BIOENERGY ASSOCIATION OF NEW ZEALAND Inc
OFFICIAL SUBMISSION TO EECA ON THE SUBJECT OF

REFINING THE RENEWABLE ENERGY TARGET AND MECHANISMS

Date : 17th December, 2001

1.0 Introduction

This paper has been prepared in response to EECA's letter dated 28th November 2001 to the Bioenergy Association of New Zealand (BANZ) on the subject of Refining the Renewable Energy Target and Mechanisms.

This paper represents the official submission of BANZ regarding suggested mechanisms required to achieve the Governments desired objective of a progressive transition to renewable energy for New Zealand and suggests reasonable targets. Wherever possible, supporting information and statistics have been included.

Given BANZ specific interests/expertise this paper deals almost wholly with stationary energy forms, and does not seek to address transport fuels (other than comments on R&D)

The majority of this paper was prepared in advance of the Background Paper distributed by EECA on 28th November. Therefore, inevitably, there will be some overlap of comments. Given time constraints, a detailed discussion of the Background Paper has not been feasible

Executive Summary

BANZ recommends a Renewable Energy Credit system with separate targets for the industrial heat sector (thermal REC or "t-REC") and the electricity sector ("e-REC"). Though more work is required to examine whether it would be feasible/more efficient to merge these into a single REC.
BANZ believes a reasonable target for the industrial heat sector is 14.6 PJ output (or 19.6 PJ input).
BANZ recommends mechanisms to give assistance for the (capital) costs of transitioning from fossil fuels to renewable energy.
In order to create certainty the renewable energy target that is ultimately chosen should be at the high end of the range, and it should be reviewed at least every two years.
In order to prevent a lull in renewable energy uptake (between now and legislation being implemented), followed by a surge in projects when mechanisms are clarified (with the consequent creation of resource bottlenecks) an announcement regarding the commencement date for eligibility should be made with urgency. This announcement should assure parties that any renewable energy initiative commissioned after 1st January 2002 (latest) will qualify for any mechanism/incentive that is eventually enacted.
Furthermore a statement that all future renewable energy projects will qualify for REC's will ease administration, increase uptake rates and promote equity.
A fast-track Resource Consenting process needs to be developed for renewable energy projects.

2.0 BANZ position on Renewable Energy

BANZ position is as follows :

1. New Zealand should use a combination of carbon sinks, renewable energy and energy efficiency to meet its Kyoto obligations.
2. Action should be taken immediately to increase the proportion of renewable energy in New Zealand's energy mix.
3. Any prevarication with respect to a Renewable Energy Policy will merely result in a net cost to New Zealand :a delay in legislation will mean less renewable energy uptake, therefore less carbon emissions are displaced so the future value of net credits (i.e. sinks less emissions) available for international trading when the first commitment period arrives, will be less)
4. With its plentiful natural renewable resources New Zealand is well positioned to set large but realistic targets.
5. Any Renewable Energy Policy should not significantly disadvantage New Zealand industry relative to its international competitors.
6. Any mechanism that is adopted should be economically efficient and encourage least cost marginal displacement
7. There should be equal treatment for all (emitters should not be shielded)
8. Increasing the use of renewables is a desirable target and should be pursued irrespective of whether New Zealand's ratifies the Kyoto protocol or not.
9. A mechanism should be employed which levels the playing field for the building of sustainable energy plants, so that there are incentives for responsible industrial customers to invest in renewables.
10. BANZ does not seek to give any competitive advantage to any particular form of renewable energy. Any solution must be simple and functional and allow commercial forces to chose the least cost energy source best suited to any particular application.

3.0 General comments

3.1 Research

BANZ believes that New Zealand is in a good position in the medium to long term to be taking advantage of its natural resources for the production of liquid biofuels, such as biomethanol, bioethanol and biodiesel. Although uncompetitive currently, research into these technologies should be encouraged, and assistance given to field testing and pilot projects. Success in this field could lead to major fossil fuel displacement within New Zealand and/or significant export opportunities for New Zealand.

3.2 Legislation

Existing impediments to use of biofuel blends in transport fuels should be removed.

3.3 Winners and Losers ?

As the NEECS Background Paper acknowledges any mechanism will inevitably create winners and losers. BANZ recommended solution will allow market forces to work, which ultimately encourages equity.

