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Speech Notes

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Good evening. Firstly, I'd like to thank Robert Park, Chair of the Hopkins Lecture Trust and Emeritus Professor of Civil Engineering at the University of Canterbury. I know a little about the history of this lecture series, and looking back over previous speakers, feel privileged to follow in some very esteemed footsteps.

You have asked me to speak on Energy Planning for New Zealand. Was this out of a sense of mischief? The reason I ask is that some say we don't have any, others say we do. My truth is we now have some, and that follows a history where we used to have lots, followed by none at all.

To use other words we went from central planning to free market and now to managed market. The pendulum swung wildly and is now settling.

I want to explore that history, briefly. Then I want to ask and answer the question "do we have the level of planning right yet" – the conclusion I will reach is not yet, but it is nearly there. Then I want to talk about the transition in energy that is occurring in New Zealand at the moment, largely due to the arrival of the post Maui era. Finally I want to talk about planning over my lifetime, then the lifetime of my two children, both of whom have recently turned 30. That will lead us off onto topics such as climate change and the forthcoming peak in world oil production. Those issues require a good deal of planning and that planning, globally, has really only just begun.

I want to get through all of this in thirty minutes, so that we might dialogue, so inevitably I shall be touching on all these topics lightly and at a canter. Note that the speech is entitled energy planning, not electricity planning, but I shall start with electricity, beginning with recent history.

The central planning era in electricity began to crumble when some idiot decided to put a high dam on a faultline that runs under the Clutha River at Clyde, and then had to spend millions grouting the river bed, millions more on putting a new road in a place where the road didn't want to go, and millions still on tunnelling the hillsides so that the resultant lake didn't lubricate escarpments, causing those escarpments to topple into the lake that had just been filled and overtop the dam that had just been built. Two low dams would have done the trick.

That idiot was the political process in general and the Government of the day in particular. Had the resulting cost overruns not been dropped into the consolidated account for taxpayers to blithely pay off over the years, then the cost of Clyde dam electricity would have been about 14 cents, which wouldn't cut it against a wholesale price that, even these days, is only half that.

So corporatisation began; commercial decision making processes, more transparency, less politics, and all of that. NZED became Electricorp and then rebranded to ECNZ to try and put the 1992 electricity shortage behind it. Development of a wholesale electricity market began.

Then the National Party decided that it would be a good idea to split ECNZ and sell the bits off. They got the job partly done before the Government changed and put a stop to further privatisation. They also decided that anyone who owned an electricity line couldn't own an electron as well, and the upheaval of the so-called Bradford reforms began, most of them irreversible.

So then I became Minister, inheriting a system that was in turmoil, but magically operating well day by day nonetheless. Most of the companies in the sector were brand new. Most of the rules needed for industry to run itself hadn't been written, and the market that was to deliver the political promise of lower prices delivered higher ones which left the public annoyed and which indirectly saw Mr Bradford depart politics.

Most interestingly of all, the formal policy was that there was no plan. The market would deliver electricity just as it delivered baked beans. Prices would be set. Markets would be clear. We would never produce too much electricity, and we would never produce too little. Intervention would be thoroughly unnecessary.

And so we entered the winter of 2001. Guess what? The Government intervened in the market, strongly and in haste, in the form of a public conservation campaign. However, the largest retailer of the day, On Energy, lost its shirt and disappeared because we refused to intervene and cap the spot price on the grounds that that would be like putting a sticking plaster over the fuel gauge.

Then it rained.

Busily industry worked to put in place the rules that Government required in the Government Policy Statement that we had issued in late 2000. All through 2001 and 2002 they worked, and in the meantime Parliament passed backstop legislation in case the industry process failed.

By early 2003 it looked like it might fail, and just then it stopped raining again. Again the public conserved, understandably grudgingly. By May the Government had had enough, as had everyone else. The backstop legislation was dusted off and the emergency provisions, which had previously been labelled as draconian by political opponents, were implemented without a whimper. The result is the Electricity Commission. We now have a regulator.

Then we intervened again. The free market model had failed to deliver security of supply in very dry periods. We had just experienced two of them in three years. So the Government built the first reserve generation plant of 150MW and ring fenced it so that it will run only in times of emergency and not therefore compete with ordinary generation investment. It was opened a few weeks ago. It was built on a Contact Energy site at Whirinaki and it's diesel fired. It is built on precisely the same site that an earlier 150MW diesel plant once occupied. When Contact was privatised by National the company took an entirely logical decision to get rid of it. The last unit left in autumn 2001, just as the rain stopped falling.

Pure markets do not deliver security of supply. But neither, as the Clyde Dam or 1992 indicate, does central planning. Had there been such a thing as price discovery Clyde would not have been built. The 1992 crisis would have been averted, or mostly averted. It was hydrologically less severe than 2001, but the resultant economic damage was more severe. Welcome therefore to a managed market, or to a regulated market. Or to some central planning, planning limited to security of supply issues.

