



Beacon Pathway Limited

Submission to draft New Zealand Energy Efficiency and Conservation Strategy

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I am happy to be contacted about our submission.

About Beacon

Beacon Pathway Ltd is a collaborative research consortium working to find affordable, attractive ways to make New Zealand's homes more sustainable: warmer, healthier, cheaper to run and kinder to the environment. Beacon aims to drive sustainability outcomes consistent with New Zealand sustainable development requirements.

Beacon is funded by industry, with matched revenue from Government research funds from the Foundation for Research, Science and Technology. There are currently five shareholding partners –

Building Research,

Scion,

New Zealand Steel,

Waitakere City Council,

Fletcher Building.

Beacon's vision of:

Creating homes and neighbourhoods
that work well into the future
and don't cost the Earth

will be realised through the achievement of the following two goals:

1. To bring the vast majority (90%) of New Zealand homes to a high standard of sustainability by 2012 and;
2. That every new subdivision and any redeveloped subdivision or neighbourhood from 2008 onwards be developed with reference to a nationally recognised sustainability framework.

The consortium has been established to bring about significant improvement in the sustainability of the residential built environment in New Zealand, by carrying out research, managing resultant Intellectual Property, and facilitating development and increased availability of products and systems via emergent markets, through working together with like minded organisations, and by lobbying regulatory authorities.

Beacon intends to develop interventions, which meet sustainability goals in a manner that aligns with consumer lifestyle and choices, achieving home quality and comfort with appropriate affordability.

Beacon is committed to funding research and initiating projects on interventions that will enable a more sustainable residential built environment. This will assist New Zealand building and construction industry to deliver and consumers to adopt more sustainable residential built environment outcomes, ensuring better returns (social, environment, cultural, and economic) for shareholders, stakeholders and the wider public.

Submission

This submission is in two parts, firstly an outline of the key points that Beacon Pathway wishes to make about the draft NEECS and then specific answers to the questions posed in EECA's feedback form.

Key Points

1. Focus on Stepwise Change

In order to achieve significant energy efficiency in New Zealand, and reduce the amount of greenhouse gases we produce, a focus on stepwise change is needed. The government's vision around Carbon Neutrality, and meeting our Kyoto commitments will not be met without it.

EECA's current suite of programmes are small-scale and will result in only gradual incremental change. There are very few completely new initiatives proposed within the NEECS – yet somehow it is expected that significant increases in energy efficiency will occur.

The NEECS needs to have an ambitious vision, set bold targets and then identify and implement the methods to achieve these. Minor tweaking or expansion of existing programmes is not enough to halt the pattern of increased consumption, let alone address New Zealand's Kyoto commitments or get New Zealand on a path to Carbon Neutrality.

Stepwise change will not be achieved without significant investment in new and expanded programmes, and without the necessary underpinning regulation to eliminate the most inefficient products and processes. Given the potential liability (anything from \$500 million to over \$1 billion) we face from not meeting our Kyoto targets, substantial investment in energy efficiency as a method to reduce our emissions is warranted. This requires more than schemes which offer \$300 off the interest paid on a solar hot water system – it means real incentives which will promote significant uptake in more efficient technologies – and need to cover the range of different types of energy efficiency programmes, targeting the areas where

biggest gains can be made for the level of investment. It also means ensuring that the industry, producers, suppliers and installers can deliver on installation and on-going maintenance.

2. Housing and energy efficiency

New Zealand's stock tends to be cold, damp, and unhealthy for many. Our dwellings tend to encourage considerable consumption of energy, water and materials or, in the case of heating, widespread acceptance of low and unhealthy temperatures.

There are significant gains which can be made from focusing on increasing the energy efficiency in homes. This needs to be undertaken with a view to upgrading homes to a high standard of energy efficiency, not to "slightly better" standards.

The current EECA insulation retrofit programme, while laudable in its objectives, only achieves minimal energy efficiency outcomes because it requires only 'slightly better' than the current state. Beacon research (and the findings of similar research programmes overseas) indicates that the minimum insulation upgrades being undertaken through EECA subsidies are resulting in energy savings being taken back in comfort gains –because our homes are still not performing well enough to achieve minimum World Health Organisation standards in terms of temperature. Such programmes need to be radically overhauled to include maximum for the housing type, rather than minimum levels of insulation retrofits (to a "best" standard) and also include a carbon neutral, energy efficient heating device such as a pellet burner or low emission log burner. Only then will they result in both energy efficiency gains and the substantial indoor environment quality improvements needed.

