



ENERGYWATCH

The Newsletter of the Sustainable Energy Forum

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

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A Pioneer in Renewable Energy Keith Dawber (1930 to 1997)

A tribute by Ken Piddington

Keith Dawber was an amazing New Zealander. Having focused on what the power of the wind could do for our country, he was unswerving in his scientific work and in his pursuit of wisdom across the globe. His advocacy for 'the cause' was gentle but persistent, like the man himself.

There was a symbolism in the way his work on wind patterns in Central Otago was built on the wreckage of one of the 'Think Big' projects in the 1980s. Just after the news broke about the cancellation of the smelter project at Aramoana, I remember hearing that someone at Otago University had acquired, for a song, the anemometer which had been on the proposed site, and was taking it up to Central to do some wind measurements.

Now that we see wind power competing in the market at less than half the cost of power from the Clyde Dam, we can appreciate Keith's tremendous vision and his determination 'to do something'. Since SEF came together in 1994, we could count on Keith bringing his ideas and his support to each of our periodic national conferences.

On the international circuit, he would pop up in Reading, Perth, Goteburg or Denver - wherever the dialogue was joined and wherever he could present the findings from his own work in Otago.

As a result, he became well-known and respected in the wind power community worldwide; together with his wife Pamela, he would be visiting the pioneering sites, talking enthusiastically into the night and sharing his strong commitment about what the industry could achieve when it reached take-off in Aotearoa. That point arguably has now

been reached, but Keith had by no means run out of work to do; his sudden death last month was therefore doubly tragic. It means that he will not be with us to share the 'highs' of the action phase, and also that we will have to do without his unique contribution to the academic and policy discourse.

What we do retain is a vivid memory of his personal charm and enthusiasm. This was an example which other 'pioneers' can strive to follow, whether they are pursuing wind power, solar or other new renewables. He also leaves a special legacy, namely the landmark publication which he co-authored with Dai Redshaw Hayward in 1995 "Sustainable Energy - Options for New Zealand".

Just after hearing the news, I scanned the book again, particularly the final chapter which says it all. It struck me then that it will surely capture the imagination of another generation of windblown New Zealanders. Every member of the Forum must rejoice in what Keith achieved, while sharing, at another level, the deep sorrow of those who were closest to him.

E te rangatira, haere! Haere! Haere!
Haere ki Hawaiki nui!
Ki Hawaiki roa! Ki Hawaiki pamamao!

Thanks to the sponsors of this issue of EnergyWatch



SEF's Year To Date

This is the first **EnergyWatch** we have put out this year. This reflects the fact that 1997 has so far been rather inactive for the Forum. We lost Andy Beer from the office in April, when he returned to the UK to plant trees and save the countryside. He had initiated some important scenario work to show how renewable technologies could take up a bigger slice of the New Zealand market by 2020, provided the right policy framework is put in place soon. We intend to seek funding for the completion of this work by the end of the year. Kerry Wood helped out again for a while, then went south to study at Lincoln. Ian Shearer came to our rescue in May and has kept things ticking over since then.

Planning for our next conference has been proceeding, but it now seems that the earliest possible date is February 1998, probably in Palmerston North. Elsewhere in this issue you will see the notice about the Office Manager position. If you know someone looking for this sort of challenge, please bring it to their attention. It would be good to have someone on board in time to work on the preparations for the Conference (and round up membership renewals etc!).

In the policy sphere, SEF has been active in making submissions on CO₂ policy and on the Land Transport Pricing Study. We keep up our contacts with Government and with the industry, but it has to be said that renewable energy did not emerge as a priority under the Coalition agreement and this is one reason it has been a quiet year.

We have welcomed the formation of the new Wind Energy Association, a move which reflects the commercial progress that the industry is now making. As with Solar Action, we will seek opportunities for joint endeavours and coordinated policy development. See Page 8 STOP PRESS.