3.4 Timing

BANZ is already encountering the attitude amongst some industry sectors that they are not going to implement renewable energy projects as it would be foolish to 'jump the gun' and thus risk not capturing the benefits of any incentive or REC.

This is an issue that needs to be addressed sympathetically by Government - and with some urgency - or there is a risk of actually decelerating conversion to renewable energy sources. Over the next 18 months there will be little or no movement by industry unless it gets a clear assurance that any projects on the drawing boards will receive the credits or incentives that are eventually eligible for such initiatives.

A press release/policy statement from EECA indicating that the Government has such a stance will get more projects off the drawing boards, and prevent the "retardation effect". It will have the added benefits of reducing the inevitable bottlenecks now forming (eg consultancy and plant manufacturing), whilst allowing lessons to be learned and administrative teething problems to be resolved.

3.5 Publicity

BANZ is encouraged to see that EECA intend to educate and provide timely and relevant information to decision makers.

BANZ believes that the majority of end consumers, if educated on the issues of climate change (and the role that renewable energy plays in emissions abatement) and if provided with timely and relevant information, will normally chose the product manufactured using renewable energy instead of the product manufactured using fossil fuel energy – provided there is little/no price difference. Increasingly surveys show that consumers will chose a product associated with a worthy cause over its competitors provided there is little or no price difference (see Marketing magazine article entitled " ----------" dated 2001. Furthermore there is increasing evidence that energy consumers are willing to pay a premium to use renewable electricity (eg Tararua wind energy and Origin Energy in Australia). This is without any assistance from central authorities. The "Green Energy" support factor.

Countless similar systems are being implemented around the world and concepts have been developed in New Zealand that, if implemented, would ensure that industry is positively motivated to change to renewables; it will see competitive advantage in doing so. Such a concept would have the added benefit if significantly reducing the tensions between industry and Government, whilst accelerating the rate of uptake.

4.0 Possible mechanisms to encourage the uptake of renewable energy

This section contains a brief discussion of the broad mechanisms that are available to Government to encourage the use of renewables, and states the BANZ position on each. These mechanisms are not preferred by BANZ. The BANZ recommended mechanism is covered in section 5.

4.1 Tradeable Fossil Fuel Permits

(No time to appraise pro's and con's)

4.2 Negotiated Greenhouse Agreements (NGA's)

NGA's, whilst simple in principle, will inevitably lead to accusations and finger pointing : Any agreement reached by one company/industry will set the benchmark for the others. Furthermore it will lead to different treatment for different industries, thus compromising the integrity of the principle of equal treatment for all.

Ultimately such a system favours those who prevaricate and negotiate hard. BANZ has heard leaders within industry express the following attitude: "If the Government goes for an NGA system it won't need a carbon tax, so all we need to do is prevaricate, so that our competitors make their agreements - then we won't have to."

The cement and steel industries may see NGA's as a tool to negotiate zero or little action, hence their support for this process.

BANZ recommend that a firm statement by Government is required to clarify that NGA's are not a viable mechanism and that it does not plan to pursue it. This, in conjunction with a statement clarifying that credit (in whatever final form the Government adopts) will be earned for initiatives from this point onwards will prevent inaction in the short term.

4.3 Carbon Tax

Whilst such a system is relatively simple to administer it does, potentially, have significant drawbacks. For instance major electricity generators have a position that, under a carbon tax regime they will not make any changes to their generation base – whilst at the same time acknowledging that there would be the incentive to act under a Renewable Energy Credit system. With a carbon tax the fossil fuel generator will pay more for their fuel but will simply pass that on to the consumer – so the desired outcome will not be achieved.

With a carbon tax regime clearly the cost of fossil fuel-generated electricity will rise. Given New Zealand's specific circumstances (with a large proportion of electricity being generated by precipitation-constrained hydro-generators - who therefore cannot supply a greater market share than currently) logic dictates that the price of hydro-electricity will shadow the price of fossil fuel derived energy. This will be a windfall gain to the hydro generators, at the expense of the consumer who is a captive market. Ultimately, under a carbon tax regime, the whole cost of the carbon tax is passed on to the consumer and there is no resultant displacement of fossil fuels.

