

# 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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## ENERGY POLICY

*Ken Piddington, Convener of the Forum*

After our first issue came out in July, we have had a lot of enquiries about membership. The question most frequently asked is "What is the Forum's policy on energy?"

At one level, that question is easily answered. As a group, we want to see a real shift to sustainability, in both the supply and use of energy in all forms. The law and the Rio Declaration (which New Zealand endorsed) require it; there are also strong ethical arguments and these are spelled out in our articles of incorporation.

From the outset, all participants in the Forum agreed that a national energy policy was the way to go. So that is our policy, because we believe the lead on sustainability has to come from government(s) – including regional and local bodies. One of our priorities was to try to convince this Government that they should formulate a national energy policy, but so far our advocacy has been rejected.

In current circumstances, the preference has been to turn the production and supply of energy over to a deregulated market. In these pages therefore readers will find regular updates on the new mechanisms and comment on how they are working. Logically, we must argue that the market should offer real economic choices, that it should create incentives for energy efficiency, for investment in conservation and renewable energy technologies. We know this will not happen automatically.

In this journal, we will therefore convey information about defects in the market mechanism. Identification of "market failure", especially in terms of environmental

factors, will in turn suggest what policy the Forum should pursue. The bottom line is that we cannot afford to have "government failure" as well as market failure... Markets can be readily captured by entrenched interests, so governments will always have a vital role.

The process of policy debate is thus in itself a key function of the Forum. But it then becomes difficult to be categorical about what the policy is likely to be. We are a new organization, set up on the "broad church" principle. Policy will emerge from the debate, but only when there is clear consensus.

In the absence of such consensus, the Forum will not see itself as having a mandate to lobby or promote any single line of action.

At our 1996 Conference in Tauranga, there will be a focus on transport issues and this will illustrate the process of debate first, policy second. National energy policy will again be discussed – this time in a completely novel format. And issues such as Maori investment in renewable energy, which are crying out for wider debate, will find their place on the Forum agenda.

All in all, our members will not be starved of policy opportunities.



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## CALL FOR MEMBERS - WE NEED YOUR SUPPORT

In July we launched our first edition of EnergyWatch and announced SEF was now an incorporated society seeking members. As a result of this we have had much feedback from readers and colleagues who are interested in energy issues.

However we would like to appeal to all interested individuals and organisations to join SEF. Unfortunately we can no longer afford to send out EnergyWatch to non-members. We are a small, fledgling organisation and we believe we can play an important role, but we need your membership and support. Please join the Sustainable Energy Forum, we know there must be many of you who would be interested in being part of a positive move towards a better energy future. You will also receive EnergyWatch at least quarterly and, for example, receive a discount on our Annual Conference in March if you join before 1 December.

A membership slip is on page 2 of this newsletter and a membership leaflet is enclosed with the mailout. Return either, using the mailout envelope if you wish, to SEF, PO Box 11-152, Wellington. Your support will be much appreciated.

## EDITION OF JULY 1995

I notice on the back page in a write up by Molly Melhuish she quotes "that Dunedin and The Power Company Southland refuse to supply some data...". This is incorrect.

The actual situation is that The Power Company (and I also understand Dunedin Electricity), have resigned from ESANZ because we philosophically disagreed on how this organisation is run and where it is heading for the future and as such it was inappropriate for us to supply the statistics to which you refer.

Keith McConnell, Chief Executive,  
The Power Company Ltd

## WIND ENERGY STUDIES

I head a group of researchers into wind energy in the Physics Department of the University of Otago. At the moment there are two New Zealanders (both from Wellington) and two Germans, (both from Oldenberg) carrying out project work.

One New Zealander is the ECNZ Wind Energy Fellow who is helping with contract work on the potential for large wind farms near the Clutha River. The other is a DipSci student working on laser anemometry. The two Germans are working on analysis of fine structure wind data from our 30 m tower on the Old Dunstan Road.

We are also negotiating with two other overseas students who want to come and work on our projects. While we welcome this overseas interest, it would be nice if more local demand for places in our group was occurring.

Keith R. Dawber,  
Senior Lecturer in Physics  
Otago University, PO Box 56, Dunedin.

## GROWING, GROWING, GONE?

The Tasman District is a wonderful place to be and a lot of people want to be there. Eight hundred new connections per year in addition to the existing 28,000 are quite a lot. Most of the new houses are more energy efficient than the old ones but they are also often bigger and more luxurious. So their total energy consumption is not reduced.

This means by just connecting houses one after the other to the grid we will sooner or later reach the point where the network and generation is at its maximum capacity. And then? Invest in a new grid? Build new power stations? Don't allow any new connections? Rationalise consumption?

Stop. It is not that people want or need more electricity. It is that more people want or need a warm house, plenty of hot water, light and a cold fridge.

And this is what we need more of; energy-efficient heating, lighting, refrigerating etc. And we can start right now. We just have to ask for it. Compact fluorescent lightbulbs, heatpumps, low energy freezers and fridges are readily available.

Each customer would benefit via a lower power bill; the power company would not have to upgrade the systems at high cost and new generation could be kept at an absolute minimum. But it is up to us, the customer, to ask for it. Lets start asking.

Mike Abeltshauser,  
Energy Advisor, Tasman Energy.

**NOTE:** Letters to the Editor on articles that appear in EnergyWatch or issues that are raised concerning sustainable energy are always welcomed. Please ensure any correspondence is signed and clearly states a wish to be published. The Editor reserves the right to withhold or edit correspondence due to space limitations or unsuitability. Please forward any letters to; Fiona Weightman, Editor, EnergyWatch, PO Box 11-152, Wellington.

## SUSTAINABLE ENERGY FORUM MEMBERSHIP FORM

Please enrol me/us as Forum member (s) for 1995/6. I/ we understand that this includes receiving a copy of EnergyWatch at least quarterly. Payment is enclosed for the amount shown: (Circle one option)

Individual \$40

Student or unwaged \$10.

Small Business (up to 50 employees), iwi, community or public interest groups \$200

Corporate (50+ employees) or public sector \$800

Donations most welcome:

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Thank You.

Please forward to: The Sustainable Energy Forum, PO Box 11 152, Wellington.