Members should have received a separate notice about the AGM, which is to be held in Wellington at 5.15pm on Wednesday 27 August in the EECA Boardroom, 10th Floor, Ministry of Commerce Building, 33 Bowen Street, Wellington. We look forward to seeing all those of you who can make it.

Kia ora!

Ken Piddington (Convener)

Land Transport Pricing

This article is a summary of the SEF submission on the Land Transport Pricing Discussion Paper. Our thanks to Kerry Wood for the substantial effort put into the submission.

Introduction

None of the options presented in the discussion paper gives enough attention to wider issues than who should pay how much for roading.

Of the five options presented in the discussion document we prefer Option 3: Business Model. This is the best compromise between the problems of the other options.

Another policy weakness is the interface between land use and transport, with urban sprawl in particular developing a pattern which defies sustainable transport.

SEF's Preferred Option

We see the Business Model as most likely to bring about desirable outcomes. In particular:

- Access rights are preserved.
- Major decisions remain with territorial or regional local authorities, providing local control responsive to local need.
- Local authorities are relieved of the burden of road maintenance from rates.
- Policies and projects are subservient to national, regional and local policy statements.
- Road users are charged their 'most probable' true costs, despite major uncertainties.

Other Options

The Status Quo options have several undesirable features which need to be addressed:

- Motor vehicle users are subsidised, by escaping the hidden costs identified in the Land Transport Pricing Study.
- Regional councils covering the main centres receive little or no help in clearing long lists of desirable but unfundable transport projects.

- A substantial part of local roads funding comes from rates.
- Public transport is grossly under funded, and walking and cycling are virtually ignored.

The more privatised options, the 'Commercial Model' and Roads New Zealand, also have undesirable features:

- Control of access is given to an organisation that is unaccountable to holders of access rights.
- Public transport remains grossly under funded, and walking and cycling are completely ignored.

Roading contains public good aspects which could not easily co-exist with policies driven by short term financial gain.

Issues for Consideration

Access

We believe that it is fundamental that roads having a local access function be publicly owned, because there is no practical alternative for access to the vast majority of properties. Comparisons with ECNZ and Telecom are misleading in three ways:

- There is at least some prospect of competition in both telecommunications and electricity supply. In contrast, a second roading system is unthinkable almost everywhere.
- Wires and cables are not damaged by the signal or current they carry. Roads are damaged by traffic, so a road owner has to be paid directly for use, especially heavy vehicle use.
- It is possible to manage without grid-supplied electricity (co-generation, photovoltaic, wind or diesel generation), and without telecommunications up to a point, but access is a basic need.

Tax Revenue

We believe that the present transfer of road taxation to the consolidated fund should continue, but should in future be considered as taxation to cover capital charges for the existing system, environmental costs, or both. Over time the tax should be adjusted to cover full capital and environmental costs at the most appropriate rate.

Land Use

The only city that we know of that has done a traffic study allowing for the effects of land use is Dortmund, in Germany. A traffic model was used to interact with four other main models, of the labour

market; housing market; land and construction market; and the non-residential buildings market. The study concluded that carbon dioxide emissions by transport could be cut by almost two thirds within 15 years, with car use halved.

A fundamental need for land transport reform in New Zealand is a structure capable of pursuing the kind of thinking that led to the Dortmund model, and not simply perpetuating the flawed 1960s assumption that we can solve our transport problems by building more roads.

Public Transport

In New Zealand, public transport tends to be seen as basic transport for those without cars. The concepts of giving buses priority at the expense of other motor traffic, and using public transport for speed and reliability, are hardly established at all. A theoretical rationale for a public transport approach is described in the appendix.