4.3.1 How to overcome the potential significant drawbacks?

BANZ strongly advocates that, if selected as the chosen mechanism, any revenues from a carbon tax must not be used to subsidise government income (and thus allow another tax form to be reduced). This would be a blatant misuse of an environmental tax : Any revenue generated from an eco-levy must be channeled into a separate fund which is used exclusively to accelerate the displacement of fossil fuels (for example by assisting with the capital cost of transition – see section 4.4), and to encourage research into, and development of, more future-friendly energy technologies and fuels.

Such principles are being used to collect and administer carbon taxes in European countries. To use revenues generated by a carbon tax in any other way is to take the revenues created by long-term damage to the global climate to fund short term tax reductions.

BANZ would like to make it clear that, provided these principles are adhered to, then a carbon tax system is its second-preferred option (see recommended option below).

4.4 Capital Incentives

The greatest challenge facing renewable energy is to displace existing fossil fuel usage. Specifically within the heat sector businesses will be reluctant to change a system that currently performs the task required of it adequately. Furthermore the capital has already been sunk into the existing plant so users are faced with the added hurdle of sourcing (and justifying) additional capital expenditure to finance the implementation of a renewable energy source.
(Business as usual growth : It should be relatively easy to ensure that this category has a high percentage of renewable usage, as the disruption to a business is less if renewable energy is designed into the system from the outset).

4.4.1 How to overcome the capital constraints

This challenge can be overcome if the right mechanism is chosen, with the right level of incentive and/or penalty. One suggested mechanism is for a low level carbon tax to be used to create a capital fund which is then used to incentivise business to be installing renewable energy plant.

The administration of such a system would be very simple.

The incentive should be linked to the carbon displaced. A suggested value of US$35-45/tonne, applied to the Carbon displaced over the period 2008-2012, discounted to current values, should be sufficient to provide the requisite capital assistance for the user to make the transition to renewable energy.

This modelling is quite simple, and, if applied to the targets recommended in section 6, would lead to annual assistance to industry of approximately $5-10 million. A very low portion of revenues generated from carbon tax would cover such an initiative.
(model to be attached if time allows)

4.4.2 Justifiable?

Such a mechanism would be very justifiable.

- The Government would be showing real leadership
- The mechanism, using a low level carbon tax, would be cash neutral or even positive.
- The Government can justify it : “We are procuring the carbon credits from industry immediately, so that New Zealand industry can adopt renewable energy now, without the risk of exposure to the ultimate price of carbon”
- This removal of risk leads to earlier uptake, so New Zealand Inc has more carbon credits which can be traded internationally in time.
- The Government will bear the risk (or reward) of the carbon trading at a price different to the chosen value of the capital incentive.
- The coal user would be displacing more fossil fuel emissions by switching, and so would gain the largest capital assistance from switching. This means the highest polluters would switch first.

4.5 Complimentary mechanisms

Various other mechanisms are available which could either be used in isolation, but would be most effective in conjunction with one of the broader mechanisms outlined above.

Tax breaks or accelerated depreciation mechanisms would aid cashflow and/or decrease the impact of capital spend and thus increase the incentive for industry to switch to renewables. Such mechanisms can have the effect of providing up to 20% assistance.

4.6. Blended fuels

One of the easiest ways to increase the use of renewable fuels is to mandate that coal users should co-fire : i.e. use a coal-based fuel blended with woody biomass. This will (generally) require little/no capital cost, especially where the user is using coal in non-powder form, and where coal/wood pellets or briquettes can easily be used. Such fuel substitution could qualify as a thermal REC.

4.7 The Dual Mechanism approach

It is eminently feasible to combine a low-level carbon tax regime with a REC scheme. The revenues generated from the Carbon tax could/should be used to encourage the uptake of renewables (for example by assisting with the capital expenditure – see section 4.4).

This would embody the equitable principle of hitting the biggest polluter hardest.

The downside is higher administrative costs to run two systems, and to integrate them, but these are not insurmountable.

5.0 BANZ Recommended Mechanism

The above reservations have lead BANZ to its conclusion that the most viable and effective solution is a Renewable Energy Credit scheme. The following sections lay out the pro's and con's of a REC system, how the mechanism can be administered, what levels of renewable energy uptake can be expected under such a scheme, and provide supporting data wherever possible.

5.1 Renewable Energy Credits (REC's)

The shortcomings of the other possible mechanisms have led BANZ to its conclusion that the most viable and effective solution is a Renewable Energy Credit scheme.

