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BOARD OF INQUIRY

Proposed National Policy Statement
for Renewable Electricity Generation

HEARD BEFORE DR R SOMERVILLE QC (CHAIR), MRS G BAUMANN, MR W GARDINER AND DR R CHAPMAN, MEMBERS OF THE BOARD

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HEARING OPENED [11.00 am]

APPEARANCES

Dr G Bertram, Mr D Clover, Prof B Barton and Mr R Lavanger

Mr A Cameron and Mr D Forest, Tararua District Council

Audio file: dpm 0059

CHAIR: The purpose of today's discussion, and we're very grateful to you and your co-authors for the paper we have from Mr Clover, and also Prof Barry Barton from Waikato University who is here as well. And we want to try and have a discussion basically about some matters that have come up during the course of the inquiry and also feel free the other people here to chip in as you go, but if you could just identify yourselves for the record each time. So if you'd like to move forward that would be helpful. So today is more of a - if we could just get your views on a number of things, that would be very helpful. And I think probably it might be best if I start and then the other members of the Board can raise matters as we go. Firstly, thank you for the paper. It's a great distillation of what we're talking about and discussing. And what, to start with, we're particularly interested in because we're looking at as a policy instrument under the Resource Management Act and it is whether or not the introduction of the policy instrument would actually benefit the process for dealing with renewable electricity generation in the planning sense if you like, in a regulatory sense more than anything and whether or not a national approach which would then become something that the regions and the districts need to implement, could be beneficial. And if I could just turning to your paper, it's at page 396. So this is a chapter is it, not a book is it?

DR BERTRAM: Yes. It's published next month so it's very nearly a book.

CHAIR: At 396 at the bottom of the page, and this is on the modelling, there's the additional renewable electricity scenario. Here it assumes a relaxation of planning and land use constraints and over the page there are some assumptions made concerning the resource consent hurdles which the author believes, or the inputter, that the wholesale price will come down by a full 4 cents per kilowatt hour on this 2025 horizon, which is quite a

reduction. When you did this work, do you know what's in behind those numbers? What assumptions were made?

DR BERTRAM: My understanding is that behind these numbers is a lot of rumbling discontent in the industry being held up by resource consents and also the feeling that if they didn't have to go through those, those consent hurdles, they could in some way deliver cheaper options and the sort of thing that they'd be thinking of I'm sure is being able to build hydro in sites which otherwise might be withheld from them, being able to simply go ahead putting in a variety of stations that would not be subject to countervailing arguments to do with the environment, to do with the social impact, the sort of things that the RMA currently protects. I think I wouldn't put too much weight on this particular scenario because I think it's there's a wish list tucked in behind it in the database that the modellers are using. Without digging up the wish list and itemising exactly which projects they think they're going to advance under that scenario, it is very difficult to unpick it. But I would guess that there are two or three hydro proposals in there that they think would otherwise face really steep hurdles with hearings. But to be honest, I don't know, this is second-hand modelling work that I'm reporting. It reflects the fact that we don't have the resources or the model to do this ourselves, and as a substitute for being able to the modelling, what I've done is worked from work that the Electricity Commission or the MED has done and so it's a matter of extracting results from the various model runs and then presenting them in a format that fits the frame of what we're trying to achieve. And given due notice, I could go back to the MED I suppose and ask them please can I have the list of projects behind that particular run, and that would pretty well sort out what the constraints are that they think they will overcome.

MR CLOVER: Doug Clover here, the process for developing the scenarios that they've used in their modelling is a process of discussion, where they got

people from the industry or interested parties together and could have a discussion about who those interested parties would in fact include in that discussion, and gained a sort of consensus around some world views. Whether you agree with that or whether you think that that's realistic or not is of course where that consensus came to. Now what they then did was the generation expansion model has a list of what they think the projects they've done - I've identified a whole bunch of projects like thermal, hydro, wind, co-gen, all that sort of stuff and they've ranked them based on what the costs are: fuel costs and capital costs and maintenance costs. And with different scenarios, they will take some in and take some of that out of that list and put others in and what they've done on the renewables one is they've left ones in that list that they were taking out under the - the assumptions behind that are somewhat cloudy and in my research I couldn't find them. But if you want to talk to the people at the - I think it would be useful to talk to some of the people at Electricity Commission modelling and NEB modelling because they've now - they're sort of working together. I think that's about all I can add to that in that regard, without me going through and actually pulling out the model runs. And I could do that, I'd have to go back into the bowels of the model and find out which projects they stuck in and stuck out. But these are all hypothetical projects, the consensus view of what we think this place is and the river is subject to damming and we think we would get this number of installed megawatts and this number of gigawatt hours out of it and then they put that in, and then there's assumptions about the cost behind putting that dam in.

CHAIR: Just before the others get into this. On page 399 on the long run renewables supply curve, there is a table 14.4 following that page which has a hydro assumption there.

DR BERTRAM: (Inaudible) about the runs that you are inquiring about. The reason is, there's been several rounds of modelling work done on this over the last few years. The case that the additional renewables and the renewables scenarios in Figure 14.12 on page 295 of the paper is what we were discussing before. 2006 in the MED they would therefore be based upon 2005 vintage database from the Electricity Commission. The people who did these scenarios, not all of them are still in the country, Ralph Samuelson, who was in charge of the Ministry of Economic Development's modelling program, is of course now in Japan and whether records have been kept of the details of that work is not too clear. So when you turn to Table 14.4 and Figure 14.15 where we're looking at the long-run renewable supply curve, this is data which was not available at the time that these 2006 scenarios were run. This is the result of working during 2007/2008 by the Electricity Commission trying to assemble a database of instant opportunities for generation. And one of the things that came up during the investigations of 2007/2008 as I understand it is that they found a great deal more wind potential than had previously been put into the database, and they have also put in a slab of marine which is again modern technologies and wasn't in the older modelling runs. So there's quite a bit more cheap renewable capacity or potential showing up in the more recent databases compared to what was available when these 2006 runs were done.

[11.10 am]

CHAIR: Right and were the 2006 runs where there is the 28% reduction assumed through okaying resource consent hurdles, was that not carried into the 2007 modelling?

DR BERTRAM: No, there's no comparable run in the later modelling where they actually strip away resource consent.

CHAIR: So that's the only thing we've got really in the paper that might look towards removing barriers in terms of the planning.

DR BERTRAM: Yes. Throw away the RMA and we can save you this amount they think on our -

CHAIR: I think you might have mentioned in the paper too about the cooling process helping. Same page. Has there been any analyse done on whether it has helped or not?

DR BERTRAM: Well, the difficultly with the cooling process is that to my mind it is the only cooling we've done on electricity construction is the Stratford Power Station in 1997 wasn't it?, when Simon Upton called it in and opposed a condition on the consent, that ECNZ as it then was would have to plant trees to make up for 1 ½ megatons of emissions from the station. Now I've seen no retrospective evaluation of performance under that. I'm assuming that ECNZ and its successive companies have complied with that requirement. But it's conspicuous as an isolated case. You've not seen call-in privilege provisions used since that single case and I'm not sure why not. I mean it seems relatively obviously that that's one route by which these sort of things could be systematically looked at under the Act as it stands, but it hasn't been used.

CHAIR: Right, so the current process where wind farms are going to Boards of Inquiry and cutting out the local authority step in the process will assist in the reducing the barrier?

DR BERTRAM: I have to say I haven't been following the wind farm consenting procedure and if indeed that's an example of call-in then okay, I just confess to completely not being involved in this, so I don't know.

CHAIR: Thank you. We've studied - well familiar with that, I just wondered whether you had been in that (inaudible). No that's fine, that's helpful. If I could just - help me with my understanding of this for a start. The other matter that I'd like to raise and we'll come back to these points, is that this business of distributed electricity and the paper seems to throw up a suggestion that even if a National Policy Statement or planning instruments were to really push in a regulatory forcing way to push distributed electricity opportunities, that it may not do anything in the sense of the overall move towards the 90%.

DR BERTRAM: I'm thinking hard as to which passage in the paper - I'll just make sure I don't -

CHAIR: No, no I understand. If we go straight to 405 and the conclusions, you've summed it up there in the third paragraph from the top of the page. Second line, "Small scale distributed generation could become a problem rather than support the 90% target."

DR BERTRAM: Yes, that's in relation to the Stratford asset problem. The difficulty we have now is that we've got 20 years under the new model electricity system and in the course of which virtually all construction and planning for construction is being done by the large gentailers. And by some minor players who've been special in their characteristics, particularly Iwi based and geothermal projects which, because of their particular relationship to the resource, can get a leg-in to the market.

From an economists point of view one looks for the opportunities for each or by any generator on merit regardless of size and regardless of technology and indeed one wants an economic mechanism to shape the technology then you can do something like a carbon charge or a

renewables quota or something to nudge the choice of technique towards more renewables. But we've not had a market where small scale operators have been able to enter or operate unless they don't have a firm grounding in the retail market and that's to do with the deficiencies of the regulatory and competitive structure in the market. Because we've gone 20 years with the entire investment portfolio being steadily skewed towards central generation and away from distributed generation, and because you need quite major reforms for the existing market structure to bring distributed generation forward in a big way, it's hard to judge what would happen if we opened the floodgates. Whether in fact distributed generation were given the opportunity to enter the market on a level playing field sort of basis, you would then get a lot of new ventures or not. Ultimately, the only test is to try it and see. But if you try it and see, you've then got to think what sort of technologies would then be welcome into the market on a level playing field with present pricing, and first off there's no guarantee they'd all be renewables. Quite a lot of them would be renewables because if there are small fossil fuel-based generation options that are also at the moment not nearly as much adopted as they might be then you might well find that your distributed generation that came forward was partly farms putting in wind turbines on the farm selling surplus power after supplying the dairy shed and the neighbours. It might also be partly small neighbourhood projects using small-scale turbines, but fuelled by gas or a diesel distiller or something of that sort to actually run a local network and supply back into the grid. And so depending on the balance of technologies that have turned up, I would assume with generation it's hard to predict what that would do to the renewables proportion.

It's also the case that more of the distributed generation you get, the greater is the likelihood that it could start strangling some of the existing assets of the central generators, which are all premised on a model which the electricity is generated in big stations sent over the grid, distributed

through the networks but not subject to being eaten out along the way by distributed generation coming in and cutting out the big generators from participation. And at the moment, the grid is priced and administered in such a way as to effectively close what otherwise would be a lot of options once the specs were independent power producers. So exactly what would happen in New Zealand if you took away the anti-competitive barriers that are in the marketplace is extremely hard to model. And the Electricity Commission A) hasn't done it and B) can't do it because they are limited in their modelling to projects of more than 10 megawatts. And a lot of distributed generation will be below the 10 megawatt threshold and therefore isn't in the modelling. If it's not in the database, the Commission just ignores it.

MR CLOVER: It's too difficult. And then you get into slightly definitional issues as to what is distributed generation and small-scale distributed generation. Is it embedded in the sense that it's primarily producing electricity for the use of that local community or that industry, or is it selling back into the grid? And one of the problems if you're doing distributed embedded generation and selling it back into the grid is that you've invested up-front in capital, and this is why you need a long-term contract. And very often you're trying to get a long-term contract from a direct competitor who's also the gentailer. And that's a level of insecurity that we've found, and there's an example in the Hawkes Bay wind farm that had some real issues about getting that long-term contract so that they can go to their bank and say we have a revenue stream. So it's just a specific aspect of what Geoff just said but that is something that has been found.

CHAIR: I've got one more before - that (inaudible) exercise in my mind. On the demand side, we've got a policy statement that includes in it, is entrenched in the objective, the 90% target for renewables. And we have actually, most of the evidence is focussed on the supply side because of

the planning implications, but the Resource Management Act does deal with the demand side as well. And we do need to address if that 90% remains in the document. Now your chapter, that's what it's all about, as I said. The relationship in New Zealand in this timeframe through to 2025, the relationship of hydro to wind, the hydro storage for peaking purposes to the wind uptake, is of particular interest to us. Because again you're dealing with a renewable source for peaking rather than a thermal source. We appreciate the thermal relationship but just dealing with renewables for a moment. In your paper you mention the difficulties with more hydro projects and also the relationship of hydro to tourism which - now just exploring those two matters for a start, the latter one first, have you actually got any numbers or has there been any qualitative work even done on the effect of flooding valleys on the tourism market?

[11.20 am]

DR BERTRAM: Yes there has, but it is a bit inconclusive. The most celebrated case is the Kawaia I think where the hydro development was in fact completely closed off on the basis of existing studies that said that New Zealanders, on a random sample basis and quite a wide-ranging study, say no the Kawaia stays undammed. And some figures were attached to that but they were not the figures of tourism earnings from the Kawaia, they were figures attached by people asked to evaluate the resource as a landscape feature in New Zealand. Other rivers that have actually been subject to quantitative analysis have tended not to, the ones that I've seen, have tended not to be really high tourism value rivers. A good subject is the Wairau, there was quite a bit of discussion about whether the Wairau was or was not a major recreational resource. And I have to say I think it's pretty inconclusive, the numbers using the river and the numbers placing high value on it for recreational purposes. They were there, but they weren't overwhelming and the quantification was not very

resource even though a major consulting stage had gone on that. The Waitaha and the Rangitata, that has also been evaluated with some reference to tourism values, but again, I don't think any of those studies really measures up as a systematic measurement of the tourism values associated that would be foregone by damming. And there's always, when it comes to resource consent, there is a balance to be struck between the loss of wild and scenic values on the one hand and the gain to lakes for boating and recreational sort of features to go with them on the other hand. And I think you have to take that case by case. I don't know of much work on this in New Zealand yet.

MR CLOVER: I'm not too sure, was it tourism or recreation, existing recreation uses, that those studies looked at and then - I'm sorry, I'm just trying to remember the status and Geoff sounds like he has worked on it much more recently than I have, but tourism - I can't recall actually having tourism as an issue, it was more about existing recreation. So for example if it was a braided river it would be the jet boating and fly fishing and whitebaiting and those sorts of things. Rather than how many people from overseas came because they wanted to see a braided river.

CHAIR: So in the economic modelling the relationship of say, in GDP terms, the tourism is the top earner versus using the resource for energy, is there any -

MR CLOVER: That I'm aware of, no.

DR BERTRAM: Well, it will vary from river to river. There are some rivers to which tourists go in large numbers, and around Queenstown obviously. A dominant component of the economic value of the wild rivers down there will be tourists going in the jet boat operations, and jumping bungies and looking at the wild and scenic features of the landscape. And the

component of New Zealanders simply been taking advantage of the landscape for their own recreational purposes will be lower, but then an awful lot of other rivers which are not iconic in the tourism sense are nevertheless used a great deal by New Zealanders for recreational purposes and that in GDP terms is very difficult to measure because the relevant purchases that are made to get the recreational value out of these rivers are people buying boats and buying fuel for the jet boat and buying the fishing gear and buying petrol to drive to where they're going to enjoy the river experience. And it's very difficult to sort those out as an identifiable stream of value-added and then relate that to GDP so trying to relate these things to GDP is relatively straightforward for overseas tourism but much more difficult for the very diffuse and often unquantifiable benefits to New Zealanders for enjoyment of their own landscape.

DR HARDING: My question really is how do we measure value in this context. I presume you would take the view that we shouldn't just be looking at GDP, that value in a broader wellbeing sense is not predicated on GDP but it extends to non-marketed values and we should be taking a broad view of that. Particularly given the RMA is not an Act that focuses on GDP but is concerned with wider questions of wellbeing.

DR BERTRAM: Yes, I've always thought of the RMA as the vehicle for doing the sort of balancing act you described. It is where to go to take a look at the GDP cost and benefits here and then set them against the whole wider range of other criteria that actually matter a lot even though they are not part of GDP. The fact that they matter a lot but they are extremely hard to measure, I mean it is a very difficult, judgemental exercise and I've been getting into all sorts over knots over the Moutua and the Wanganui many years ago. And economic science, so-called, doesn't really, it can't very

clearly for you at the end of the day, somebody's got to exercise judgement putting weights on the various values.

CHAIR: Now with the relationship between hydro storage and wind, the uptake on the wind, with these models, are there any assumptions in - in your view could you get to the, I think you had 88%, but 90% close enough to it, without further hydro being built, further storage. Providing the wind uptake and the geothermal uptake, or the wind uptake and geothermal carries off the base load.

DR BERTRAM: Putting my finger in the wind, I would have said yes, if you open the way to more wind being brought in a cost effective manner. But there's a long way to go with the technology and the learning curves and so on on New Zealand wind. I'm anticipating we'll see costs come down over the next couple of decades. Yes, I think you could get pretty close without more hydro but it's not been modelled. None of the Electricity Commission model runs that we looked at gets there with no hydro.

MR CLOVER: And those are making some assumptions about investment in the grid and the way the future operation of the grid will occur. As you are well aware, I'm sure you've heard over and over, the grid is pretty much designed to go from South to North and if you want wind, you're going to have to change that and make it a lot more integrated and dynamic, and let's be honest, intelligent grid. So I mean I did some work when I was at the parliamentary commission and we looked at that issue in a very ad hoc sort of gross way. And the issue for us came down to it wasn't so much about well how much more hydro or how much more wind you built us, what did you do on the demand side in terms of while still maintaining the level of GDP and energy services as we called them, so that's another issue which comes to the point about the demand side.

CHAIR: Yes, that's my final question before we open it up.

DR BERTRAM: Perhaps we could come back to the beginning of your last question. I take it you're going to do that now?

CHAIR: Yes but no carry on, yes I was.

DR BERTRAM: Well if you take the set of slides that I gave you, and just look up the third page, slide number 12 which is in the paper. It's bigger 14.10, not sure what page it's on in the paper. But that was where we just looked at various projections forward of the demand. Page 391. And the striking thing about that is that although the Electricity Commission's modelling and the MED's modelling have worked with a relatively narrow corridor of projected levels of demand out to 2040, you can see some wild cards there.