Cycling

Cycling provides a good illustration of the kind of public good improvements obtainable by well targeted transport investment, but unlikely to be chosen by a commercially driven organisation. Many European cities have invested heavily in cycling facilities and some huge increases in cycle numbers have been achieved, with cycling accounting for a quarter or even half of all urban trips. Achieving similar results here could do much for the public good:

- A useful contribution to reducing carbon dioxide emissions, as well as improving the country's trading position in the years after closure of the Maui gasfield.
- Individual health benefits from greater exercise. The British Medical Association (1992) quotes a study concluding that:

Of all physical activity variables, cycling was found to have the strongest association with fitness...
- Major gains in cycle safety. The cycle fatality rate in the Netherlands is an order of magnitude lower than in NZ, despite cycle helmets being a rarity in the Netherlands.
- Major reductions in infrastructure cost.
- Further gains through interaction with public transport. Cycle facilities at public transport

stops can increase the catchment area of the stop tenfold, allowing fewer stops, fewer routes and hence faster and more frequent services.

Markets

It seems to us that too many contributors to the debate on transport funding rely on 'the market', without any clear idea of what market is involved and what market failures it might bring. We suggest consideration of the following markets:

Road freight

This is an effective market, with large numbers of traders competing on an equitable basis with few market failures

Freight

Here the problems of level playing fields begin to creep in, with the difficulties of road/rail competition. There are market failures but overall there is still a functioning market.

Road space

Here all players pay an entry fee (rates or vehicle registration) and all motorised players also pay a trading fee (petrol, road user charges). Some players also pay a trip fee (parking charges) but this is not directly connected to the market. Some areas are much more popular than others and there is no mechanism to ensure a fair distribution. There are obvious market failures.

Passenger transport

Here the players fall into four groups:

- Subsidised car users
- Heavily subsidised company car users
- Public transport users, most of them subsidised to a variable extent
- Unsubsidised cyclists and pedestrians

There are several market failures, perhaps mainly because of untargeted and frequently hidden subsidies.

Public transport provision

Here we see two market styles, which we call the UK and European models. New Zealand operates something between the two.

The UK style market is unregulated, and profitable for operators of worn out, smelly and sometimes dangerous diesel buses. Market failure is inevitable, in public transport provision, passenger transport or both.

The European style market is heavily regulated. Operators co-operate in this market so that they can compete collectively in the passenger transport market.

Key features are that operators have the security needed for long term investment, and that some market failures in public transport provision are accepted to gain the benefits of competition in passenger transport.

Conclusion

The most important market is the 'passenger transport' market - the moving of people, whether by walking, cycling, passenger motor vehicles or public transport (road, rail or unconventional).

In the larger centres this may be much more a single market than is generally recognised, as explained in the appendix.

Appendix

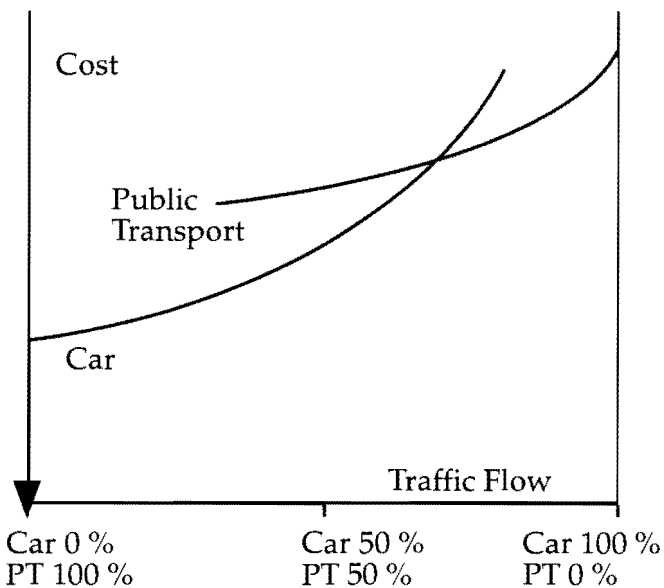
Increasing the capacity of urban transport

This work provides a theoretical basis for the practically very successful encouragement of public transport in cities such as Zurich and Freiburg.

