Joint Sustainable Energy Forum/Energy Federation of New Zealand (EFNZ) Seminar on Government Energy and Climate Change Policy, Wellington, 16 February 2007

Report by Tim Jones

Introduction

Just before Christmas 2006, SEF and EFNZ discovered that both organisations were planning to hold seminars or conferences early in 2007 to consider the Government's recently-released set of proposals on energy and climate change policy. The two organisations then decided to hold a joint event, which took place in Wellington on Friday 16 February.

The objective of the seminar was to get comments from a range of perspectives on the five Government energy policy documents released in December, looking at two questions in particular: are the goals of the Government's policies correct, and are the measures proposed the right ones?

All five documents were discussed during the course of the seminar, but the focus was mainly on the draft New Zealand Energy Strategy (NZES) and New Zealand Energy Efficiency and Conservation Strategy (NZEECS), and the Transitional Measures document.

Programme

Welcome – Rob Whitney, EFNZ
Introduction "Powering our Future" - David Smol, MED

Session 1 – Energy and Climate Change

"Energy and Climate Change" Catherine Beard, Greenhouse Policy Coalition
"Carbon Trading – Trustpower Strawman Proposal" Peter Calderwood, Trustpower
"International Lessons in Energy Policy" Catherine Mitchell, EECA
"Realising the Potential – Wind Energy and the NZES" Fraser Clark, New Zealand Wind Energy Association

Session 2 – Low Carbon Transport

"Transport, Mobility, and Access to Services" Tim Jones, SEF
"Walking & Cycling in NZ and the Draft NEECS" Carolyn O'Fallon, Pinnacle Research and Policy Ltd
"Low Carbon Transport" John Collins, Bus & Coach Assn
"Vehicle Technology: Can it Support the Strategy's Aspirations" Andrew Campbell, CRL Energy
"Transport Fuels: First Steps Toward Sustainability" Barry Blackett, BP Oil NZ

Lunchtime Presentation

"Climate and Energy: Today Problem with a Today Solution" Peter Read, Massey University Centre for Energy Research

Session 3 – Electricity Supply, Demand, and Security

"The Role for Infrastructure in Meeting the Government's Energy Strategy Challenges" Kieran Devine, Transpower
"An Active Demand Side" Doug Clover, Parliamentary Commissioner for the Environment's Office
"Electricity Security and Supply - The Role of Demand" Nigel Isaacs, BRANZ
"Security Without Subsidy" Murray Ellis, Energy Consultant

Session 4 - Low Emissions Power and Heat

"Impact of the NZES and NEECS on Closing the Gap for Realising the Bioenergy Opportunity" John Gifford, Scion Research
"Electricity and Energy from Coal: An Environmentally Sustainable Solution" Chris Baker, Coal Association of New Zealand
Presentation on the goals of the NZES and NZEECS: Brent Layton, NZIER
"Goals, Trends & Strategies for Low-Carbon Power & Heat" Molly Melhuish, SEF

107 people (including panel members and session chairs) registered in advance for the seminar, and probably about 100 attended all told.

All but one of the presentations are available online at

http://www.energyfed.org.nz/NZ%20Energy%20Policy-16Feb07.html

so I will not attempt to summarise each in detail here. Instead, I'll give a quick account of each of the panels, and then discuss the gaps and weaknesses in the Government proposals that were revealed by the seminar.

Introductory Session

Rob Whitney of the Energy Federation welcomed participants to the event, focusing on EFNZ's "three As" of energy: availability, accessibility, and acceptability. He was followed by David Smol of the Ministry of Economic Development, who introduced the Government's suite of energy policy discussion documents. Most of what he said mirrors the introductory remarks in the documents, but a couple of points should be noted here: he commented that renewable energy sources should be favoured until carbon sequestration becomes technically and commercially viable, and said that key issues were

a) Influencing investment until carbon is priced
b) Addressing any barriers to renewables

c) How and which emerging technologies to support

David Smol said that the NZES and NZEECS were closely linked, but that the NZES focused on the Government's role, whereas the NZEECS took a sectoral approach and focused on priorities for action. On transport, he noted that both CO2 emissions and the coming peak in cheap oil supplies were of concern, but he expected that climate change would be the main driver of change in the transport sector.

Energy and Climate Change

Chair: Jonathan Boston, Institute of Policy Studies, Victoria University of Wellington

Not surprisingly, Catherine Beard, spokesperson for the Greenhouse Policy Coalition (representing the big emitters), criticised the Government's proposed policies as being unduly biased towards emissions reductions over security and affordability of supply. She also criticised the lack of adequate cost-benefit analysis in the documents - a criticism which was echoed by several other speakers. She also made the point - which has been raised previously in SEF discussions - that increased energy efficiency doesn't necessarily mean emissions reductions, and said that agriculture and forestry need to share the emissions reduction burden.