Do we have the level of planning about right? As I have said my answer is not yet, but nearly. Some of the rules, transmission pricing methodology, are almost unbelievably still not in place. Much of this stuff should have been done in the nineties but correctly sequencing events was not a strong feature of that Government. In any case I have surely had time enough, but the fact that it involves the possibility of wealth transfer between players has meant that all the industry processes, so optimistically embarked upon, failed. The Commission is now fixing this backlog.

Some of the tools are not in place. I have not yet given the Commission the full toolbox of necessary powers. If we are to have a market model, the model needs to function better still. The Commission can advance that cause, if they see the merit and if they have a full toolbox. The necessary legislation will be through in the next few weeks.

Or to give another example, electricity planning in this country, under any model, has never planned for demand side management or energy efficiency. Always the thinking, the speeches and the random outbreaks of panic and catastrophising speak of the supply side. It has always been that way. The end result, surprise surprise, is that our economy uses energy inefficiently. The demand side market or the energy efficiency market is not working; it is close to opaque. It is much the same in every country, the difference being that we have been uncommonly slow in recognising it. That is one reason why our energy intensity did not start to decline until the nineties, twenty years after most countries.

Some people still don't recognise it. These are folk who dryly observe that there is no such thing as a \$10 bill on the pavement because economics dictates that it will already have been picked up by someone. But these are the same folk who will walk straight past a \$50 bill because it represents the dividend of an energy efficiency investment. To give you an extreme example I know of a heated swimming complex where a \$70,000 per annum saving is available so long as a one-off investment of \$80,000 is made. Right now, it still hasn't been.

So demand side planning is still not optimal. In recent weeks we have set out to fix that too. Now planning for security of supply involves both the supply and demand side and the Electricity Commission can in effect buy both. The demand side investment is currently tiny, as we learn how to size it. And the remarkable work of the Energy Efficiency and Conservation Authority continues unabated, probably rapidly increased if the Commission chooses to purchase services from them.

But the point to grasp is that demand side planning and supply side planning now reside in one organisation, the Electricity Commission. They buy whichever is the cheapest as they implement their security of supply obligation. So there we have it. The pendulum is now more or less in the middle, with a managed market and a regulator. We still need to finish the rules, we still need to give the Commission a full toolbox and we need to secure a future where supply side and demand side thinking are integrated.

Now I turn to that transition, not in electricity but in energy that I spoke of at the beginning.

The transition could be characterised by many things – the move to distributed generation, the possibility of a permanently higher price for oil, the advent of hybrid motor vehicles, the arrival of wind energy, the future for biomass and on it goes. However I want to limit my remarks to the Maui gas field.

We don't have one. It has gone, or it has nearly gone. Maui was big. It was enormous by our standards and when discovered it was sizeable even by world standards. The fact that it is running out around two years early has been a comprehensive pain in the neck. It has had many repercussions. The Maui Contract had to be negotiated so that the incentives to fully deplete the field were in place. I convened these negotiations. They were complex and frustrating for all of us and they took over a year. But they are now done. Second, electricity and gas prices rose earlier than they might otherwise have and the result, as always, is a grumpy public. The reason is that thirty years ago the Maui contract allowed gas prices to rise at only half the price of inflation. After the inflationary '70s and '80s Maui gas became very cheap indeed. Replacement gas isn't.

But the biggest repercussion was psychological. Maui was always big and comfortable and long lasting. Until now. For decades we haven't particularly looked for more gas because we haven't needed to. We have looked for oil, and found gas, but most of our gas potential is still unexplored. So now we need a significant increase in exploration levels, even to the point where the Government has recently announced a more favourable fiscal framework, for five years, to help the increase get under way. Not that we are in any immediate trouble – the likes of Pohokura and Kupe see to that – but a decade from now they too will be well on the decline.

What is more, a free gas market doesn't really exist. Gas has been traded by way of very long-term contract. The Maui contract is one of the oldest and arthritic in the economy. However the industry and the Government are now well advanced in getting modern governance around the industry, and the future will be a much freer market than exists now. A Government policy statement on gas has now been finalised.

I don't believe that the finance sector has yet fully adapted to the idea that long gas contracts are unlikely to be a part of our future because another Maui-sized field is unlikely. They have a risk aversion which has yet to catch up with the reality that Maui is gone.

As the post-Maui era dawns so the Think Big era sets, evidenced most notably by the rapid decline in methanol exports from Methanex.

And finally, our largest electricity plant, Huntly, is running hard on coal these days to plug the gap between Maui and its smaller successors. While coal does not play a large part in our energy mix, its ability to give our system some resilience is very important.

So did energy planning help in all of this transition from Maui to post-Maui?

Yes and no. Certainly the economy as a whole was planning for the demise of Maui, but then we got the timing wrong. Or, more accurately, we may have; debate about how much gas is still left in Maui continues as it always will in any gas field.

The improvements to gas governance were certainly planned by the Government, and will arrive on time, as will the changes to policy for exploration. On the other hand I was caught short about eighteen months ago by an absence of a coal stockpile. I think that was a planning failure, directly attributable to the split of ECNZ and the move to a market based approach.

The future for gas is roughly the same as for electricity – a managed market model with a regulator – though the likely regulatory model will be co-regulation with industry. If that doesn't work I shall reach for backstop legislation as I did last year for electricity. That legislation will be in place in the next few weeks.