There are some scenarios that people have constructed after due consideration, where as you can see there's a feasible demand track from two of the sets of models that we looked at that runs very, very far below the mainstream projection. Indeed, ends you up with around 47,000 gigawatt hours out there in the 2030's.

[11.30 am]

Now, this brings me to the denominator problem which to me was the intriguing thing that we hadn't spotted when we set out to write the paper and stuck out a mile at the end. 90% of what? And none of the government policy statements really tell you what the denominator is in regard to that 90%. And if they mean 90% of installed capacity in the system should be renewable that would be one thing, if they mean 90% of

the projected demand from the MfE projections should be renewables, that's another thing. If they mean 90% of whatever demand emerges after we've seriously got into doing something about energy efficiency in this economy, it's a completely different story altogether because on those low demand projection scenarios where electricity demand grows far more slowly than the Electricity Commission assumes, you've got a much smaller amount of electricity required, you can be much more economising in how you choose the resources that take that demand. That means with the low-demand scenario, you really can pick and choose much more rigorously, and the RMA can bite much harder on the choice of techniques than if you think that you're up against the old rushing surge of unstoppable demand for electricity. So I think this is absolutely fundamental to doing any sort of National Policy Statement. It has to say what the denominator is and it has to embody some expectations about how the denominator is going to evolve itself, and this is the great untapped resource in New Zealand is that we have not gone to the demand side yet, and we don't know what it will deliver.

MR CLOVER: In terms of our model, it was a technical-based model. We said what was technically-possible and then, if you wanted to do things in terms of replacing fluorescent lights and improving electric motors and doing those sorts of things, then generally we took a conservative view of what could be achieved. Effectively said by 2050 I think it was there would be a doubling of the overall average in energy efficiency in the system which is basically just tweaking what is already happening as we go through time as there's a general turnover of the capital stock but accelerating it to a greater degree. What that will cost, how and what benefits there will be, we didn't do that analyse as part of the parliamentary commission. The objective was to say why are we always focussing on the generation side when we have this huge resource. And of course when you look at the cost structure of the curve for carbon

abatement you see a lot of the positive, where you're actually getting positive benefit out of the energy efficiency areas, so there's an overlap there as well. So there's a huge resource in New Zealand, we're incredibly inefficient with the way we use our electricity in this country compared to other first world countries.

DR CHAPMAN: Mr Clover can I just clarify whether you're referring to PCE Scenario B there. In Figure 14.10.

MR CLOVER: Yes. I've got to start wearing glasses. Yes that is the one.

DR CHAPMAN: So that's the one which ends up at about 46,000 gigawatt hours by 2030?

MR CLOVER: And that is still assuming the same level of GDP growth under both scenarios, but what we are seeing is a 3% and if you still wanted to service that level of GDP growth, but you did it through using electricity more efficiently, how much gigawatt hours per year would you need to do that? None of that scenario, we were quite happily running under our scenarios and I know that these quite - we were retiring Huntly early and just using gas, thermal for emergency reserves, spin up reserve and that sort of stuff, and we did put one hydro in, one medium-sized hydro project, but the rest was largely done through wind, geothermal and some token amount of marine further out. And the reason why in our original scenario we didn't have any marine up to 2050 and we got a feedback on the draft saying why no marine? A caveat we used was that we would only use electricity generation technologies that we knew were already in place and had we some cost data on, so that we could rank them accordingly. So for example we had the data on advanced thermal so we are including that and we had cost estimates on that, we had cost estimates on wind, we had cost estimates on geothermal, so we could incorporate that but at

that stage we had nothing and we still, I don't think, have anything robust on wave or tidal type paths, but we've stuck it in at the end because it was an acknowledgement that by 2050 surely there would be some marine generation in New Zealand.

CHAIR: This may be outside your field, it may be something Professor Barton wants to comment on. But we did ask the Electricity Commission witness about whether there are any incentives for generators to promote energy efficiency on the demand side and he couldn't think of any. But we're not - the National Policy Statement isn't focussing so much on that but it still needs to be taken into account. It may be something that Professor Barton can talk about later.

PROF BARTON: I certainly can't think of any. I can think of incentives that go the other way. There are incentives not to encourage wasteful use in some cases.

MR CLOVER: Well not wasteful, but certainly as I commented, you sell volume, you want volume. The only time that the generators are really concerned about maybe cutting - and that's only temporary, it's during a dry year. And during a dry year if they're exposed to the spot to some degree they may wish to and that's when they'll go out and do the short-term conservation programs. But an ongoing process like say California for instance, we don't have in this country. No requirement by the generators or the gentailers to look at energy efficiency, except given this that they starting to get into household insulation, but that's I think partly PR, partly for health issues as well.

DR BERTRAM: There's no special advantage to electricity retailers or generators in the insulation game - insulating houses. That's something

that can be done by a completely independent operator, it's not necessarily integral to the retailing of electricity.

MR CLOVER: Some of them do have sort of support systems or advice programs that they provide, again that's part of their community engagement.

CHAIR: So could I just sum up. Is it your opinion from your research that we could get to the 90% without a significant demand side influence through energy efficiency whether it's -

MR CLOVER: Without a significant demand side?

CHAIR: Yes.

MR CLOVER: Well my opinion, and I don't know - this is based on my working in the electricity area for the last nearly 20 years off and on, is that yes you could but you'd have to dam some rivers, you'd have some pretty significant dams, you'd have to put wind farms where there are possibly certainly landscape and other values that you would be infringing, you'd have to use geothermal fields that perhaps have other values, and you'd likely have to take an aggressive approach to marine as well and be an early adopter of that technology without demand. It could be done, we are very rich on renewables, but the trade-offs are dear and that would make it extremely - we would have some very contentious and there would be some very high-value rivers. I can think of for example the Moutua where (inaudible) one that I would be thinking seriously about if I was going down that scenario, the Mohaka is another one, that's got some issues about instability. You start getting some really - the lower Waitaki has definitely got to be on the system again, that's going to be there anyway. So yes you're definitely, you'd be putting wind farms on coastal areas that would

have high amenity and landscape values and perhaps Tangata Whenua values as well, so you'd be looking at - and having to invest quite a lot on the grid. Perhaps a lot more under that scenario and that's an issue that - I don't know whether you've talked about the costs of linking in remotely located renewables is a huge issue. Who pays for that and how that cost is recovered is another issue.

[11.40 am]

DR BERTRAM: I'd agree with Doug. I think that technically 90% is straightforward, we can see how to do it. A lot of the costs however are in the trade-offs and on the environmental side and so this will be at the heart of the RMA's approach to the demand side. The demand side can take the pressure off resources and so the 90% is easier and cheaper to achieve with a lack of demand side than without.

MR CLOVER: And another issue, and I know that this is outside, but if we did go down a demand side paradigm, where you're thinking demand side first and then thinking about how you (inaudible) demand side down into demand subsequent, the benefits in terms of carbon emissions is - I think you start to get into a whole series of co-benefits in terms of our international obligations, so there's that issue as well. So doing a cost benefit analysis with that would be really -

CHAIR: Has anyone done that? Did the PCE not do that?

MR CLOVER: Well the PCE couldn't, I mean you'd need to talk to Jan about that. So it's something that - I'm sure they'd need to hire someone like Geoff to do it.

DR BERTRAM: Just going to add one thing to it. 2013 is a date that's coming now over the horizon pretty quickly, and that's the date at which the obligation to connect electricity consumers comes to an end. From 2013 the lines companies are no longer bound to have universal connection to everybody in the country and that means there's potentially quite a lot of disconnection of particularly isolated rural areas, that's likely to happen, when that threshold is passed. That may or may not have quite big implications. I think it probably will have big implications for the spread of more distributed small-scale rural supply systems to make up for the withdrawal of centrally-supplied power. But we really don't know how the lines companies are going to play this strategically and whether the government has a policy or not that stretches that far out is a mystery.

MR CLOVER: It also relates to whether the government - I mean my understanding is that 2013 is under review and whether there's the political will to continue with that. But there has been work done by the, going back a bit, the Ministry of Energy, looking at the implications of the removal of the obligation to supply, which simply means that you have to pay the full cost of being the last person on the line, and just to give you a rule of thumb that we used and I think it's still roughly about $20,000 per kilometre. So if you start working up, multiplying, I'm sure it's more in some areas and less in others. I don't know whether inflation has had an effect on that. So you're looking at quite a lot. So we're looking at what would happen when people come off the grid. We've modelled it back in 1990 and essentially you get a cascade. The first person goes off, the rest of course everyone else on that line has to pick up the cost, the main cost shared cost. Then another one falls off and then you're getting the cascade effect. So the issue then of course is what is available for these people in terms of stand-alone micro generation systems. And at this stage we are really still only just - there are some real enthusiasts out there that are doing it, we've got Massey University's Totara Valley project

which is an ongoing working project, a teaching exercise as well. It can be done, it costs a little bit more but it certainly would help. But these people will be off the grid, they would be feeding back into the grid, so. There's the other issue of course which we haven't discussed here and I'm not too sure, can't remember if we - the whole issue of terms and conditions of people who generate who want to sell the surplus back into the grid small scale and the whole issue about how much they're paid and do we have feed-in tariffs and that sort of stuff, and I don't want to go into that.

DR BERTRAM: I would just add on the end of this that this points again to the importance of defining what volume of demand is denominated in this sort of exercise because as people fall off the grid, they fall off the demand as measured by bodies like the Electricity Commission. But they are still within the New Zealand economy, consuming electricity, and the more disconnected supply and demand you develop in the New Zealand electricity system, the more difficult it will become to define what we mean by total demand, of which 90% or whatever is to be the renewables percentage. And if we were to get into a situation where it is possible to disconnect from the grid, then use non-renewable supply and escape any regulatory net relating to a 90% target, there's an obvious strategic problem with the policymakers. At the point where people start disconnecting from the grid on a small scale it may look trivial but at the point where strategically it's possible to disconnect from the grid and thereby suddenly place yourself outside whatever regulatory definition of the market prevails. In a world where carbon pricing is becoming a difficult problem and where government regulation is biting and having some serious cost implications you could see some industries possibly contemplating (inaudible) not to be part of the national system.

CHAIR: That is interesting, thank you. Perhaps we will start with Dr Chapman?

DR CHAPMAN: I think we've actually covered most of the issues I wanted to cover, but I just wanted to go over some of the numbers again, just so I understand them. For example, very helpful to go through those, I think it was Table 14.4, that set of numbers, essentially coming out of Sue towards the back of page 400 of the paper of the chapter, and I mean the big thing that impresses the reader there is the 16,390 coming out of wind, which is a very big hunk. And we actually had a Mr Gledoe (ph) I think it was from the Electricity Commission essentially confirming those numbers. He gave us some evidence. And he didn't specifically refer to the 16,390 but he did talk about a very large amount of available wind capacity. So I take it that you're comfortable with those later projections from the Electricity Commission or you wouldn't have put them in the chapter. And you would give those considerably more weight than the early MED numbers, is that correct?

MR CLOVER: Well I try to keep up with what the guys are doing at Electricity Commission and they are constantly refining their numbers and constantly having peer review by the industry so if they are comfortable with that, then I'll be more comfortable with what - I feel that they've evolved and developed and yes I place more confidence on those numbers. The upstage of that has been quite unclear. At least no I think they are better numbers than the earlier numbers.

DR BERTRAM: I'm comfortable to the extent that they are from an authoritative source that has been peer reviewed and had therefore some official status. I would be more comfortable if I'd done it myself. But that involves going round an awful lot of New Zealand and talking to a terrific number of people and I'm taking it that the Electricity Commission has in fact done the field work or has commissioned the field work from its consultants and that they've done it right, and so we presented these as being the best

numbers that are available currently in New Zealand, and I think that still stands.

[11.50 am]

MR CLOVER: My understanding and you need to clarify this over again with the Electricity Commission is that what they're doing is they're getting access to commercially sensitive data collected by the various generators and potential generators who were doing the wind measurements in various sites, getting a better feel for where the sites are and which sites have the various potentials. And they're finding that they can be more confident about stretching the boundaries of these potential sites. As you know more about them and you know more about the wind technology, you can start to see where you can put wind turbines in places and still get a good return in places where you thought were perhaps marginal before, so that's part of that ongoing evolution. I think I expect to see that continuing. The issue - I can't remember and I apologise, these a gross potentials aren't they? They don't take into account the ability of the grid to accept intermittency, so you may need to think about that although, again, and this is anecdotal, my understanding is that the Electricity Commission is getting more and more bullish about the capacity of the grid to manage intermittent wind and we started off with we were comfortable with 10%, then we're comfortable with 15%. And I've heard some chatting away about getting up to 30% now so that's quite impressive.

DR BERTRAM: Looking at that table, I've just spotted what - I'm not sure, I'm trying to reconcile the total figures with the total potential figures and wondering why marine has dropped from 400 to 300 here and I'm wondering whether in fact there's a typo on the table here. But I would draw your attention to the fact that the marine and the geothermal potentials that are assessed in our table both strike me as being pretty

conservative. I think that if you look at the international literature in the last couple of years about geothermal, there's a great deal more interest now in what's called low grade geothermal. We've tended to focus on high grade geothermal in New Zealand and I suspect that there's an enormous amount of low grade potential there that we haven't really gotten use. Because as Doug says, these are numbers that emerged from talking to the generators who have themselves be focussing on high grade, and I'm not sure, I'm not an expert geothermal coming up and it could be well worth exploring I think, the extent to which this low grade potential well in excess of what's possibly available.

DR CHAPMAN: Yes, certainly our impression from going round the country talking to people like Contact is that 756 megawatts would be very conservative on that in terms of additional capacity. There are other players in the game as well of course.

DR BERTRAM: The book in which this chapter is to appear has a separate chapter on geothermal in which low grade geothermal is addressed.

DR CHAPMAN: Leaving aside low grade, even high grade geothermal, that looks like a conservative number. Oh yes, while we're on this table, what about solar. Any concentrated solar power in there or -

MR CLOVER: No none of the scenarios that have been looked at. It's not seen as a technology that's really - it's an Australian technology.

DR BERTRAM: It's not cost-competitive in New Zealand except in niche applications is my understanding at the present time, and that's because there are so many competing alternatives available here. You find solar coming into its own for example in North African desert situations where you have an enormous amount of sun and not a lot of alternative

resources to hand. You find it coming into its own in New Zealand in stand-alone applications such as illuminated road signs with their own solar panels on them, vehicle counters, that sort of thing. But to my knowledge nobody is seriously thinking about commercial side of it in New Zealand on a large scale.

MR CLOVER: When you're talking about collective systems where you have industrial megawatt scale, no. And again, remember the 10 megawatt cut off. Where solar would come in in terms of electricity in New Zealand will be in micro kilowatt level and I'm actually becoming more and more confident that that will be seen more and more around New Zealand, especially if it becomes the norm to start building houses with a few PV cells. The costs of PV are coming down all the time, but it is really very much about kilowatt level and again that will come back to the whole issue about thermal and hydro.

DR CHAPMAN: Yes, it certainly is an issue that interests us because of the longer-term implications of it. When explained logically, at least one submitter has said looking out to 20 years or 30 years, if solar PV can supply a significant part of urban electricity demand, you may actually reduce the need for generation of electricity from large stations, and in that scenario it's possible that you could wind back some of your reversible generation projects. So that materially matters in terms of the reversibility argument.

DR BERTRAM: Yes, the successful distributed generation potentially strands and so cost assets and central generation the reversibility yeah. It's not just reversibility of the physical capital assets, of course, it's the reversibility of the site.

DR CHAPMAN: In an economic sense.

DR BERTRAM: And also in an environmental sense. Once you've built a hydro dam, reversibility is a considerable problem in the sense of taking hydro down the way is not an easy business. Unless you're in (inaudible) but that's an exception.

MR CLOVER: The issue of, this again comes back to a definitional issue, from the perspective of gentailers, us putting in PV's or micro wind or, I'm a little bit less optimistic about micro wind, larger-scale community wind for example. From the point of view of the gentailers, they are losing demand, they are going to have assets, from the line companies they're going to have excess capacity and even worse they may have to deal with unpredictable generation from distributed micro sources which is something of a concern to them. So would you consider PV, photovoltaics, is it a demand reduction or is it supply just on spot. So that's another issue.

DR CHAPMAN: It's not dispatchable.

MR CLOVER: Yes, it's not dispatchable, largely they have to take it as they find it, if it's being fed back into the grid, and there'll be whole issues about that. But this is something that the RMA can speak to because the whole issue of urban form and urban planning is another issue that relates to this. Some people may find lots of PV on lots of houses objectionable. The other issue which relates, again I go back to micro wind, I did some work again at the Parliamentary Commission for the Environment's office when we were looking at micro wind, we were looking at the issue of the introduction of Swift which the one down there hasn't done that well. And that's the 1.5 kilowatt wind turbine from Scotland. That is most likely not going to get ahead because they are very specific, but the larger ones, the 5 kilowatt and the 10 kilowatt where you need them on quite high masts

may be suitable for three or four households. Those are going to have issues around planning and how do you fit those into urban landscapes or semi-urban landscapes. So that is an issue that I think needs to be thought about because we're always thinking about big multi megawatt power stations. Emerging technologies are happening at that scale, at the neighbourhood scale, the community scale. So there's something that needs to be thought about.

DR CHAPMAN: Would you say that's likely to arise around the urban periphery, that sort of scale of wind generation?

MR CLOVER: Yes, I think that you could (inaudible) depends on - I could envisage a future where if we are going into a carbon constrained, energy constraint future where you might start to see in parts within the urban areas. I'm talking turbines smaller than the one in Brooklyn, I'm talking about the size of 15 kilowatts which is -

DR CHAPMAN: How high are you talking there?

MR CLOVER: Normally about at least 10 metres off the ground, but probably about 20 metres off the ground.

PROF BARTON: How big would the blades be for a 15 kilowatt?

MR CLOVER: Most probably blades going from here to here.

DR CHAPMAN: A two to three metre blade span.

MR CLOVER: Yes.

DR BERTRAM: There's one in those in Petone I think. I saw it the other day.