5.2 Mechanism

As laid out in the NEECS Background paper, a REC system creates the incentives for change by giving industry a choice between:

- Implementing renewable energy generation. It can then sell the surplus onto the open REC market or to the relevant authority.
- Do nothing, but buy the requisite REC's on the open market or from the relevant authority.
- Do nothing and pay the penalty for not implementing and not purchasing REC's.

The cost of this last alternative to the generator/user is capped using a maximum penalty level set in advance; hereinafter referred to as the backstop.

5.2.1 Efficient, low cost mechanism that protects international competitiveness.

Clearly the availability of these three alternatives leads to an efficient system, which suits all energy generators/users. If it is feasible and economic (given the ability to generate revenues by selling the excess REC's created) then generators/users will implement renewable energy projects.

The use of renewables would increase – so achieving the objectives of fossil fuel displacement – but at a very low overall increase in average cost per unit of energy. Thus the competitiveness of New Zealand industry will not be compromised against our international trading partners, regardless of their reaction to Climate Change.

5.2.2 Point of obligation

For the electricity sector the point of obligation should lie with the generator.
For the heat sector the point of obligation should lie with the heat user. This is the most practical solution for the heat sector, as it will result in pull from within the sector – always more expedient and more resource efficient than a push approach by sellers of bioenergy plant or fuel.

5.2.3 Threshold and Administration

Such a system would be reasonably easy to administer. A lower threshold of (say) $1MW_{th}$ could be used during the early stages of a renewable policy. An alternative measure/threshold would be 25,000 GJ per year – this removes the issue of utilisation levels, and is more verifiable from records.
This level is suggested for the following reasons :

- Such a level would capture all the significant users of fossil fuels. Speculatively BANZ suggests that this should cover around 80% of thermal heat use in New Zealand.
- Though EECA's data-files may contain such info, BANZ suggests that such a level probably involves 1-2,000 heat users across New Zealand – therefore a thermal REC scheme with such a level should be relatively easy to administer.
- Such a level captures the low hanging fruit : applies the 80/20 rule.

- Such a cut-off level does not preclude (indeed may compliment) another mechanism for the smaller heat user, who are (depending on the nature of the end use) maybe better suited to other forms of heat generation (such as solar)
- Bioenergy is more economical at larger scales. $1MW_{th}$ (or 25,000 GJ/yr) is a realistic starting level.
- (Note that heat users below $1MW_{th}$ (or 25,000 GJ/yr) should still be able to sell t-REC's – though, due to their size, should be under none of the obligations created by a thermal REC scheme. This will allow opportunistic players to gain the credits associated with displacing fossil fuels where, for whatever reason, this is feasible).
- A tiered system could be used to take account of whether the t-REC is displacing existing usage, or is new heat use. This would add complexity to the system – but, provided simple delineation's can be drawn then the system could use a simple factor (of 100% of the suggested value in section 5.3.2 for existing fossil fuel displacement, or (say) 70% for new use.

Energy bills can be used to verify heat usage. The energy data could be sourced from the fuel retailers, of which there are few : so identifying the heat users will be easy, and independently verifiable.
The IRD could therefore add this to their scope of auditing. Another authority/agency could take responsibility for verifying the usage and sources (past and present) In such a way existing infrastructure can be utilised. Though the resources would need to be boosted (more manpower and some system refinements/extensions) this is a relatively easy and cheap way to get such a thermal REC system working.

5.2.4 Business as Usual versus Displacement ?
To a large extent this debate is a distraction. There is a case to be made that only generation (heat or electricity) that would not have happened without a mechanism/incentive should qualify for REC's. However such a stance would introduce arguments of inequitable treatment, and debates as to whether a project should qualify or not.

BANZ recommends that all projects commissioned from 1st January 2002 (latest) should qualify for REC's. This simple rule will eliminate costly and wasteful debate. Realistically the sector most at risk of not qualifying for REC's is, perversely, the sector that is the most environmentally responsible and sustainable - Forestry. (Because forestry industries generally either produce wood waste and/or are located close to forestry residue such facilities will have a greater challenge to claim/justify that a project is eligible for REC's – as authorities could argue it is BAU. This could lead to an inability to claim REC's – whereas competing industries can) Why penalise this sector relative to industries which are both less sustainable and more energy intensive?
The forestry sector needs all the help and stimulation it can get. Although BANZ appreciates that decisions are yet to be finalised the forestry industry is currently faced with the possibility of having certain obligations imposed on it as a sink - which will make it less competitive in its overseas markets. The sector would welcome any mechanism that would sweeten that pill.