# CAN AUCKLAND GET ITS TRANSPORT ACT TOGETHER?

*Jack Woodward*

Auckland is expected to top one million by 1997, its growth in the year to last March being equivalent to adding a town larger than Masterton. Auckland City is the second-fastest growing local government area on either side of the Tasman. However the Auckland region's traffic congestion problems have reached crisis point. Car use grows at almost twice the percentage of population growth; last year there was a five per cent increase in vehicle numbers, while there has been a halving of public transport use since the mid-1980's.

Much of the blame for Auckland's present transport woes has been attributed to the planners of the late 1950's and early sixties. A motorway network was to be developed with a light rail system, but the rail aspect was dropped along the way as planners opted for the road solution. Light rail proposals have recurred however and most recently a scheme dubbed 'Superlink' was put forward by a group comprising New Zealand LRT Ltd, AEG, Evans Deakin Industries and Mercury Energy. The core of this network is a light rail transit system running on the main commuter corridors in the east, south and west, with buses providing feeder services. The Superlink proposal is well researched and ready to be implemented. The Auckland region could have LRT in place in three years. A key feature of Superlink is its affordability. The southern and western lines together with the inner city loop and Manukau extension would cost \$230m with the eastern line costing an additional \$65m. The Superlink proposal assumes a public-private sector partnership, and favours ownership by a community trust.

A key element in a public transport network would be a transfer station at Britomart in downtown Auckland. In July of this year the Auckland City Council unveiled its proposal for a new Britomart Underground Transport Centre, to be built on five underground levels at an estimated cost of between \$285M and \$330m. The sale of sites for massive commercial developments above ground would finance the construction of the Centre below. Four underground levels are earmarked for car parks (approx. 3000 spaces in all), with Level 2

comprising a rail station (LRT, Inter-city and suburban services) and a bus terminal. Most existing structures on the site would be demolished, of a total of 13 heritage buildings only 3 would be retained intact. The proposal has attracted widespread criticism as being too grandiose, too destructive of the existing environment and having too little emphasis on public transport issues. The Auckland Civic Trust has unveiled an alternative proposal which provides exactly the same public transport facility but at about one third of the cost of the Council proposal.

The Auckland Regional Council has given final approval to its Regional Land Transport Strategy aimed at the creation of a transportation 'super network' to meet transport needs for the next 10 years and beyond. Included are proposals for ferry routes, busways, cycleways and a pedestrian friendly environment. Light rail and the North Shore Busway are both scheduled for completion by the year 2000. Limited forms of integrated ticketing would permit transfer between the public transport modes, while timetables would link buses to ferries and light rail. The restructuring of the bus services is already underway, including more use of various bus priority measures. Criticisms might be levelled at the number of roading measures, although completion of the region's arterial road network has long been identified as a priority to easing congestion. Nonetheless the targets set for public transport use are surprisingly modest namely; a recovery to 40 million public transport trips in 2000 from the present 30 million, as against a peak of 60 million in 1985.

That there is a desperate need to tackle Auckland's transport problems is surely beyond question. The real question is whether the political will and consensus exists to do anything effective. Perhaps we should have a closer look at the Alliances 'Greater Auckland Plan'. This includes a Light Rail Network integrated with ferry and improved bus services and backed by the finances of the Auckland Regional Services Trust. Public transport emerged as a major issue in the October elections, and the Britomart development bonanza could be a polarizing factor in the case of Auckland City.

## SEF CONFERENCE, 29-30 MARCH 1996 ENERGY, TRANSPORT & DEVELOPMENT:

### POLICY AS IF PEOPLE MATTERED!

Planning is well under way for our 1996 Conference in Tauranga, so please make a note of the dates in your diary. We will be circulating more information on the conference before the end of the year. Also keep in mind that if you join SEF before 1 December you will receive a discount on the conference fee.

As you can see from these EnergyWatch pages, there is currently much debate on the question of NZ transport.

SEF's March Conference will focus on NZ's transport problem's, looking at the current situation and options for the future. In addition the Conference will be looking at National Energy Policy, Electricity Reforms and receiving an update on Renewable Energy. There will also be a public meeting and exhibition space available for displays. We look forward to a strong attendance as with previous Annual Conferences.

# WHAT ARE CITY ROADS FOR?

Kerry Wood

Urban roads have all kinds of uses:

**Access:**

- Access for people and freight
- Vehicle loading and unloading
- Parking
- Services (Phone, water etc)

**Amenity:**

- Light and air for buildings
- Outlook from buildings
- Context and setting for buildings
- Space for trees and grass
- Views

**Recreation:**

- Play space for children
- Jogging and recreational cycling
- Walking Shopping

**Community:**

- Seeing, meeting and talking to others

**Transport:**

- Walking and cycling
- Main services (trunk cables, gas mains etc)
- Buses and light rail
- Cars and trucks

All these uses have different and conflicting needs, but so often the debate centres around the supposed need for cars and trucks to access any address at any time, door to door and without delay. Other uses often have to fit in as best they can. As Lewis Mumford puts it, "The private motor car has devoured the one commodity the suburb could rightly boast: space. Instead of buildings set in a park, we now have buildings set in a car park." (The City in History).

A great many traffic surveys do not count pedestrians and cyclists, but now traffic engineers are finding that a 6 lane highway may be carrying more people on two footpaths, each 2 m wide, than on the 20 m road between them. Dedicating two out of six lanes to buses - or cycles - would triple the carrying capacity of the road. Given this knowledge, setting traffic signals so that buses and cycles have no priority and pedestrians get a 15 second scurry every two minutes may not be the best use of junction time.

The effects of over-encouraging cars can be bizarre. The citizens of Houston consume five times more petrol per capita than the citizens of Zurich, even though Zurich is wealthier and - to most observers - a more pleasant city. The Zurich authorities are convinced that their policy of discouraging traffic has brought economic benefits, not penalties.

In London the passenger carrying capacity of streets leading into the central city has fallen steadily over half a century, despite all the road improvements in that time, due to the switch from buses to cars. A theoretical study produced the following table:

A few people going by car can travel much more quickly than the on the buses without delaying the buses much. As the number of cars builds up everyone is delayed but the cars are always faster than the buses. If half the passengers go by car they get a slower ride than they would by bus if everyone else went on the bus too.