MR CLOVER: Again, the cost is an issue at the moment but it depends about all the other issues as well.

[12.00 pm]

PROF BARTON: The primary wind turbine in Petone is a 5 kilowatt and the blade is about a metre and a half blade.

DR CHAPMAN: The diameter of the blade -

PROF BARTON: The diameter would be twice, 3 metres say.

DR CHAPMAN: 3 metres diameter, okay.

DR BERTRAM: Turbines on that scale are feasible to install in backyards and I know of at least one person living in Ngaio who has confirmed the feasibility of putting one in the backyard but they've been told they can't do it. But technically you can fit them into a Wellington backyard, well within the (inaudible). But what do you do about bird strike, noise for the neighbours.

MR CLOVER: Noise is an issue but then again heat pumps are probably as noisy. I don't know whether this is an issue you want to talk about, but the whole distributed small-scale community-based, especially whanau-based generation is an issue I think that the future really needs to think about. And how we are going to cope with that is going to be an issue

CHAIR: It's an issue under the NPS because there is specific policy dealing with below 10 megawatts to try and expedite those sorts of projects. It is an issue we have to grapple with.

DR CHAPMAN: This table 14.4 got us on to a discussion of various contributions from various technologies, but I wonder if I could go back to that table briefly because it seems to me that it's actually pointing to a very considerable - if one was to take that 16,000 megawatts seriously, and I don't know quite what the cost curve would look like, but if most of that was available at for example below about $130 a megawatt or at least not much more, then you would be - well perhaps you can give us some indication of the gigawatt hours that might come out of that?

DR BERTRAM: Well, a quarter of that is available at $95 a megawatt or less which is well under the threshold that you are suggesting.

DR CHAPMAN: Sorry, could you go over those numbers again?

DR BERTRAM: Well, taking that table, considering 3,800 megawatt are listed at costs per megawatt hour of $95 or less so that's about a quarter of the - a bit under a quarter of the assessed potential a bit under 4,000 out of over 16,000. Now I think it could probably presume that another couple of 1,000 megawatts would come in under the 150 but then you'd be getting it at a much higher cost. What sort of gigawatt hours would you get out of them, well in New Zealand, wind tends to run with a load factor of 40% plus or minus a bit.

MR CLOVER: I think it might be bigger, I mean that's the best sites, 40%. I'd go from 30-35 that range.

DR CHAPMAN: 35% load factors, yeah.

DR BERTRAM: In that case you just (inaudible) the gigawatt hours.

DR CHAPMAN: By 9 x 35% roughly?

MR CLOVER: And I think you could conserve because those best sites are taking into account the wind as well so top end. The other ones, the more expensive ones, are going to have a lower load factor because they are on poor wind sites.

DR BERTRAM: Yes, I think you could reasonably calculate this on 35% for that 3,800. That would give you the gigawatt hours.

CHAIR: Sorry I can't help myself. These numbers have nothing to do with resource management of the catchments do they, as far as landscape or anything? These are just wind basically.

DR CHAPMAN: And out of the cost.

CHAIR: And the cost.

DR BERTRAM: Those are purely the financial costs of establishing and running a station.

DR CHAPMAN: The question really arises, how much of that 12,590 megawatts is likely to be available at anything like a realistically commercial price? Something below perhaps 20 cents a kilowatt hour.

DR BERTRAM: The question is as you move into the 12,590 outside the ones that they've costed, you're looking at a variety of particular sort of situations and in each one of them you'd have to look at in its own right, the cost implications. Some of these will be opportunities which if the grid were to be extended, would suddenly become highly attractive, but without a grid extension, they wouldn't work. Some of them will be opportunities

to actually go for a local (inaudible) supply on a farm or in a rural community and might well turn out to be quite viable when you actually sat down to cost them. But the people doing these numbers have not costed them because they don't represent opportunities that are currently available for central supply or for integration with the grid. Some of them will be hillsides where there is known to be wind but nobody's sorted out the foundations that you'd need to put the wind turbines on them and so on, and so they are genuinely completely unknown costs, the engineers cannot tell you what they will cost without going out there and surveying the site and looking at the problems that would be involved with construction and maintenance and operation. So you'd need, I think you'd need to probably ask the Commission to break down that number. According to the tranches of capacity that have gone into that total, and see if they couldn't classify them a bit more informatively than they've done here. I'm not aware of them having done that.

MR CLOVER: SKG did a lot of this work and put together the information for them and I've read the reports and a lot of it is still - you know wind is there but we think it's hard to get at, it's quite a long way from a grid injection point. We think it will cost this much, or (inaudible) this much, so we can get those sort of assumptions. But stuff that they do, like below the $95 per megawatt hour. You've got a fairly good confidence that they are more confident about those numbers than the other ones. As a total, yes I'm confident about the 16,000 megawatt or in that order of magnitude megawatts that you can install. The cost that will come in is another issue.

DR CHAPMAN: Crudely, just give me numbers, just on the wind alone 3,000 megawatts is something like 9,000 gigawatt hours, something of that order, whereas 3,800 is more like 12,000 gigawatt hours. Those are

pretty big improvements on the capacity of the whole system and if you add in perhaps 1,000 megawatts of geothermal in that price range, and -

DR BERTRAM: Pretty much a load factor of 1.

DR CHAPMAN: Yes, exactly. Well 0.9 or something, then you're looking at perhaps something of the order of 50 to 20,000 gigawatt hours extra. Do you think that's broadly plausible?

DR BERTRAM: Oh yes, entirely. I mean these are very big numbers relative to the existing New Zealand system and we have about, 8,000 installed megawatts?

MR CLOVER: It's a bit more than that, 8,500 and we're up about 44,000 gigawatt hours on the -

DR BERTRAM: (Inaudible) think, "Okay well we can get a 50% expansion on the system just putting those two renewable technologies onto it," assuming you can handle the integration of them into the system. One of them is a very high load factor, one geothermal one. And there's a lower load factor one, wind so (inaudible) percent. You're still making a big addition to that 44,000 gigawatt hours of annual supply.

DR CHAPMAN: Do you have time for one more question?

DR BERTRAM: Sure.

MR CLOVER: I've got 15 minutes.

CHAIR: I'm sorry, we're taking a break.

DR CHAPMAN: You talk about the PCE model being a technically-based model and by 2050 a doubling of energy efficiency I think. So this question relates to the electricity demand expansion over that time. What sort of energy demand then did you, electricity demand did you come up with in that range perhaps?

[12.10 pm]

MR CLOVER: We did two scenarios. We chose two scenarios and our scenarios, they're not forecasts, they're just hypothetical situations. One we assumed that if the current level of energy efficiency improvement just continued and the current demand based on GDP growth of 3%, by 2050 we're looking at roughly 90,000 gigawatt hours a year demand out of the market. And the only way that -

DR CHAPMAN: 2050, what number again?

MR CLOVER: Roughly 90, I'm doing this from memory so these are (inaudible) issues, so you're looking at 90,000 which was effectively a doubling of the demand.

MRS BAUMANN: And that's your scenario A?

MR CLOVER: That's scenario A. And essentially the only way we could - we started damming, we did what the Electricity Commission does with mixed a integer programme, we did just by stacking. Essentially you stack the projects based on what we thought the long-run margin of costs was and then when we needed an extra number of gigawatt hours we pulled it out of the line, and what we found was where we had a lot of coal, and we had dammed quite a few rivers and I can tell you it was very upsetting for us (inaudible). So the other assumption was what happens if you

accelerated the average rate of energy efficiency improvement within a year from it's currently less than 1% up to about 2% which has been achieved in other countries. Whether it is the same is another issue but we then looked at a lot of the work about what the technology potentially can do to deliver this and we essentially came up to a hub - we got increasingly as the time went on got a slight level with a drop back a little bit.

DR CHAPMAN: Can I just explore those numbers again. You raise the autonomous energy efficiency improvement rate from less than 1% to about 2% per annum. What did that do to the electricity demand growth rate? Did it pull it down?

MR CLOVER: It pulled it down significantly from what, 90,000 gigawatt hours to 50,000 gigawatt hours by 2050 under that assumption. So we're looking at just over a half. And under that scenario we found that we could meet that demand and retire old thermal power stations at their expected retirement date. Under the other scenario we were finding we were refurbishing places like Huntly and running them for another 40 years. So you could play this again, we just had a whole lot of options and then suddenly we didn't have so much wind under that scenario. It seems counterintuitive but under the high energy efficiency scenario, we weren't putting in as much wind. We had a lot more wind under the - we had a lot more coal and thermal generation. We were very concerned around both scenarios in respect to new gas supplies. We didn't assume that there was another Maui discovery in the Great South basin or anything like that. And we didn't assume for example LNG imports. That's most probably that's different from the way the Electricity Commission holds that option open in terms of - that's essentially how we did it. And I know I acknowledge it's very gross, it was very aggregated in that sense, but it was again the purpose of it was just to get people thinking about some of

the potentials of moving into a demand side paradigm or demand management paradigm.

DR CHAPMAN: And that 50,000 was by 2050 wasn't it?

MR CLOVER: Yeah. It was actually increased and then it started to drop off as we got starting to get more and more of the efficiency kicking in.

DR CHAPMAN: But overall your rate of, I mean to expand demand from say 40,000 which you were probably working off at the time.

MR CLOVER: It was 42.

DR CHAPMAN: 42 say, 42,000 gigawatt hours up to about 50,000 over 40 years is actually a very slow rate of growth isn't it?

MR CLOVER: It actually went higher and then as I said it dropped back in the last decade or so.

DR CHAPMAN: That's helpful thanks. We've got time for a couple more. Right, I now have the page reference here. But the comment was made earlier on about the feed-in tariff making a significant contribution and also net metering making a significant contribution. I know you don't want to get into those in detail, you made a quick remark to that effect before, but perhaps if you could just say what sort of contribution those might make?

MR CLOVER: Well, again we can only compare with overseas experience in for example feed-in tariffs and to a lesser extent net metering have been used in many jurisdictions both within the United States and in Europe.
The most well-known I think in terms of feed-in tariffs for small scale is Germany. Sorry the numbers escape me at the moment but there is a

significant micro generation industry potential, sorry in terms of electricity generated at the micro scale is quite significant. I know it's not large compared to the total demand of Germany, but it is quite a significant proportion.

DR CHAPMAN: Could you give a sense of that, is it of the order of 2%, 5% of the total?

MR CLOVER: Somewhere around 5%, somewhere around that level. And more importantly it's also created a really a large sector of the economy. There's another GDP spinoff there. I think that there's a need for more work in this area and it's something that we touched on briefly in the PCE report saying that we thought it was worth looking at, and I will comment and Geoff doesn't have to acknowledge this but I think it's an issue that has been not addressed in the latest review of the electricity sector.

DR BERTRAM: I'm already on record as saying it's a great hole in that review.

MR CLOVER: And ties in also with the whole issue of smart metering and getting better tariff price signals to users and the parliamentary commission's report highlights some of those issues as well.

DR CHAPMAN: But if we were to have a take out message on feed-in tariff relevant to our purposes here, would that be a message such as that it could make a significant contribution to, if you like, demand, by pulling back demand?

MR CLOVER: By pulling demand as alone from remote generation? Yes it would, I think it would. Now the debate, and I would find it very difficult to argue that it wouldn't make a difference, what I would think would be the argument is are the economics and then you start to get into the

non-market values that are associated with that. And a lot of this stuff comes back to the problem that we don't have a price on carbon. If you put a price on carbon then a lot of these other issues start to become clearer and you can get a better sense of the economics of some of these alternatives, these policy objectives, so we are trying to second guess what the price of carbon might be in this case, in terms of the benefit of having a remote - and just another point that Geoff touched on and I just want to repeat it, if we do go for micro generation in this country, at the moment there is no real guarantee that you would end up with renewable remote generation. Diesel generators are still a really useful way of generating, especially the modern types of diesel generators that are a lot more efficient and they can do things with it. You don't want, well from my perspective, and again I come from a sector that wants to reduce carbon emissions and reduce reliance on finite fossil fuels, is that you don't want a plethora of generator sets going up around the country and say, "This is great we're reducing demand on our hydro resources." You can get perverse signals without, so there's that as well.

DR BERTRAM: I think that's right and I think the feed-in tariff needs to be read as code for a much wider set of possible policy options. And before you just say feed-in tariff, you need to I think stand back just slightly and think what are you trying to achieve, and if you design the policy options with an eye on where you want to go, it's easier to think your way through exactly how you do it. And there are two relevant things.

There are firstly, Doug alluded to, whether you treat the distributed generation and resultant feed-in tariffs as a reduction in demand or an increase in the supply. And this is not a trivial thing when you're planning an electricity system and looking forward. New Zealand is quite unusual in treating wind for example as a dispatchable source of supply, look at

California where wind is a subtraction from demand. Look at (inaudible) around the planet when I talk about this.

[12.20 pm]

So there's that question about defining where your boundary of demand is around which you're going to build the policy instrument. You've got to think about who pays the feed-in tariff. Somebody has to fund the purchase of electricity from a whole variety of more or less reliable more or less state of the art suppliers, all of whom will be queuing up to get to the window to sell what they have. And at the moment there's not in the New Zealand market architecture a bar for independently produced distributed power. And so one can't just say, "We'll have a feed-in tariff," you've got to work out who pays and how it's done, where the responsibility lies for operating it, how you what regulatory controls are in place to make it work fairly and openly.

And then one further step back from this is that a large amount of the very small-scale distributed and demand side technologies that are coming forward are implicitly run with explicitly passing through markets. And in so far as a household rearranges its own energy economy within the household and thereby changes its behaviour with respect to the supply of electricity from outside suppliers, that is no less a part of the overall market balance than the explicitly priced and marketed bits of the system. And that seems to be the point at which you have to say yes this is a reduction of demand when the household has put up photovoltaics on the roof and they've got a wind turbine in the backyard, they're only taking backup supply from the local network. It's difficult to say whether this is supply from the point of view of the national economy, and yet it is really supply from the point of view of the national economy. The boundary which we go from supply to demand in the market is always going to be

arbitrary and you need to mentally set that boundary at the point where your policy instrument is going to buy whatever that policy instrument is to be.

This is just a big cautionary thing about just saying feed-in tariffs is a sufficient solution. You've got to think it out and make sure that the tariff is designed and built and put into the right architecture to get the results you're looking for, otherwise all sorts of perverse outcomes can result.

DR CHAPMAN: No, I appreciate that the feed-in tariff is a broader question. I guess that what I'm trying to get at here is what is the likely denominator if you like. What is the likely size of demand that we're talking about and will some of these anticipatable policy developments over the next 15 to 20 years have any effect on that and a feed-in tariff is one possibility which I think we've explored adequately, but another one is net metering. What might it plausibly do to demand?

MR CLOVER: No, I don't know to be honest. The parliamentary commission again did a report looking at distributed generation and we did some rough numbers and I'm sorry I can't recall the numbers. We actually got East Harbour to just put some numbers of what you might see if you went down a couple of distributed micro generation and we were looking, I think we were looking at roughly about 16,000 gigawatt hours per year in that order. But please you can download the PDF off the website. What's it called? We had a catchy title, "Think Smart" or something like that, "Think Small" or something like that, "Get Smart, Think Small" Those numbers are very much back of an envelope numbers and I wouldn't -

DR CHAPMAN: But if you're talking - I mean even if at the outside 2,000 gigawatt hours a year you're talking max 4 or 5% of the current supply.

MR CLOVER: The gap's looking really at residential though so you're looking at the segment, sector and perhaps the micro farming as well.

DR BERTRAM: Dr Chapman, the question you've asked could be addressed from a econometric point of view by taking a jurisdiction which has net metering arrangements and comparing its performance with uptake with New Zealand which does not. And as it happens, Tasmania has net metering, has many a hydro device in that metering I understand. I remember being over in (inaudible) a few years back and going to stay with somebody who had solar panels all over the roof and a computer sitting in the laundry and they were running on a net meter. And I had the impression from talking to them that actually it was quite widespread uptake of that. As a lifestyle choice essentially, I asked her about the how much she was saving on her bill from this, and it didn't appear to have been the reason why she put it in, she put it in because it felt good to have it. But nevertheless we could get measures of uptake from Tasmania hydro under their net metering and find out how that added up.

CHAIR: Just to pause. I'm sorry, I'm not sure who you are?

MR LAVANGER: My name is Rick Lavanger and if I may comment on that particular issue.

CHAIR: Sorry if you could just introduce - what are your qualifications? Sorry, we haven't got you on our list of presenters.

MR LAVANGER: Sure, that's all right, I apologise. I've got a Masters in rural energies specifically wave and tidal, and I'm an energy researcher at the moment in parliament.

CHAIR: Thank you.

MR LAVANGER: Just a quick note to say that net metering and feed-in tariffs are both hindered by, well it's not really a regulatory barrier, it's called GST, and it actually complicates any particular mention you want to make in the RMA about promoting these things. It's a completely separate issue from this hearing but it has a significant reduction on the potential. We have net metering happening now simply because the GST barrier is too great to overcome so the easiest thing to do is to do net metering and pretend that we don't have a wholesale market and a wholesale price versus a retail price. And it's a very awkward scenario at the moment but I just thought I'd throw that in there, it is the biggest single obstacle to net metering and feed-in tariffs for policy instruments of that ink.

CHAIR: Thank you very much.

MR LAVANGER: You're welcome. Micro and mini generation will not move until that particular policy barrier is addressed.

DR CHAPMAN: Well, I've exhausted that particular line of inquiry. On page 381 you talked about getting renewables over 90% being likely to require either a very high carbon tax or regulatory limits on the despatch of thermals once they're built which I can understand. Perhaps you could explain the impact of a carbon tax and the sort of plausible projections you might be making about what a very high carbon tax might mean there. This is in the context of the discussion about the logic of despatching thermal once it's built.

