamps in 1983 and cut their streetlight power bill by 35%. By 1987 the program had a total cost of $5.5 million and had saved $9.7 million.

The other recent book release is by Nancy Cole and P.J. Skerrett called 'Renewables are Ready' (Chelsea Green, July 1995). This edited review is by Donella Meadows and was published in The Global Citizen.

The myth prevails that renewable, solar kinds of energy are exotic, unworkable, expensive and undependable. Meanwhile the 500 inmates of the Adams County, Colorado, jail use 20,000 gallons of sun-heated hot water a day. The investment to build the solar hot water system paid back within five years.

East Montpelier Elementary School in Vermont is heated with a high-tech, low-pollution, wood-chip-gasifying furnace. It brought the school's annual heating bill down from $25,000 to $3,600, even though an addition expanded the building by 50 percent.

The Kickapoo River flooded the business district of Soldiers Grove, Wisconsin, just one time too many. So the citizens moved their downtown out of the floodplain, and while they were at it, they designed the new buildings to get as much energy as possible from the sun. Soldiers Grove now has a grocery, pharmacy, bank, gas station, restaurant, clinic, library, post office, sixteen-unit housing complex for the elderly, and several homes, all primarily solar heated. The owner of the pharmacy, whose fuel bill has plummeted, says, "When things are close financially, this solar heating can make a real difference."

After Hurricane Andrew tore down power lines for miles around, solar-powered streetlights in Cutler Ridge and Kendall, Florida, kept right on shining. Powered independently by their own photovoltaic panels and batteries, the lights worked fine without the central grid. During the three weeks the power was off, people gathered under the solar streetlights at night to play cards.

These are just four of 70 stories about working, affordable renewable energy systems, north and south, big and small, all described in this new book. It's a factual book, intended to help people break the fossil-fuel habit. You can find there plenty of information about how renewable technologies work and how to contact the people who are using them.

Maybe the best example of that hopefulness is the book's picture of the world's largest sun-powered electric generating plant right next to the Rancho Seco nuclear plant, which was shut down by public referendum. What will the Sacramento, California, utility do without the power from that mammoth nuclear plant? It plans to save 800 megawatts through increased energy efficiency (they call it the "Conservation Power Plant") and to install 400 megawatts of renewables. For starters, over the next six years 14,000 houses will receive solar hot-water systems.

"We can't wait for the politicians and the media to wake up," says Nancy Cole. "If it's going to be done, we'll have to do it ourselves." And we can, and we are. "All we've done in Renewables are Ready," says Cole, "is to give visibility and voice to a movement that's already there."

(Donella H. Meadows is an adjunct professor of environmental studies at Dartmouth College.)

PACIFIC ISLANDS

Recent studies of electricity use in the countries of the South Pacific show a clear trend away from evening peakload towards daytime peaks; this is believed to be caused by the growth of the commercial sector, use of office equipment, air conditioning, etc.. Since solar PV is already economic on many of the more remote islands, this means that it will now become competitive for daytime peak generation. Already, it is understood that there are plans to increase funding for solar power installation in the region, by ADB, UNDP and others.

HYDROGEN COMES CLOSER

Work at Lawrence Livermore Laboratories in the US shows that hydrogen can be used in internal combustion engines and give a lightweight low-drag version of the ordinary saloon a range of 480km with no storage problems. The key is to use it in a hybrid mode with electrical energy to provide surges of power (and to store lost energy through braking). Running costs are expected to be below those of running on gasoline (but only where there is already a sizeable infrastructure for hydrogen distribution in place). Such vehicles would meet the rigorous new standards being applied in California and elsewhere.

LA CLEANS UP

Positive results are being achieved by using market-based instruments to clean up the smog in the Greater Los Angeles region. Both mobile and stationary sources of pollution are included under the scheme, which allows a tradeable credit to former polluters when they clean up. Other ideas include vehicle leasing, with responsibility for engine maintenance staying with the lessor, so that much higher standards can be be achieved across large fleets of vehicles. Los Angeles is also supporting research into fuel cell vehicles and other technologies which offer lower pollution and higher efficiencies.