5.2.5 The importance of the backstop
The backstop penalty puts a cap on any parties liabilities. Crucially this provides a maximum cost, which is centrally controlled by the Government. The fact that, over-time the backstop can be altered (increased or decreased) gives the flexibility that if the renewable energy uptake level is not sufficient then the backstop level can be increased – thus increasing the financial impact on the energy user and hence increasing the incentive to change, or to buy credits.

Such a flexible backstop will allow market forces to work and least cost solutions to be implemented first. Commercial forces prevail - and an efficient mechanism delivers the desired results.

So once a certain target is achieved, or indeed, looks like it will not be reached, then the backstop level can be altered upwards to accelerate the uptake rates.

The availability of such a flexible mechanism, if enshrined in the Climate Protection Bill, has two major benefits :

- Major mistakes can be avoided : Given the tight timeframes of the Government and the inevitable imprecise science of forecasting uptake levels under any mechanism, the Government can change the backstop level if it looks like the original level was not leading to the desired results.
- When certain targets are reached, the backstop level can be further increased, making viable the next tier of technologies on the price curve.

5.2.6 Low risk option

A REC system is of low risk to the Government. It has been proven to work in this region of the world. It can be implemented with a low impact on the cost of energy to the domestic consumer and to industry. Regardless of which way the decision to ratify Kyoto falls a REC system supports the vision of the Government. Emissions will be reduced, and the targets and backstops can be adjusted according to the uptake rates.

5.2.7 Single REC Mechanism

A limited amount of consideration has been given by BANZ to a single REC covering all use of energy; electricity, heat and transport fuel. This mechanism could be instead of the separated heat/electricity system outlined above.

A single REC mechanism would necessitate a number of conversion factors to be applicable to different energy use situations. These conversion factors would be available in the same manner that IRD publishes depreciation tables.

Such a mechanism could be administered in the same manner as GST returns. Electricity generators, heat users, and transport fuel suppliers would provide monthly REC returns advising of how many REC debits and credits they had created and used themselves, purchased, or sold. Having a universal REC system applying to all energy would be administratively and conceptually simple to manage.

5.3 Sector specific targets

Certain energy types and fuels are best suited to different sectors of energy demand. Therefore BANZ believes that the best solution (i.e. most efficient, least cost displacement of fossil fuels) is to divide the total energy sector into three broad sectors; electricity, heat and transport. A REC scheme is well suited to the first two of these categories. Separate mechanisms (such a carbon tax regime or Mandated Renewable Energy Target) should be used to address the transport sector, which, therefore will not be considered further in this paper.

5.3.1 Electricity

- Renewable energy forms eligible in this sector are (in no particular order) hydro, solar, tidal, landfill gas, wave, geothermal, wind and biomass. Some of these forms of generation are (at present) more competitive than others. Mechanisms should not favour any particular generation technology - market forces should be allowed to work.
- Electricity REC's would be known as "e-REC's".
- Assuming that the difference between investing in renewable technologies rather than currently used fossil fuelled technologies for *electricity generation* is between 3 and 5 c/kWh, then this provides a baseline for establishing electricity REC values.
- All sellers of electricity to the Grid should be required to annually lodge electricity REC's in proportion to their sale of generation compared to the generation sales of the country.
- These REC's can be either: sourced from installing renewable generation, or purchased from a party with an excess of REC's, or purchased from the greenhouse authority at the backstop price of (say) 4 c/kWh.
- A target for this specific sector, by 2012 needs, to be nominated, but could be, say, 4000 GWh/a (14.4 PJ output) by 2012. Some of this would be from bioenergy but it is difficult to estimate how much – from Co-generation alone it may be around 150MW_e – or 1,230 GWh/a (4 PJ's)
- If Project Aqua were to proceed (potentially over 500MW_e) then this target should be revised upwards.
- There could be a fossil fuel factor (say 2) which would mean that fossil fuelled generators had to lodge twice the number of REC's as Hydro or Geothermal generators in proportion to their share of the country's electricity generation.