Peter Calderwood of Trustpower gave more details of their emissions trading proposal, which is on pp. 24-25 of the *Transitional Measures* document, and suggests a transition towards full emissions pricing. Although this proposal has some attractive features, I note that it would delay the introduction of a full price on carbon in electricity generation until 2018, which seems rather too late to me.

Catherine Mitchell, currently seconded to EECA from the University of Warwick's Business School, gave one of the most interesting presentations of the seminar. She had five points:

1. Be clear about your goals, e.g. reducing carbon - how and by when? (she said that, in Europe, this goal was generally one of two strands of a sustainable energy policy, the other being building a sustainable energy system)
2. Stimulate innovation
3. Involve people - an inclusive policy open to new investors tends to be most successful
4. Have a flexible policy design - there is rarely one perfect policy, so rigidity on such matters as price-based measures versus renewable obligations is unhelpful
5. The whole framework matters

A number of these points were teased out further in question time, and over lunch. Regarding innovation, she said that many countries in Northern Europe were moving beyond the "regulatory state model" of pure market-based economies which still applied to such countries as the US, Australia and the UK. Put briefly, in these countries, innovation was seen as a normal business risk which emerges from competitive markets. On the other hand, the northern European countries were recognising that the market did

not deal particularly well with certain aspects of climate change, energy security, and terrorism, and that those Governments were prepared to take proactive steps to stimulate innovation. In these countries, purely economic goals are no longer seen as the only ones worth adhering to. Until recently, she would have ranked New Zealand as a market-based country, but the PM's recent "Speech from the Throne" appeared to have moved us closer to the more directed approach.

Over lunch, she also queried the assumption in many of the policy documents that New Zealand would be a "technology taker" or "fast follower", rather than an innovator. This assumption denies New Zealand's record of technology innovation and shortchanges the potential benefits to New Zealand of action.

The final presentation was by Fraser Clark, Chief Executive of the New Zealand Wind Energy Association. He pointed out that references to wind power as a "promising" technology were outdated: worldwide, there are 70,000 MW of wind installed, and this is going up by about 25% per year. In New Zealand, by contrast, wind represents about 1.5% of installed generation, and a rule of thumb was that intermittency did not become a problem until wind was about 20% of installed generation.

He queried the objective of the NZES: was it to reduce greenhouse gas emissions (which would lead to such measures as a cap-and-trade system) or to encourage renewables (which would lead to the use of renewable obligation or feed-in tariffs), and said that wind needs policy certainty. The need for policy certainty was another point which several speakers echoed.

The discussion which followed this panel was wide-ranging. Much of it focused on the urgency and scale of New Zealand's response, with Peter Calderwood pointing out that New Zealand is about to face the real costs of failing to meet its Kyoto emissions target for the first time, when the 2008-2012 commitment period starts, something which has tended to be overlooked in the discussion on future climate change and energy policy. Ken Piddington noted the NZES's focus on big projects, and asked where the support was for local energy initiatives of less than 2MW in size.

Closing the discussion, panel chair Jonathan Boston stressed the need for urgent action to avoid dangerous climate change, saying that, to meet the recommendations of the Stern Report, New Zealand as a developed country would need to make something like a 90% reduction on its 1990 level of emissions by 2050. The costs of mitigation are comparatively low, while the costs of inaction are very high. The sooner we start, the better, and while a price on carbon is essential, it is not the only measure that's needed.

Low-Carbon Transport

Chair: Tim Fraser, Ministry of Transport

The transport sector is a rapidly-rising source of GHG emissions: domestic transport CO2 emissions rose by a staggering 62% between 1990 and 2005. Transport also faces

increasing concerns over the security of oil supplies. It is notable that the Government's paper on transitional measures (those to be taken pre-2012) ignores transport completely.

The presentations to this panel started with alternatives to motorised transport, then covered public transport (from the perspective of the Bus & Coach Association), then went on to detailed issues of vehicle types and fuels.

I started off the presentations by outlining the principles being proposed in the transport part of the draft SEF submission:

1. Avoid or reduce the use of motorised transport where possible.

2. Where motorised transport is needed, encourage alternatives to private road transport where possible.

3. Provide transport energy in ways which use the minimum possible net emissions profile and the minimum possible quantity of fossil fuels

4. Where fossil fuels are being used for transport, use them as efficiently as possible, and with the lowest possible emissions profile.