BUT IN EUROPE...

In Europe it will be regulation by consensus. The European Commission is about to issue a directive which will further reduce the principal pollutants from motor vehicles in most European Cities between now and the year 2005. This comes on top of a 90% reduction over the last 25 years (on a per vehicle basis). Lengthy negotiations among all the parties, including vehicle manufacturers, were recently concluded. But these measures willdo nothing for congestion – the average speed of traffic in Central London is 8mph and declining! Neither will it solve the specific inversion problems of cities like Athens (where the age of the fleet is a large part of the problem).

AND IN AUSTRALIA?

Manufacturers are aiming to produce a recyclable and efficient motor vehicle by the year 2000. Lifecycle studies show that the average new car currently produces 115 tonnes of CO2; this will increase by 15% over 1995 levels by 2010. But system efficiency (including fuel consumption) could reverse this trend and bring about a 3.6% reduction over the same period.

WIND FOR AUSTRALIA?

Experts consider that Australia is lagging behind the northern hemisphere, where there is a surge in investment in modern wind generators. There has been an insufficient market to interest Australian industry. A forecasting workshop will be held in Newcastle early in 1996, with the aim of convincing potential stakeholders that there will be high growth in installed capacity over the next 10 years.

CO-OPERATIVE RESEARCH CENTRE

Bids are being considered for the establishment of a CRC for Renewable Energy in one of the Australian States. This will bring industry, energy interests and the research establishment together in a focussed approach to research and development. Annual funding of A$18 million was announced in the 1995 Budget, and competition is keen because of the multiplier effect of the Government's seed funding.

EXTERNALITIES AGAIN

Transport externalities are estimated at around A$6 billion for the State of Victoria. This calculation sets monetary values on impacts such as noise, health, congestion and accidents. The same study estimates that CO2 emissions could be reduced by around 16% compared with projections for the year 2005 – at no financial cost to the community.

OPTIMISM ON COSTS

Developers of new technologies for solar PV and solar/thermal power generation continue to claim that Australia could have relatively cheap power from both sources within 5-10 years. But plans to use the Olympic Village as a demonstration project for the new technologies may founder because NSW has a surplus of cheap coal-fired generation and the potential investors would be more interested in replacing high-cost rural power schemes. As in New Zealand, they now have to meet uneconomic maintenance costs on long feeder lines; PV at less than A$2 per watt installed would be very attractive in such locations.

RENEWABLE STORAGE

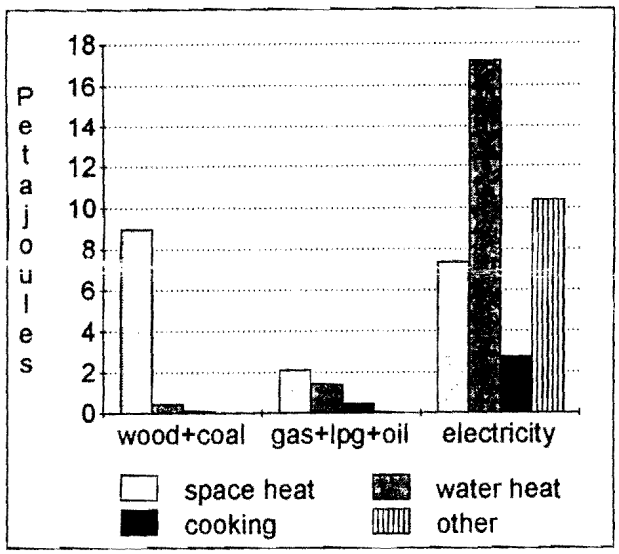
Researchers are losing faith in new battery technology as a solution to this core problem for many renewable sources of electric energy. Ideas about liquid air and other variants are now being pursued. Small-scale electrolysis to produce hydrogen is being seriously examined (and could link with the emergence of hydrogen as an automotive fuel and as feedstock for fuel cell power generation).