Journeys By car (%)	Journey By car (min)	Journey By bus (min)	Time Average (min)
0	(32.6)	50.4	50.4
10	34.5	52.7	50.9
20	36.9	55.7	51.9
30	40.5	59.8	54.0
40	45.8	66.2	58.0
45	50.1	71.2	61.7
50	55.6	77.4	66.5
60	83.5	108.2	93.4

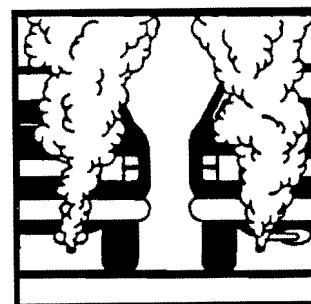
Building roads generates traffic, but the opposite is also true. The City of London introduced a 'ring of steel' traffic management scheme as an anti-terrorist measure, and found that traffic vanished without ill effect. The scheme may now be made permanent. There has been no noticeable displacement of traffic into neighbouring boroughs, pollution levels are down, crime is down by 17% and journeys on foot are easier.

Density is a crucial link between urban and transport policies. Doubling the number of people in a given area reduces average journey lengths in the area by about 30%, making cycling and walking more viable. It doubles the number of potential passengers on a bus route without affecting operating costs. If more buses are put on in response to demand the improved service attracts still more passengers. The difference between Houston and Zurich mentioned above is mainly due to density. Houston has a very low density of 9 persons per hectare, Zurich about 55.

Road building pushes down density. Houses are demolished to make space for the road, traffic is increased and with it the need to devote space to parking. Urban sprawl is encouraged. People seem to think of their territory in terms of travel time rather than area, so being able to travel faster tends to encourage travelling further. Curiously, something similar seems to happen with freight. In the UK the tonnage of food hauled by road hardly changed between 1976 and 1992, but the distance it travelled increased by almost 50%.

Obviously we cannot rebuild our cities overnight, but we do not have to. The bias in favour of the car has developed over the last half century, and can be eliminated over a similar period if we can stop further unsustainable development.

"If the present day measure of disadvantage to pedestrians and cyclists had arisen at one blow, people would scarcely have let it happen" Rodney Tolley (Ed), The Greening of Urban Transport



# ELECTRICITY MARKETS - THE BIG PICTURE

*Molly Melhuish*

New Zealand's wholesale electricity pricing system will enter a new era before the end of this year. The market will be like a chainsaw - a powerful tool when controlled but terrifying in the hands of an untrained or unscrupulous operator.

If competition succeeds, overall prices will fall, not rise as predicted by most opposition political parties. In today's deregulated system, falling prices will allow demand to rise - new power stations will be built and carbon dioxide emissions will rise. Only strong environmental regulation and specific pricing such as carbon taxes will prevent this.

If industry collusion keeps prices high, the industry will use its wealth to maximise shareholders' value, as required by the Companies Act. The most natural way to do this is to attract large customers and build new power stations to serve this profitable part of the market. Small consumers, unless they are protected, will end up paying for the new power stations, and further environmental loss will occur.

Both scenarios are unsustainable, because without regulation for public policy, industry will simply use its ever-increasing revenues to expand. A fully competitive market can only benefit the environment and small consumers if all consumers pay full environmental costs

and if less-competitive consumers are allocated, as of right, their share of the benefits of the market.

It is disturbing that Government refuses to anticipate these entirely predictable outcomes. For example Government has no plans for monitoring damage to river banks or lake shores which could result from pricing pressures (see 'Market Mechanisms' Article). Also its discussion paper on the regulation of vertically integrated monopolies (such as local power companies) is based on the old ideology of "economic efficiency", and ignores all special characteristics of the energy sector.

Government has also gone soft on information disclosure requirements. The Optimised Deprival Value of lines monopoly businesses has not been disclosed - yet this is critical to comparing the financial performance of different companies, and to establishing whether they are cross-subsidising their competitive businesses from monopoly profits.

Actual average prices for domestic, industrial and commercial electricity consumers, which have always been disclosed in the Electricity Statistics, are to be replaced by information on tariffs - but these are becoming less and less relevant as special contracts are used to shift advantage to the more-competitive sectors of the market.

If the electricity market is a chainsaw then it cannot be given sovereign power over the jungle but must be used in the service of society's goals.

## FIXED CHARGES FOR POWER LINES

*Peter Kammler*

The Energy Companies Act 1992 requires power companies to separate the cost of power lines from the cost of electricity. Each of the two components can have a fixed charge and an avoidable, per-kilowatthour, charge. Although Government has the option to regulate against fixed charges, it has not done so.

The bulk of energy efficiency measures can be implemented at a cost far below that of new electricity generation, and substantially lower than the present averaged cost of generation. To minimise costs to both electricity users and the national economy, it is desirable to enhance the economic viability of energy efficiency measures, possibly to the extent that they can be used to make new generation unnecessary.

The power companies argue that fixed charges are necessary to avoid subsidising small users. This argument is not valid. In fact, it is the inconsistent user who is subsidised, irrespective of whether it is a large user or a small user. For example: A holiday beach settlement requires a line network which is under-used in winter.

However, it should be noted that inconsistent users are not subsidised by the power company but by other network users. There is no doubt that it is less costly for both the individual consumers and the national economy to subsidise a few inconsistent users while in return reaping the full benefits of energy efficiency, and by that postponing the extraordinary cost of system expansion.

The present pricing policy of power companies is predatory pricing because it suppresses the least costly option for supply of energy services such as light, heat and motor torque. In addition, fixed charges shift business risk, that is asset utilisation, from the investor to consumer. Shifting business risk from the developer to other parties is always counterproductive, as the Think Big debacle has shown.

The aim of the reforms should be economically efficient pricing, and this includes disallowing fixed charges. Line charges should be levied as avoidable charge, per kWh used. This would be consistent with other economic activity, including the provision of the roading system. Here, the charges also are variable, depending on usage. This is because they are levied through the tax on fuel, and - in the case of heavy vehicles - through direct road user charges.

The Government should be pressured by consumers and NGOs to regulate for competition between electricity and other fuels, including energy efficiency, by disallowing fixed charges for both lines and energy. Instead, every year the power company should 'strike' a rate per kWh, which allows it to recover the cost of providing the lines network. This should present no difficulties because the companies will have a good estimate of demand through their forward contracting anyway. Any overs or unders could be carried forward to the next yearly period.

## CO2 WORKING GROUP

A joint public-private sector working party has been established to examine elements of the Government's CO2 policy to explore alternative measures which may achieve the Government's CO2 objectives.