5. Ensure that fossil fuel prices are kept at a level (likely to rise over time) which encourages the transition to lower-emissions alternatives.

I also included a section on teleworking (another name for telecommuting). Teleworking is an effective alternative to physical commuting, and it is comparatively cheap to set up, but its use by New Zealand business is often stymied by cultural factors ("That's not how we do things here!") and the perception that broadband services aren't yet fast or reliable enough to permit it. Government support has been conspicuous by its absence, and this may partly be because teleworking falls awkwardly between policy and funding stools: it's a transport alternative, but is considered under labour market policy rather than transport policy.

Carolyn O'Fallon of Pinnacle Research and Policy Ltd discussed walking and cycling. Her presentation outlines the latent demand for walking and cycling which is not currently being met, and she commented that there are currently many different Government strategies to promote walking and cycling, though good in themselves, aren't integrated - in particular, those addressing the issue from the transport side aren't integrated with those addressing it from the public health side. The NZEECS merely states that a target for walking and cycling is "to be developed". She said that investment in infrastructure by itself won't do the job – travel behaviour change programmes are also needed.

John Collyns from the Bus & Coach Association commented on two areas of difficulty for his members: the reluctance of bus and coach engine manufacturers to cover the use of biofuels, in particular those made from tallow feedstocks, in their engine warranties,

and the resultant liability issue which the Government's biofuels sales obligation will create; and the current argument between his members and regional councils over procurement rules, which has led to a big reduction in industry investment in new fleet in 2006. If these problems could be overcome, then he was positive about the role his members could play in fulfilling the transport goals of the NZES and NZEECS.

Andrew Campbell of CRL Energy looked at vehicle and fuel technology, from the points of view of their feasibility in New Zealand, the time it would take them to have a significant impact on emissions, and their overall emissions reduction possibilities. He started by cautioning that vehicle technology is a relatively small part of the total picture, and said the CRL modelling showed that fleet emissions would stabilise by 2025 merely from business as usual improvement.

He started by looking at alternative fuels for internal combustion engines, noting some of the same issues with biofuels raised by the Bus and Coach Association, but also suggesting that E85 vehicles deserved more attention than they had so far been given in New Zealand.

Turning to other vehicle technologies, he estimated that, to have a significant impact on the vehicle fleet, all-electric vehicles would have a lead time of 20-30 years, hydrogen vehicles 20 years, and plug-in hybrids 10-20 years (with 5-10 years needed to solve the technical problems). However, electric vehicles could be piloted in New Zealand now, or very soon. In each case, he said, we need to start planning now to be best prepared for the uptake of these vehicle types.

The final speaker was Barry Blackett from BP New Zealand, who gave a detailed presentation on the chemical and physical properties of various biofuels, looking both at their advantages from an emissions point of view (in terms of their potential to recycle carbon) and their effects on engines. Although Barry didn't say this outright, I got the impression that BP were somewhat taken aback by the Government's decision to raise the biofuels sales obligation from the 2.25% originally proposed to the 3.4% decided upon, but he confirmed that this meant most companies would have to use both biodiesel and bioethanol to meet the obligation.

From the audience, Ray Deacon commented that he was disappointed with the transport section of the draft NZES, asking in particular why there was no mention of congestion pricing. He asked if SEF intended to highlight this, and I said that we would (our submission will discuss this among a range of other measures designed to reduce single-occupant vehicle trips). Other audience members expressed concern at the absence of transport from the *Transitional Measures* document, and also criticised the lack of firm commitment to public transport in the draft NZES. There was considerable discussion of the pros and cons of specific vehicle and engine technologies.

Lunchtime Presentation

Peter Read of Massey University gave a presentation on his strategy for biosphere carbon stock management. His work demonstrates that this strategy makes it possible to return CO2 levels to pre-industrial within half a century. The core of this approach is to treat greenhouse gas emissions, and specifically CO2 emissions, as a “stock and flow” problem rather than as pollution. Therefore, we need to extract more CO2 from the atmosphere, and store it somewhere safe. Peter proposes that this be done by greatly increased tree-planting, concentrating on those parts of the world in which tree-planting has the best net emissions effect – predominantly in the developing world. Additionally, it involves increased areas of sugar cane in the tropics and fast growing grasses in temperate regions, both co-producing food and biomass. This should be coupled with the greatly increased use of biomass as fuel raw material. Peter recommends that we start preparing for this approach now, so that we can ramp it up quickly if the risks of abrupt climate change are shown to be greater than is currently expected.