HEEP¹ tells us that 36% of the energy in households is used by 20% of the houses – these are the homes which need to have energy efficiency programmes targeted at. HEEP also tells us these high energy using homes are no warmer than others, so it can be inferred that significant energy efficiency gains can be made from improvements in the thermal envelope and heating method of these high energy using homes.

As well as addressing our existing homes, we need to stop building inefficient homes. The Auckland NOW Home® uses 33% less energy than a comparable home, yet cost no more to build. Despite their high appliance use, the efficiency of the home means that the current occupiers use 45% less energy than in their previous house. While clearly some energy takeback has occurred by the family and their appliance use has increased, the home is substantially mitigating against this.

The Building Code minimums need to be lifted to achieve these kinds of outcomes. While the energy efficiency provisions recently proposed are a good first step, that is all they are. The time for their introduction, and the level at which the standards are proposed to be set is still too low.

There is also a desperate need to increase the energy efficiency of domestic hot water systems. If the New South Wales Government can introduce hot water efficiency standards which effectively eliminate electric hot water cylinders, (which are inefficient users of energy) in new homes, why is this not possible in New Zealand?

¹ BRANZ (2006) HEEP Year 10 Report

3. Renewables generation – local, distributed systems

If we are to adapt to climate change, as well as mitigate its impact, then resilient carbon neutral solutions are needed. More emphasis on local distributed renewable energy is needed. Small-scale, local level wind power, micro hydro (not just smaller macro hydro), biomass and solar generation are all possible at the local/neighbourhood level and are far more likely to gain community acceptance. For example, a series of small wind turbines powering a local community of a few hundred homes will be much more widely accepted than the current large-scale wind farms. Their impacts would be lower, and if they allow communities to be more self sustaining, those impacts will be more widely accepted.

Low emission wood burners and pellet burners are an obvious technology for the development of a major promotion programme similar to that which is being undertaken for solar hot water, but (as with solar water heating), require much higher levels of incentives to ensure market uptake.. HEEP tells us that homes heated by wood burners are the warmest and driest in the country – and in colder areas they are also a very suitable method of heating hot water.

4. Incentives need to be smart, targeted and realistic

The Environment Canterbury Clean Heat programme has demonstrated what a well designed incentive programme can achieve with market transformation at a regional level. Nationally the Electricity Commission's investment in the Compact Fluorescent lamps has achieved a high level of uptake and indicates the level of engagement required to succeed across consumers, power utilities and retailers.

Current incentives programmes offered by EECA are insufficient and poorly targeted to achieve significant uptake. The solar hot water loans scheme is a case in point. Market research by Beacon shareholders indicates that most people currently renovating their homes fund small-scale renovations (such as hot water system replacement) out of cash – not by taking out a loan. The additional paper work and lack of direct incentive means this is a poorly targeted, ineffective tool. In comparison, Environment Canterbury offers a suite of well-targeted incentives which differ for different parts of the market. For example, low income households (community service card) get FREE upgrading of their insulation – to “better” rather than minimum standards as well as a FREE heating device. Landlords get a 40% subsidy towards the insulation and heating device and all other homeowners are offered the choice of either direct subsidies of \$3.50/m² of insulation, \$500 off the cost of a nominated efficient heating appliance and \$100 towards fireplace removal or an interest free 10 year loan on their upgrade.

5. Good urban form is fundamental to achieving energy efficient transport

Beacon Neighbourhood Research strongly identifies the link between urban form and energy efficiency, and overseas research (eg Peter Newman²) identifies that people in inner city apartments can use up to 15 times less total energy than a person in a poorly connected peripheral suburb – largely because of transport energy use. Yet peripheral, badly connected, isolated edge development continues to be our favoured form of urban development. Strong underpinning regulation is needed to promote good urban form – perhaps with Councils held directly responsible for the carbon impacts of unsustainable urban planning as a way of sheeting home the consequences of poor decisions.

² See for example: Professor Peter Newman keynote address - Sydney Futures Forum Wednesday, 19 May 2004

Significant increases in travel demand management programmes are also needed. Within the Auckland Region there has been tremendous success from the small number of currently funded programmes. Based on current funding, a 21% increase in greenhouse gas emissions and a 26% increase in transport energy use will occur in Auckland alone by 2016³. It is a national issue to turn this around and again programmes need to focus on stepwise rather than incremental change.

6. Regulation is required around energy efficiency – incentives are not enough

There appears to be a strange reluctance in New Zealand to regulate for reasonable minimum standards around energy efficiency. As has been demonstrated overseas (eg in most of Australia), introduction of high minimum standards around energy efficiency has a very low additional cost to new homes. For example, the New South Wales Department of Planning identified the following costs for implementation of a 25% reduction in energy use for new homes when compared to a standard new home through the mandatory application of the BASIX model.