DR BERTRAM: Well, effectively what we're saying here is that that last 10% if you measured the demand according to the conventional measure that we currently use, that the Electricity Commission currently uses, squeezing

out the last 10% is really hard because until all the thermal stations have actually fallen over and crumbled into dust, you basically have a slab of emergency generation which if given the opportunity to offer its power for despatch will do so and will do so at prices that will get it into the market and so when I say very high carbon taxes here I meaning prohibitive carbon taxes. Whatever the carbon tax takes to force these guys out of the despatch order to a sufficient extent to get their supply below 10%. And I have no idea how high that is, but I do think it will mean it is above the sort of range of carbon tax that we're talking about (inaudible) climate policy unless some other check comes in. This 10% about not quite half of it is accounted for by co-generation for example. And co-generation is almost certainly going to continue to come off gas and other fossil fuels for the foreseeable future because it's a by product from high grade industrial heat and they're going to be burning the fields to get the high grade industrial heat anyway and so you're going to have the electricity coming as a side effect of that. That leaves you with only about 5% or 6% to come from the dedicated fossil fire thermals. And if you're looking at three decades and thinking okay we're going to squeeze our fossil fire thermals down to that share of the market, allowing for the fact that you'll be using them to backstop wind when the wind isn't blowing and allowing for the fact that you'll be using them in dry years to make up for water shortages and so on. You really are talking about quite high economic sacrifices to get thermal down to that level in this country, and then unless we do get a huge amount of excess capacity installed in renewables at which point they can backstop each other, and regulation can force all the thermals completely out of business.

[12.30 pm]

MR CLOVER: There is actually a perverse outcome that could occur because the advantages with thermal of course is they can be used as spin

reserve, (inaudible) all those functions that make sure the thing the lights don't go brown and dim out. So to do that with renewables, you may need to overbuild your renewables. You may need a large surplus capacity which comes with an environmental cost. So it may be good to keep the last 10% or the last 5% thermal in the PCE scenario. We assumed that you'd have to keep some thermals there ready to back up to firm, spinning reserve, all that voltage regulation, frequency regulation and all that sort of stuff.

DR CHAPMAN: To get a sort of tangible sense of this, by 2025 you're looking at Huntly being phased out, old Huntly being phased out. So you're talking about E3P for example, are you?

DR BERTRAM: And no, Rodney if it's built. Southdown and Stratford itself.

DR CHAPMAN: And Rodney if it's built, offering the spinning reserve or offering that peaking capacity?

MR CLOVER: Yes. Well I'm just trying to remember though what CCGT's are like with spinning up quick. I think they can be a bit temperamental. So you may even want to keep some of the old boiler-type thermals. Cycle turbines sitting there, I know they're inefficient, they produce a lot of CO_2 per megawatt hour produced but you want something that can fire up within a very short period of time. They used to be - the old Stratford station was two or three 707 engines which sat there, jet engines and they could be spun up in under 30 seconds. And I mean..

DR CHAPMAN: As long as they're already running.

MR CLOVER: No, no just push the button. Very impressive, very noisy but that's not to say that with a smarter system network you might not be able

to reduce that capacity. But I think always from a technical perspective, you're going to need something that you can spin up very, very quickly. Hydro can do that, you can spinning reserve for hydro but again it's where the hydro is and where the demand spikes occur and whether thermal's required. So I think we'll see some thermal stations sitting around Auckland inactive for 90% of the time or 95% of the time or something. Someone's got to pay for that and how that's done has always been a problem for any electricity system around the world.

DR BERTRAM: Not quite any because as we pointed out in the paper, Iceland has pretty well 100% renewables, but two things. Number one, Iceland does have, as far as I can make out, I've not been there so I'm going on the published statistics, they seem to have quite a slab of thermal capacity that they've retained. And presumably in mothballs but it's there in the numbers, so they have the capacity to go thermal if they need to. They've defined the offshore Island of Grimsey which is diesel-fired as being outside the market and so they get a percentage. Not as a denominator. And then of course they have, most of the baseload is thermal in huge amounts and then they have very large storage hydro available to them which means they have a back-up resource in their hydro system which is sufficiently large to pretty well guarantee that they can supply without having to resort to the thermals. So don't take 100% Iceland too literally as a guide for New Zealand. I don't think we can get that close, without a great deal more excess capacity stored in renewables.

MR CLOVER: Again, I just come back to reiterate that point I made earlier. It may not be good from a climate change perspective to try and eliminate the last 5 to 10% from an environmental perspective, because you may end up having to dam a river that you didn't wouldn't have to anyway. Spinning reserve for hydro is quite adequate. The only problem is New Zealand's location issues of course. Perhaps you could try to think of

anything around Auckland that's worth damming! So I mean that's my point. So I think that 90% is an admirable target but to try and say we must get to 100% then you start to get into some serious issues, not just economic issues but whole issues about whether there's a trade-off point.

DR BERTRAM: Our 90% represents the far end of that plateau of feasible, moderate cost options.

CHAIR: Thank you very much for that. We've covered the field so thank you very much. We really appreciate that discussion and also your book that you're putting out, publishing. You said that there are other chapters. Is there another chapter on the demand side?

DR BERTRAM: The book is an international collaboration so this is the chapter that we wrote. There are about 20, 25 authors I think with all the topics relevant to this. Quite a lot of country case studies and impact chapters on geothermal and on wind and on the demand side. I'm just trying to remember. I can certainly supply you with the contents list for the book.

CHAIR: That would be very helpful. Is there anything on the regulatory forcing inside?

DR BERTRAM: No, this is a book that focuses more on the technical opportunities to get away from carbon-based generation. There's a previous book edited by the same person, Kerry (ph) which is about the regulatory and market-designed environment. It came out three years ago and I have a chapter in it on New Zealand.

CHAIR: Well thank you very much, I appreciate that. And I think probably the - Dr Bertram, I realise Mr Clover has to get away, but if you want to -

DR BERTRAM: I'll sit and listen for a while, yes.

CHAIR: That would be helpful. All the best with your research. Now, Professor Barton, do you mind if we just start the conversation with you now and then we've got lunch at 1 o'clock. It's been a long run but we may as well get it sorted. Yes, thank you very much for coming. You've probably - I think Ms Beruldsen sent you some points but you've probably gathered from the conversation we've had this morning, that because of the 90% target which is included as an objective in the document of the instrument at least, we do have to look at the demand side, even if the emphasis isn't there clearly, but we do need to look at it under section 7(b)(a)(a) or (b)(a). And I understand, I appreciate that you've got a considerable amount of recognised expertise in what's happening internationally in energy issues, and we're particularly interested in how you can address these sorts of things, in the context of an instrument, a statutory instrument that will then hopefully be given effect to throughout the local government, regional and district. And so we're in your hands really, we're very grateful to you for coming today.

PROF BARTON: It's a pleasure to be here, I'm happy to try to help. I haven't focused much on the RMA side of it actually knowing that I could add very little to your expertise and management of those matters. Some of my work on energy matters internationally has been with a group in the International Bar Association. Within the International Bar Association there is the section with a long name: section of energy and environment resources infrastructure law. SEERIL for short and can be descriptive at times. And in that, uniquely within the IBA there's an academic advisory group that was sort of built in as the section was established. There are about 18 or 20 of us, it's by invitation only, it's been a wonderful source of opportunities for information for collaboration over a period, and I gained a lot out of it. And a couple of points, I will refer to one of the studies that

we've completed (inaudible) recently. I suppose, well I found the discussion so far very interesting and I'm very glad to see the focus that you're giving to the demand side. It doesn't always happen. There is a seminar on in Auckland tomorrow, put on by Moutu with speakers who you would all respect and admire, and it is all about electric cars, nuclear energy, renewables and that, and not one word about demand. And that's a lapse, a very typical lapse. In analytical circles it happens, in progressive circles, even the Greens, not the party but the approach. They often fail to think about that, so it's a curiosity. But if you look at the work that the International Energy Agency does, trying to get a picture of things on a global basis, you realise that that is missing the elephant in the room. The International Energy Agency is associated with the OECD of course, and they've done great work over the last few years on the idea that we are getting an energy transition. And exactly what type of energy transition it is, is not entirely clear. At the most basic level though, supply and demand patterns simply cannot be continued, particularly in relation to oil. The lines just don't match.

[12.40 pm]

In addition of course, without any action, energy-related carbon dioxide emissions will double by 2050, oil reserves in the ground have now become a serious issue. There have always been the peak oil people out there but the IEA, although they over time have remained agnostics if you like on that but now have started to express real concerns out of their own analysis about reserves. So we're in a transition of some kind. It's not a question of whether we want to go through an energy transition, it is going to happen to us whether we like it or not. What is up for grabs is what type of energy transition do we want. What opportunities do we have to shape it. For example, again this is in the IEA figures, they suggest that over the next 20 years or so the investment needed in new energy

infrastructure on a global basis is about 20 trillion dollars, and the question is where do we put it. They model different scenarios as the Electricity Commission and others we've been hearing about do in New Zealand, and they model a reference scenario. They don't call it business as usual because they don't see it can pan out that way, but with the existing policies settings.

Policy scenario suggests basically that if governments actually did what they say that they're thinking of in terms of policy shifts, what difference would that make. And they work also with a 450 policy scenario which would require very aggressive greenhouse gas measures to be put in place. With the first two a reference scenario and then an alternative policy scenario, the amount of the investment is about the same, 20 trillion dollars. In fact, the alternative policy scenario is 19.5 but what's half a trillion between friends. After the financial crash we're kind of inured to trillions now, aren't we. But where it would go would be very different and to put it in a nutshell, my limited lawyer's understanding, is that the alternative we have is either to continue to put it into the upstream side, more oil wells, more oil refineries, more crude oil tankers, LNG tankers, LPG tankers, massive electricity grid rebuilding and so forth. Or we conceive sizeable amounts of it going into the downstream side, and essentially energy consumers reinvesting in different ways themselves. That's kind of interesting, not only that the investment would be done in different sectors, but it does have quite significant implications I think in terms of policy and if you like the politics of it. The possibility of energy users having a good deal more control over the investments and over the way that they use energy. So it's really quite a striking set of alternatives. Taking two of the scenarios, the reference scenario which is as close as they'll give us to business as usual and the 450 policy scenario, the aggressive climate change one, if you can visualise and I haven't got it as handouts, but you've got one curve going up pretty steep, you've got

another one going up somewhat and then dropping back down quite significantly. If you ask what the gap is and try to break out the different wedges, what the OECD foresees is that the contribution or the difference would be is that a lot of it would come from the demand side, from energy efficiency. In fact, globally they calculate that it would be 54% contribution in terms of the difference. Again from renewables, your particular concern, renewables and biofuels would be 23%. In the OECD there are fewer opportunities so it would actually be 18%-9% from nuclear and 14% thinking of not so much energy but carbon dioxide emissions from CCS. So look the main thing to come back to is the 54% from energy efficiency measures, demand side management and so forth. So that is the elephant in the room at times when our friends are talking about energy supply without for a moment thinking about energy demand. And that is one of the key things I would really hope to bring to you, the importance of that side of things.

DR CHAPMAN: Can I just clarify that, are you saying 54% of the gap between the reference scenario and the 450 scenario -

PROF BARTON: Arises out of energy demand restraint. And in different versions of the figures you'll see larger figures, 70 or 80% depending on exactly how it's cut and different versions of their modelling work. I can make my own take on that available to you but better would be to go straight to the IEA materials direct. The IEA advocates clean technology road maps at the national level, and certainly with the energy strategy we've been working along that path in New Zealand towards different clean technologies. The technologies that the IEA see as having the most potential for benefits in energy efficiency are in buildings and then also outside energy efficiency, carbon capture and storage: CCS. On other things they see electrified vehicles, flexi-fuel vehicles, nuclear, smart electricity grids, co-generation, concentrated solar, being possibilities and

obviously concentrated solar depends very much where you are. So that's some of the background that I have been working against. One of the questions that you put to me Josie was simply should energy efficiency be covered in the proposed National Policy Statement, and so obviously my answer is yes. I think that couching an NPS in a way that recognises the elephant in the room would be a significant step forward. Obviously, there is quite a lot in our New Zealand policy environment that has sought to do a great deal on energy efficiency matters. There's the work of EECA obviously and in addition an awareness of energy efficiency opportunities has spread and is part of our energy policy work as a whole. I tend always when looking at policy documents or things from think tanks or whatever to look to see it's renewables, tidal, nuclear, CCS - and usually energy efficiency is number four or five on the list, and that's striking.

[12.50 pm]

So we are doing some things in New Zealand but by international standards I'd argue not a lot. This perhaps takes into question the third of the questions: what is the international approach to addressing energy efficiency. I think on the positive side you can say that there is an enormous experience internationally with energy efficiency programs and you've got to think of a history there really. They started off in reaction to the oil shocks of the 1970's, and in United States it was PURPA public utilities, no one can remember what it stands for but everyone knows what PURPA is. And some of the big things it did of course was mess around with the natural gas pricing systems to make it more possible to sell gas if it was for co-generation systems. So if you were building co-gen you had a much better chance of selling gas through the market. There are a number of other things done under PURPA and its successors that encouraged the early wind farms and so forth. And I'm not in a position to

go into detail but some of those things were very successful and some of them were crashing failures. They were brought in a hurry, they allowed the possibility of exploitation by unscrupulous operators one way or another. However, analyses do point out that on the whole, there's a lot of instructive lessons to be taken from this 30 years of history. That's in the United States, but also in Europe and Japan we have seen a similar history of programs to push energy efficiency. As Geoff or it might have been Doug said a few minutes ago, energy efficiency is sort of something that develops naturally anyway without forcing from a policy point of view. Each year without any policy settings, fridges will be a little bit better built, cars will go a little bit further for the same amount of petrol and so forth. So in a way we are in a happy situation of seeking to nudge the .75 to 1.2 or something like that, rather than, as it were, go against the grain. There's quite a lot of history built up about the specifics of energy efficiency programs. Some of them are command and control programs in many countries. In Europe, in Australia, in the United States you will find plenty of programs that are very directive and certainly extremely directive by the standards of New Zealand. How buildings are to be built, how cars are to be put on the road, the café standards in the United States and so forth. So quite directive by the standards we have of regulatory intervention that we have become accustomed to here in New Zealand. You also see a huge amount of work being done on information measures and, if you like, non-command and control measures for energy star programs, information for people buying cars, information disclosure in advertising and so forth. So there is a lot of experience in these programs and a systematic search in particular sectors quickly brings up a number of programs that people could be think of for New Zealand. There are a lot of interesting questions about behaviour and behaviour in this area, conventional economic analysis applied to it seems to imply a very high discount rate if people are thinking of the investment. If you're investing in a bank deposit, you don't expect to see your money double in two or three

years, but when you're buying a new fridge you sort of seem to expect a pay back in the same sort of period, in that sort of period. It's nuts, it doesn't make sense, so the rational man has to give way to a more nuanced sort of person and it has been interesting as a non-economist and perhaps I better shut up here while I'm ahead and surrounded by economists, but it's been really interesting for me to pick up on behavioural economics and the interesting ideas there about how people actually do make decisions and try to apply some of those insights to improve the nature of the regulatory interventions that we can consider.

CHAIR: Professor Barton, I wonder if we could just take the adjournment now. What you're saying is particularly interesting and we don't want to interrupt you but I think we need to be sustained by some food.

ADJOURNED [12.55 pm]

RESUMED [2.00 pm]

Audio file: dpm 0060

CHAIR: Now Professor Barton, thank you for taking that break so we could have some lunch. But please we interrupted you midflow so just carry on.

PROF BARTON: I was talking about the energy efficiency side of it, which I'm glad that the conversation that I heard earlier has picked up on. It's not a time or the place to go into a long listing catalogue of different energy efficiency measures that can be put in place, you know that would get boring for us all, but it is striking that within the largest the OECD countries, they use one third less primary energy, to generated unit of GDP than they did in 1973, so they are going - to create a unit of GDP, to earn a dollar in this world, they need one third less primary energy than they did in 1973. It's quite striking.

In many such countries there are substantial regulatory components about energy efficiency in the structure and regulation of the energy industries, electricity in particular, where local distribution companies - retailers - generators are all being pressed in these sort of ways. We like all that in New Zealand, and so in terms of our policy settings, it's a striking absence in terms of what we are trying to do about the demand side.

However, that does us a little bit away from the work on renewables. On renewables of course New Zealand has a significantly different profile from many OECD countries. We've already talked about Iceland, but apart from Iceland and Norway, we are in an unusually good situation in terms of the amount of renewables that we already have. Nonetheless it is striking the gap between what other countries are doing to increase renewable uptake, and what we regard as common place in our regulatory

settings in New Zealand. In the European Union there are - there is a green certificate programme for renewables, even tariffs for renewables are common place. There are tendering procedures in different countries and tax incentives. And we see very little of that.

One study that I've drawn on to make a few points was done by colleagues of mine in our academic advisory group, who look beyond the carbon economy. You might want to have a look to get names et cetera, you're very welcome. That was a collaboration to be presented at the surreal meeting the last surreal biennial meeting in Copenhagen, and it struck accord with many of the conference goers from different parts of the energy and resources industry internationally.

CHAIR: Is it Regwell, Catherine Regwell is coming to the Resource Management Law Association conference.

PROF BARTON: Yes, yes indeed. I'll be out of town myself - well I'll be in Demark, teaching on energy environment in relation to wind farms.

CHAIR: Coals to Newcastle in that country.

PROF BARTON: Yeah it is a bit. Yeah, so Catherine is a long standing contributor in our group and yes, she would be good at the RMLA.

CHAIR: Is she still University College London?

PROF BARTON: Yes. We're doing quite a lot of work on CCS as it happens, or co-director of quite a large group that have got on CCS net. There's an interesting chapter in there by Anita Rummer (ph), University of Copenhagen and Ilene McCarg (ph) from the University of Glasgow, and comparing the progress with renewables, particularly wind, in their

respective countries and I have in haste to going through this in order to think of what to bring today, I found myself flicking off an email to them both, what a wonderful chapter I wish I had read it properly before, because it touches on a number of things which are really quite relevant to us in New Zealand, especially if you are thinking about us sort of as more in the UK way of doing things and - so there is some interesting comparisons to be made.