Which leads me to a much bigger energy planning issue – planning for the effects of world oil production decline. About the only thing that commentators on this issue agree on is that world oil production will peak and decline sometime this century. If planning for the decline in Maui turned out to be a bit tricky, trying to put a date on when oil production will peak is a real headache.

It requires data we don't have and assumptions we can't test. We even have to factor in psychology, which itself varies from denial to catastrophising. But it will be this century. And it seems more likely to be in the first half than the second, though equally one could argue that it might be in the middle.

I'll put some dates on the table to give the issue some focus. Oil production seems likely to peak sometime between 2021 and 2067, with probability highest around 2037. The source I'm choosing to quote is the US Department of Energy's Energy Information Administration deploying up to date US Geological Survey estimates. The two outlying dates, 2021 and 2067, are the result of different chosen assumptions on the size of reserves, and rate of demand increase between now and then.

I stress again that other estimates abound, and that I do not assert that I have chosen the right one. I simply don't know. I chose it because it's probably mainstream. That doesn't necessarily make it correct.

Some of you will remember that back in the sixties the Club of Rome predicted the world would run out of copper, but along came, for example, fibre optics, and those who ridiculed the prediction were proved right.

Conversely there is Hubbert's accurate prediction in the fifties that US oil production would peak early in the seventies. He was also ridiculed but his prediction eventuated right on time.

So how do we plan, or begin to plan, for this? Globally, the evidence for planning comes mainly in the form of targeted research and development effort. The technologies are many – hybrid motor vehicles being the most obvious success to date. The words hydrogen economy have crept into the lexicon in recent years and a lot of research and development effort is focussed on fuel cell technology. But only ten years ago the focus was different. It was on electric vehicles, so called zero emission vehicles, and in another ten years it is possible the focus will shift afresh. Planning for success in a particular, identified technology is problematic.

But if the fuel source is to be hydrogen then where is it to come from? Again there are a lot of technologies at play. Extraction from coal has a lot of current focus and extracting from quite a range of biotechnologies has another. Then again, in the New Zealand context it may even be contemplated that hydrolysing water is an option.

Enter climate change. The difference between an oil production debate and a climate change debate is the difference between sources and sinks. Will we run out of fossil fuels first, or the atmosphere's ability to absorb the resultant CO₂? Given the huge global stocks of coal the answer is certainly that we run out of sink capacity first.

That means that, as we switch from oil we aren't going to have the option of, say, burning coal to produce electricity to split water to extract hydrogen to fuel a car. Which is why of course research on the direct extraction of hydrogen from coal is accompanied by research on sequestration of the resulting CO₂.

In New Zealand we have our own research going on, at CRL, IRL, IGNS and elsewhere into aspects of a hydrogen economy. Our various biotechnology skills are likely to prove important globally, over the next one or two decades. For our size, we have a lot of them.

But the best planning we can do, given that we will be, or will be substantially, technology followers is to be found in climate change policy, transport policy and sustainable development more broadly.

The New Zealand Transport Strategy is now twenty months old and the associated law, the Land Transport Management Act, is about eight months old. We are just beginning to see their effects. Piloting a vehicle emissions standard begins later this year, double tracking of some rail has now begun, the rail track is now back in public ownership, a road pricing study is underway, the North Shore bus way is being built, cycle ways are being built, passenger transport funding has increased 70% since the change of government (though off a low base) and so on. It is, I stress, just a beginning.

Or, to give an example from climate change policy, tomorrow I attend the opening at Te Apiti in the Manawatu of the first of the wind turbines on that 90 MW site. Not that wind power substitutes for oil in the New Zealand context, but if our future includes the option of hydrolysis from renewables then we may as well edge towards that future. That particular project received emissions or carbon credits, later sold offshore, as the result of the Government trialing a policy called Projects to Reduce Emissions.

The problem with climate change planning is that we have to reduce the causes, and prepare for the effects, simultaneously. Climate change is coming, ready or not. Changes in temperature, rain fall and storm frequency are now being predicted with growing, but still insufficient, accuracy. We put out our latest predictions to all local governments, last week.

One consequence, in Canterbury more than anywhere, is the need for a national water policy. Climate change will probably see wetter headwaters and drier plains. Our ability to allocate water is currently weak. That is why the Government is now engrossed in developing a national water policy led by Marian Hobbs, with folk like me and Agriculture Minister Jim Sutton taking a keen interest.

There are infrastructure issues to consider too. Transpower found some pylons flattened earlier this year from high winds, local governments will need to take care that their sewage systems don't become tidal before they become obsolete and the Prime Minister has sharpened her interest in the adequacy of New Zealand planning law following the Bay of Plenty flood.

Infrastructure issues abound in this country, from transport to electricity to water. Which is why Michael Cullen convenes an infrastructure ministers group. It is why the Government's growth and innovation advisory board has it firmly on the agenda. The immediate task is to address the infrastructure deficit of the nineties. We're in catch up. The task further out is to plan for, not just a prosperous future in a progressively transformed economy, but a future which this century promises the twin challenges of peak oil production and the effects of climate change.