5.3.2 Heat

- The renewable energy forms eligible in this sector are as for the electricity energy sector. However, realistically, some of these forms of generation are (at present) not suited to heat generation. As above, mechanisms should not favour any particular generation technology - market forces should be allowed to work.
- Thermal REC's would be known as "t-REC's".
- A reasonable green heat target is suggested to be 14.6 PJ output (19.4 PJ input), based on the following assumptions :
    - An average plant would be used for 7,500 hours per year (ie 6 day week, 24 hours per day)
    - Average utilisation of 90% of peak output during this 7,500 hours.
    - This leads to a total average utilisation of approx 77%
- This level is very feasible from bioenergy (see section 6.1 below). In addition to this some opportunities to use geothermal steam will exist. The scale of the geothermal opportunities have not been appraised by BANZ. It may be that there is some small overlap within this 14.6PJ's but the overlap is not expected to be significant.
- A t-REC could be sourced and traded, where all Industrial/commercial heat users (above a certain size – see section 5.2.3) produced from fossil fuels requires the user to lodge their proportionate share of t-REC's annually with the authority.
- Because it takes about twice as much fossil fuel input energy (typically) to create 1MW_e versus 1MW_{th}, displacing fossil fuel generated heat displaces only a half of the carbon emissions displaced by renewable electricity. So in order to ensure consistency between any renewable energy bill and any

climate change/Kyoto legislation the relative quantities of carbon displaced need to be recognised in the mechanisms of a REC scheme.

- Therefore t-REC's would be expected to be worth about half of an e-REC, so the backstop t-REC would be worth say 1.9 c/kWh (approx $5.30/GJ on output heat – meaning if the boiler were 80% efficient the backstop REC would equate to approx $4.00/GJ on fuel input – see calculations in section 5.3.3) and would be expected to trade at lower than this figure.

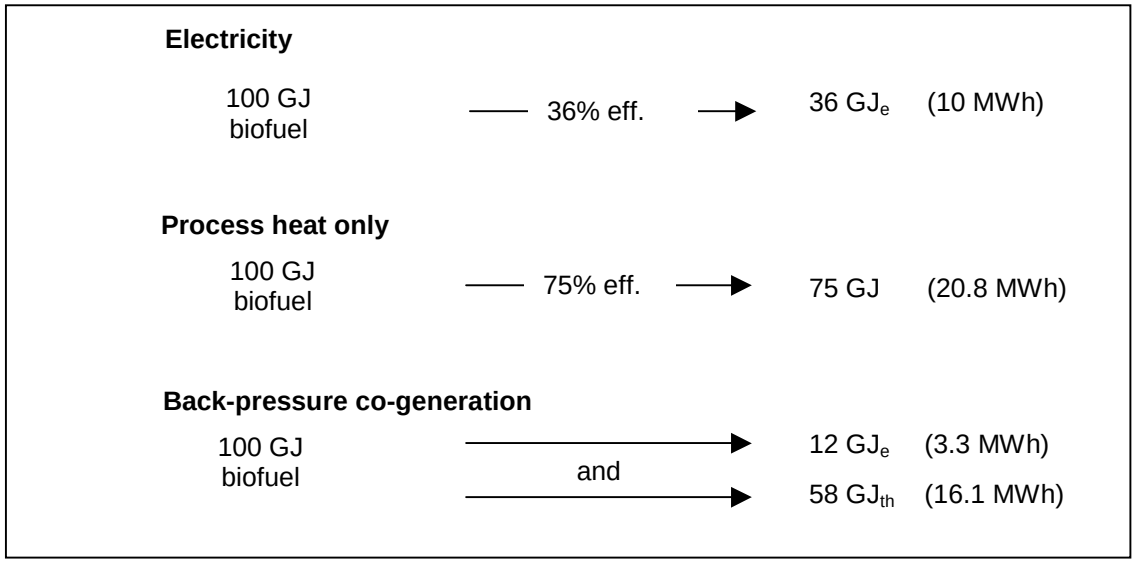
5.3.3 Combining heat and electricity to optimise efficiency

The most significant improvement in emissions reductions in the Industrial sector will come from biomass fuelled back-pressure turbine co-generation.