Demark of course has such a high level of uptake of wind turbines that they basically have reached saturation, one wind turbine for every 6.7 square kilometres of surface, so they are going offshore more and more. The main action now is re-engineering the existing wind farms to take out all the half megawatt stuff, and put in two or three megawatt towers. They will be bigger, but they'll produce a good deal more per hectare of land used. And what you read is there's a high level of local ownership in co-operatives, although that is declining somewhat now in Denmark in favour of commercial utility companies like we have. Strong support mechanisms, energy strategies, which include political agreements and agreements with utilities. This sort of agreement seems to be rather more the Scandinavian way of doing things, where if there is some policy problem in an energy or an industrial or environment field, the matter will be put in the hands in a group of people from all different parties, told to go away and figure it out for a few months or a couple of years whatever it takes, and then bring it back and we do that sort of thing to some extent here, but in Scandinavian countries they stick with it. So there's a fundamental political difference there in our cultures, and I don't understand it but - or I don't know what to do about it. I do understand it very much in that many of our arrangements, including the ones you're working with under the RMA do not foster that type of strategising and co-operation. There's very little in our systems to require one District Council to get along with the next District Council. They can come back

and tell the mayor or the chief executive, I didn't say yes to any of their stupid ideas, we don't have to do anything, so no quite right Barry, we don't have to. And you know, and you we did the same, I think to some extent in our industries as well. I'm generalising so forgive me if I do, but it's something of a characteristic and what I wonder without having anything written is what could be done in a National Policy Statement to engender and reward co-operation rather than hinder it. What would be the characteristics of an NPS that would promote and reward co-operation rather than hinder it. Now I'm an academic, I just ask questions, I don't give answers to them, but you know anyway I put that forward as a characteristic that would help, and in terms of specifics, it would be following what we see as one of the successful elements of the Danish approach to their key renewable.

So they have arrangements co-coordinated by the central Government that include the industry, grid regulation, purchase obligation, long range planning, tax exemptions, research, substantial state funding, information programmes, co-ordination with the spatial planning procedures on a long term basis. A lot of the growth in wind farms in Denmark was promoted by the guaranteed price, and apparently that worked by a guaranteed price for each turbine or each development for 10 years, and so there wasn't a single feed in tariff, but there would be one organised or decided for each development. However, that has faded away. Since 2005 now apparently it is solely market prices, although the green certificate programme that is operating does give a market advantage to wind generation.

[2.10 pm]

Wind turbines are subject to the general planning requirements, which would be the equivalent of our RMA and a permit is required for them. And there is an element of national direction in their spatial planning, in

what is called the Wind Turbine Circular. Now I don't have a copy of that, but that would stand out as something worth pursuing as a possible precedent for your work, and obviously if it does function effectively in a country like Denmark, then we should be - our intention. If I can help in contacting Anita Rummer (ph) for example to ask about that, I would be happy to do so.

CHAIR: We'd be very grateful.

PROF BARTON: She owes me a chapter for our next book, so I am in regular contact with her at the moment.

CHAIR: We'd be much obliged if you could do that.

PROF BARTON: In the spatial planning in Denmark, matters such as impact on surroundings, landscape is a factor that is taken into account, and like New Zealand the planning is in the hands of a municipal authority - but the Ministry of Environment may influence the location of wind farms.

The Government requires municipality to integrate plans for future wind farms into their local zoning. So there is specific direction from the centre as to what you must put in your district plan, to put it in our language. There have been some ups and downs in that, but I think the main thing that I take from it is that there are market similarities there.

The wind power circular that I mentioned includes and indicates a preference for the grouping of turbines, and it includes a rule that a turbine must be at a distance from its neighbours no less than four times the overall height of the turbine. It strikes me that that would be the type of requirement you would have in a closely populated country, and I suspect many of our ridge top developments at the back of the - in the backblocks

of the Manawatu or something would meet that pretty easily, so it's perhaps a rather different sort of thing, but I think it will be interesting to explore in terms of the extent to which central co-ordination is being given and direction given to local authorities.

In the United Kingdom there is a patchy record on renewables. Their target for 2010 was to attain 10% electricity generation from renewables, 10% and we might look down our noses at that, but obviously our situation is a different one. The planning system by which they mean the Town and Country Planning legislation that has some similarities with the RMA, in the United Kingdom still dominates any analysis of why the United Kingdom does not have more wind power installed. Wind developers encounter very significant opposition, long hearings, high refusal rates et cetera, et cetera - the same sort of thing that developers here would complain about. And in the United Kingdom they are finding that going offshore is being favoured simply because it is easier from a planning point of view.

Large developments in the United Kingdom that is over 50 megawatts are dealt with separately. The planning consents, are granted by Ministers under the Electricity Act, although it sounds suspiciously like our call in - in that same criteria and broadly the same procedures apply as to a smaller project that would be consented by a local authority. Either way, in their system it is a public inquiry in front of an inspector. There is an element of central planning guidance that again would be desirable to explore. There have been what I call planning guidance, but as I understand it, it is something like the NPS. Ilene McCarg (ph) reports that they have been increasingly strongly worded about the importance of renewable energy, but that is an approach that has had only mixed success. So you'll find mention of that in the book there, page 314 and I'll read into the record, they sight an article by M Trinick,

T-R-I-N-I-C-K - the title of the article Green on Green Planning for Wind Energy 2006, Journal of Planning Law at page 89.

“There have been reforms in Scotland and proposed for England as well, to enable certain developments including major renewable energy projects to be deemed of strategic importance, strategic national importance and in Scotland to be dealt with by Ministers and proposed in England to be dealt with by a new infrastructure planning commission. Decisions would be in accordance with the national policy framework, and the time limits are restricted by statute”.

McCarg (ph) and Rummer (ph) however point out that there are difficulties with requirements of this kind, if they do not bring people along. And that a lot of the difficulties that are being encountered in the UK are in this field, not bringing people along. In addition, settings within the electricity regulatory structure also contribute difficulties. There is the non-fossil fuel obligation, is a system that they have, the NFFO. It’s apparently intensively competitive. You bid in for what you are going to do, but that requires you, for example if you are going to build wind, that you must find the cheapest site, and the cheapest site will often not be the most environmentally astute choice, so having to go cheap, will sometimes require nasty.

In the United Kingdom there is no local ownership of developments, no local industry and at this point, the similarities and the differences between the two countries can be explored. Two key differences - In Denmark there is a much higher level of public acceptance of the benefits of investment in green energy. So levels of public acceptance are a great deal higher. Secondly, the foundations of Denmark’s success were laid prior to market liberalisation. As I mentioned before in Denmark long term planning has been an essential part of their approach. This involves a

wide range of stakeholders within Government, within industry and beyond. It produces a stable investment climate and the co-ordination of policy initiatives that I mentioned before. Costs to consumers have been high, but by bringing the public along those have been politically acceptable. For example the realisation that most wind farms, this must have been back a couple of decades when the wind farms were going to be largely built by local co-operatives, it made a big difference and that essentially a national champion in terms of the Vestice (ph) company, was going to produce large numbers of jobs, high tech jobs, skilled jobs, that would pervade right through the economy. Those were things that brought people along, and made it possible politically for Denmark to do things including in its spatial planning and intrusion on the landscape, if you like, that have not been successful in the United Kingdom, where there has been little co-ordination. There's been little attempt to build public support, Government agencies are not encouraged to take a holistic approach. Market forces and economic efficiency are prioritised. The authors point out that you can draw similar distinctions right through the EU, between the countries that have done well in the wind renewables and those that have not, so it isn't just in their view, characteristic of those two countries.

[2.20 pm]

There are obviously some quite sobering lessons to us there about how we tackle environmental macro economic, developmental questions of all kinds, but I think there perhaps are a few ideas about what we need to do. Some of them go well beyond not only the RMA, but also energy policy in the way that it's ordinarily conceived of. I think it was striking, the intervention we had this morning about GST, you know interesting example of how you have to look in odd places. Another thing I speculate about is that in New Zealand we do not have high quality legal frameworks

for co-operatives, communities that want to do things. We have well developed systems for private enterprise under the Companies Act, and we have well developed systems in Government, Local Government Act, Crown Entities Act and conventional Government departments and we haven't done a lot for the area in between. If you were to set up a community based wind farm development, how would you do that - would you do it under a Trust, well the thought of having to go to a High Court every so often - is under the Trustee Act and you know that sounds bizarre but actually the energy trusts, they'll end up having to do that sort of thing quite often and it's nuts when you think about it. You know, those energy trusts have terrible problems of governance, confidentiality, secrecy. And I think part of it is because we don't have a little ground there that is well populated as it were with legal framework. Similarly if you set up something under the Incorporated Societies Act, you know its right out of the 1850s, it's the 1908 Act in theory but in proof it's from - must look it up one day. Research project for some student some where but - so if you see what I mean, that I suspect that there are issues there that would explain some of the Danish successes, and certainly if you do hear this anecdotally when you're talking to people, you can say, oh no Barry, you don't need to worry, Danish farmer doesn't hear distracting noise keeping him or her awake at night, what they hear is free sex, free sex, free sex, free sex as the turbine goes round. So that's thought provoking too.

So some of what I've mentioned - are things that might relate specifically to what could be put in a National Policy Statement on renewables. I have focused on wind primarily, but I think some of these points would extrapolate to other renewables as well. The need to bring a wider range of people, communities and organisations together and perhaps the need for a regulatory framework that is more hands on than has been conventional in New Zealand in the last 20 years. I'll leave it at that.

There are - I have had a quick look at renewable energy things in Australia but none of them I think could relate directly to the path that you have got ahead of you.

CHAIR: Thank you so much. Well do you mind if we just have a few points we could tease them out with you. There were some other questions in that email.

PROF BARTON: I'm doing very well with question number 1.

CHAIR: You have, yes. But onto number 2, now it may be that you intentionally kept away from it, because - and that was the one, what approaches can be taken to promote wind farms within district plans, and do you have a view on how best to address landscape and wind farms, eg requirement of assessment criteria or zones in plans, see Colorado approach. Now I realise that's - we're grateful to you for being here because of your international expertise, and it may be that this is something you prefer not to deal with, but if you can help us, that would be -

PROF BARTON: With question number 4 of course it's a matter of judgement as to the extent to which a district plan should promote wind farms, and the extent to which it perhaps should do so to a greater level than the sort of high level settings indicated by Part 2 of the Act. There, there is already a certain amount of promotion. There, there is the opportunities' for evaluating the competing values. It would certainly be possible to be relatively prescriptive in a National Policy Statement, in ways that would require district plans to do more to deal with wind farms without it very overt promotion to the extent that, that would be an effort to promote them beyond Part 2 values indicate, and in particular it should be possible to give some sense of expectations and requirements on a national level, and some of those I think would have to come out of an understanding of

supply and demand, that is where the wind suppliers and perhaps requiring districts with - which include the highest yield areas, the ones thought most useful, to be providing in a more specific way, perhaps with inventory as a minimum, than one would require of other districts. One can also imagine areas close to load having similar scrutiny. So in my neck of the woods the west Waikato sorts of areas, they are not the most high yielding places in New Zealand from a wind farm point of view, but they are close to load.

As for the Colorado approach, I did go over the document, the PDF. I'll confess I didn't get a great deal out of it. It was interesting as a largely industry lead, effort as I understood it, and a relatively low key way to do some mapping out of energy as a whole in Colorado. I couldn't figure out what the problem was that it was addressing, and there are times when if it isn't a solution to a problem, I wonder whether it is simply another problem. So I didn't see how - see what one could get from the Colorado experience, it didn't solve any problem of ours.

CHAIR: That as the last - just picking up on that for a moment, the - we have had two possible approaches put to us, from different people with wind farms, one as that it would be preferable to have no go areas shown on a plan, so that there's some certainty particularly for the applicants, and those no go areas would be based on outstanding natural landscape values or whatever, and then we had another view which was please identify those areas where you are going to - where they can be promoted as an activity, and part of that was activity status and things like that. Would you have a view on those approaches?

PROF BARTON: I think they both have merit. They're not incompatible. The amount of work that they would require however would be substantial. I think if we were to listen to our friends in the landscape, architect and

landscape analysis community they'd say that that's a mammoth survey. You could draw parallels with the geological surveys work on coal resources for example where you know they've got very thorough knowledge of that resource but to build it up, so it could - on the other hand, it may well be worth it. There are things like that where we have often I think failed to deal with it on a national basis, and pushed it down to district councils, often ill equipped to do it and at times given them general exhortations that don't actually help them solve the problems. And you know, thinking of - there was mention of, well I pick on other District Councils and the ones that were mentioned in the break as sort of micro councils that to my certain knowledge have next to no capacity, and you've got to sympathise with people. If they have a planner or it is the one planner who does the plan and all the resource consents and you know they're out gunned at ever turn, and that's how we are running the country. So in a field like this, there would actually be quite substantial return on an investment, in proper inventory which would allow us to justify go and no go zones for wind and for that matter, for hydro. You could imagine the fight that you would be buying with the white water community, but the alternative is to do it on an ad hoc basis, and of course you know that is one of the generally perceived weaknesses of RMA decision making. So if we could, find ways to invest properly in figuring out what choices we want to make on a national basis, it would actually be - it would be new, it would be a national conversation we were not used to. If it was to apply, yes foresee, we contemplate dams on these rivers, but not those rivers. But on the other hand, what we're doing at the moment is overall probably poorer.

[2.30 pm]

MRS BAUMANN: Sorry, I missed -

PROF BARTON: Poorer, in that it is ad hoc, it is river, by river and that allows decision making to be captured by a feeling of well it's just this one river, when in fact you know this is simply one in a sequence and narrows down our decision making.

MRS BAUMANN: Or vice versa, that must look at this river because there's lots more you know, untouched, so it doesn't need the national approach.

PROF BARTON: Either way it's exactly the same thing.

MRS BAUMANN: Yes, yes.

PROF BARTON: And applicants from you know, quite, quite properly you know have got no wish to encourage decision makers to look at the big picture, you know -

MRS BAUMANN: Either way, yes.

PROF BARTON: They are saying, don't look at that big picture out there, just look at this narrow thing and permitted base lines and that I can carve it down even smaller, just look down - that's how we do it. So to break out from that in National Policy Statements would take us into new perhaps scary territory, but I think it is better than that alternative.

DR CHAPMAN: Are you suggesting that this - that an initiative might be centrally supported, funded, but nevertheless carried out at the local level, or are you suggesting that it might be done centrally?

PROF BARTON: I think it could be done centrally on a central scale, and it wouldn't preclude the need for site specific resource consent applications

and so forth. So it would be what you call it, at satellite level view rather than you know sea level view.

MRS BAUMANN: Can I jump in there and say, how can you however deal with the very problem they've had in Denmark is that they're now putting up the small, the technology change in effect, so mapping
New Zealand as to what we know about current technology may actually lock it down to much.

PROF BARTON: Good point. Yeah, quite agree. You would need to build in much flexibility as possible.

MRS BAUMANN: The wind farm community is saying well it's a great idea, but what today may not look so great, but with the new technology, Dr Burton said something similar too.

PROF BARTON: Yes, I'd fully see that point.

CHAIR: Do you see the water conservation orders as being that - it's sort of a, the piece in the jigsaw when it comes to hydro on a national basis, in a sense that they are national instrument, whereas we haven't got anything like that for the wind.

PROF BARTON: No we don't, and certainly one of the characteristics of a water conservation order is that the merits of the river concerned will be evaluated on a national level. We don't do that for other things and another example is the comparators on outstanding landscape, what is outstanding and you know as case law that says that it is outstanding within a particular district.

CHAIR: Yes.

PROF BARTON: Carterton District Council hearing, you know it's outstanding within Carterton. It doesn't make much sense.

CHAIR: Yes.

PROF BARTON: Yes, so to suggest you know systematic national level engagement of this kind, and investment is going against the grain. I think a lot of people would say, oh it's going to be interesting to run the numbers as to whether there were - the cost benefit analysis was positive.

CHAIR: Is it counter intuitive to actually have a national approach where you're excluding for renewable energy generation in a national policy that's meant to be promoting it, because certainly there's a real certainty in that approach where the other values, national values, are trump - trumpet and that's, those values are articulated in the planning instruments and you know you're not to go there, because there's just no point for the developer, but it's to develop an instrument where in the places where you do go, there's more certainty, within the planning regime -

PROF BARTON: Yes, there is promotion and there is clarity in the - and certainty and if the point of all this head-butting has been removed to some extent from the system, then that can be regarded as progress. Naturally you'll be in the position where you'll be listening to a number of people and some of them will have been pushing, advocating for one industry or one sector or another, and good on them and they should, but you'll be looking for something that operates at - in the overall national interests, rather than that.

CHAIR: Yes of course. It was one thing we put to Dr Palmer, which I don't know whether you are in a position to think about it, and that is - this business

of, where you've got a National Policy Statement that is directive if you like, not quite prescriptive, and then - and you deal with it through things like activity status controls, that would say that when it comes to wind you should make sure it's either discretionary or strict discretion or something like that, but it shouldn't be a non-compliance, that was the first one, but the second point we put to him which is probably the real conundrum is that just about all of our submissions have been saying, oh well we've got a real problem when it comes to the balancing, where as a regulator, we don't really know, we need some assistance, can you actually elevate a section 7 matter which is electricity - the renewable electricity, section 7, whatever, can you elevate that so that it becomes equivalent to a section 6 matter, and then we're looking at it as a decision maker we say well we're not going to be overcome by the section 6 matter, we're going - this is now of national significance, therefore it should be on an equal footing at least, if not a greater footing than section 6 matters. Now instinctively I have difficulties with that because of the way the Act is structured, but that submission has been coming up all the time. Help us with the balancing between section 6 - and when it comes to electricity, which is a section 7 matter.

MRS BAUMANN: 7J.

CHAIR: 7J sorry, yes the benefits to be derived from use and development of renewable.