Mogridge (1997) has shown that the speed of motor vehicle travel in central London is closely related to the speed of public transport. In an editorial in the same issue of Transport Policy, Goodwin draws attention to the fact that traffic flow is unstable yet seldom comes to a complete standstill, even with major road closures. These observations have profound implications:

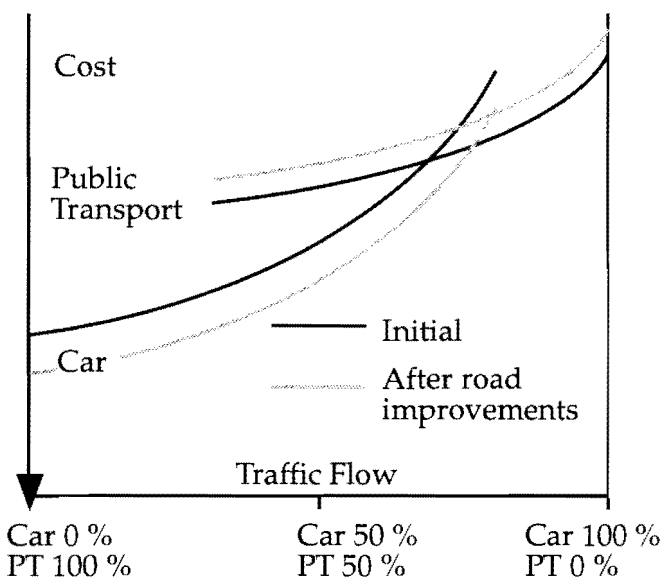
- Significant numbers of passengers will transfer between private and public transport to obtain the best advantage: private and public transport are in the same market.
- Transport demand is much less rigid than is usually supposed.
- Publicising the traffic chaos expected from a road closure usually has the effect of avoiding traffic problems.

Mogridge points out that motor vehicle operating costs rise as vehicle numbers increase but public transport costs fall as passenger numbers increase. A generalised curve of costs looks like this, assuming constant total demand (adapted from Mogridge 1997):



The horizontal axis shows the passenger carrying share of public and private transport, with private vehicle costs rising with increasing market share and public transport costs rising with falling market share. The balance between private and public transport is at the point where the curves cross and costs are equal.

If a roading improvement is made the two curves move, as shown by the lighter lines:

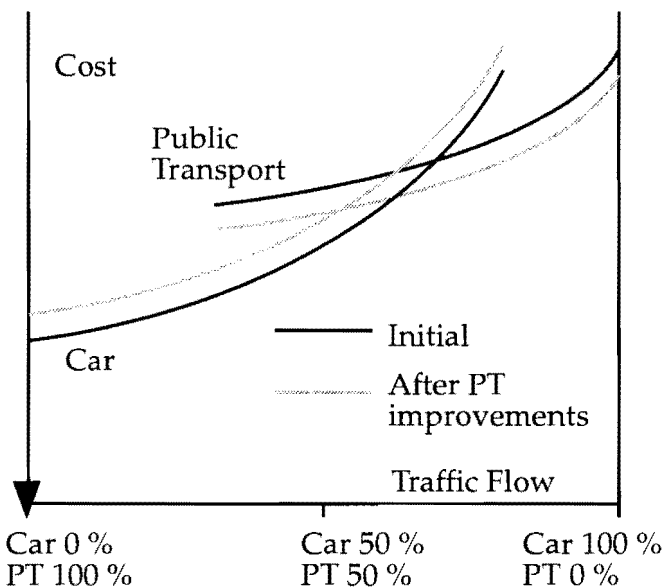


Car costs fall because of faster travel on the new road. Public transport costs rise because of passengers lost to faster travel by car, and perhaps also because of additional delays due to the new road, as shown here.

Such delays may originate from a more roundabout route, greater difficulty in re-entering faster traffic

streams after a stop, or consistently missing traffic signals set to give non-stopping vehicles a 'green wave'. However, lower travel times by car has brought more cars onto the road, moving the equilibrium point to the right, and higher costs for public transport have moved the equilibrium point upwards. The 'improvements' have made everybody worse off.

The other approach is to improve public transport, making trains or buses faster or building a new facility such as a busway or light rail.