One of the shortfalls in the Australian REC regime is that it encourages biomass condensing steam turbine electricity generation (approximately 36% efficient) at the expense of biomass co-generation which may only have a 12% electrical efficiency but can operate at 70% *overall* efficiency. A regime which includes both e-REC's and t-REC's would go a long way to addressing this problem.

The following explains this principle in more detail :

Table 1 : Conversion Efficiencies for Fuel Utilisation



Setting a REC value for process heat:

Value of REC for process heat = (Value of REC for electricity)
× (conversion efficiency of fuel to electricity)
÷ (conversion efficiency of fuel to useful heat)

i.e. for example above $0.04 × 0.36 /.75 = $0.192

Table 2 : RECs received for using 100 GJ of biofuel in different ways:

	Electricity		Heat		Total	
	Produced (MWh)	REC attracted (@$40/MWh)	Produced (MWh)	t-REC attracted (@$19.2/MWh)	$ Total	**$/GJ fuel**
Electricity only	10	$400			$400	**$4.00**
Heat only			20.8	$400	$400	**$4.00**
Back-pressure Cogeneration	3.3	$132	16.1	$309	$441	**$4.41**

6.0 The Renewable Energy Targets and their effect on Certainty

BANZ encourages the Government to adopt aggressive renewable energy targets. New Zealand is well positioned to show true global leadership, with a low cost of uptake. This will lead to the following advantages:

- Enhancement of New Zealand reputation as an environmental leader.
- Associated spin-off benefits in tourism and exports.
- In time the consumer will demand products manufactured with minimum impact to the environment - New Zealand will be well positioned to capture the market share and price premiums that will be paid for such properties.
- Export of technologies and expertise developed in the renewables field.
- A more robust, better balanced energy supply less dependent on rainfall and fossil fuels.
- A healthier environment, with associated savings in health costs and increases in productivity.
- Job creation.
- Waste minimisation.

6.1 Target Range for the Heat sector

From the numbers suggested above BANZ are recommending approximately 30PJ's of new renewable energy (both sectors of stationary energy, but excluding domestic heat and small commercial users) by 2012. This is felt to be quite conservative and should be revisited. We would expect it to be increased in time, especially in the electricity sector as technologies improve.

Given its' area of expertise in biomass the comments below relate to the Heat sector target of 14.6PJ's. Below is a broad analysis of whether such a level passes the high-level tests of resource availability and suitable energy demand.

6.1.1 Resource availability

New Zealand has an abundance of reasonably well distributed biomass. At current levels of log production, there are (conservatively) around 4 million tonnes of biomass left in the forests every year. Assumptions :

- Only 50% of this is readily recoverable, so say, 2,000,000 per year
- Only 50% is within reasonable distance (say 60km) of a heat demand *(more work needs to be done in this area to look at the geographical match between resources and heat demand)*: So say only 1,000,000 tones per year of forest residue is economically available.
- Add to this figure the amount of clean (untreated) wood processing residue currently being dumped, conservatively estimated at 700,000 tonnes per year *(more work required here to verify : WasteMinz could supply some numbers?)*
- Also add other green waste (prunings, trimmings etc) going to landfill and other clean construction and demolition waste and there is at least another 300,000 tonnes available per year.
- This leads to a total resource availability of at least 2,000,000 tonnes of biomass per year.

(Whole section re-worked here – original taken out to prevent confusion !!)

Such a level of resource availability, if one assumes an average calorific value of 10GJ/tonne) means there is around 20 million GJ of biofuel readily available - which can only increase as forest harvesting rates increase and harvesting processes are improved to allow more biofuel to be economically recovered.

20 million GJ equates to around 14.6 PJ of output heat (or 19.4 PJ input heat assuming an efficiency of 75%)

Assuming a thermal heat plant is run at an overall utilisation level of 77% (see section 5.3.2) then this leads to an installed capacity of around 600MW_{th}. So the next question is whether all this bioenergy can be used in New Zealand's energy system.

6.1.2 Suitable demand

Having verified that the resources are economically available, the other question is whether there is sufficient energy demand for 14.6 PJ's of thermal heat. At this point – in order to compare like for like – it is appropriate to switch to input heat - so 19.4 PJ is the pertinent number.