PROF BARTON: Speaking entirely as a matter of first impression, I don't know that we've had such cases in New Zealand, dealing with the NZCPS, with New Zealand Coastal Policy Statement, which is the only National Policy Statement that we have any experience of, so I don't know that such a matter has come there and in that respect, in the section 6, it's covered -

CHAIR: Yes the coast is covered.

PROF BARTON: (inaudible) and so it's (a) isn't it.

CHAIR: So it's there.

PROF BARTON: So this might be new territory. I can imagine a Court saying that a National Policy Statement doesn't allow a rewriting of the RMA.

CHAIR: Yes.

PROF BARTON: On the other hand a National Policy Statement must be capable of having real effect in the world, and in terms of prescriptiveness one would look at the Auckland Urban Limits case, Long Bay Okura, not the judgment last year, but not that one -

[2.40 pm]

CHAIR: The Bollard one.

PROF BARTON: Yeah, yeah. Where the Court's - did it go to the Court of Appeal, High Court -

CHAIR: Oh one did go to the Court of Appeal, yes, the MUL in Auckland.

PROF BARTON: Yes.

CHAIR: Yes, yes it did.

PROF BARTON: Where the Court deliberated about what is a policy.

CHAIR: That's right.

PROF BARTON: And they would then say, hey policy is just airy fairy wishy words, you know aspirational statements, but they said no, it can be that, but actually a policy can be very directive, and it can direct people as to what they can and can't do, and it can direct councils as to things that they must put in their plans or take out so one would look to that for that aspect of it. As for the elevation so there would - yeah, one could not couch it in terms of taking the section 7 matter and giving it section 6 like status. Yes, so yeah interesting question. Yes, I'm not aware to what extent reasonable wind farm development has been precluded by it not having a section 6 status. One would need to ponder that. In discussions about people getting turned down, you know one always remembers the fact that well there are a lot of projects which were actually deserved to be turned down and they couldn't be conditioned, they should never have been thought up, and there's only one thing to do with them and that is turn them down and the regulatory system such as the RMA embodies that in this operation. So I'm not speaking with any enthusiasm about negative results, but I don't know the extent to which wind farms, wind farm development is hailing in New Zealand, and in RMA processes and to the extent that it is, I think there is some interesting elements to be had here about public engagement in the way that Rummer (ph) and McCarg (ph) discussed, rather than it being any specific technical flaw in our spatial planning processes.

MRS BAUMANN: You're just saying - you said it's the force of the argument against which has not had the opportunity of having that educational development (inaudible) community Denmark?

PROF BARTON: Quite right, a sense of community involvement.

MRS BAUMANN: And that's coming through in the cases, rather than that we've got plans that are not properly focused or something?

PROF BARTON: Yes and that is - these people doing this to our district, rather - you know, I mean you could say it's okay if we do it ourselves, but there is an element of that in it and equally with the sense that there's the technology and so forth, it's all totally from overseas with a couple of - two bladed exception.

CHAIR: It is interesting, that whole point about section 6, section 7 because the NPS would be implemented at a regional level, in other words, if you had the - an emphasis in the NPS when it comes to doing the regional documents or developing the - and the district documents, that emphasis is meant to be carried through, so I suppose the submission we've been getting is well as long as the emphasis is in the NPS, then it will be fair, it will be dealt with in a fairer way as far as wind or generation is concerned. At the time of the planning, the on the ground discussion plans - so there's that side of it and that may be where the submissions are coming from. I'm going to have to go - we're going to have to go back to them and have a look at them, but - so there's that point and as far as this business about district plans or the community being involved and that sort of thing in district plans, the call in procedure now where it can be referred directly to the Environment Court means that the local community hearing is gone, which can also aggravate that sense of -

PROF BARTON: Even if it the decision is a wonderful decision.

CHAIR: Quite, yes.

PROF BARTON: It is still a sort of - it's a flick isn't it, it's a dismissal of the community.

CHAIR: Yes. Dr Barton thank you very much for your contribution, that's been very helpful.

PROF BARTON: One other aspect that I also think about, it perhaps goes the other way to some extent, is that one of the good things about wind is that it's very visible and - wind farms, and it makes people think about where their energy is coming from. It's in their face and as an energy enthusiast or thinker I think that's quite healthy, rather than it coming from somewhere else and you know it's almost alienation from it, but also lack of accountability for it, and especially with climate change issues, the risk of not being accountable for our emissions, thinking about our emissions from Huntly or where ever, it's a problem so there is actually something reasonably healthy about people having to look at where their electricity comes from.

CHAIR: In your reading if you read up much about the planning approaches for tidal. You were saying there's some offshore - you say there's some offshore in the UK and so forth, but have you looked at the regulatory mechanisms used for offshore -

PROF BARTON: I haven't at all I'm afraid. It is very much the growing thing in North Sea Countries - Germany for example has similar saturation rates actually to Denmark. It gets talked about a bit less, but it's big there too. So first of all there has to be an allocation process which has generally been done by some sort of bidding arrangement as far as I can make out. As for the spatial planning aspects, I don't know how that works.

CHAIR: Right. We've got an issue with our - this NPS in that there's the coastal marine area that has been excluded from the lower - below 10 megawatts, the policies, below 10 megawatts is encouraged, but that encouragement

doesn't cover the coastal because there was some concern that you could get a few megawatts - a facility just generating a few megawatts, which is about two kilometres long as a sausage bouncing in the water, and so that would become a permitted activity or something, and that just isn't on so it was - and that was the rationale for excluding that under section 32, so I was interested just to know whether there are comparable overseas situations where those sorts of things are controlled through planning instruments, but it may be that - it may be when we're going through this test and I'm not sure whether there's anything in that, that would help us with that -

PROF BARTON: Not on marine energy.

CHAIR: Not on marine energy.

PROF BARTON: No. No the development I was thinking of is wind energy in the offshore.

CHAIR: Wind energy.

PROF BARTON: Yes, so I'm sorry -

CHAIR: No, no, that's fine. So that is an issue that - we've got the pilot programme going up in the Kaipara, I think it is. And so this Board of Inquiry is waiting for a number of decisions. There's the Project Hayes, there's the policy statement on the coast and things - and this type of decision which must be due out any day, things like that which will help us work out where the difficulties are and the issues, and the Environment Court has said in the number of cases which you have cited to us that it's looking for support for national guidance as well on both on renewables, particularly wind. Well thank you very much. Is there any other

questions? Thank you very much Professor Barton, we've really appreciated that and sorry we've kept here you longer than anticipated.

PROF BARTON: No, no problems at all.

CHAIR: Many thanks and we'll give you back your book.

[2.50 pm]

Audio file: dpm 0061

CHAIR: Well welcome. Thank you very much for attending. We've - I won't introduce the Board - but you'll know who they are, but we're very grateful to you for coming along because what's happened is that we've had regional authorities telling us what they are doing about landscape issues so forth, but we've had very few District Councils, and it was apparent that your District Council is right in the thick of it and we would be really grateful for your advice about how we can assist, if at all, when it comes to developing a national instrument and if it's going to filter down.

So we're in your hands as to how you wish to present.
Mr Cameron, you may wish to start, but we have - everything's being recorded and it's going out into the ether, so I'll just - if you could just acknowledge who you are. Thank you very much.

MR CAMERON: If the Board pleases my name is Andrew Cameron, and I appear today in my capacity as counsel for the Tararua District Council. The way in which Mr Forest, who is appearing as the witness for the Tararua District Council - and I have discussed the matter, and the way in which we feel we can most practically proceed is for Mr Forest in fact to present evidence to you as to his experience with the Tararua District Council now over some 15, 20 years as to the council's district planner. He prepared the first plan and we are now in the throws of carrying out the first review of that district plan, and he will tell you how he has prepared that plan - what the provisions are and what considerations he has brought to bear in the context of the preparation of the initial plan, but in particular the current review. We are very conscious of the fact that we appear before you to address the issue of cumulative effects, which of course is the - is an issue for the Tararua District Council. So really I think

what I can - all I can usefully add initially, because I rather felt that I might ask Mr Forest to present his evidence and then for us to have some opportunity to answer any questions and to clarify any points with you that you may wish to raise with us.

I think perhaps though - initially I just simply note that from the section 32 analysis that the primary drivers for this National Policy Statement, certainly as I understand it, are to explicitly articulate the national benefits of renewable electricity generation, and then to guide or to prepare a policy statement which will guide the decision making process. I have some difficulty with the latter proposition, and that will become - and I think that will be apparent why from what Mr Forest has to say to you. On the other hand, the Tararua District Council entirely endorses the approach taken in the sense that it is useful I think that this proposed National Policy Statement does explicitly articulate the national benefits of renewable electricity generation, and that in itself as I think of assistance to District Councils, and in particular the Tararua District Council where we are faced with applications and obviously argument about what those benefits might be. This I think assists with that part - with that part of any hearing process.

I am just going to - before Mr Forest commences his evidence, just read to you from a planning, from a reporting planners report, back to the hearing committee in relation to the submissions on the district plan, what that planner said in relation to wind farms, because I think it's actually relatively informative. She said - that the most significant issue faced by the council in its deliberations is the issue of renewable energy generation development and wind farms in particular in the district, and this issue has been recognised throughout the district plan as one of significance and has gained increased prominence as the review process has progressed. She goes on to say she's been acutely aware of the need to ensure that

the intent of provisions are clear and their implementation is practical. The issue of wind farms is by no means straight forward. It is a fact that the Tararua district has a world class wind resource, that the district already contains wind farms, and that the council receive resource consent applications in the future for more. I consider it to be clear that wind farms have local, regional and national benefits, but they also have adverse effects which are mostly, if not entirely, local in nature. National guidance on the matter is clear, on the fact that increased levels of energy generation need to come from renewable sources and that decision makers need to have particular regard for climate change and the benefits to be derived for renewables. What is not clear, however, is exactly how the benefits and costs of wind farms are to be reconciled, and accordingly how and if the various matters under Part 2 of the Act are to be weighed in relation to wind farms. She goes on to say that Case Law has provided us with guidance.

Mr Forest will continue to explain to you how the Tararua District Council views what progress can be made around this issue, and I will leave it for him to do so and then we can answer any questions that you may have.

CHAIR: Thank you very much Mr Cameron. Mr Forest - welcome.

MR FOREST: Thank you. Thank you Dr Somerville. Now my name is David Forest. I'm the Consultant District Planner for Tararua District. I'll take the initial statements as read, and I've put it in written form for you so hopefully that will be of assistance if you need to go back to it.

Under point 4 - I would just like to make the point that this is my view as, and my experience as the district planner. It's not that of the, officially that of the Tararua District Council. It hasn't been before the council as an

elected body for resolution, so - but of course other officers of the council have in fact seen what I'm about to say and endorse those words.

In terms of background and I won't go through all of those but the Tararua District Council has processed and determined the following wind farm applications. The initial one in 1996 was TrustPower - which was 137 turbines on the Tararua Ranges to the north east of Palmerston North. Then in 1998 ScanPower made application, or was consented for a 20 turbine wind farm near Saddle Road in the Manawatu Gorge. Then in 2003 stage 2 of the TrustPower's wind farm was approved. 2003, Meridian's Te Apati wind farm consisting of 55 turbines was granted consent, then in 2008 we, being the Tararua District Council received an application from Contact Energy for a proposed wind farm consisting of 65 turbines in the Waitahora area, towards the east coast of the district. That is now subject to an appeal to the Environment Court, and in 2009 we have just received and in the process of setting up a hearing for the New Zealand wind farms proposed Te Rere Hau eastern extension, which is entirely within the Tararua district. So in short - there's been a large number of wind farm applications of which I have been involved in, as the reporting officer, in everyone.

Of those applications, the first four were granted. The consent to Contact Energy's application was refused by the Council, and as I said before, that's subsequently been to the Environment Court, and the Te Rere Hau one is currently in process.

Wind farm prospecting continues within the district, with the main areas being the Tararua Ranges and the Puketoi Ranges which run roughly parallel to the Tararua's, roughly half way to the east coast, from the Taraura's.

We are well aware that further resource consent applications to wind farms are likely to be forthcoming. We know for certain that there are three or four in that Puketoi area, and there are also other companies prospecting in other parts of the district, as well as on the Tararua's. So it's by no means complete in terms of its ability to allow further wind farms.

[3.00 pm]

The current approach of the council's operative district plan is to consider each wind farm resource consent application on its own merits as a discretionary activity, and that's by default because all activities in the district are discretionary unless otherwise permitted, controlled or prohibited by the plan. So there's not an activity specified which enables wind farms, it's just merely that it's not specified as any of those other categories, so therefore by default it is considered as a discretionary activity. This approach was debated at some length I might add, and has not changed in the proposed district plan, however a number of substantial submissions were received to the proposed district plan, both in support and in opposition to this approach. The council has heard and considered all of the submissions received in respect of the proposed district plan, but is yet to determine and notify its decisions on these submissions. It is unlikely that the activity status of wind farms, that is discretionary activity status, will change, but careful consideration is being given to altering or adding to the objectives or policies in the district plan to address the assessment matters raised in the submissions received, and that is particularly in relation to amenity effects. At present, cumulative effects are considered on a case by case basis, visual, landscape and amenity value impacts are the main adverse cumulative effects to be considered in relation to wind farms. To a lesser extent, where the turbine density is high, noise emission might also have potential to result in adverse cumulative effects upon the environment. Now most of the noise

experts would say that if you add additional turbines, then it doesn't materially alter the levels in any significantly adverse way, however, we do have different types of turbines and we are certainly aware that in the case of New Zealand Wind Farms with the two bladed turbines that adding additional turbines could well, and that's still under examination at the moment, could well increase from a cumulative point of view, the noise that's being generated from the existing turbines. So that's why I had to hedge a little bit in terms of making that statement.

Landscape architects by way of evidence to hearings of resource consent application's - in which I have been involved, have argued that the visual effects of wind farms must be assessed on a case by case basis on their merits. Effects can vary considerably depending on the nature and the scale of the turbines proposed, and on the topography of the wind farm site and its locality. For example, the number of different turbine sizes and styles such as exist on the Tararua Ranges, may have a greater adverse cumulative effect on the environment than the coverage, or the extent of, a smaller number of turbines of a similar type and size. So just to explain that and I assume you've already seen the Tararua's in which case you'll know what I mean, you've got larger ones which are three bladed, and tubular, you've got smaller ones that are lattice towers and then you've got the smaller, even smaller still, two bladed turbines from New Zealand Wind Farms, so you've got quite a distinct difference in terms of where they are located, and the landscape architects tend to say that, you know, they wouldn't be quite so concerned if they were all large tubular ballerinas along the - you know, in terms of cumulative effects, along the ranges, but because we have these different types, different sizes, different styles of turbines, they are not particular aesthetically pleasing in the minds of many of those landscape architects.

The - now where did we get to, sorry, I digress again - If one accepts such a proposition, it suggests that it would be difficult if not impossible to establish a National Policy relating to the cumulative visual effects of wind farms or for that matter, to devise a nationally acceptable or applicable set of standards. Notwithstanding the view of many landscape architects that each application ought to be considered on its merits, the council has seriously considered adopting an exclusionary approach to wind farms within the district. This approach involves pursuing the identification and exclusion by means of district plan provisions, of those areas of landscape or other amenity value upon which turbines cannot be erected. The council has attempted to identify such areas by means of district plan consultation processes. This has included public consultation via two informal district plan discussion documents, and the notification of the proposed district plan. The outcome of these public notification processes was a singular lack of submissions regarding areas to be avoided. The only exception being further submissions, so they weren't originating submissions, but further submissions received from Waitahora Valley residents in respect of the proposed district plan arising as a consequence of Contact Energy Limited's resource consent application with the proposed Waitahora wind farm on the Puketoi Ranges. Accordingly, the council has decided at this stage to continue with a case by case assessment of wind farm proposals, thereby relying on an applicant to produce a comprehensive fourth schedule RMA assessment of effects on the environment including an evaluation of cumulative effects, and the relevant provisions of the district plan and the legislation.

The proposed National Policy Statement. My reading of the proposed National Policy Statement is that it's intended to explicitly articulate the national benefits of renewable electricity generation, and to guide the decision making process. Inevitably that guidance is intended to ensure that greater weight is afforded to renewable electricity proposals and their

benefits, when deliberating upon and determining applications in respect of say wind farms, that is section 104 in Part 2 evaluations under the RMA. Assigning greater weight to renewable electricity proposals is potentially in conflict with environmental protection measures in RMA section 6, and with amenity value protection measures contained in district plans. For example in the Tararua district plan, zoning provisions are designed to protect rural amenity values within the rural management area of the district. Objective 2341 in policy 2342B of the Tararua plan state, the objectives to ensure a high level of environmental quality and amenity throughout the rural areas of the district and policies, one of which is to protect and enhance the character, its level of amenity and environmental quality of the district rural areas, and then there were a series of other things and various things that go with that.

These environmental quality and amenity value objectives and policies are fundamental to, and underpin all the provisions of the district plan, and are the basis for differentiating the various management areas or zones which are contained within the plan. Now the proposed National Policy Statement appears to contain an underlying presumption, and I refer to the last sentence in the preamble on page 1 of the proposed National Policy Statement, that “greater certainty will be provided to decision makers, applicants and the wider community by means of a National Policy Statement which adopts a nationally consistent approach to balancing” and put in square brackets deliberately the word “weighing”, “the competing values associated with the development of New Zealand’s renewable electricity generation resources”. In the case of wind farms, I do not consider that the inherently conflicting, ie competing values can be balanced. Inherent conflicts of values exist between local and national interests and must be weighed. As such they cannot be balanced, ie they are irreconcilable. National interests and local interests must be weighed and which is to take precedence in the outcome will be determined by the

decision maker. Local amenity value impacts of 120 metre to 150 metre high wind turbines cannot be mitigated, avoided or remedied. Therefore, it becomes an all or nothing situation. Either the national interest in generating renewable energy takes precedence, and consent to develop, operate and maintain a wind farm is granted, or local interests take precedence and consent is refused on the grounds that the amenity values of the locality will be significantly adversely affected, and are not otherwise able to be remedied, mitigated or avoided.