Several recent issues have spurred this development 1) the conflict between national CO2 policy and the case-by-case approach of the Resource Management Act (as highlighted by the Stratford decision). The Environment Minister has made it clear that he believes that consideration of CO2 impacts should be removed from the RMA into an economic instrument. 2) Higher-than-expected levels of economic growth 3) the need for further analysis on NZ's carbon sinks 4) whether a carbon charge is the most efficient economic instrument to use if progress is not adequate by mid 1997 (some organisations are lobbying for the introduction of Tradeable Permits).

The Working Group Private Sector members are; Bill Falconer, former head of Petrocorp; Keith Turner, Electricity SOE Development Unit; Guy Salmon, Maruia Society; and Ken Shirley, NZ Forest Owners Association. Officials from the Ministries of Environment, Commerce, Treasury and Forestry will join the group.

The Working Group is not expected to address existing funding commitments for EECA, Energy Sector Reforms or the Land Transport Pricing Study. Consequently it will be interesting to see how the Working Group integrates these other crucial dimensions of CO2 policy, as the latter two are progressing in parallel with the Working Groups review.

The Working Group is to report to the Government by the end of November with an analysis of the issues and options. A discussion document will be released for public consultation by the first week in February. Public submissions on the discussion document will be received by the end of March. Under the terms of reference the Working Group is expected to "consult widely, taking into account the views of all interested parties".

## WILL NZ MEET ITS CLIMATE TARGET?

In a recent report for the Ministry of Forestry and Ministry for the Environment, the NZ Forestry Research Institute revised calculations on the levels of carbon sequestration by plantation forests. This has resulted in making it more difficult for NZ to meet its international climate obligations. The changes to earlier estimates were largely due to better estimates of forest planting between 1992-1996 and more information about the age profile of our forests and the impacts of this on CO2 absorption.

The report 'Carbon Sequestration by Plantation Forests' shows that in 1990 planted forests absorbed about 20.4 million tonnes of carbon dioxide. This is about 1.7 million more than was previously estimated. By comparison carbon dioxide emissions in that same year were about 25.5 million tonnes. This makes it more difficult for NZ to achieve its stabilisation target for the

year 2000 because it raises the 1990 baseline absorption level.

Also the report shows that projected CO2 absorption in 2000 is about 23.8 million tonnes, down by some 3.6 million tonnes on an earlier estimate. This will compound the effect of the change to the 1990 figure.

Both the Minister of the Environment and the Minister of Forestry now believe that NZ can only expect to return to 1990 CO2 emission levels by the early years of the next decade, rather than by the year 2000 as committed to at the Earth Summit.

However the report clearly highlights the uncertainties in the scenarios which have encompassed so many variables. In a note of caution the report warns that the value of carbon sequestration "could vary by as much as 2Mt either way, or more if the estimate is being derived for a year some time in the future". The level of precision should not be overstated "for example, it would be unwise to derive national policy that is dependent on determining annual forest sequestration to the nearest megatonne of carbon".

## WIND POWER PROGRESS

On 18 September Wairarapa Electricity announced that the company was proceeding with the construction of New Zealand's first windfarm at a site south of Martinborough. The project will provide almost 6% of the current electricity needs of the Wairarapa, although the site is capable of expansion.

The total contract value of approximately \$8.8 million will include a New Zealand content of about \$2.7 million, much of this spent with local contractors. The seven German wind turbines will now be ordered and will have a total capacity of 3.5 MW. Offers of finance have been received from banks in Germany and New Zealand, but as yet there was no firm decision on funding.

The excellent site and the technology of variable speed turbines would allow electricity to be produced for about the cost of supply transmitted from elsewhere in NZ. Wairarapa Electricity expects the windfarm to be operational within about nine months.

However in Wellington on 22 September (despite much public support being expressed for wind power in general) the Hutt City Council refused a resource consent for the EnergyDirect windfarm proposal at Baring Head.

The council cited concern over the appropriateness of this windfarm in a coastal environment, the impact culturally and the visibility of the proposal. Significantly the Council was also not prepared to balance the benefits, including CO2 reduction, of wind energy against any potential adverse effects that may arise. EnergyDirect are lodging an appeal on the decision.

The Sustainable Energy Forum is interested in progressing some work with those who made submissions on Baring Head so as to draw on their experiences to ensure positive lessons are learnt for progressing NZ wind power.

Lastly, both ECNZ and also Central Power are working towards resource consent applications in the Manawatu region.



# WHAT DO OUR ROADS COST?

Nobody really knows what roads are worth, but in New Zealand the Ministry of Transport has made a good start. In July they published the first of three Land Transport Pricing Study discussion papers: "National Roothing Account: the Cost of Roothing Infrastructure". Two more, on the cost of road crashes and the cost of environmental pollution, are due in October, and public comments on all three papers are being accepted until the end of February 1996.

The July study states that New Zealand has 15 000 km of urban road (97 % sealed), 66 900 km of rural road (45 % sealed) and 10 400 km of state highway (98% sealed). The study estimates that the depreciated replacement cost is at least \$ 25.8 billion, made up of \$ 7.4 billion for state highways and \$ 18.4 billion for local roads.

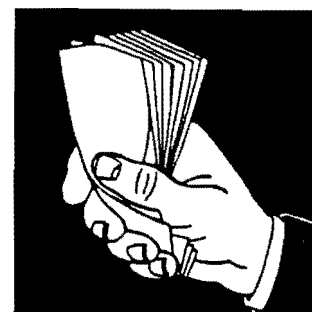
A 6.4 % real rate of return is suggested as realistic for investment in roading, so if roads were the responsibility of one or more State Owned Enterprises they would be required to pay capital charges of \$ 1.65 billion per year, or about \$ 2.2 billion after allowing for 2 % inflation. This is money that road users are not paying now, and it is excluded from the road lobby's calculations when they say that the government is overcharging road users.

Construction and maintenance of State Highways is paid for by Transit New Zealand, who get their money mainly from fuel taxes (petrol and diesel) and road user

charges on trucks. Local Authorities get a TNZ grant for around half their costs for local roads (depending on what is being done) but pay the rest from rates. According to the MoT study \$ 265 million of a total of \$ 499 million spent on local roads came from rates in 1992/3, so rates are paying for 53 % of local roading expenditure, or 32 % of total expenditure. Again, this is money that road users are not paying now.

The studies of environmental costs and road crashes are likely to bring more bad news for the road lobby. Carbon dioxide is perhaps the biggest but certainly not the only issue. Who pays for streams polluted by oil dropped on to the road, or for a small company that collapses when a key employee is killed in a road crash?