BASIX 25 Energy rating & Thermal Comfort – Actions and Cost for single dwelling⁴

Target for July 2004	Actions	Additional Costs for a Typical Single Dwelling
BASIX 25 rating	Gas hot water system – high efficiency (5 star)	\$757
	Ceiling fans	\$1805
	Well ventilated refrigerator space	\$40
	Outdoor clothes line	\$416
Thermal Comfort	External shading (600mm eaves)	\$860
	Wall insulation	\$1100 *
TOTAL COST		\$3878

Beacon also believes that in addition to introduction of high minimum standards for NEW Homes, the government needs to consider introduction of regulation requiring retrofitting of existing homes for greater energy efficiency. This could be in conjunction with the introduction of the HERS Scheme. For example, homes could be required to be insulated to meet a minimum standard at time of sale, or at time of rental. BRANZ data would indicate that currently between 700,000 and 900,000 New Zealand homes are not insulated to current, inadequate, Building Code standards.

Thirdly, Beacon believes that higher minimum standards around energy efficiency of appliances must be introduced. Many households are continuing to purchase cheap low efficiency appliances without realising the ongoing running cost impacts. Victoria Australia, for example, has introduced a requirement for appliances on sale to meet 4 star energy efficiency standards. New Zealand needs to do the same. It is possible for example, to buy a 5.5 star energy efficiency fridge, so there are not technological barriers to their production. When ongoing running costs are considered, energy efficiency appliances for the householder are a “no brainer” yet unfortunately voluntary measures have not been sufficient to eliminate low energy efficient appliances.

³ Auckland Regional Council (2005) Auckland Region Land Transport Strategy

⁴ Source NSW Department of Planning. Summary of BASIX Cost Benefit

Response to EECA Questions

Question 1 Within each sector, do we have the right mix of actions?

- Very few new actions are proposed, most are just extensions of existing programmes. It has to be asked, if existing programmes haven't achieved our targets in the past, why do we expect they will in the future?
- Generally actions should be developed which achieve multiple objectives. For example, prioritising local renewable distributed generation at a neighbourhood or household/business level would result in a reduction in greenhouse gas emissions, an easing of demand on carbon emitting generation sources, and greater resilience in local communities.

Question 2 Do you have suggestions for prioritising actions within each sector?

- Actions must be prioritised on the basis of their contribution to stepwise change and whether they will contribute to multiple objectives. For example, targeting high household energy users for high thermal performance improvements, coupled with renewable household level space and water heating initiatives would result in greenhouse gas reductions, reductions in peak load on the grid, improved public health (because they have cold, damp homes too) and greater resilience of local communities.

Question 3 Have we assigned accountability for actions to the right agencies? If not, who should be responsible for those actions?

- There is a general concern that this could be EECA "passing the buck". Other government agencies need to be accountable, but that should not be used as an excuse by EECA in the future for NEECS targets not being met. Surely there is the opportunity for EECA to take a leadership role and accept the responsibility for ensuring other government agencies and departments achieve their targets.

Question 4 Do you consider that the proposed approach towards setting targets and performance indicators, as described on page 63, is appropriate? If not, why?

- The proposal to use CO₂ emissions to ratios of GDP/population/total primary energy supply as indicators to measure progress is opposed. In order to meet our Kyoto commitments - and the government vision of carbon neutrality - we need to reduce the TOTAL CO₂ emissions, not just the relative emissions.
- Similarly indicators which measure emissions/energy use per floor area are flawed as this can mean increased building size – and increased energy and CO₂ emissions are disguised.

Question 5 Do you agree with how progress towards meeting targets and progress indicators will be monitored?

- No, as discussed in Q4. Bold positive actions are required.

Question 6 How can local government and non-government agencies work with central government to improve the uptake of energy efficiency and renewable energy?

What is needed to enable this to happen?

- There is considerable cynicism at a local government level around working with central government, as often a “divide and conquer” approach seems to be being used and successful programmes such as the Energywise Councils Partnership have been dumped. Local government is however much better placed than central government to deliver actual energy efficiency on the ground as it has a direct and close relationship with its community. But this requires EECA to devolve decision making and funding to a more local level – promotion of local Energy Efficiency Plans – where bulk funding for initiatives is provided, could be one way of doing this. Within an appropriate framework, local energy efficiency plans could allow local communities to determine the best methods for their communities to achieve energy efficiency targets, and the best ways to incentivise the outcomes. This would require allocation of funds from central government however – Councils do not need more responsibilities without any increase in funding.

Question 7 What contribution or role do you think non-government organisations and business organisations can make and play to improve energy efficiency and enhance the uptake of renewables?