In the context of the management of cumulative effects, it is almost inevitable that wind farms will eventually reach a threshold of acceptability for the district community. In conjunction with the proposed National Policy Statement becoming operative, this will create a need to provide more explicit provisions within the district plan. It will then be essential that all relevant section 6 RMA protection and preservation considerations, be explicitly articulated in the district plan. This will ensure that resource consent applications for renewable electricity generation developments in areas assessed to be sensitive - are subject to detailed scrutiny, and that renewable electricity outcomes occur where the community considers them desirable. This is not to suggest that the cumulative effects of the aggregation of wind farms in any one location will necessarily be adverse, but rather that consideration of this matter must be subject to the section 6 RMA priorities identified by the community in its district plan.

However, in the interim - I am of the opinion that this is presently being appropriately managed through the provisions of district and regional plans and the RMA, and when the proposed National Policy Statement becomes operative this approach will need to be reviewed in order to adequately address cumulative effects at a policy level in light of section 6 RMA matters, such that the decision making process reflects the principles of sustainable management. This in turn will properly reflect the

benefits of renewable electricity generation as envisaged by the proposed National Policy Statement.

[3.10 pm]

Now Policy 1 - turning now to the specific policies of the proposed National Policy Statement. Policy 1 states that the benefits of renewable electricity generation activities at any scale are of national significance. Whilst I understand and accept the benefits of renewable electricity generation, the difficulty arises for the districts decision makers when they have to have particular regard to the national benefits, and then weigh these benefits against local amenity values, ie costs. As discussed previously, impacts on amenity values cannot be balanced, in my view. It's a case of having to consider irreconcilable values in most cases, that is - adverse effects on local amenity values can't necessarily be avoided, remedied or mitigated in the case of wind farms.

Policy 2, again it is recognised and accepted that utilisation of the best wind resource is locationally constrained by topography and accessibility to the electricity and in most cases the national grid. As above, this may be in areas of high amenity value where avoidance, remediation or mitigation of adverse effects on the environment was not possible.

Policy 3 - in respect of wind farms it is acknowledged that wind turbines and wind farms are reversible. That is, they can be removed from the ground and disassembled at any stage, but the reality is that most wind farms will have at least a 40 year life. The manufacturers typically say an 18 to 20 year life, and experience in the Tararua district to date is that the turbines are being replaced part by part as necessary. I think they under estimated the wind resource in the area. The adverse effect on local

amenity values is therefore seen by local residents as being irreversible, even though in theory this is not the case.

Policy 4 - section 55 of the RMA, local authority recognition of the National Policy Statements, specifies the following that a local authority must amend a document and our National Policy Statement must state whether the local authorities required to use the process et cetera, et cetera.

The proposed National Policy Statement, through policies 4 and 5 adopts the approach specified in section 55 2A(a) of the RMA, but these two policies are restricted to investigation activities, Policy 4, and the development and operation of small and community scale distributed renewable electricity generation, Policy 5. The proposed National Policy Statement for renewable energy generation provides no guidance in respect of section 55 of the RMA, as it may relate to wind farms or other large scale renewable energy generation activities. I consider this is appropriate, as any wind farm should be considered on its merits, on a case by case basis. There are too many variations in wind farm turbine types, locations, in terms of variations in topography, and both have a major impact in terms of landscape and noise effects, and adverse effects for any meaningful National Policy on the siting of wind farms to be developed.

Conclusion - In my opinion it would be difficult, if not impossible, to promulgate and apply fairly and universally a National Policy, or a standard for that matter, on the siting of wind farms. Wind farms should be discretionary activities and assessed on their merits. The cumulative effects are best considered on this basis as well, for the same reason. Thus in terms of the invitation from the Board, to comment on the relevance of the draft National Policy Statement in respect of addressing cumulative effects of wind farm developments in this district, my answer is

that the National Policy Statement has no relevance as currently drafted. In my view, it will not assist district council decision makers to reconcile the inherent conflicts between local community value interests and the national interests in enabling renewable electricity generation for the reasons I have outlined above.

I am more than happy to answer any questions from the Board.

CHAIR: Well thank you very much Mr Forest. In fact this evidence is - this will assist us considerably, so we do have some questions for you because it seems that your district is the example of what's happening with the planning issues, and also there are very good points that you make about the difficulties when it comes to even suggesting that you can balance these things, but you can't, in terms of commensurate values and so forth. So thank you very much. I'll just ask my colleagues whether they have any questions.

DR CHAPMAN: I did have a question, just to clarify your paragraph 11, if I might, which is around the visual effects and the - did it cover noise as well, it certainly covered cumulative effects, I guess my question there is - it relates to this statement, if one accepts such a proposition it suggests that it would be difficult, if not impossible, to establish a National Policy relating to the cumulative visual effects of wind farms. I wonder if you could explore that a little more for us, just given the propensity of people to look at a range and say, one wind farm would be fine, but when you've got half a dozen lined up and they're all different and all having a visual impact, they are overwhelming, the effect of that cumulatively is overwhelming. So I wonder if you could explore that for us a little more.

MR FOREST: What I'm suggesting there is that there will be a threshold that will be reached, when a particular application comes in where the community

says, no we don't want any more in which case that will be clearly articulated through, I would hope through the RMA consenting process. Alternatively, the ones that have already established, or there may be an adjoining area where - and it's already starting to happen in the Tararua's, where an adjoining authority is already indicating that its community doesn't want any extension along the Tararua's into its district, in which that district can articulate those concerns through the statutory processes under the first schedule, and take an exclusionary approach and say for part - you know, section 6, Part 2 matters, of protection of high value landscapes and so forth, this community does not want to allow any intrusion, any significant intrusion into that landscape, which would include things like I guess intrusions like wind turbines - and so there are two ways that that can be done. So what I'm saying is that I don't think that - I can't conceive of how you could put words into a National Policy Statement or even a standard, and I'm aware that there's quite a push through the Local Government Association with some of the territorial authorities in our area, to have a national standard, or national standard provisions in relation to the siting of wind farms and turbines.

DR CHAPMAN: So am I right in thinking you cannot conceive of any wording that an NPS might offer, that might for example suggest to district councils that they identify some sort of threshold, (inaudible)00.28.37 at which, you know -

MR FOREST: No, I think because I think it will vary depending on what's already there. I mean we've got a particular situation in the Tararua Ranges, where you've got a - quite a mishmash of something landscape architects would say mismatch, but a mishmash of turbines, and that has its own particular set of difficulties. It may be quite different if you had an extension of wind farms which were all of a universal sizing and design, and so it would be difficult to say what the circumstances would be for

which those cumulative effects would become adverse and significantly adverse.

DR CHAPMAN: In other words, am I right in thinking that you don't see any way for a council to anticipate that threshold because of the (inaudible) if you like of the sorts of wind farms that might spring up.

MR FOREST: Yes, unless there is a - what is the correct wording, unless there is a recognition, an expression of significant values that are assigned to a particular area, in terms of those values under Parts - section 6 and Part 2 and particularly in terms of landscape values, so if they had already identified that there was a particular landscape that was of high value to the residents of that particular part of the district, then presumably they would articulate that through the process. Either through the district plan process and the first schedule or through a resource consent process, which they've done in the case of Waitahora for example.

[3.20 pm]

DR CHAPMAN: Yes, but that's precisely the sort of thing I had in mind anyway. What we've been thinking about in the hearings we've had, where rather than specifically for example request that District Councils identify no go areas, one option might be to ask District Councils to identify the values that you know could be, in other words Part 2 values, that might be material to a threshold being reached or to be - you know consenting or decision making, and once those values are identified to go through a process of you know identifying, in relation to particular areas or parts of the district, so is that feasible?

MR FOREST: It may well be feasible where you're going into a new area, as in - as happened with the Waitahora wind farm application, that it was

geographically remote from the Tararua situation, and so you could articulate, I believe you could articulate those values quite well in terms of coming into you know - it's what I call the 15 Montane Valley (ph) situation, so that would - I think you could do it in that situation, I think it would be far more difficult where you already have an existing situation, and you're trying to determine where do you draw the line, where's the threshold of acceptability, and I think that would vary quite a bit, depending on the particular location, the topography, the type of turbines that are already there, a whole range of different things, so I would imagine that that would be far more difficult.

DR CHAPMAN: Thank you.

MRS BAUMANN: Thank you Mr Chair. I want to sort of go back to first principles. We're enjoined to consider this proposed National Policy Statement in the current form, and to investigate how we can improve it or support it, to encourage renewable electricity generation in New Zealand. When I read your submission, I don't get much help how we can carry out that, or ensure the policy statement carries out the promotion of renewable electricity generation or have I missed something?

MR FOREST: No. I think Mr Cameron made the distinction right at the start - that, it was - there were two aspects to it. One is the promoting the fact that renewable energy, or renewable electricity generation is in the national interest and it's important, and I have no problem with that, it's a question of actually how you then manifest that at a district level. And what I'm saying is that - and I have had some considerable discussions with Mr Cameron as to how we could be constructive in terms of doing that, because I don't envy your position at all, in terms of trying to find ways in which this could actually happen, and it's a fundamental clash, as always with many planning issues between national interests and local

interests, and so unless there's probably more direction through, as was being suggested, as to what councils need to do in terms of excluding areas or identifying the values that need to take precedence. To exclude those areas so that the other areas then can be given greater weight in terms of renewable energy -

MRS BAUMANN: So you think that's one way we could make this more effective, this Policy Statement more effective, on the ground for users?

MR FOREST: Yes.

MRS BAUMANN: Any other ideas, because we've had a myriad of them -

MR FOREST: I'm sure you have.

MRS BAUMANN: But we're interested in your experience - and what would -

MR FOREST: I still think it comes down to the individual districts and communities making that choice.

MRS BAUMANN: But that may not meet our brief, make it easier or certainly help councils and users.

MR FOREST: Well if we take it back to the - because it's a National Policy Statement, if we take it back to - and I haven't talked to Mr Cameron about this, he might tell me off - you can deal with him, I'm sure, at a national level, I think that there's probably a series of things. I think identifying the high value areas can be done nationally, and I think identifying those values and effectively

re-fencing, creating no go areas for those, and I'm particularly thinking of those high value scenic areas, I mean I've just spent some time in

Queenstown and I originally came from Central Otago, so I know that area quite well and so there are some areas that I think you could, from a national point of view, it's in the national interest to actually identify those, and I think there are - if you are using a what I could a geographic information, GIS sipping approach, the other thing that I would put in there would be those areas where at this stage anyway there are technical limitations in terms of the grid, for actually being able to hook that energy into the system.

MRS BAUMANN: But that may be only as long as the grid remains undeveloped.

MR FOREST: Yes.

MRS BAUMANN: So it can have only a temporal effect.

MR FOREST: Well no not necessarily, I mean even if you developed the grid, there's still going to be areas where there's a fantastic wind resource, but the transmission licence and the technical issues about ramping electricity from a wind farm into the system, and dropping back off again and so on, those technical issues could well -

MRS BAUMANN: But that would no doubt be an issue for the developer, who could quickly come to that conclusion.

MR FOREST: Yes.

MRS BAUMANN: Rather than a planning response.

MR FOREST: That's right. So yeah if you let the market - but if you want it from a planning point of view and say well look quite clearly there are some areas that are highly unlikely to ever be -

MRS BAUMANN: In terms of section 6.

MR FOREST: In terms of section 6 and then be able to put those in -

MRS BAUMANN: At a council like the one you consult for would find that kind of approach acceptable, at a national -

MR FOREST: Yes, I'm sure they would, because suspect that they - none of those areas would make - would fall within their district, so they would still have the same difficulties to face, but it might be acceptable in terms of resolving some of the issues in other parts of the country.

MRS BAUMANN: Yes, the other thing I wanted to - a couple of other things I want to explore, you didn't cover in your submission and that's one issue about in the National Policy Statement there is this business of the 90% renewables, and we've had quite a lot of submissions that either - that it should not be seen as an objective, in other words the thing that may guide councils when it's doing this weighing, whether it's you know, how far or how close we are to 90, by the use of that 90% in a Policy Statement. You got any comments as somebody who has to consider these applications, whether that would add another grenade into the whole mix?

MR FOREST: Well -I see it as indicating the seriousness - with which Central Government is wanting to pursue - renewable energy generation.

MRS BAUMANN: It wouldn't put you on extra enquiry as to whether we were at 88% or 90%?

MR FOREST: No, no.

MRS BAUMANN: Okay.

MR FOREST: No, not at all.

MRS BAUMANN: The only other thing I wanted to talk about, is you do talk about the balance, sorry weighing of amenity and renewables, do you not see that this Policy Statement in effect, is saying as far as section 7 matters, is giving sort of an extra emphasis to the renewables rather than just straight amenity values?

MR FOREST: Yes I do, yes.

MRS BAUMANN: And that you have a concern about that?

[3.30 pm]

MR FOREST: Yes. Yes, because the difficulty is how once it becomes operative a district like Tararua would implement that in terms of the provisions in its plan, when in fact the current emphasis is on amenity values and protection of those amenity values.

MRS BAUMANN: Yeah, I mean it throws a bit of a bomb into the plan.

MR FOREST: Yes. That's a very good way of putting it.

MRS BAUMANN: Yes well I call a spade a spade. Thank you.

CHAIR: Just returning to your statement at paragraph 9, in the penultimate or the last sentence you refer to the objectives and policies that you are working up for your proposed plan Mr Forest, and there - to address assessment matters, do you - within your plan I'm not familiar with it, if you could help me, do you have assessment criteria within your plan?

MR FOREST: Yes.

CHAIR: You do, so when it comes to wind farms, you've got an activity status as discretionary. You then have a number of assessment criteria for dealing with applications, all sorts of applications.

MR FOREST: That's right.

CHAIR: And in that area where wind farms are - is that zoned rural is it?

MR FOREST: Wind farms at the moment aren't listed as a discretionary activity perse.

CHAIR: No, no.

MR FOREST: They are there by default, so in theory they could go anywhere within the district the case could be made.

CHAIR: Yes, certainly.

MR FOREST: But realistically it will be in the rural area.

CHAIR: In the rural - so you have the rural zone, the discretionary activity, now the assessment - and you have your objectives and policies for your rural

zone and then you have assessment criteria for development in a rural zone, whatever it is whether it's a wind farm, do you, you have assessment criteria?

MR FOREST: We have criteria, particularly relating to protection, section 6 matters.

CHAIR: Right.

MR FOREST: But we don't have any criteria at the moment in relation to wind farms, for example. We do have some in terms of renewable energy in the urban and settlement parts of the plan, and that's particularly geared towards the relationship - maximising solar gain in relationship of houses and in terms of the orientation of the section of the road and all that sort of thing, so there's quite a bit in there, and so the council's already looking at the small scale side of renewable energy, but it's not specifically putting any criteria or hasn't got any criteria in the plan at present.

CHAIR: No.

MR FOREST: And so what I'm saying there is, that as a consequence of the large number of submissions that we receive, the council is now considering that. They haven't yet made their decisions on those, but they are seriously considering introducing criteria into the plan to assist in the decision making process around wind farm applications.

CHAIR: Yes. Well at the moment without the criteria, if somebody were say to apply to build a building in the rural zone, and we've got the objectives and policies and it's a discretionary activity, are there assessment criteria for that building, landscape, amenities and so forth?

MR FOREST: Yes, there are.

CHAIR: Right, now at the moment then within your plan, and that's what you're obviously looking at in your review, is that your objectives and policies don't necessarily touch on wind farms or renewable energy for your rural zone I take it.

MR FOREST: No.

CHAIR: And your activity status would stay the same, but - and your assessment criteria are not comprehensive enough to cover wind farms, is that a fair summary?

MR FOREST: That's right, that's right.

CHAIR: And the work that you've undertaken to develop your objectives and policies for dealing with wind farms and assessment criteria, to implement those objectives and policies, how are you getting on with that? I don't need to know the outcome, because I realise you are in a process at the moment, but how are you getting on with your actual work on developing the assessment criteria?

MR FOREST: We are reasonably comfortable with where we have got to.

CHAIR: Yes.

MR FOREST: On the grounds that we had a lot of submission from obviously the wind farm companies, from ECA, from a large number of different organisations and individuals, so we've got quite a range of views that we are able to take into account, so we've been able to look seriously at how those provisions could be developed, based on that information.

CHAIR: And do you think that the assessment criteria worked out as a result of those submissions, would be transportable into other districts, because of the experience you've had as one of the few districts that have had the experience that you've had ,could that be transportable?

MR FOREST: Yes, some - certainly will be, yes.

CHAIR: And do you have a - are they within a 32, section 32 assessment or something, can you help us with that because we're confronting this very issue about whether or not there should be a model set if you like.

MR FOREST: I probably could, once the council makes its decisions.

CHAIR: I understand the difficulties with that and it would have to be on the basis that your council may not necessarily incorporate the ones you are telling us about, but if you've done that sort of work with your expertise, it would be invaluable for us. The other matter is the same with the objectives and policies - you've obviously done some work - although I understand that will be a little bit easier when it will be more generic -

MR FOREST: Yes.

CHAIR: So if I could just ask you and Mr Cameron to think about whether you can give us some guidance or some help there, without it being a council position, and I understand that you are - and the other matter is the Regional District interface, and the planning instruments in your area, we've had some evidence about - it's Horizons isn't -

MR FOREST: Yes, correct.

CHAIR: Horizons is it number 1 - number something plan -

MR FOREST: Proposed One Plan.

CHAIR: Proposed One Plan, that's right. Now my understanding of the Act at the moment, is that there would be an obligation on you to implement whatever the regional instruments do eventually, and it seems - we're getting evidence now when it comes to land usage there is more of an input at a regional level in regional documents which must have an effect, more than there used to be, must have an effect on the districts, have you any comments about that interface. Should we be putting the effort into - into assistance with regional instruments, or is it really better to go straight to the districts where activities are occurring?