Together the discussion papers are described as a basis for consultation with the transport industry. The MoT say they will be carrying out extensive consultation with a wide range of interest groups. The upcoming debate is going to be interesting, and SEF intends to be there.



## CO2 VOLUNTARY AGREEMENTS

In July 1994 the Government announced its decision to use voluntary agreements as a major policy instrument to achieve its Climate Change policy objectives. In September 1995 nine companies representing major industries signed agreements to reduce carbon dioxide emissions from between 4 - 49% by 2000 compared to 1990 figures.

At the signing ceremony the Prime Minister said that the Government takes the Climate Change Convention "very seriously" and that they were committed to bringing emissions down "to protect our future". He added that the savings from these nine companies would amount to nearly two million tonnes of carbon dioxide by 2000, compared with emission levels if the steps had not been taken.

Discussions on CO2 savings commenced in 1994 between the Ministry of Commerce and New Zealand's major CO2 emitting companies and sectors. These focused on the 12 industries which accounted for over half of all CO2 emissions - steel, oil refining, methanol and synthetic gasoline production, electricity generation, aluminium smelting, cement, oil and gas production and distribution, pulp & paper, dairy processing, meat processing, wood panel production and coal production.

No company had the data and the forecasts readily available, and therefore all had to define their emission position (with all data on 1990 being audited by EECA). The evidence from companies is that they have been conservative in setting their target for 2000, and that most

are likely to exceed it. Some questions have been raised on the forward commitment linked to the agreements. For example in one instance a large % of the savings results from changes between 1991-1994. Also savings may be identified using one of three meteorologies and, in addition, the actual texts of agreements vary widely. However, each company has committed to annual reporting on progress, and these reports will be open to audit by EECA.

Figures as provided.

	% Savings in CO2 per unit of production by 2000	Estimated Tonnes of CO2 saved per annum by 2000
<b>Industry</b>		
ACI NZ Glass Manfrs.	16.5%	11 500
BHP NZ Steel	13.2%	284 000
Carter Holt Harvey	45.8%	433 000
The Cement Industry	12.0%	130 000
Comalco NZ	4.0%	29 000
Petrochem	28.0%	64 000
Winstone Wallboards	21.0%	8 500
<b>Energy Transformation</b>		
ECNZ	Not Applicable	874 000
Methanex	5.5%	118 000

# MARKET MECHANISMS

The way New Zealand's local power companies buy electricity will soon change immensely. The wholesale prices paid for small amounts of electricity not bought on contract (spot prices) will be allowed to rise to very high levels - perhaps several dollars per kWh, at the rare times when shortages are imminent. But spot prices will be typically around 2c/kWh, and sometimes 1c/kWh or less, when supply is abundant.

In the past, power companies resisted such "uncapped" spot prices, because of the great uncertainty that would result in their annual budgeted costs. But now the electricity market can offer a variety of "hedging contracts" which in effect insure companies against high prices to whatever degree they choose. The changes are designed to allow power companies to choose whether to pay a premium (which funds oil-fired power stations to be kept on standby for times when demand rises above the ability of other power stations to supply), or whether instead to pay some consumers to switch off.

Today ECNZ charges this premium, 1.6c/kWh, for every kWh it sells wholesale. Power companies which buy much of their electricity on spot prices will save insurance premiums, and have a very strong incentive to avoid high-cost electricity. They will look towards a number of ways to reduce their demand at those particular times. This may have an impact on both consumers and the environment.

If these new systems work as intended, it could be good news for both sustainability and power prices. High spot prices will encourage power companies to pay certain of their more flexible customers to switch off whenever the price is high. Switching off will reduce the pressure to build new power stations; it will also cut the total cost of running the electricity system, and this means lower power prices on average.

But the new market systems will put more pressure on both small consumers and the environment. Prices reaching dollars per kWh may sorely tempt power companies to cut small consumers off without paying compensation. Most small consumers want security of supply instead of lower prices, and those small consumers

who are willing to adapt to changing power costs may not be offered tariffs which reward them for doing so.

Power generators may also be tempted to run hydro lakes with greater variation of flows, because this will allow more efficient running of their gas-fired power stations. But flow variations will erode sensitive river banks, and even threaten lakeside beaches such as happened in the 1970s at Manapouri. If people pay high prices for a highly secure supply, a prediction that New Zealand will 'need' \$10-20 billion of new power stations within 15 years could come true.

New meters now can enable even small consumers to contract with power companies to switch off selected loads - perhaps water and space heating or refrigerators, at an instant's notice. Consumers who can then switch to alternative fuels for water and space heat could be given a discount as high as 1.6c/kWh on their entire power bill. Their flexibility would enable ordinary consumers to be protected from the threat of power cuts, or even rotating blackouts, which their power company might impose simply to save money on the wholesale market.

Impacts of the electricity market on small consumers and the environment should be monitored. The information disclosure regime reports power cuts (see the last columns on the 'Monitor' backpage), but only those coming from broken high voltage lines. However there is no current commitment to monitor river flow variations - river users should be ready to alert their regional council if they see any erosion or other untoward effects.

The wholesale electricity market can lead to sustainable energy supply only if it is designed from the outset to allow small as well as large consumers share in its benefits, and only if environmental costs are paid in full.

The Electricity Market Company (EMCO) will send newsletters describing the development of the market, and will make available position papers and minutes of the separate subcommittees to anyone on request (from the Director, Energy Market Company, PO Box 5422, Wellington).

## STRATFORD QUESTIONS

The Stratford power station was described as a "disaster" at an electricity reform conference in Wellington recently ('Electricity Generation, Distribution and Supply', 11-12 September) - not by the environmental movement, but by Barry Leay, Chief Executive of the Electricity Supply Association in response to a question. Other participants echoed the same sentiment.

The concerns of the supply industry are not about the need for new power stations, nor about building new power stations using fossil fuels, which form the core of the environmentalists' arguments. The concerns centre on Stratford's location close to other energy sources but distant from load centres, and the high cost of system security imposed by the particular design which is favoured.

There's a lot more to electricity than kilowatt-hours. Somebody has to pay for the 'insurance' of spinning reserve (having enough other generators spinning but not

generating to take over if a generator breaks down suddenly). This is particularly relevant for the Stratford Power Station which is to be a single 350 MW generator, - at present the largest generators are 250 MW at Huntly.