- Such groups can have a significant role to play in terms of generating community acceptance. For example, one of the reasons why Environment Canterbury’s Clean Heat programme has been so successful has been its delivery in partnership with the local community energy trust. This differs from the much less successful model used by Nelson City Council whereby the full programme has been delivered directly by the Council.

Question 9 What role do you see, if any, for energy conserving behaviour to reduce energy use and carbon emissions?

- Critical role. Incentives must be sufficiently attractive to change behavior.
- Such behaviour should be encouraged all the time. All energy generation has an environmental effect, however minimal. Generating unnecessary energy should be avoided.

Question 10 Limited targets are currently proposed for the transport sector. There is an opportunity to include more specific transport targets that apply at a local level, e.g. increased modal share of public transport. What targets would be appropriate to include in the final strategy?

- Energy use and greenhouse gas emission reduction targets are required – and need to be underpinned by both better regulation and a stronger range of demand management and mode switching programmes.

Question 11 Do you think there is an opportunity to increase the energy efficiency of freight movement? And if so how do you think this could best be achieved?

- There is significant opportunity, particularly in the area of long distance freight movements. The proposed Shipping Strategy is supported. Effectively road freight is being subsidised over rail and shipping with the ongoing heavy investment in roading. This needs to be transferred to investment in rail and shipping.

Question 12 Do you think we need one renewable energy target or specific sector targets? What measures are needed to achieve a target or targets?

- Specific and ambitious sector targets are needed. Measures need to be SMART.
- A matrix of targets which include National targets, targets by sector and by region are needed.

Question 13 Is setting a renewable electricity target appropriate?

- Yes – again how about something ambitious like 100% renewable generation by 2020 (through a combination of building, neighbourhood and larger scale facilities)

Question 14 Are there other targets we should be using for the electricity sector, e.g. a low-carbon electricity system target?

- We should have targets such as annual reductions in **Total** carbon emissions

Question 15 Are there any big opportunities that have been overlooked in this draft?

- The opportunity to set a strong vision, clear goals and targets and a ambitious well funded programme to achieve them.
- Regulation to eliminate low efficiency (eg 1 and 2 star) appliances – many of these are manufactured in China and still contain CFCs – which as well as damaging the ozone layer are themselves greenhouse gases.
- Recognition of emerging technologies (eg LED lighting) and putting in place the regulatory framework (such as a date for eliminating incandescent bulbs) to promote faster market penetration and price reduction
- Recognition of the potential to promote low emission wood burners and pellet burners as space heating/ water heating sources and run programmes similar to that in place for solar hot water.
- Recognition of the urgent need to target high energy users with incentives and information programmes about how to get a better quality of life through energy efficiency measures.
- Setting high standards of efficiency for imported cars, and requiring emissions standards for them, and for warrants of fitness. There is a strong correlation between emissions which create local air quality pollution and poor fuel performance.
- Generally transport actions proposed are weak and will not achieve total transport energy reductions.

- Government could provide a lead role in demonstrating efficient low carbon farms through its SOE Landcorp, as could many councils who own farms. For example the ARC is the largest farm owner in the Auckland Region and has achieved substantial energy and greenhouse gas emission reductions over the last 4 years – while maintaining it's level of profitability.
- Solar panels on large industrial roofs would be a great demonstration project. Freyberg in Germany has a “solar city” approach and use of large industrial buildings for solar generation is a key part of their approach.
- Development of an incentive programme for replacement (rather than just cylinder wrapping) of old (pre 1990? Pre 1985?) electric hot water cylinders with solar hot water, hot water heat pumps or wetbacks.
- Accelerate proposed changes to the Building Code.
- Stop measuring the thermal performance of homes relative to 1977 Building Code standards – these are 30 years old. How about assessing houses against a standard of whether they can achieve World Health Organisation minimum temperatures with a set amount of energy?
- Consider the energy efficiency benefits of water efficiency. Any strategy around energy needs to also consider the energy costs associated with collecting, storing, transporting, treating, use and disposal of water. This can be a significant cost and energy use which is not currently considered in water planning. Decisions to, for example, build a new water supply dam (as is currently proposed in Wellington) instead of introducing measures to promote efficient use of water, will incur significant extra energy costs in:
 - Construction
 - Operation (eg pumping stations, pipe network)
 - Disposal of wastewater
- Hot water is a major energy use in households (approximately 30% of household energy consumption), the majority of households do not have low flow devices. New hot water systems are often high pressure mains systems, and these will exacerbate the problem. Use of flow restrictors on taps and low flow shower heads will therefore have a significant positive benefit in terms of both water and energy efficiency.