The viability of such an approach is not yet universally accepted, and there were a number of questions about the feasibility of it following Peter’s presentation, but I think there is growing acceptance that such an approach deserves serious consideration and further investigation.

Electricity Supply, Demand and Security

Chair: Ralph Mattes, Major Electricity Users Group

Leading off this panel, Kieran Devine, General manager of Systems Operations for Transpower, gave a very interesting presentation on the issues Transpower faces in integrating renewables, and in particular intermittent renewables, into the national grid.

Perhaps not surprisingly, his approach to grid management and to the system's capacity to handle intermittency was conservative. He commented that, at present, the system spills water in preference to wind where that choice is available, and questioned whether this is the right approach to take. Transpower is looking for ways to integrate hydro and wind generation.

Again, it is well worth reading his presentation in full.

Much of the discussion time for this panel was taken up with Kieran Devine's presentation. During the discussion, he pointed out an important gap in the NZES and NZEECS: they neglect the issue that there is no "cash for negawatts" - in other words, there isn't a way for companies to make money out of reducing electricity demand. Nevertheless, he said, there an increasing number of businesses looking to get around market rules and find a cashflow in this area. He said that the 10% of controllable load in New Zealand (i.e. ripple control for water heating) is unusual internationally, and is a good feature of the New Zealand electricity system; and he was concerned at the load that extensive adoption of plug-in hybrids would put on the electricity system, asking whether the power would come from - though he was reminded from the audience of the potential for off-peak recharging.

Kieran Devine was also challenged on his inclusion of marine energy, specifically tidal energy, among intermittent energy sources, given that the "intermittency" of tides is predictable - but he joked that what he would really like is tidal power generation that could be relied on to be at maximum during the morning and evening power consumption peaks! He acknowledged the point, however, that multiple tidal power schemes in different parts of the country could smooth out the intermittency of tidal power. Asked about distributed generation, he said that Transpower was somewhat gun-shy about distributed generation at present, and had expected it to be further along by now than it is.

The second presenter for this panel was Doug Clover of the Parliamentary Commissioner for the Environment's Office. Doug said that the PCE's definition of a sustainable electricity system is that “true sustainability is only achieved when production is based entirely on renewable sources of energy that are managed within their natural rates of replenishment.” This in turn requires that an active demand side be developed. Doug pointed out that demand side response provides a means for increasing system security by reducing peak loads, and said that a competitive consumer electricity market should include both power you can buy and demand you can forego (another way of looking at "negawatts"). Doug then pointed out that the draft NZES devotes eighteen pages to electricity supply and only half a page to demand.

Later, responding to a question, Doug said that the focus on the demand side should be on the consumers' need and ability to make choices. The technologies to do this are coming on-stream - how do we access them? For Doug, the key is good price signals which include the costs of externalities. In his personal view, the current system breaks down because of vertical integration - so the Government needs either to regulate to prevent this, or to re-do the electricity reforms.

Nigel Isaacs, of BRANZ and SEF, gave an excellent presentation on how and where energy is actually used in New Zealand homes. He pointed out that the NZES focuses on electricity, largely ignoring the actual way that energy is used. The HEEP (Household Energy End-use Project) research has found that on average 29% of household energy goes on heating water and 34% on heating air - in total just under two thirds of the energy is for low grade heat that does not need to be provided by electricity. The HEEP analysis suggest that contrary to popular belief, the real problem with electricity use occurs at the top end of the market - in big, electricity-hungry homes. He said that we should use non-electricity sources of stationary energy to do those things they do best.

Analysis of HEEP data shows that shifting to high efficiency electric heat pumps does not alter the overall residential electricity demand and actually makes the peak demand worse - this is a consequence of the importance of solid fuel for space heating. It is only as a result of the HEEP work that we now understand the relative importance of different fuels and the purposes for which they are used. His key point was that policy should be based on data, not assumptions - and the evidence revealed in BRANZ's HEEP shows that stationary energy policy is being based on assumptions that are badly wrong. Nigel argued that demand should be given equal treatment to, and equal priority with, supply.

The final presenter in this session was Murray Ellis, also of SEF. Murray's presentation was on "Security without Subsidy", and he summarises it as follows:

Security can be gained by actions on the demand side as well as supply. Demand that the consumers can manage without for a period can be just as valuable as additional supplies in providing security, and often much cheaper. Its limits are that the cost to the user will rise if the period of interruption is prolonged, and that transaction costs are involved for small consumers, unless their participation is compulsory. Improving technology is mitigating both constraints. On the supply side diversity of supply is usually more beneficial than increased supply by reducing the size of problems instead of installing additional capacity that is rarely used.