- **Wood and coal make up over half the fuel used in New Zealand's household space heating.**

This is just one snippet from the massive amount of information in the first issue (June) of "Energy-wise Monitoring Quarterly", published by the Energy Efficiency and Conservation Authority (EECA). It publishes and analyses information and trends of how efficiently New Zealand uses energy in domestic, commercial and industrial sectors. The aim of the Quarterly is to foster public debate on energy efficiency issues as well as to inform EECA's own work.

The first issue focuses on New Zealand's energy intensity, and on ratios such as energy use per capita in different sectors, and for commercial buildings, energy use per square metre of floor area.

Household Energy End-Use, 1991



The chart above, drawn from figures in the June issue, shows the energy use in houses in 1991, in Petajoules - 1 PJ is the amount of oil in a NZ coastal tanker; Wellington city uses about 3 PJ of electricity per year.

We immediately note that water heating uses twice as much electricity as space heating, the same as found by the 1971 Household Energy Survey which has been the only source up to now of end-use information on energy in houses. What surprises most people is the large amount of solid fuel used in space heating.

The petajoules used in 1991 for space heating were: wood, 6.393, coal, 2.592; fuel oil, 0.500; LPG, 0.289; gas, 1.347; electricity, 7.383. The figure for wood included an estimate of gathered wood and wastes. Space heating used 36.5% of total household energy.

Space heating is important because electricity is expected to become scarce first during winter months. Using wood more efficiently, and using more natural gas for space heating, may be the most cost-effective ways to defer new power stations.

- **New Zealand's end-use energy intensity fell 2.9%** in the year ended March 1994, compared to an average annual increase of 2.4% during the previous decade. Information just to hand shows that the March 1995 year saw a further decline of energy intensity, of 3.2%,

The energy intensity of a country's economic activity, an indicator much used internationally, is the amount of primary energy used per unit of gross domestic product.

A method devised by Murray Patterson of Massey University separates the major influences on energy intensity into: the mix of consumer energy (the amount of electricity used compared to primary fuels), the growth or decline of energy-intensive industry, the amount of energy used in households, and technical energy efficiency.

Of these, the largest effect in 1994 was the decline in household energy use, which was associated in each of two previous years with an increase in power prices and annual power bills, as indicated by the table below. The Quarterly, on pages 3-4, gave statistics for three years; a further year's data were kindly supplied by the Electricity Supply Association. The new statistics however only apply to 66% of households due to the resignation of several power companies from the Association.

Houshold electricity demand, prices, costs

year ending March:	1992	1993	1994	1995 *
demand/house, kWh/yr	7890	7594	7592	7244
average power bill, $/yr	700	702	734	748
average price, c/kWh	8.89	9.24	9.67	10.19

* figures from 66% of supply companies which are members of ESANZ

Further discussion of these figures is given in an EECA paper, Analysis of New Zealand's 1995 Energy Intensity, dated 8 November 1995. It notes that gas penetration into the domestic market increased from 6.5% in 1990 to 8.4% in 1995 (March years), during which time solid fuels declined from 18.3% to 14.2%. The March 1995 Energy Data File confirms that this decline is almost entirely of coal, and that wood use remained approximately constant.

Energy-intensive industries other than aluminium and steel grew rapidly in 1995 and this would have contributed to a 4% increase in energy intensity had it not been offset by technical efficiency, household energy reduction, and the changing mix of consumer energy.

- **Health sector buildings use the most energy per sqare metre of all types of commercial buildings,** followed closely by educational buildings (high schools, polytechs, universities). Some examples from recent EECA audits, which we aggregate to some extent, give the annual energy use in kWh/m2: commercial retail, 95; offices, 155; industrial warehouse, 155-210; educational, 433; health/medical, 477. Other information allows us to estimate household energy use as about 95 kWh/m2, the same as in commercial retail building.