*Note : BANZ are aware that the figures below are very general, and that more work is required to analyse each of these sectors in more detail. BANZ suggests that EECA's data-files may be useful for this, or, if not, then a specific study is commissioned as soon as possible. **

An analysis of the existing gas, oil and coal use in New Zealand reveals a current usage rate of 92PJ's within the industrial, agricultural and commercial sectors (EECA figures – Energy Data File July 2001) This sector also uses 79PJ's of electricity, of which a good proportion will be for space and water heating.

Note that this submission has not considered the Residential sector, where 6PJ's of gas and 42PJ's of electricity is used currently. A substantial portion of the electricity usage will be for space and water heating. At a later stage mechanisms to increase renewables within this sector should be considered (such as energy island, district heating, solar heating etc. The Norwegians consider this sector to be equally easy to switch to renewables, with a relatively simple administration system)

Allowing for expansion in the dairy and forestry sector alone this 92PJ's will rise substantially. Thus a 19.4 PJ target for this energy sector represents around 20 % of the total sector based on current size, but probably closer to 15% by the relevant date of 2012.

In total it is estimated that at least 130PJ's of energy are used in New Zealand for heat at the present time, likely to rise to at least 150PJ's. In that respect the recommended target for this sector represents around 12%.

** If one takes the view that (in order to create certainty) any target should be on the ambitious end of the range, then a detailed analysis of demand is not critical to the setting of the target.*

6.1.3 Uptake rates

The final reasonableness test is whether such a target represents a realistic uptake level per year. At approximately 600MW_{th} this equates to an average uptake of 60MW_{th} per year over the 10 year period. In this respect the target looks too conservative, so the target should be reviewed every two years at the least. To put this into perspective uptake rates over the years 2000, 2001 and 2002 are expected to average around 100MWth per year.

6.1.4 Conclusion

Clearly the 14.6 PJ (output) recommended target for the heat sector passes the tests of resource availability and (at least provisionally) suitable demand, as well as representing very achievable rates of uptake.

More work would need to be done to look at likely costs of adoption, but under a REC system market forces will soon find the right level, so lack of such information should not delay the choice of mechanism nor the implementation of such a mechanism.

6.2 Target range for the electricity sector

Other organisations/associations are better placed to comment authoritatively on this target. It could be that 14-15PJ's is very conservative, especially if Project Aqua proceeds.

6.3 Certainty

The governments desire to create certainty for business means that the renewable energy target must be able to be reviewed at a minimum of every two years. Any less than this will mean that businesses actually operate in a less certain environment – as a big project may mean over-supply of credits, thus suppressing the value the credits – which will negatively effect the economics of future project, and reduce the ability to plan projects with any certainty.

The objective of creating certainty is also a good argument to make a distinction between the heat and the electricity sector : Each sector would be isolated from the effect of any big project in the other sector.

7.0 Resource Consents

A major obstacle that will prevent and/or slow down the uptake of renewable energy is the time consuming, expensive and resource-intensive consenting process. Authorities need to realise the national/global benefit of renewable energy projects, and factor this into the process. Wherever possible renewable energy projects should receive fast-track processing.

8.0 Recommendations

BANZ recommends that a dual sector REC mechanism is implemented in New Zealand - dividing the stationary energy sector into electricity and heat and setting different targets for each sector. For the heat sector the target should be 14.6 PJ output (or 19.4 PJ input)

A Government policy statement should be issued as soon as possible clarifying that any renewable energy generation that goes on stream after 1st January 2002 (latest) will retrospectively qualify for the applicable levels of incentive/credits that are made available when the legislation is enacted.

Appendix 1

Precedents

Australia

As stated in the NEECS paper the Australians introduced legislation centred around mandated targets, with a REC system to support it and provide the funding and incentives for the system to be effective.
One key difference between Australia and NZ that should be noted, is that Australia is about 80-90% dependent on fossil fuel generation whereas NZ is about 65-75% dependent on hydro electricity.

Below are some notes taken at a recent interview of the Australian Greenhouse Office by a member of BANZ. This highlights learning's to date :
(To follow)

Norway

Norway has a broadly similar scheme to the Australians. However Heat is also included. The mechanisms they use for Heat are various subsidies and incentives. *(At this point BANZ is trying to find out more about how these work and their effect)*

Interestingly, the Norwegian Ministry of Petroleum and Energy is now evaluating whether the heat credits can be rolled down to smaller scale commercial and residential heating systems.