The NZES addresses security, but in a very confused manner. It looks for it from:

- energy efficiency, which has only a transitory effect on security;
- DSM which is mostly about peak reduction, but can help if it includes interruptibility;
- diversity, which is described only as not including coal, nuclear or lignite;
- regulation, which is described only in terms of price control; and
- proactive information supply, which is not described at all.

This is illustrated with the actions taken, but these consist only of various subsidies to increase supply, plus leaning on generators to act non-commercially.

What is needed is a competitive market based mechanism to provide security services which does not specify the means to provide them. This can be achieved by a system of call options. At least to get this going, the buyer would need to be the system operator, acting under an obligation to sustain security, and calling for tenders at regular intervals. The sellers could be both generators and large consumers or aggregators of small consumers. The market would operate somewhat similarly to the present reserves market, but over longer time periods.

Low Emissions Power and Heat

Chair: Peter Neilson, New Zealand Business Council for Sustainable Development

The first speaker was John Gifford of Scion Research, who gave due regard to the positive elements of the strategies, and also looked at key barriers to the uptake of biofuels. These he identified as the (poor) health of the forestry sector, the fact that change was not easy and was complicated to implement, and the need for demonstration plants. He concluded that the strategies went some of the distance required in the area of promoting innovation and growth in the biofuels area, but not far enough.

Chris Baker of the Coal Association said that coal with carbon capture and sequestration (CCS) was a vital part of meeting the climate change challenge. He focused on the global context of increasing generation capacity from coal, and claimed that CCS is the only way to make a significant reduction in global atmospheric CO2 emissions, given that coal

currently makes up 39% of world electricity generation. He looked at New Zealand's involvement in international 'clean coal' research, and said that, in his view, Government investment in low emissions technologies, rather than market mechanisms, would be the key driver of future emissions reduction. In response to my question, he said that CCS should be commercially available for gasification plants by 2015, but that he didn't know when retrofitting of existing coal generation plants with CCS would be possible, or what this would cost.

Brent Layton of the NZIER, whose presentation is not available online, was the only panellists to question how serious a problem climate change was – he also criticised the discount rates used in the Stern Report, and a number of other aspects of the current public discourse on climate change. He also provided an amusing dissection of the expressed goal of the NZES, saying that it would not have passed muster in a first-year economics class due to its vagueness and imprecision. Therefore, although coming from a very different perspective, he echoed the calls by many of the speakers and audience members for the documents to be given clear, unambiguous, measurable goals. Replying to a question from Robin Brasell, he said that the strategy ought to set out high level principles, and clearly identify tradeoffs.

The final panelist was Molly Melhuish of SEF. Molly covered goals, trends and strategies for low-carbon power and heat, and she gave a detailed analysis of the documents' inadequacies in these areas. Her conclusions were that:

- GHG emissions are increasing especially in the residential sector, and major policy change is needed to reverse the trend
- Affordability to domestic consumers is reducing, but the government has a conflict of interest in power sector profits
- Investments today are mainly in large-scale energy projects; so the priority now is to support local renewables, energy efficiency, and price-responsive demand
- The present deforestation trend must reverse: we need trees for multiple use including carbon sequestration, water and soil conservation, energy, recreation, timber for low-carbon building, and (importantly) biodiversity
- A price on carbon should begin now, and be targeted to those best able to manage emissions (not avoid costs or shift them onto others).

In conclusion, Rob Whitney and myself gave brief closing addresses and thanked the participants, the organisers, and the sponsor, Transpower.

Gaps in the Policy Documents

While the good points of the various policy documents were acknowledged, a number of gaps and weaknesses in the policy documents were identified. These included:

- Lack of clear, unambiguous, measurable targets
- Lack of emphasis on New Zealand's financial liability over the first Kyoto commitment period (2008-2012), and measures to address this.
- Lack of clear price signals
- Lack of cost-benefit analysis
- Emphasis put on financial costs to existing and/or large players rather than potential benefits to small and/or new players
- Goals, objectives and policies based on either no data, inadequate data, or wrong data
- Not taking the carbon constraint issues seriously enough, and therefore moving too slowly
- Downplaying of the demand side (in both stationary energy and transport) relative to supply
- Taking too long to get a price on carbon into the market
- No cash flow for negawatts
- No way for builders of distributed generation to capture the saved costs of transmission
- Lack of emphasis on regional roles and responsibilities
- Lack of real-time price information in both transport and stationary energy
- Distorting effects of expenditure on roads ignored
- The wide gap between what the strategies propose and what the Prime Minister is calling for.