Public transport costs fall because the route is faster and so attracts more passengers. Private car costs may be unchanged if there is plenty of road space available or the improvement is to a rail line, or may rise (as shown here) if shared road space is dedicated to public transport, for example in the form of bus lanes or bus priority at traffic signals.

However, the lower costs of public transport mean that the overall balance between public and private transport falls, so costs are lower for all transport users. The improvements have been a success.

Commercial traffic flow is largely independent of public transport provision but commercial traffic speed is much the same as for other motor vehicles. Improving public transport speeds up all traffic and so benefits commercial traffic too.

If you would like a full copy of the SEF submission, please contact the SEF office.

Carbon Tax Design Issues

A working paper describing a possible design of a carbon tax has been released for comment by Treasury.

This paper suggests taxing sources of carbon rather than the actual emissions.

It contends that the content of sources is a good indicator of the amount of CO² emitted and suggests that it would be easier and more efficient to tax a small number of sources rather than the large number of emitters. Payments for absorption of CO² are not proposed.

The tax would apply to the production and importation of all fossil fuels and other CO² sources (eg limestone burning for cement production and geothermal steam extraction for electricity). Exports of these items would be exempt.

Legislation would be needed for the tax and the options are for a stand-alone Act or as an addition to an existing Act which levies taxes or regulates emissions (RMA, Income Tax Act etc).

A full copy of the working paper is available from Treasury or on Treasury's web site <http://www.treasury.govt.nz>. Comments would be most welcome.

Amorphous Silicon PV Cells

Solarex, United Solar and Cannon Japan are beginning mass production with a target of 25MW of PV cells annually. Single crystal and poly crystal cells currently produce about 80MW annually worldwide. Amorphous cells are cheaper, use smaller amounts of material and production is more easily automated. Until recently their efficiency tended to decay rapidly but recent developments have stable efficiencies over 13%.

United Solar and Cannon Japan aim to solar shingles/rooftop products and Solarex will target the solar farm applications. The widespread use of this technology in New Zealand could have a significant impact on the need for more centralised generation systems.

Regional Landscape Plan Submissions

Regional Landscape Plans are an important target for the renewable energy industry and SEF members are encouraged to make submissions on these documents whenever possible. The following paragraphs may assist you to prepare and submit a brief but important submission on your Regional Plan.

The landscape plan should recognise the benefits of sustainable energy services such as photovoltaic (PV) arrays and wind turbines. Both these technologies have potential to form an important part of New Zealand's energy future. The costs for power from them is falling steadily and their efficiency is increasing.

The main feature of PV systems is the fixed array of panels. These panels produce electricity directly from sunlight, so they need to be accessible and exposed to the sun. However they can easily be screened by trees and need not be located on ridge lines. Visual impacts should be easy to control and secondary features such as transformer or rectifier stations are minor structures.

The significant features of wind turbines are the large rotating blades on support towers. These structural features make wind turbines less visually benign than PV arrays - they are tall, the blades move and they are best located in exposed/windy sites. However New Zealand's consistent high/steady winds make this technology very attractive in our energy future.

Your submission could also request that renewable energy technology sites be established over as wide an area as possible, compatible with reasonable landscape protection, on all rural land. Send a copy to Sustainable Energy Forum. We like to know about the actions being taken by members.

Transport Strategy Group Developing National Land Transport Strategy

The Ministry of Transport are working on developing a National Land Transport Strategy, and for several months have been running a series of meetings of a Transport Strategy Group (TSG). Kerry Wood has been on this group, representing SEF but reporting back to Greenpeace and ECO too.

The National Land Transport Strategy is being developed to fit on top of the regional and local strategies developed by Regional Councils and local authorities.

All local strategies will eventually have to be 'not inconsistent' with it. 'Land Transport' includes mainly roads and railways, which for the first time are being considered on the same basis, and also ferries and coastal shipping.