Trans Power, in the new world of the competitive wholesale electricity market, has decided to target charges for spinning reserve and other ancillary services' to the generators which impose the costs, instead of spreading them amongst all generators. The original bidder, the UK company National Power, pulled out as a result, leaving the way for a consortium of Fletcher Challenge, Mercury Energy and TransAlta to recently buy the Stratford rights.

This change in charging could be good news for small-scale energy supply and for energy efficiency measures, at least when they are in the right place at the right time, as they could not only reduce transmission losses but also reduce the need for spinning reserve and other services.



# ECO VILLAGE INITIATIVE

Richard Ball

The Christchurch Eco Village Initiative (EVI) provided the catalyst for a recent two day meeting on sustainable urban development. This small but productive conference demonstrated the inextricable links between energy use and wider issues of sustainable development. Overseas and local speakers emphasized the opportunities and benefits for business, the community and the environment from more sustainable practices.

The EVI conference was held in Christchurch on the 14-15 September. The Eco Village itself was proposed by local architect Russell Devlin in response to a number of clearly unsustainable developments that are currently taking place in the city. Russell's initiative was picked up by the newly formed Sustainable Cities Trust (SCT). Together Russell and the SCT used the EVI as a focus for the conference on sustainable cities.

Energy issues were inherent in the discussions. Russell Devlin spoke of the opportunities for improved building performance through solar and energy efficiency technologies. Russell stressed the integration of the EVI with existing and new urban facilities. He pointed out the positive spin-offs to other service providers through reduced need for more power lines, roads and waste disposal.

Transport issues were given a strong representation through two captivating addresses by Associate Professor Peter Newman. Prof Newman specialises in City Policy at the Murdoch University of Western Australia and has an international reputation as an expert in this area.

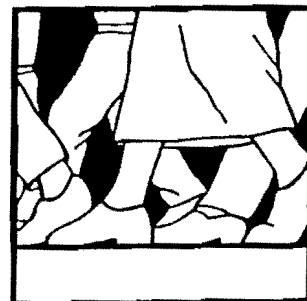
In his first address Prof Newman used slides to graphically contrast the urban environments in several US cities with those of more progressive, mainly European, cities. His presentation brought home the need for sustainable development by illustrating the immediate effects on the communities in which we live. The car dominated US cities were characterised by a loss of community orientation, decline in public and private services, social and environmental degradation. In contrast, the alternative strategies employed in the selected European cities were getting people out of cars and reclaiming the streets as community spaces.

Prof Newman's graphic presentation not only gave a rationale for sustainable development but gave a vision of how to be more sustainable. In one example near Bremen, Germany, a completely car free development was massively over subscribed by people wanting to live there. Peter and other speakers showed that increased urban densities can be attractive and integrated into existing amenities. Public transport can be both viable and preferred. Nodal developments can allow communities to thrive while maintaining rapid access to city centres and green spaces.

The benefits of sustainable business practices was emphasised by several speakers. Dr Richard Steckle, an international expert on public purpose marketing emphasized the need for businesses to have both financial and social 'bottom lines'. Dr Steckle emphasised these dual 'bottom lines' were wholly compatible with each other and successful business. The social bottom lines (such as more sustainable energy and environmental practices) should reflect the concerns of customers now and in the future according to Dr Steckle. He also gave many examples of how non-profit organisations could tap into this social and environmental concern.

Rick Christie, CE of Tradenz, also emphasised the competitive advantage that sound environmental practices would provide. Mr Christie saw this occurring through voluntary compliance with the soon to be introduced ISO 14000 standards.

The conference demonstrated that while many of our concerns may be global there are many things that we can do in our own communities. The EVI conference was an invitation to business, communities, planners and politicians to become involved and lead the way.



## DIARY - DATES TO NOTE

**Late October.** First round of bidding opens for the Energy Saver Fund (proposals due by the end of December). The Fund is targeting practical measures to improve energy efficiency in NZ homes, with money being allocated by competitive tender. Contact EECA, David Weinstein, 04 470 2200.

**November 23, Wellington.** Energy Efficiency and Conservation Authority 'Green Energy Seminar'. Examining 'Greenpower' market opportunities and mechanisms, using the case study of CitiPower in Melbourne.

**November 29 - December 1.** 'Solar '95. Renewable Energy: The Future is Now.' Hobart, Tasmania. Annual Conference of the Australia & NZ Solar

Energy Society.

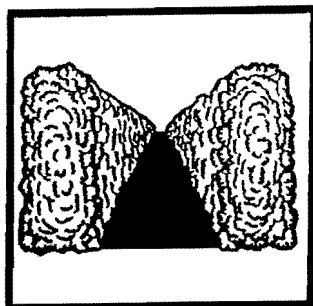
**By February 29.** All comments in to the Ministry of Transport on its three transport discussion papers (the costs of roads, accidents and environmental pollution).

**February - March.** Public submissions on the discussion document from the CO2 Working Group on the Government's CO2 policy.

**March 29 - 30, Tauranga.** SEF's Annual Conference, 'Energy, Transport and Development: Policy as if People Mattered.' AGM on the evening of Thursday 28 March 1996, Conference begins Friday 29 March. A discount on the registration fee is available for SEF members who join before 1 December.

# BIOMASS CONFERENCE SHOWS GOOD PROGRESS

*Ralph E H Sims and Drusilla Riddell-Black*



A Pitts Special aerobatic bi-plane flown on ethanol fuel derived from Biomass and demonstrated to over 450 delegates at the '2nd Biomass Conference of the Americas' epitomised the high state of the art that Biomass conversion technology

has now reached. The ideal fuel to eventually replace leaded aviation gas has been identified as 100% denatured ethanol which can be produced from a wide range of feedstocks. Over 1800 hours flying time have already been clocked up during the evaluation programme.

The 4 day meeting included several papers which focused on CO2 "stashing" (a lovely Americanism!) and it is interesting to note the conclusions of a 3 year project by the US Environmental Protection Agency on "Climate change mitigation strategies in the forest and agriculture sectors". The major points were that:

- \* large scale tree planting offers substantial opportunities for C sequestration in the post-2000 period but timber prices could be reduced as a result;
- \* increasing the use of recycled fibre to 45% by 2000 will increase C sequestration but only in a minor way after 2020;
- \* use of conservation tillage and winter cover crops can increase C sequestration in soils; and
- \* use of biomass energy offsets C emissions from fossil fuels but that dedicated energy plantations will be necessary since using existing forests will deplete C from the forest sink.