MR FOREST: Well - I have admit to a bias.

CHAIR: No, that's fine.

MR FOREST: I consider that the district level is where most people have the incentives to get it right and that's - and in most cases if there's anything happening then residents or rate payers will contact their Local Council, even though it may be a function that's exercised by the Regional Council, so they are always the first port of call. And I think in terms of articulating some of those values, particularly to do with the visual and landscape aspects of wind farms, I think it's very much a local issue. I'm still unsure in terms of the regional ability of terms of where you have say a mountain range which is a high value wind resource which you know, crosses three or four different authorities. It's probably a situation there where there is a need for regional guidance, particularly through a Regional Policy Statement because that then would say, look we want some consistency here between different districts and that's - the Regional Policy Statement

I think is the mechanism for ensuring that the districts get together and understand that they need to be reasonably consistent in terms of how they approach it - one way or the other.

CHAIR: And with the Manawatu - this situation with this regional overlay as it were, with the same mountain range - has that happened in your area, where the regions got together with the districts to try and work up a Regional Policy that you are all comfortable with?

MR FOREST: No it hasn't yet. What they - I understand the Regional Council is doing in terms of the One Plan, is have engaged landscape experts to assist them to develop some generic provisions, and generic approaches to - if a district is to undertake a landscape assessment, then this is how we would like you to go about it, so that there's a commonality of how you actually go about identifying those section 6 landscapes of high value, for example, and so that's probably been their emphasis. Historically, there's been a little bit of a problem in the sense that they - the Regional Council put in a list of what they call areas of high scenic value, including the- now I've got to get this right, there's a difference of opinion in terms of wording about ridge lines and sky lines, so there's been a big break about ridge lines and sky lines, but they have identified the sky line of the Tararua Ranges as being of significance from a landscape point of view, so the district was obliged through - when its district plan was put in place, to put that into the district plan, but there was no underpinning assessment to allow those values to be given due weight in any decision making process. So we then relied by we I mean the district planners around the region, we then relied on the region coming in and making submissions in respect of any particular planning matter or resource consent application, so that we could assign some sort of weight and significance to that, and that didn't happen. So we had the first three wind farms go up in the Tararua's without any comment at all from the Regional Council. At all - and we

were desperately wanting some guidance in terms of how that was to be attributed.

[3.40 pm]

CHAIR: Is the position improving now in the sense that they are going through - we're an inquiry so it's not - there's no accountability from what you tell us in the sense of - it doesn't go into our recommendations or anything, but we would like to know whether or not there is inefficiencies in this integration of instruments, and your area's the area who have all these wind farms.

MR FOREST: Yes, I think there's a lot more that could be done. At one stage the Regional Council called the Mayors and its Chief Executives of the various constituent district authorities together, and said - look we really need you to sort out this wind farm business and you know, you need to tell us whereabouts in the district we can put wind farms in your districts, or where you can't put wind farms and my understanding and I wasn't party to that, but my understanding of the outcome of that was that the district said, well it's all very well, but we aren't wind farm experts, we don't have the expertise to know where the wind resources are, so we can't say these are the areas that we should go and equally, we're all at different levels in terms of identifying the values under section 6, as to where they shouldn't go, and so basically they just backed off on it and in fact they pulled out some aspects and I'm not quite sure if that was deliberate or whether it was just by omission, in terms of the landscape areas they thought - or deemed to be regionally significant or identified as being regionally significant, and so we've got to a stage now where my understanding is that all the Regional Councils is planning to do - is identify these landscape processes and values that if the districts and

when the districts get around to doing landscape assessments, that they do it in a manner which is consistent across the region.

CHAIR: So it's a methodology.

MR FOREST: So it's a methodology.

CHAIR: There's no mapping or anything?

MR FOREST: Not that I'm aware of, no, no. That's been suggested.

CHAIR: Right, but that's not part of this PC - this whatever.

MR FOREST: This One Plan -

CHAIR: Have you had any experience of using overlays for landscape - where you've got your zone, your underlying zone, and you have an overlay of an area which you manage it, for different values -

MR FOREST: Yes, yes I have.

CHAIR: And how's that worked? Could you see it working in the context of a wind farm? So you've got a high resource wind area, and you have it identified and within that identified area, you've got different assessment criteria or something like that, but it doesn't change your rural zoning.

MR FOREST: Yes that can work.

CHAIR: That can work.

MR FOREST: That can work. My experience has been that a lot of overlays have not been particularly well drafted, so it becomes a drafting issue and I - but that's a universal -

MRS BAUMANN: Conceptually it's quite a good approach.

MR FOREST: Yes, yes.

CHAIR: And your assessment criteria within your overlay, would that include things like ecology, landscape, amenity, all the things that - all the values that could be - would have to be addressed at the same time as the development values?

MR FOREST: Yes.

CHAIR: But that's not an approach that's been taken by Horizons?

MR FOREST: Not that I'm aware of, no.

CHAIR: What's happened to that Local Government resolution? Did it get passed?

MRS BAUMANN: Yes.

MR FOREST: My understanding is that -

CHAIR: But what happens to it?

MR FOREST: I don't know.

MRS BAUMANN: The same as the fate of other resolutions I imagine.

CHAIR: The cumulative effects issue - and it may be that - we may get some assistance when the Environment Court's case comes out in Project Hayes, because I understand in the Hinerangi ones, and the adjacent area, well not adjacent, but in close proximity - have you - in your experience with the list of wind farms, how have you accessed cumulative effects? Have you assessed it mainly on visual, have you?

MR FOREST: Yes.

CHAIR: So have you assessed it in respect of - in respect of - how can I put it, the capacity of the environment just to have such a large area dedicated to one type of development?

MR FOREST: Yes, indirectly in terms of amenity values.

CHAIR: Through amenity values.

MR FOREST: So we've assessed it in terms of the provisions that we have in the plan, the objectives and policies and reasoning that we have in the plan, in relation to those amenity values.

CHAIR: Right. Have you looked at the sustainability of the physical resource of these wind farms, the fact that if an area is clearly of high value as far as the resource is concerned, if you've got the infrastructure there and another one there, another one there, that that's a benefit at all, in sustaining physical resources rather than natural resources? Has that argument ever been run?

MR FOREST: As in economies of scale?

CHAIR: Yes.

MR FOREST: No.

CHAIR: I just wondered if it had ever been run because this policy talks about any scale and I just wondered -

MR FOREST: Yes, yes.

CHAIR: No that's fine.

MR FOREST: No, no I certainly haven't - I haven't experienced that. We certainly haven't looked at it from that point of view.

CHAIR: I suspect one day you might have to with all - everything that's happening in your area.

MR FOREST: Well I suspect, and this is only my suspicion - that that will be the next issue that will come up because our subsequent applications in the Puketoi Ranges for example, will be dependent on trying to have a single transmission line linked to the grid, and I'm aware already that several of the wind farm companies are trying to negotiate their way to provide that link to the grid, because at the moment there's no link. So there the economies of scale in terms of providing that link to the grid would become quite important.

CHAIR: That's just the - people often forget about the natural and physical resource sustainability, rather than just the natural resource.

MR FOREST: Yes.

CHAIR: Well I'm really grateful. Now Mr Cameron do you wish to add anything to what Mr Forest has said?

MR CAMERON: If I may.

CHAIR: Yes, certainly by all means. Mr Forest you may want to stay there in case you both wish to -

MR CAMERON: That would be very helpful in fact because we've discussed this at length. I think just to pick up on the last point, that you have raised Mr Chairman I think it is a significant issue potentially for the Tararua district, and indeed the last sentence of Mr Forest's paragraph 15 was intended to be directed at that very point.

CHAIR: If I could just pick that up. Oh the application - yes, yes.

MR CAMERON: And so very much from - within the Tararua district, it is certainly accepted that - and I think this is the subtlety if you like of the issue that we've been asked to assist with, and that is that of course the aggregation of wind farms in any one location as opposed to environment, if I can distinguish between the two, isn't necessarily going to be adverse as Mr Forest has said. The point is of course, is that if we look at the Tararua Ranges within the region, to pick up on the question of the regional instrument, and if we were to look at the environment within the region as a whole, and let's say the Tararua Ranges, we go from an area where there has been a significant aggregation of wind farms, around Tararua and behind Palmerston North and that continues with the -

[3.50 pm]

CHAIR: Mighty River -

MR CAMERON: Yes with the Mighty - and we're likely to be facing I think further application, a further application for a wind farm up in behind Shannon, relatively soon as well, and I act for the Horowhenua district as well, so it's an issue that I'm rather mindful of. So when you ask the question, as you have about the regional instruments, and in terms of that providing guidance, certainly the way in which I'm viewing this - at present is to ask myself this question and that is, well if we're going to look at aggregation of wind farms, and accept that that isn't necessarily going to be adverse in this location, what does that actually mean for the wider environment, because of course we may well have an outcome at the northern end of the region, if you like, or the northern end of the ranges, but on the other hand, at the southern end of the ranges, which are at the present time relatively unspoilt, it may be important that that remain so. And in fact, and so really what paragraph - what that sentence in paragraph 15 is really trying to emphasise, is that the issue of cumulative effect needs to be - cannot be considered in my view at least, simply within a district, and what might be tolerable within a district or to a district or to that community. It actually has to extend to an appreciation of the wider environment which that particular form of - and in this case wind farms, is actually potentially going to have an adverse effect on. So this issue of cumulative effect in my view, is one that has a number of subtle layers to it, and it cannot and does not necessarily - it cannot be applied in the way that we perhaps ordinarily do as practitioners in a very straight line form, and say well okay, this is what - these are the cumulative effects of this activity, therefore we actually have to have this far broader appreciation of what it might mean within the environment generally speaking. Now what is that environment - what does that consist of, in this particular instance, I think it consists of the Tararua Ranges as a whole.

CHAIR: That's very helpful because we've always had this issue with hyro going over several - but you bring it up with wind, and how many - is there just the one Regional Council or is there another one at the southern end?

MR CAMERON: No.

CHAIR: Does Wellington not come into that?

MR CAMERON: Wellington, yeah no Wellington does come into that. No, no, it's all - sorry it's all Horizons from Tararua, I'm sorry I'm thinking of Horowhenua as well, down the southern end of Tararua Ranges.

MR FOREST: There's one piece of Tararua in the southern end, southern corner, south east corner that's within the Wellington region, but it's not very nice.

CHAIR: So normally it would be a regional instrument, but once again it may be that it could be a national issue.

MR CAMERON: So I think certainly in terms of this issue of cumulative effects, we need to approach it with some care, having regard to the layers, the layer point I suspect - the layer point which is I guess an acceptable way of expressing the point that I'm endeavouring to make. I'm very, very interested picking up on the discussion you've just had with Mr Forest on the point of the overlay, use of overlays, I should tell you why, in the context of the advice that I will give as a consequence of the discussions that Mr Forest and I have had, and our overview or overall consideration at least to this point of what is proposed in this National Policy Statement, and that is that it is certainly absolutely clear to me that smaller rural councils and councils generally, but smaller rural councils which I think struggle with some of these issues, will have to carry out appropriate and

acceptable levels of assessment in relation to section 6, protection issues. So in other words, issues of biodiversity protection, issues of landscape, what constitutes an outstanding landscape within the districts, they are going to have to be assessed and comprehensively understood. Now I make that point because in my opinion at least, putting to one side the issue of section 7 amenity related issues for a moment, if one is going to develop an overlay it will have to consist of -it should consist of, and this is a submission being made in response to the discussion you've just been having, so excuse me if it's incomplete, but the point that I would wish to stress to my client I think, is that any such overlay zone would need to be carefully developed on the basis of a section 6 assessment, which would need to incorporate an appreciation of the amenity value related outcomes - related amenity value issues which the district plan themselves, and section 7 mandates be given consideration.

CHAIR: Yes.

MR CAMERON: Now if that approach is taken then of course an overlay however one might wish to express it, if you want to put it - take the approach of an overlay, immediately falls out of that process, I think.

CHAIR: Yes, Indeed and if I can just explore that with you, because it's a very interesting conversation we're having on this. Section 7 - the reason I raised it was as you've pointed out Mr Cameron, the amenity comes under section 7 and is bound to and so is the electricity issue, it's under 7, so it's to get - to get the process of getting these values recognised in one instrument, and that was just -

MR CAMERON: Well I accept entirely that that would be desirable but I'm going to take it - just if I can just develop the point a little further -

CHAIR: Yes and I realise there's resourcing issue's -

MR CAMERON: Well put that to one side, certainly my - the advice I will give my clients, particularly a client such as Tararua and I might add Horowhenua and any other district that I think is perhaps going to need to consider the effects of wind farms in the future, I think we also need to take into account not only the need for an overlay zone as such, but also what the status of any activity will be within that zone, and I think
Mr Forest and I both agree on this, despite that is perhaps might not be as clear from his statement of evidence as it might be, that within any such overlay zone we would consider that any activity such as wind farms or that may impact on those values, would need to be a non-complying activity. Now in this way, we then start to - we start from the premise within the Tararua district, that this activity is a default activity, defaults to discretionary, so we are relying very heavily on a section 5 overall judgement and we are making that point very, very clear. On the other hand, we do take - I take the view that if the National Policy Statement becomes operative, then there will need to be assessment of the section 6 and other related concerns, and an overlay outcome may well be preferable but certainly those areas which lie within such an overlay, if we were to adopt that approach, would need to be the approach I think the activity status should be non-complying. Now in that way - we can start to come to terms with this issue of effects and perhaps cumulative effects, in a way which at least ensures that the effects of wind farms are not going to impact on areas that are considered to be sensitive, and that's a word that Mr Forest used and this was the argument that, if you like, underpins the reasoning that - of his evidence.

CHAIR: Would it be possible within the overlay concept, when you're doing the work, if you find that your landscape or ecological values are in section 6 terms are really high, to show the wind farm as non-complying within

those areas, but in the areas where amenity values and development values for want of a better term, wind farms, are sort of on a pa, you could look at it in a restricted discretionary, and say the discretion is restricted to looking at the amenity values. In that way you would be speaking of intended policy as well.

MR CAMERON: Well that may well be the view that you have - as to the way in which the extra emphasis as Ms Baumann has put it, is to be given effect pursuant to section 55, and certainly I don't' have a difficulty with that and it would just be important however to ensure that those criteria are sufficiently thorough, to ensure that if it is to be considered on a restricted basis, then it has some utility to those potentially affected although I must say that the recent - that the amendment proposed in the current Bill, which does away with the woolly approach to restricted discretionary activities actually would assist us with such.

[4.00 pm]

CHAIR: Right.

MR CAMERON: I can't think of a lot, but that is one that stands out to me because everybody gets utterly cross eyed I think with that decision, me included and I do think that does open up opportunities such as this which, I think were more problematic.

CHAIR: Well you may be interested to know gentlemen that the - there's been a different view given by a number of generators, you'd think there might be the same view, but some generators have said that - admittedly these are witnesses giving evidence in a generator - that may not be a board view, but some have said that we would like - we would like the ability - we'd like some certainty, and it's better to actually know where these values,

section 6 values are, and where the community says look we just do not want wind farms, we'd rather know that - than go through the process and that's where you get to at the end of the day, so that's been one view, and the other view of course is well just let's leave it to a discretionary activity and we will have ago and see how we get on, and we've go the expertise on the wind and the local authorities got the expertise in the other values. And so we're getting different approaches here.

MR CAMERON: That's exactly what we got through the submission process for the Tararua -

CHAIR: Did you?

MR CAMERON: Yes.

CHAIR: That's interesting.

MR CAMERON: There wasn't a single wind farm operator that wanted anything other than discretionary activity status - which was interesting. We expected that possibly they could be asking for say control or restricted discretionary, but they were more accepting of discretionary, but the big difference was the difference that you've outlined.

CHAIR: Right.

MR CAMERON: Some might have wanted greater certainty, and others were quite happy to just leave it as a default, discretionary and take it on its merits under section 5 in Part 2.

CHAIR: Well we feel for you because we know what you've been through.

MRS BAUMANN: Feel for us too.

MR CAMERON: Well I do - we do, that's right, we do. I made that comment before.

CHAIR: I interrupted you sorry.

MR CAMERON: I think - I have pretty much covered the points that I wish to make. I do want to emphasise that in terms of the discussions that Mr Forest and I have had, and the way in which this plan is presently structured, we do place and I think this really is in direct response I think to you sir, is that the overall judgement approach is one with the right activity status, having regard to an appropriate assessment of what constitutes a sensitive environment warranting levels of section 6 protection and so forth within the district, it will become very necessary for - if we're going to succeed within our district, to deal with the issues of this, and inevitably wind farms give rise to, you'll need to take this - take such approach. But I do think that this proposed National Policy Statement if it becomes operative - will trigger that response and certainly it does in my mind. That's the outcome that I believe I'm obliged to provide. That's the advice that I'm going to be obliged - as a consequence of this process.

Lastly in terms of - one last question the capacity of the environment dedicated to one type of activity I think - I have really wrestled with that issue in the course of our consideration of this matter generally. For the reasons that are expressed in that last sentence of Mr Forest's paragraph 15, we have put that to one side, and we believe that - sorry it is our opinion, that we would rather approach it on the basis that we have discussed it, than to concentrate on any concern of that nature.

CHAIR: And it may be in section 9 terms that you'd have some difficulties with it.

MR CAMERON: I agree, but for completeness I thought I should just add that, to the discussion.

CHAIR: Yes. Well thank you very much. Now Mr Cameron do you have any difficulties with Mr Forest providing us with his expertise.

MR CAMERON: Not at all, can I just tell you that he has considerable more expertise, and he is a resource that would be well capped in this respect.

CHAIR: Well thank you very much for your help, both - and thank you for taking time out to submit because we realise that we're - this wasn't scheduled for.

MR CAMERON: No not at all, it's been actually a real pleasure and it's helped us both as well, with our consideration of issues that we are having - to deal with, so it's far from being a (inaudible).

CHAIR: Right well thank you. We'll adjourn the hearing now.

ADJOURNED [4.05 pm]