A principal starting point was the Ministry of Transport's vision for

Safe, sustainable transport at reasonable cost

Another was a vision workshop attended by some 120 people representing road users, transport customers, other transport interests, government departments, local authorities, and environmental interests.

Ongoing support was provided by the TSG, a smaller group of some 50, with further work on particular issues done by smaller 'focus groups'. Issues covered included Vision; Access; Safety; Environmental effects; Economic Efficiency and Funding.

The process had its hiccups — 50 is a large group for developing consensus — but all members were surprised at how much consensus was reached.

Some of the highlights were the group's recognising:

- The need for a safe transport system to avoid imposing danger on others.
- The very different needs of different areas. There were presentations from Opotoki District Council (unsealed rural roads on school bus routes with a twentyfold increase in traffic

loading for one year as timber matures) and Waitakere City (development to tame a wilderness of commuter suburbs designed for servicing only for cars).

- The need to identify and monitor all the adverse effects of land transport.

The next stage is for recommendation to go to the Minister.

Brussels proposes tradeable credits

Renewable energy will become a serious player across the European energy market by 2010 if proposals in a Green Paper published by the European Commission at the end of 1996 are accepted by Member States.

The Commission wants to double the 'renewables' market share to 12% by 2010. Its main proposals for achieving the target - a system of tradeable renewable energy credits, minimum EC taxes on conventional energy sources, and measures to improve renewables' access to electricity grids are likely to receive a hostile reception from electricity utilities.

The UK, currently at the bottom of the EC renewables league, has already said that it regards the target as too ambitious.

Search for more efficient lamps

The success of the US golden carrot prize for a more efficient refrigerator has triggered the Swedish Government's NUTEK (equivalent to EECA) to announce the worlds largest technology procurement competition for an energy efficiency residential incandescent lamp.

More than 60 million incandescent lamps are sold in Sweden each year, and NUTTED are looking to other utilities and lamp buying organisations to join with it to create a huge demand for the new product which does not yet exist.

The functional requirements for the new lamp are:

- Function like an ordinary light bulb and have similar dimensions.
- Be at least 30% more efficient than a standard incandescent.
- Be so cheap that it is successful in the consumer market and cost effective for short burning hours.
- Last at least 3000 hours (standard bulbs are about 1000 hours).
- Be possible to use with a dimmer.
- Give full light output in cold climates.

You can check progress on this one on:
<http://eff.nutek.se/engelsk>

Renewable Energy Database

SEF is assisting EECA to develop a database of renewable energy industry information. EECA's objective is to remove the 'lack of information' barrier and to facilitate of renewable energy products and services.

The information collected will be made available as printed lists on request and may be published on the internet.

If you have not received a copy of the registration form please contact SEF or Fiona Weightman of EECA Ph: (04) 470 2200 or Fax: (04) 499 5330

Research Support Wanted

Bryce Richards, BSc (VUW) and currently a M Eng Sc student (in photovoltaics) at University of NSW, is looking for industry support (possibly using the FoRST / GRIFS scheme) for his PhD on a renewable energy topic.

His current project is deposition and optically characterising thin film silicon onto glass for solar cell applications. He will consider any aspect of renewable energy for his PhD work. If you would like more details or to contact Bryce please phone the Energy Fitness Bureau (0800 65 46 36).

STOP PRESS

Just before going to press, we learned that the NZ Wind Energy Association had accepted a proposal from SEF to service its administrative needs for a period of six months. This means we now have an office job which is almost full time and we would like to find someone who is looking for a challenge of this type.

As with previous Office Manager positions, flexible arrangement can be made to suit the individual appointee. The essential skills are the capacity to run an office without day -to-day supervision, medium level computer literacy and clarity in all forms of communication. Some accounting skills and familiarity with GST returns would be an advantage, as would an interest in energy policy and the principles of sustainability.

The job will be based in Wellington, but we are still interested in someone outside Wellington who would be able to take on the preparation of *EnergyWatch*. For a full description contact the SEF office.

ENERGY WATCH

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