Growing crops for energy is gaining interest supported by farmer lobby groups such as the Soybean Association which has recently set up the "National Biodiesel Board". As in Europe, many vehicles are running on biodiesel but the comparative price with diesel is not yet convincing. However, engine manufacturers are beginning to support their warranties when using such fuels.

Concerns at the mono-culture nature of energy crops were expressed in several papers and deemed to be not the way to go from both the aesthetic and sustainable points of view. The links between waste water disposal and energy crop production to give a sustainable system if properly designed were covered in several papers.

Gasification has received a lot of attention in recent research activities such that large companies such as Westinghouse and Batelle have plants either already operating (in Paia, Hawaii on bagasse) or nearly completed (in Burlington, Vermont on a range of wood wastes). The hot gas clean up problems have been largely overcome it seems.

Another exciting gasifier project is the 1 MW(electric) power plant being developed in North Carolina by a major

consortium including the USEPA to demonstrate that converting wood energy to electrical power at this scale can result in waste utilisation, pollution alleviation, and fossil fuel conservation. This is the scale that may be of greatest interest to New Zealand industry in the first instance. Co-generation is of course quite feasible.

Work on fuel cells using biomass feedstocks is also progressing. A 2.8MW "pre-commercial" unit has been demonstrated by a company based in Connecticut. Currently it is running on dilute ethanol which is relatively cheap since the need to produce anhydrous ethanol can be avoided. The rural market is the target where a utility does not have a concentrated customer base as in urban areas and line investment costs are high.

With regard to economic issues, a banker's perspective made it clear that biomass projects were still seen as risky. She claimed the technology was not proven, the feedstocks could not be guaranteed in terms of availability and quality, the developers were often under-capitalised, and whilst oil and natural gas prices remained low, biomass was simply not competitive.

Since the previous conference in 1993 it was also disappointing to note that the political will towards biomass had dissipated somewhat and that congress is apparently giving scant regard to the Rio agenda. There has been a reduction in biomass research funding (though it is still enormous per capita in relation to New Zealand's paltry offerings!) and even the pioneering Californian Biomass power plants have declined in number from 50 to 29. This is partly due to the low feedstock availability but also to the reduction in support price which is due to drop from 18c/kWh to 5c/kWh next year. Thus, the 3-4 % of electricity generated from Biomass at present is likely to decline. So much so that a "Biomass Entrepreneur" has second hand biomass steam turbine plant for sale and he sees New Zealand as a prime market. So if anyone wants an "as-is, where-is" wood-fired power plant, please give me a call. The commission might help pay for some more local biomass research!

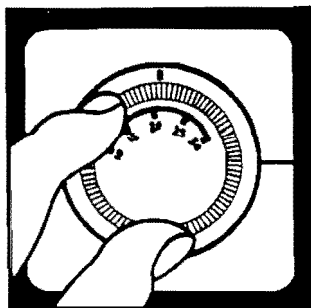
In the USA, the recent deregulation of the electricity market (have you heard that phrase before?) has caused utilities to fight for their market share. Consequently developing Biomass technologies have been an unwanted distraction. However, there are signs that they are beginning to look towards the future again and planning 15 years ahead. Some are beginning to grasp the concept that of all the renewables, Biomass is the only one that can be used as a base load and turned on and off to meet peak demands. In addition, the good co-operation evident between research organisations and industry shows that there is hope for the future for Biomass.

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# PERFORMANCE OF LINES COMPANIES 1994-5

Molly Melhuish



Disclosure of information on electricity lines businesses is the sole means of regulating them. This information has just been released, and the table over the page has been created to set out the profit data plus some physical data on the lines businesses.

The sources of the data,

NZ Gazette supplements, are available in major public libraries.

We would welcome readers' comments on the significance of this information. They will note that returns on equity seem low compared to typical company expectations of 10-13%. This is because the value of equity is figured at Optimised Deprival Value, which is typically about twice book values. The Accounting Rate of Profit, considered by Ministry of Commerce to be the best measure of company performance, is similar to the return on equity, but takes account of asset revaluations. See definitions below.

The most important issue is whether lines businesses are cross-subsidising the competitive activities in trading or generation. This will be difficult to analyse, especially as Optimised Deprival Valuations for lines businesses were not required to be disclosed. We hope to publish these data together with some analysis in a subsequent issue of EnergyWatch.

The validity of some of the disclosed information has been questioned, for example data in the column "direct costs/km line". According to the disclosed information

some of the local power companies have costs almost half as much as Trans Power's. The disclosed documents do not contain the information needed to understand the causes of these variations. Double counting or other errors may have occurred in some cases. If enough interest is shown, it may be possible to require companies to publish corrections in a subsequent Gazette.

Further notes to the table:

- \* Definitions are from Electricity (Information Disclosure) regulations 1994, p. 33: Accounting rate of profit = {(earnings before interest and tax)-(cash tax)-(interest tax shield)+(revaluations)} divided by (average total funds employed, minus half the amount of revaluations). The Ministry of Commerce considers this the most useful of the three profit measures.
- \* Accounting return on total assets = earnings before interest and tax, divided by average total funds employed. Accounting return on equity, being net profit after tax, divided by average total shareholders funds.
- \* Figures for Trans Power are from its 1995 Annual Report, except for information on load factors, losses and interruptions, which come from the 1994 information disclosure from Trans Power.
- \* Lesser-known power companies whose names do not indicate their locations: Mainpower (N. Canterbury), ScanPower( Dannevirke), WEL energy (Waikato), Trustpower (Tauranga districts), Alpine (Timaru), Electro (Palmerston North City), Central Electricity (Alexandra), Powerco (Wanganui), The Power Company (Southland), Central Power (Manawatu districts), Top Energy (Kaikohe). The trading branch of the Horowhenua lines company trades as Electra.
- \* Horowhenua disclosed profit figures before and after rebating profits to consumers, separately. We show the before-rebate figure. Other companies including Mercury also intend to rebate some of their profits.

## IPPC REPORT DUE DECEMBER

In the latter half of December the Intergovernmental Panel on Climate Change (IPCC) will release its 'Second Assessment Report'. This will be an update on the most recent and reliable information on climate change and its impacts on our planet. There will also be a special report on climate change and health from UNEP and

WHO concerning the possibility of the increased spread of diseases, such as malaria. With the continuing debate on the role and significance of climate change these authoritative documents should provide both useful information and updated statistics.

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## Performance of Lines Companies 1994-95

owner- ship	company	accing rate of profit %	return on assets %	return on equity %	income (lines) million	cons. / km line	direct cost / km line \$	indirect cost / customer \$	load factor %	loss ratio %	interruptions min's / customer planned unpl.
trust	mercury e	<b>10.9</b>	<b>14.7</b>	<b>13.2</b>	<b>192.0</b>	<b>29</b>	<b>3526</b>	<b>53</b>	<b>64</b>	<b>4</b>	
city c	dunedin	<b>8.6</b>	<b>8.6</b>	<b>5.8</b>	<b>28.5</b>	<b>27</b>	<b>3956</b>	<b>51</b>	<b>53</b>	<b>5.9</b>	3 33
city c	egmont	<b>8.1</b>	<b>9.5</b>	<b>10.1</b>	<b>10.9</b>	<b>7</b>	<b>2910</b>	<b>142</b>	<b>59</b>	<b>4.9</b>	9 2
city c	tauranga el	<b>8.1</b>	<b>11.8</b>	<b>9.8</b>	<b>3.6</b>	<b>26</b>	<b>2416</b>	<b>162</b>	<b>51</b>	<b>3.8</b>	85 84
city c	el invercarg	<b>7.9</b>	<b>9.7</b>	<b>6.7</b>	<b>7.0</b>	<b>29</b>	<b>2878</b>	<b>71</b>	<b>50</b>	<b>5.8</b>	155 56
trust	mainpower	7.9	10.0	7.5	27.9	5	554	154	62	5.3	112 64
private	rotorua	7.8	<b>10.1</b>	<b>8.1</b>	19.1	14	1165	102	56	6.8	121 37
trust	wairoa	7.8	10.0	7.4	<b>4.0</b>	6	1442	86	55	4.6	167 <b>469</b>
trust	scanpower	7.2	7.4	7.2	3.1	7	693	61	64	7.8	<b>1336</b> <b>817</b>
city c	southpower	6.8	8.6	5.7	<b>110.0</b>	19	986	141	54	4.7	191 59
trust	westpower	6.7	8.3	6.7	9.5	5	1496	135	64	<b>9</b>	234 118
coop	otago power	6.6	8.4	6.6	8.9	3	357	<b>313</b>	62	6.6	112 0
trust	eastland	6.3	5.6	4.4	14.6	7	1108	128	55	8	
other	wel energy	6	<b>10.3</b>	6	41.6	18	1802	69	59	5	160 49
city c	nelson elec	5.8	8.6	5.8	1.8	<b>41</b>	2250	<b>390</b>	57	5.5	0 99
trust	northpower	5.5	6.9	5.1	23.1	8	867	55	<b>65</b>	5.3	84 36
other	trustpower	5.4	7.7	5.4	27.1	21	<b>5221</b>	94	53	6.2	181 64
cc,trust	alpine	5.2	6.8	5.2	16.3	8	1986	55	<b>65</b>	5.1	129 60
city c	taranaki	4.9	7.4	5.6	28.6	10	1118	127	58	6.2	<b>312</b> <b>533</b>
trust	waitomo	4.7	6.2	4.7	8.2	4	662	72	56	<b>8.9</b>	<b>262</b> 62
city c	electro(pn)	4.4	5.4	4	12.5	18	<b>4871</b>	113	56	4.3	60 33
private	bay plenty	4.3	5.6	3.8	20.2	11	2142	199	<b>72</b>	2.3	126 54
private	powerco	4.2	6.3	4.5	22.3	10	882	210	58	6.2	173 65
private	wairarapa	4.1	5.7	4.4	12.5	8	1626	37	64	5.2	
cc,priv	capital p	4.1	6.9	4.3	<b>52.9</b>	<b>47</b>	2857	177	54	3.8	314 31
trust	horowhenua	3.8	3.8	7	16.4	18	1189	121	52	7.6	
private	central p	3.8	6.0	4.8	32.5	8	628	<b>290</b>	60	7.3	169 35
city c	taupo	3.7	5.4	3.9	9.6	16	<b>4505</b>	94	64	3.5	
private	energydir	3.5	5.4	3.5	50.0	<b>33</b>	<b>4423</b>	38	48	5.2	142 71
trust	waipa	3.1	4.3	2.8	9.8	8	1186	55	57	6.6	177 65
crown	the power co	3	5.6	4.4	25.8	4	435	258	64	8	
trust	c hawkes b	3	1.7	1.5	4.3	3	406	108	58	7.6	111 79
coop	el ashburton	2.8	2.0	0.8	9.4	5	1247	32	59	6.8	201 116
trust	tasman	2.6	3.9	3	21.8	11	2613	130	62	6.3	174 95
trust	central elec	2.4	3.6	2.4	10.5	7	1334	118	59	10	65 39
trust	top energy	2.1	3.7	3.8	15.9	5	1477	84	<b>65</b>	<b>9.6</b>	31 69
trust	waitaki	1.7	1.5	1.1	6.3	6	960	90	<b>65</b>	5.8	
trust	buller	1.7	2.5	1.6	2.8	9	1853	<b>336</b>	<b>67</b>	4.1	
trust	counties	1.5	3.0	2.1	18.4	9	1067	87	58	8.4	167 70
private	power nz	1.2	3.3	2.1	<b>127.0</b>	16	1267	136	45	6	150 36
trust	hawkes bay	0.8	1.1	1.1	30.2	14	2243	72	58	5.2	94 48
trust	marlborough	0.7	1.4	0.2	11.0	6	1428	76	58	6.5	188 69
trust	king c	-0.1	1.8	1.8	6.8	6	1138	275	46	6.7	157 52
	median	4.3	6.2	4.5	15.9	9	1189	90	58	5.9	155 62
crown	trans power	7.3	7.9	6.8	523.6		9521	994796	69	6.1	4 6

Sources: Ownership, from Wylie, Carolyn, NZ Electricity Directory, 1995

Consumers/km line, from NZ Electricity Supply Statistics, 1993-94, Electricity Supply Association of NZ

Information for Mercury, Wairarapa, Eastland, Buller, from disclosure reports to Ministry of Commerce

Other information: NZ Gazette Supplements nos 80,82,84,86,89,91,93,95,97,100,101; Aug-Sept 1995

Care has been taken to ensure data are accurate, but no liability can be accepted for errors. Readers should go to original sources.

Boldface and small figures indicate the entries in the top and bottom 10%, respectively.